

# THE CDIO FRAMEWORK IN UNIVERSITY DESIGN: UCEN PROJECT, GUATEMALA

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## ABSTRACT

Describes the conception and design of a new university motivated by socioeconomic conditions and their impact on higher education in Guatemala. How the proposal for this innovative paradigm incorporates CDIO standards and active, participatory learning practices is significant. Included are the principal features of the **UCEN** Education Model: learning outcomes based curriculum, faculty development, supportive learning environment, and relationship with society. The paper presents the plans for curriculum structure, inspiring first year program, active learning methodologies, student support services, university social responsibility, and program evaluation. There is a brief presentation of the financial and management model of **UCEN** before the conclusions. Most significant is how the proposal for this innovative paradigm is motivated by socioeconomic conditions and their impact on higher education in Guatemala.

## KEYWORDS

Establishment of a New University, Education Model, Design of Higher Education Institutions, CDIO Framework Application.

## I. INTRODUCTION

This paper presents the model for a new university to open in 2015 in Guatemala - Central American University of Applied Knowledge (UCEN). A multi-disciplinary team has spent three years in research, design, and the ongoing authorization process. The principal challenges deal with the socio-economic reality of any developing country and its effects on education systems, which are particularly severe in Guatemala.

Guatemala's population in 2012 was 14.6 million, of which 40.3% live in poverty and 13.3% in extreme poverty [1]. The social disparity is reflected in the education. In 2011, the net schooling rate for primary schools was 93%; for junior high school (called "basico" in Guatemala), 43%, and high school 23% [2]. Private schools have an increasing share of the in-school population in the higher grades for various factors, including the lack of public junior and senior high schools and transfers based on parents' perceptions of higher quality education in private schools. In 2011, 10% of all students attended private primary schools; 32%, junior high school, and 69%, high school [2]. See Figure 1 for graph showing the net schooling rates for primary, junior high school, and high school.

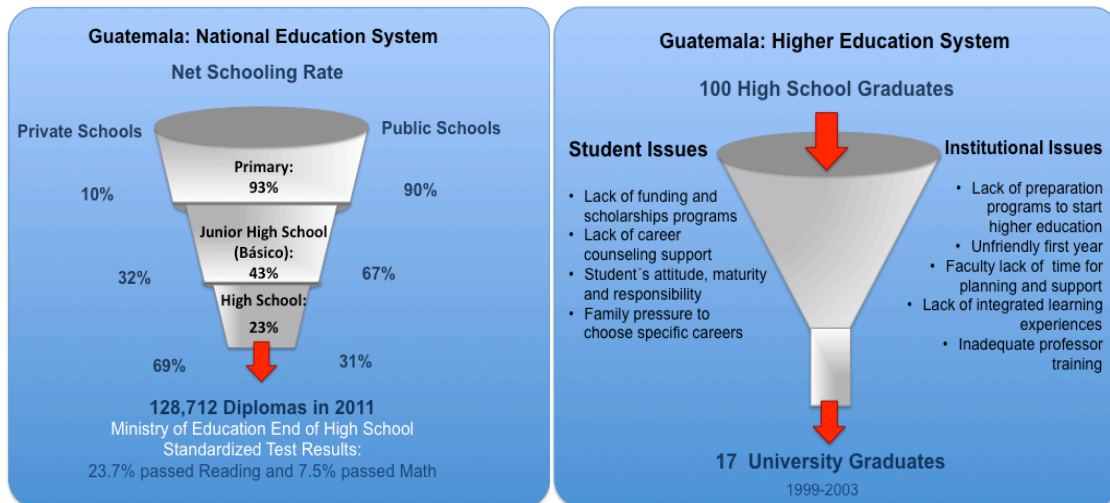


Figure 1. Guatemala's net schooling rates for primary, junior high school, and high school (left); and the drop out rate for universities in Guatemala and its main causes (right).

The most recent data for university attendance, 2010, estimated that 10.4% of the population between 20 and 34 had some college preparation. That year, 42% of university students attended USAC, the public university, and 58% were enrolled in private institutions [3].

The quality of education is evident in the results presented yearly by the Ministry of Education. In 2011, only 7.5% of graduating seniors attained the expected level of achievement in mathematics and only 23.7% in reading comprehension, with the highest achievement levels concentrated the students of a few private schools [4].

These low achievement levels pose an enormous challenge for Guatemala's universities. Only a small percentage of the population is adequately prepared to perform well at expected university levels.

There are no recent data on graduation and dropout rates. The most recent data, from 1999 to 2003, indicated that the national graduation rate was 17% [5]. One reason is that the family income of potential students from an average middle class family is insufficient to allow full time study. 83% of students who enter university never finish. The average completion time for a 6 year undergraduate program at the national university in 2005, varied between 10 and 16 years depending on the career [6]. These data alone motivated UCEN to develop a model that would alleviate most of the contributing factors and contribute to a much higher graduation rate. See Figure 1 for graph showing the drop out rate for universities in Guatemala and its main causes.

A UNESCO study (2005) reported that the principal causes for university abandonment were: 1) the lack of funding and scholarship programs, 2) high rates of unemployment, 3) students' attitude, maturity, and responsibility issues in relation to their studies, 4) lack of career counseling support, 5) students lack of academic preparation, and 6) inadequate professor training. These indicators have informed our planning of the new university [5].

While our process began with an acute awareness of the challenges, the work has led to a growing feeling of opportunity. It is an opportunity, we now see, to have an impact on

educational practices in the country.

With the unanimous support and recommendations of business, universities, and non-governmental agencies, the Ministry of Education proposed a reform of teacher training last year. Currently, Guatemala has a system of normal school preparation for instructors. Future teachers receive a high school level training utilizing the same out-dated and inadequate methods that produced such low levels of achievement in the entire system. Graduates of teacher training programs scored even lower achievement levels than the national averages – only 19.8% reached the minimum literacy level and 3.74% in mathematics [4].

The reform would require an additional university schooling for certification, but, unfortunately, with little change in traditional methodology. The resistance to the reform by the normal schools– staff, students, and their families – with long sit-ins, demonstrations, sometimes violent, suspension of classes during the past year is emblematic of the education problems that Guatemala faces.

Yet, it is in this context that we are seeing a tremendous opportunity.

During our research on university models and educational practices, we received substantial cooperation from the Academic and Professional Programs for the Americas –LASPAU–, including bibliographical references, technical assistance, bibliographical references, contacts, and training. It was through this cooperation that we learned about the CDIO initiative.

We carefully studied the CDIO standards and they constituted a central reference in the design of our educational model. In applying the CDIO standards to our work, we discovered other aspects and ramifications not previously considered. Their use also allow us to learn from the experience of other institutions and utilize, with more confidence, concepts and ideas that are quite innovative for Guatemala. The standards are imbedded in the university's design of programs and services, its evolving culture, as well as the developing plans for the physical structure and environment of UCEN.

In addition to the CDIO framework and standards, we have taken into account the World Declaration on Higher Education in the Twenty-First Century: Vision and Action of the World Conference on Higher Education of 1998, the Bologna Declaration of 1999, the results of the Latin American TUNING Project, as well as standards of the US regional accreditation bodies. The model has also benefited from generous contributions and guidance from national and international academicians from respected institutions.

Central to the model being developed are a learning outcomes orientation, student centered – active learning methods, an integrated curriculum including aspects of liberal arts, a learning resource center with on-line and laboratory services, a First Year Program, a Learning Generator, pro-active student services through the Dean of Students programs, faculty development and professor certification programs, and collaboration with private and public organizations and companies that offer students both professional experiences and part-time employment.

Beyond the long-term advantages for Guatemala of having professionals with our learning outcomes profile for disciplinary understanding and personal and interpersonal skills and attitudes involved in both the private and public sector, we see an opportunity to demonstrate

the success of this model in this context and influence educational practices throughout the system.

### ***A New University***

The promoters of the creation of UCEN are a group of Guatemalan citizens and international academics that believe in education as a critical element of development, responsible citizenship, and competitiveness in the region.

The initiative stems from a growing demand on higher education to provide high quality programs, innovative education models, and new or actualized majors to serve Guatemala's needs in a globalized 21<sup>st</sup> century.

UCEN will be private, non-profit, independent, apolitical, non-residential, and non-denominational, based on a holistic and systemic understanding of the world and human beings. UCEN will begin with the following undergraduate majors: Bachelors in Science in Business Administration, Information Technology Management, Public Administration, and Public Accounting and Auditing. The latter program is based on International Federation of Accountants (IFAC) educational and accreditation standards, as well as the recommendations of the United Nations Conference on Trade and Development (UNCTAD). These standards have never before been applied in Guatemala.

Graduate and other undergraduate programs will be developed in the future in partnership with high academic standard institutions. UCEN expects to open with 200 students and have 1,500 enrollees by its fifth year of operations.

#### *Mission*

To be a university community dedicated to exploration, experimentation, and creation as means of realizing the potential of human beings to realize their aspirations and cooperate for the common good.

#### *Vision*

To be a socially and culturally diverse university community, known for being dedicated to its students' learning; that fosters conditions that stimulate its members to learn, investigate, and develop, encouraging interaction between the academy and the environment, and integrating theory and practice.

The design of the future university has two basic elements: the education model and the financial/management model. This paper focuses on the first, and presents the latter only in a summarized manner.

## **II. UCEN EDUCATION MODEL** (See Figure 2 for a graph showing the main elements of the UCEN Educational Model)

The UCEN model is:

**Holistic and systemic.** The model promotes the integration and dynamic interaction among its

components to avoid their fragmentation and marginalization.

**Student learning centered.** The learning of the student is positioned at the axis of the model, aligning each of the components with the learning outcomes established for the programs of the university.

Through the implementation of its educational model, UCEN seeks to **graduate students who are able to investigate and understand complex situations, conceive creative solutions and implement them to serve society; integrating knowledge, skills, values and resources.**

To achieve this, UCEN seeks to provide:

- Solid and rigorous academic preparation in the various disciplines
- Cognitive skills involved in analysis and communication
- Personal, interpersonal, and professional skills development
- Ethics, values, and social responsibility required for professional practice
- Responsible citizenship attitudes
- Self confidence, creativity, and entrepreneurial skills
- Learning through experience
- Preparation for lifelong learning
- Professional practice experiences

One of the most interesting and innovative approaches that we found in the CDIO framework is how the learning outcomes (knowledge, skills and attitudes) are set in the context of the professional practice of each career, to equip students to perform effectively in the real work place.

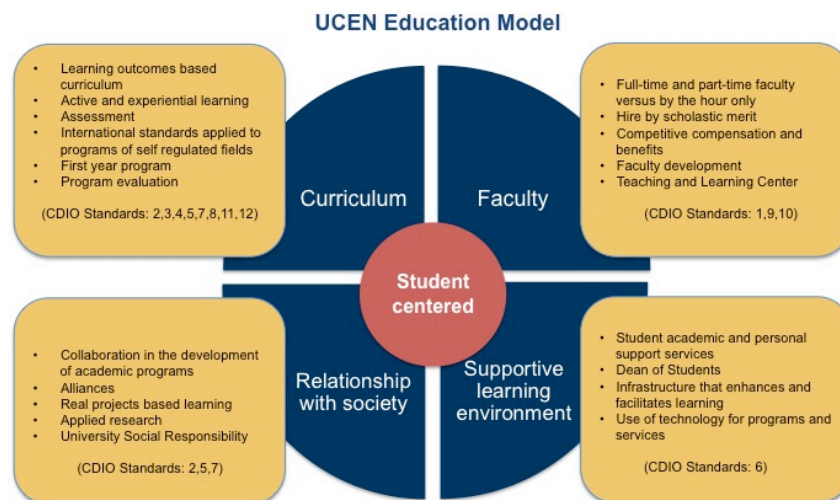


Figure 2. UCEN Education Model

## **A. Curriculum Development**

### *Learning Outcomes Based Curriculum*

Based on the graduate profile, the developing curriculum includes learning outcomes for disciplinary knowledge, skills, attitudes, and professional practice. These are integrated in the curricular map that includes courses, introductory seminars to major disciplines, and activities of the Learning Generator (LG) - a project based learning initiative connected to real businesses and organizations. The design stage seeks to clarify methods and strategies for active and integrated learning, participatory assessment, and program evaluation.

UCEN has validated the graduate profile and learning outcomes with the collaboration of international and local academics, other university students, industry representatives and practitioners from the specific field of each course of study,

In addition to the disciplinary knowledge and specific skills and attitudes integral to each field of study, the following categories of personal and interpersonal skills and attitudes have been established and validated for UCEN's programs.

**Personal skills & attitudes:** problem solving and decision making, applied research, critical thinking, initiative, preparation for life long learning, innovation and creativity, sustainable application of technology and resources, ability to identify components of an integrated system and apply multidisciplinary approaches to system analysis, integrity, responsibility, self confidence, perseverance, time management, self management, and proactive citizenship.

**Interpersonal skills & attitudes:** oral and written communication in Spanish and English, multidisciplinary teamwork, leadership, entrepreneurship, openness, solidarity, appreciation of cultural differences, social and environmental responsibility.

**Professional Administrative Skills –CPIE:** comprehend, plan, implement, evaluate.

The UCEN team is designing training activities for faculty and staff that combine faculty development and syllabus creation. By immersing the participants directly in a CDIO-guided process, they will be better equipped to comprehend, plan, implement, and evaluate learning programs that will allow learning outcomes for the students to be realized. **(Appendix 1)**

### *Active, Experiential Learning*

To ensure that students internalize content, deepen their understanding, and develop their skills, active, participatory learning is key.

Course orientation, labs, workshops, dialogue, simulations, problem solving exercises, project based learning, case analysis, action-research, cooperative learning and other activities which are specifically designed to create active learning will form the basis of the syllabi.

UCEN's design will foster shared responsibility among faculty and students. The university and faculty will provide materials and tools for interesting and challenging learning activities designed to engage the students' active participation in their own development.

UCEN will establish a unit called Learning Generator (LG) that will design, coordinate, and

implement activities to facilitate real world experience and to promote entrepreneurship through project based learning.

The LG will have its own institutional space and resources, including a group of mentor-consultants who are practitioners with experience in the consulting profession. The LG will develop alliances with entrepreneurial organizations, cooperatives, international companies, NGOs and public organizations to identify opportunities for students to design, implement or evaluate projects, creating opportunities to investigate, apply knowledge, develop professional practice skills, integrate theory and practice, reflect, and learn.

Free on-line platforms, resources, and courses will provide opportunities for students to expand their learning and for faculty to create a more flexible and open curriculum.

#### *Assessment (Methods, Training, Monitoring)*

UCEN will implement an assessment system that is 1) integral, to ensure that all learning outcomes are assessed, 2) participatory, to allow both students and faculty to use various methods to diagnose and evaluate progress in the learning process, and 3) continuous, as part of the effort to evaluate both student and faculty performance. An important function of the Teaching and Learning Center (T&LC) is the systematic and continuous assessment of learning processes, achievements, and areas for improvement. This focus on methods for assessing different learning outcomes is a crucial aspect of faculty development.

#### *Curriculum Structure*

UCEN's use of on-line-free materials, syllabi, courses, and resources will increase the academic offerings, flexibility, and quality allowing faculty to extend learning opportunity and, at the same time, reduce operational expenses.

The four initial UCEN courses of study are BS in Business Administration, Information Technology Management, Public Administration, and Public Accounting and Auditing. Each consists of Fundamentals, Management core, and Major emphasis, which areas are included in each year's studies. **(Appendix 2)**

The first block aims to develop holistic learning outcomes for science and the humanities, including elements of a liberal arts approach, and emphasizes the development of fundamental skills like problem solving and decision making, communications (mainly writing and oral presentations), team work, leadership, core personal attitudes and values, and professional ethics.

The Management block will target the development of learning outcomes for the core managerial knowledge and to reinforce skills and attitudes, particularly entrepreneurship and those within the professional context

The third block is comprised of learning objectives for the core and advanced disciplinary knowledge, skills, and attitudes for each course of study. In the case of the Public Accounting and Auditing program, capstone courses have been included to prepare students for a voluntary international certification.

The UCEN courses of study have been designed as five-year programs for students working part time. Full time students may complete them in four years.

### *First Year Program*

In Guatemala, a significant proportion of first year students abandon their studies. UCEN is developing an innovative first year program to enhance enthusiasm, insure that students have fundamental knowledge, skills, and attitudes to cope with initial college challenges, as well as engage and retain students.

This program will help students adapt to distinct forms of learning, become aware of their own learning processes, acquire required levels of knowledge and skills, develop active study and learning skills, enjoy interesting experiences that motivate them to continue learning, help them to understand the practice of the various professions, make informed decisions about the careers they will chose from in their second year, and familiarize them with the support services available.

Although important disciplinary content is included, it will be integrated with the holistic development of personal and interpersonal skills and attitudes that will prepare the student for the following years. Special emphasis will be given to writing, attaining pre-calculus level, oral communication, experiencing methods like Socratic dialogue, development of metacognition, learning good study habits, critical thinking, creative problem solving, systemic thinking, bibliographic research skills, and responsibility.

As introductory courses to the management disciplines, UCEN will offer two seminars in each semester of the first year to give the students the opportunity to better understand how the different majors are professionally practiced in real life, what professionals from each major do, and what competencies are required to be successful in their profession. Knowledgeable and experienced national professionals will facilitate these seminars, sharing their first-hand experiences with students.

The activities of the Learning Generator for the first year will include an orientation week, designed to immerse the incoming student in activities that promote creativity, solidarity, self-confidence, and get them to know the UCEN faculty, culture, and environment. The Skills Integration Seminar for the first semester will consist of activities that include case studies, discussion, media analysis, negotiation cases, creativity workshops, and research projects proposed by students, reflection activities, and a LG journal, among others. During the second semester the LG will coordinate a simulation called "UCEN Republic" in which students will represent different sectors of a country as they try resolving a real or simulated issue.

### *Program Evaluation*

A system will be put in place in order to ensure an effective and continuous program quality control. Programs will be evaluated in relation to their objectives and the university's educational model, as well as accreditation standards being studied.

University stakeholders will participate in the evaluation process: students, parents, professors, staff, and industry. Evaluations will provide relevant and reliable information for UCEN to understand achievements and challenges, formulate changes in its plans and processes with



the aim of improving and achieving its mission, purposes and objectives, determine optimum allocation of resources, and report results to authorities and stakeholders.

A planning unit will perform institutional research, making use of all data collected and analyzed by other institutional academic units, particularly the Teaching and Learning Center, whose functions include a systematic and continuous assessment of learning processes, achievements, and areas for improvement.

Various internal strategic and academic units will collaborate in the evaluation. The University Council is responsible for establishing the system and guidelines. A planning unit will support the University Chancellor in its implementation and the presentation of results. The Board of Directors will supervise the process.

## ***B. Faculty***

The usual idea of faculty does not apply to most private universities in Guatemala, where the majority of professors are hired on an hourly basis calculated on classroom activity only. Their contracts do not include compensation for time required in planning, assessing assignments and providing feedback to students, meeting with other professors, or other activities commonly associated with the concept of “faculty.” Only the national university, San Carlos, (USAC), has a high proportion of full time faculty.

Most of these professors are actively involved professionals motivated by an interest in education and the development of their field of interest in Guatemala.

UCEN plans to have a high percentage of full time professors in the first two years of the program to allow considerable time to be dedicated to planning, advising and orienting students, assessing, and organizing. For the upper year classes of the program, UCEN expects to hire a high proportion of part-time professors, and professionals with substantial experience in management and specialized fields to provide courses that are specific to each major.

UCEN plans to hire faculty by demonstrated scholastic merit and offer them competitive compensation and benefits, applying internal and external equity.

### *Faculty Development*

Faculty development is an essential component of the UCEN model. A T&LC has been designed to actively implement permanent programs for faculty development, particularly to advance competencies directly related to the learning outcomes of the UCEN programs.

UCEN is developing a training and educational competencies certification program that consists of three phases. All faculty members will participate in the first phase of the training program before beginning classes. The training will be conducted by experienced faculty and teaching innovators. Each phase of the program will include opportunities to prepare or improve course syllabi. This program will prepare teachers to effectively integrate learning outcomes, experiential learning, sound assessment practices and technology applications in their activities and help advance the UCEN education model.

The T&LC will offer workshops with international specialists in faculty development and

innovative educational practices. All its programs will be open to faculty members of other universities.

Another function of the T&LC will be to assess, monitor, and provide feedback to professors concerning their teaching practices, and to gather information for the evaluation of the programs.

### **C. Supportive Learning Environments**

#### *Student Support Services*

Besides the economic issues, a significant difference exists between the concept of student support services in universities with high graduation rates and the reactive concept applied in most Guatemalan universities. UCEN's Dean of Students, charged with advocacy for the needs of students, coaching and mentoring programs, promoting student leadership, and social responsibility activities, all designed to help students identify and resolve many obstacles to their success.

Recognizing that academic and student support services are crucial to student success and retention, UCEN will work pro-actively to address the key academic and personal factors that affect students' success, motivation, and determination to continue their academic preparation.

Among the proffered services are:

- Specific courses to reinforce writing, mathematic, and technology literacy skills
- Digital/in person library services
- The Career Portal - open to all Guatemalan students - with tools for vocational exploration and information about careers and occupations.
- Career counseling
- Early Warning System within the university to detect and respond proactively to students' academic or other major issues, channeling notifications and assigning cases to help resolve them
- Student Counseling
- Tutoring

#### *Learning Workspaces*

UCEN will start operations in a rented space. Our evaluation of the developing program will inform the design of the spaces required in the new university campus, to be built within three or four years.

#### *Admissions*

UCEN will utilize a merit-based and transparent admissions process. A conscientious admission process, coupled with an active perusal of the learning outcomes, will lead to more completion success.

A university committee will assess each student's intellectual capabilities, character, personal characteristics, and motivation in order to appraise the potential for successful participation in and completion of the program. Each student will be required to take the College Board

standardized PAA exam and submit high school academic records. In addition to these data, students will be assessed through personal essays and interviews.

#### ***D. Relationship with society***

UCEN believes in a strong and permanent interaction between universities and society. That will be achieved through taking industry and investors' needs and opinions into consideration, applied research, real project based learning, work practice, internships, and practitioners sharing their experiences.

Our first interactions used a collaborative approach to validate graduating profiles and learning outcomes. Other initiatives include the joint implementation of conferences and training with other Guatemalan and international universities in topics like accreditation, implementation of learning outcomes based curriculum, learning models and practices, international trends and standards in regulated professional practice, the evolution, trends, and standards for university libraries, among others.

Through similar interactions and technical cooperation, UCEN has also established relationships with various local, regional, and international universities and organizations.

The relationships with the private, public, and NGO sectors will be developed through the LG. UCEN is building strategic alliances with investors to establish university level work centers near the university. A study/work package will be available to assist students and provide financial sustainability for the education model.

#### ***Social Responsibility***

The programs for Social Responsibility and the LG social projects will also interrelate faculty, students, and staff with marginal communities, providing opportunities to apply knowledge and skills acquired in their programs, to propose and implement solutions to real problems within a local community. This will be done with the support of a university mentor-consultant and in collaboration with public, private, or international organizations, and NGO's.

#### ***Scholarships***

The Council of Trustees and the promoters of UCEN will lead a fund raising campaign to constitute a revolving fund for scholarships to be managed by the UCEN Foundation. These scholarships will be awarded to students with great talent and potential and limited family income. There are institutions working with poor and marginalized communities that are potential sources of students and funds for these populations.

Scholarship recipients will have to commit support for a new student through different means beginning two years after graduation.

#### ***Extension School***

UCEN will have a University Extension School that will offer continuing education courses. English as a Second Language and the certification of accounting and taxation for bookkeepers will be among its first initiatives.

### **III. FINANCIAL AND MANAGEMENT MODEL**

According to the needs determined by the financial model, the financiers of UCEN are willing to fund the infrastructure, equipment, and working capital for the first three years of UCEN's operations, if needed. The arrangement for facilities and equipment is similar to that of a project funded through leasing, but the conditions of this particular structure permit UCEN to adapt to the actual income flow. The university will also seek donations and promote fund raising to assure long-term sustainability.

Student enrollment and tuition fees paid to the University and the extension school will generate operating income. Given the endowment, donation, and scholarship practices in Guatemala, university tuitions will have to be moderate in order to attract enough number of students to make operations viable, thus making significant academic investments extremely difficult.

A conservative financial model has been prepared in order to have the tools for ex-ante evaluation, financial administration, follow up and ex-post evaluation. Integrated financial management system software will be put in place before operations begin.

The management model is comprised of human resources, procurement, infrastructure maintenance, transportation services, and administrative processes. An integrated management information system will be used to facilitate effectiveness, transparency, cost reduction, and productivity.

UCEN plans to have a lean administrative structure and make intensive use of IT. The UCEN organizational chart has been developed with few vertical levels. A set of key performance indicators will be used for keeping an effective administration.

### **IV. CONCLUSIONS**

Given the immense challenges faced by the Guatemalan education system, UCEN has the opportunity to integrate CDIO standards and creative educational practice, to innovate with an evolving learning paradigm, and to initiate systemic changes in the preparation of Guatemalan professionals.

Our research, anchored in the CDIO initiative, observation of different models, experience with creative learning practices, and interactions at higher education events have been key in convincing Guatemalan educators and entrepreneurs interested in education to challenge the traditional system and be willing to implement an innovative paradigm.

Using CDIO standards in the process of designing UCEN we learned that: 1) the basic CDIO framework can be applied to any university program, 2) the CDIO framework is a useful tool for universities at different stages of development, 3) these standards are relevant in different cultures, contexts, and sizes of universities, and 4) CDIO standards are compatible with other innovative frameworks for higher education institutions.

Although creating a well-integrated design, including the application of international standards for higher education, is a necessary first step towards the achievement of UCEN objectives, it is only in the implementation that we can demonstrate the efficacy of these learning processes.

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## Appendix 1

### Learning outcomes related to Business Administration Programs Comprehend, Plan, Implement, Evaluate – CPIE

#### 4 Context of Professional Practice

##### 4.1 Understanding the Context

###### 4.1.1 Practice of the Profession

- Internalize the objectives and roles of your profession
- Accept the responsibilities of your profession
- Explain the impact of the exercise of your profession on organizations
- Explain the regulation of your career on national and international levels
- Recognize the influence of the legal and political aspects on your profession
- Describe the process of creating norms and granting professional accreditation

###### 4.1.2 Professional Ethics

- Explain the principals of personal ethics
- Explains the values that govern UCEN
- Give examples of conflicts between situations in the practice and the ethics that govern your profession
- Identify conflicts between situations in the practice of your profession and your ethics
- Explain the relation between making an error and assuming responsibility for it
- Practice giving due credit to third parties
- Describe how to create, utilize, and defend intellectual property
- Explain development that is environmentally sustainable in relation to your profession

###### 4.1.3 Developing a global perspective

- Explain the globalization of human activity
- Compare diverse cultures
- Explain the processes of agreements and alliances
- Recognize the differences among distinct cultural organizations

###### 4.1.4 Organizational context

- Understand the importance of organizational philosophy
- Analyze the relation between an organization's culture and its results
- Infer the functioning dynamic of an organization
- Explain the nature of organizational change
- Establish opportunities for organizational improvement

#### 4.2 Planning

##### 4.2.1 Strategy principles

- Understand and integrate the necessary elements to develop a business model
- Adequately formulate a business plan and/or project
- Formulate a business strategy

#### *4.2.2 Operation principles*

- Understand the process of operational planning
- Understand the key elements in establishing objectives and goals
- Prioritize tasks to manage time effectively and complete assignments
- Focus on the work systematically and methodically
- Formulate budgets that reflect organizational strategies
- Develop processes to locate markets

#### *4.2.3 Entrepreneurship*

- Explain the need for and consequences of business entrepreneurship
- Generate ideas for a business
- Conceive a new business model
- Describe the process of starting a new business
- Describe the desirable personal characteristics of an entrepreneur
- Conduct an auto-evaluation of your own potential as an entrepreneur

### **4.3 Implementation**

#### *4.3.1 Organization*

- Describe the process of organizing
- Establish and manage the necessary systems and procedures for the operation of an organization
- Identify the technology that you can use in business operations

#### *4.3.2 Direction*

- Inspire others to move toward the business's goals
- Describe the nature of organizational conflict
- Demonstrate your negotiating skills

#### *4.3.3 Resource Management*

- Describe the processes utilized in procuring resources necessary for the organization
- Demonstrate your ability to plan and control finances
- Integrate resources for implementation or operation

#### *4.3.4 Control*

- Design and operate control systems
- Design and use strategic management indicators

### **4.4 Evaluate**

#### *4.4.1 Analyze indicators of performance to compare results with projections*

#### *4.4.2 Explain factors affect performance*

#### *4.4.3 Predict the impact of obtained results*

#### *4.4.4 Recommend corrective measures to improve performance*

#### *4.4.5 Create processes that will produce improvement*

## Appendix 2

### UCEN Curricular structure Public Accounting and Auditing – 10 semester program

1A	Algebra	Communication	Introduction to Management and Public Administration	Seminar: Public Administration and Business Administration	Skills Integration Project
1B	Pre-calculus	Social Science	Microeconomics and Macroeconomics	Seminar: Public Accounting and Auditing, and IT Management	Skills Integration Project
2A	Statistics	Information Technology	Statistics for Business	International Business and Globalization	Skills Integration Project
2B	Lógica	Análisis social	Introduction to Financial Accounting	Business Law	Skills Integration Project
3A	Society and Politics	Applied Science	Financial Management	Financial Accounting	Skills Integration Project
3B	History	Political Science	Introduction to Marketing/International Environmental Analysis	Financial Management	Skills Integration Project
4A	Project Management	IT Management Applications	Financial Management and Advanced Accounting	Taxation	Skills Integration Project
4B	Introduction to Human Resource Management and Organizational Behavior	Introduction to Entrepreneurship	Assurance and Auditing	Elective I	Skills Integration Project
5A	Business Law	Information Systems Strategy	Strategic Financial Management	Professional Practice and Ethics	Skills Integration Project
5B	Public Policy and Development Issues	Governance and Risk Management	Capstone	Elective II	Skills Integration Project