



The 'New' Normal of Business Education in a Post Covid Era: *The CDIO Approach*

By:

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**Venue: School of Business
Kuwait University**

Wednesday, 12 of January 2022

Presentation Agenda

- The Evolution of Business Education
- The Evolution of Business Profession.
- The Role of Business Colleges.
- Business Education and Innovation.
- Innovation Business Curriculum Framework.
- The CDIO Model: Context, Standards and Syllabus.
- CDIO Standards for Business Education.
- CDIO Syllabus for Business Education.

Why Business Education ?

The Evolution of Business Education

- Higher demand for goods
- Increased globalization (communication & transport)
- Many upcoming factories in Britain
- Rise of labor work in factories
- Management theories focused on administration of civilizations rather than business (economy)

Industrial revolution

19th century

Early 20th century

Organizational management principles

1949

- Focus shifted from job to workers who performed those jobs
- Business education focused on recruitment, employee relations, training, incentive planning & effective leadership
- Business education emphasized participative and group decision-making, motivation and leadership
- This led to the US legislature passing fairer employment practices and widespread focus on Human Resource Management, soon a new component of Business Education.

Modern management theories

20th century Late

- As a result of the recession and partly as a result of technological changes
- Education and creation of businesses are viewed as the driving forces for economic growth
- Promotion of entrepreneurship has become one of the priorities of governments and other organizations
- Number and diversity of courses offered in entrepreneurship have increased over the past two decades

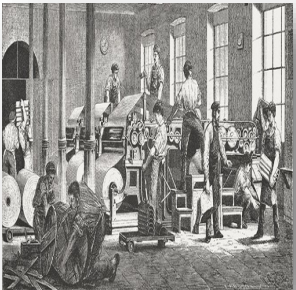
Early 21st century

Digital marketing
MIS
Social responsibility

Present

- To compensate for short supply of skilled labor
- Focuses on doing each task/job at shop level
- Management theories focused on time and motion studies at the factory level to increase efficiency

Scientific management theories



- Emphasizes top level of management
- Systematizes the administrative approach to management
- Relates to functions performed by a manager
- Focus of theory was on planning, organizing, coordinating, commanding & controlling

Human relations and behavioral theory



- Increasing complexity of organizations
- Emphasizes on multi-disciplinary and future-oriented approaches
- Considers the impact of mathematics, sociological, behavioral, technical, and other sciences
- This led to students being educated in statistics, research and problem solving

Innovation and entrepreneurship



3 Oldest Business Schools

ESCP Business School

(École Supérieure de Commerce de Paris)



Established in 1819

Jean-Baptiste Say
Economist & Businessman

Wharton University of Pennsylvania



Established in 1881

Joseph Wharton
Steel Maker

Harvard Business School



Established in 1908

School of Arts

Evolution of Business Education

Currently

- Teaching change management courses
- Emphasis on statistical analysis, applied research, and strategic management
- University funded entrepreneurship centers encouraging student innovation
- Integrating technology with business- operations research, management information systems, digital marketing, big data analysis, modeling, and simulation (in finance)
- Sustainable business practices- corporate social responsibility and ethics courses
- Introduction of hands-on and interactive learning experience
- Talent in HR Management
- Branding
- E-Commerce
- E-Banking
- Effective Management in Times of Crisis.
- Growth Management



The Evolution of the Professional Business Context

Evolution Seen in the context of Business Profession

Sustainability

Globalization

Innovation

Leadership

Entrepreneurship

Knowledge Economy

Demographics

Technological Change (Disruptive Technology)

Market Research

Extrapolation & Interpolation

Monopoly

Efficiency and Quality Measures.

Corporate Governance

Social Responsibility

Green Responsibility

Exponentiating technologies,

Business Plan

Mobility

Business Research

Business Review & Growth

Business Benchmarking

Flat Organization

Strategic Thinking rather than Strategic Planning

Pattern Recognition



The Evolution of the Professional Business Context

Strategic Thinking and Planning

Effective strategic thinking requires:

- Curiosity
- Creativity
- Boldness
- Open-ended thinking
- Pattern recognition
- Problem-solving

Effective strategic Planning requires:

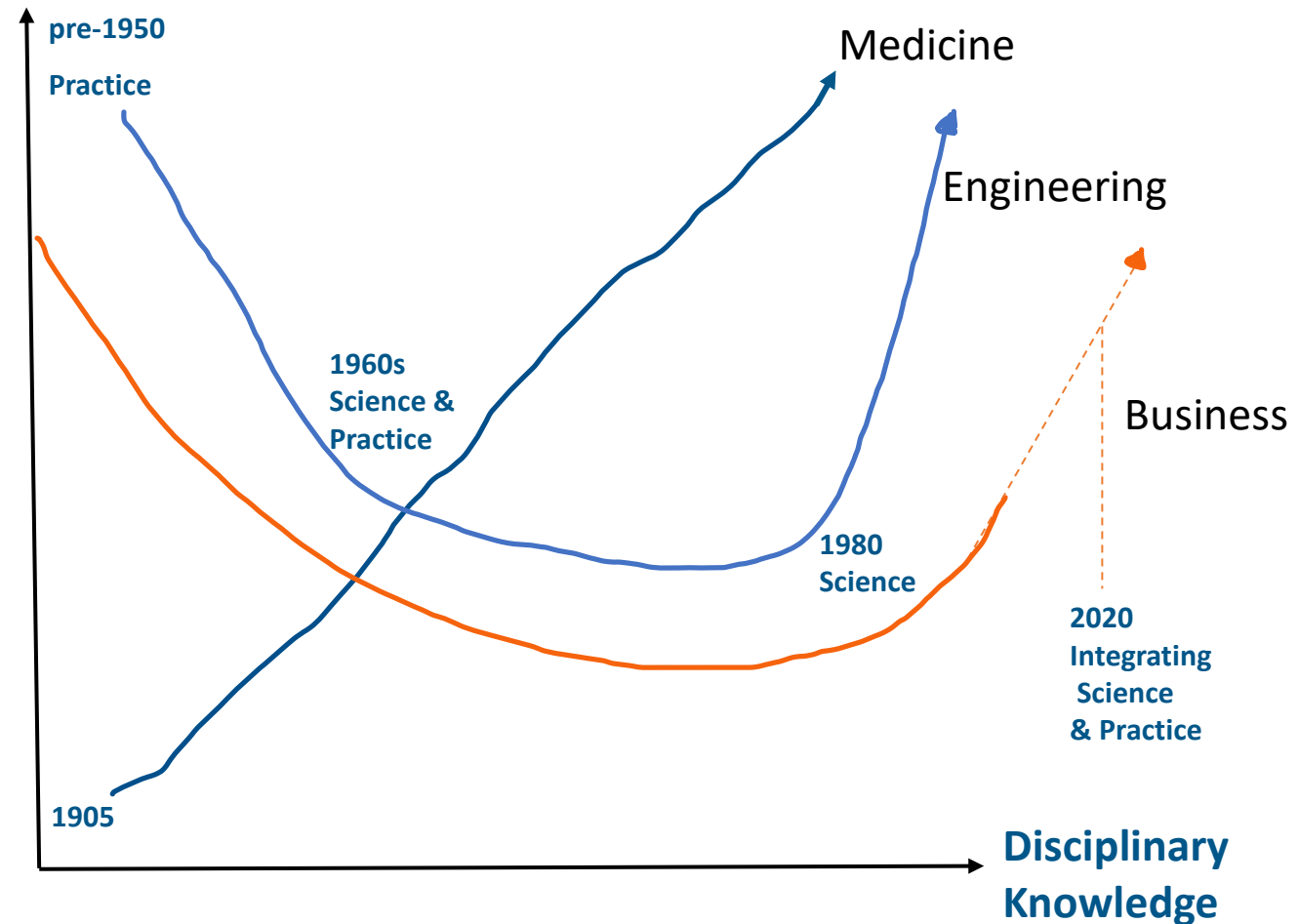
- Organization
- Prioritization
- Critical thinking
- Risk management
- Communication
- Flexibility



<https://www.strategyskills.com/solutions/strategic-planning-and-facilitation/strategic-planning-process/>

Development of Business Education

Personal, Interpersonal, Innovation, System Building, Implementation, Collaboration, Professional Skills & Practice.



Business Professionals need both dimensions, and we need to develop education that delivers both



The New England Journal of Medicine
American Medical Education 100 Years after the
Flexner Report

**MEDICAL EDUCATION
IN THE
UNITED STATES AND CANADA**

**A REPORT TO
THE CARNEGIE FOUNDATION
FOR THE ADVANCEMENT OF TEACHING**

**BY
ABRAHAM FLEXNER**

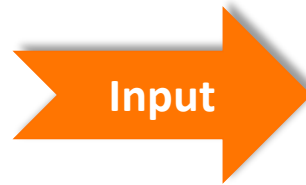
**WITH AN INTRODUCTION BY
HENRY S. PRITCHETT
PRESIDENT OF THE FOUNDATION**

BULLETIN NUMBER FOUR (1910)
(Reproduced in 1960)
(Reproduced in 1972)

**437 MADISON AVENUE
NEW YORK CITY 10022**

The Learning Context for Professional Practice

- A focus on the needs of the customers, clients, and the society.
- Delivery of products, processes, services and systems.
- Incorporation of inventions and new technologies.
- Stewardship of the environment and the working place.
- A focus on solutions, not disciplines.
- Working with others and providing leadership in technical endeavors.
- Communicating effectively.
- Working efficiently, within resources, and/or profitably.



The Context of Business Education

Direct the learning process toward the professional practice

Benefits of Learning in the context of the Business professional practice

Learning in the context of professional practice:

- Increases retention of new knowledge and skills
- Interconnects concepts and knowledge that build on each other
- Communicates the rationale and relevance of what students are learning
- Enables students to build their own frameworks for learning



University

Workplace

The Business-Oriented Professional

Attributes

Survey

The business-oriented professional, is the one who has attained and continuously enhances technical, communications, and human relations knowledge, skills, and attitudes, and who contributes effectively to society by theorizing, conceiving, developing, and producing reliable structures, devices, systems and services of practical and economic value.

The industry looking for graduates with a specific set of business-oriented attributes facilitating:

- Understanding of Economics
- Data Analysis
- Financial Accounting
- Negotiation
- Business Management
- Leadership
- Inter and Intra Effective Communication.
- Emotional Intelligence
- Decision-Making
- Networking
- Business law

Internships & E-Internships

Critical Thinking

Pattern recognition

Curiosity



The Business-Oriented Professional

Quick Industry Survey-Soft Skills

To better understand the needs of business education; we conducted a survey with the industry.

This is what they had to say:

We need to focus more on:

Business communication

Motivation and ownership

Flexibility

Real-life experiences

Attitude

Work ethics

Money Education

Personal and life skills

Knowing the real workplace

More practicality

Analytical skills

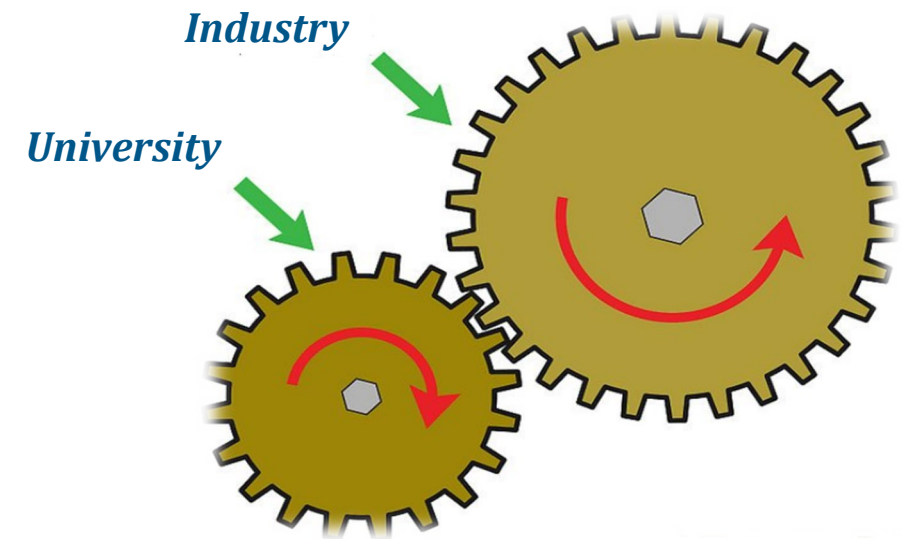
Participating in internship opportunities



The Big Question

What is the role of Business Colleges

- What Business colleges should do to prepare the graduates to be able to become business-oriented professionals entertaining the required attributes.
- The Business Education developers should look at *the context* of business profession very closely to perform the required reform



Which one is gearing the other

The Purpose of Business Education

- Business Schools aims to connect business education and human life to develop graduates who are creative, adaptable, have business knowledge and management skills with an entrepreneurial spirit and are socially responsible citizens.
- Most importantly, business schools should aim to create professionals with an entrepreneurial mindset who are able to make an impact and change the future.
- Business schools play a crucial role in optimizing the way private corporations and public institutions are managed. The aim is to develop and sustain better standards of living in a global free economy.
- In this sense, business schools need to closely examine their curriculum development with an innovative perspective.

Business schools should be engines for social and economic development

Challenges Facing Business Education

Simulation Labs for :
 Management
 Banking
 Human Resources
 Marketing
 Branding
 Event Management



Shifting Student Demography

School of Business Facilities

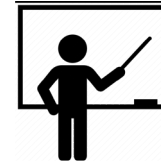


The University Strategy and Governance Model

Pedagogical Approaches



Relevant Academic Research



Faculty Readiness

*Facilitators
 Mentors
 Advisors
 Engagement*

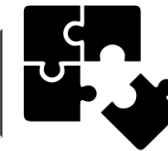
Importance of Innovative Partnership



University Degrees Vs. Professional Certificates

Big Threat from Agencies

Disruptive Technologies



Forms of Learning

*Project Based Learning
 Problem Bases Learning
 Capstone
 Cooperate
 Research Base Learning
 Flip Classes
 Technical Visits
 Case Studies
 Surveys*

Transform the challenges into drivers

Central Questions for Business Colleges

Need to Know

What is the professional role and practical context of the profession(al)?

Program Learning Outcomes

What knowledge, skills and attitudes should students possess as they graduate from our programs?

Pedagogy Implementation

How can we do better at ensuring that students learn these skills?

We need to *innovate*:

The Programs

The Workplace and Facilities

The Teaching & Learning Pedagogies

The Assessment Tools and Methods

We need to *professionally rehabilitate*:

The Faculty Members

We need to *engage*:

The Students & the Stakeholders

Understanding Innovation within the Context of Business Education

What is innovation?

Disruptive (new way), Sustaining (better way), Efficiency (doing more for less)

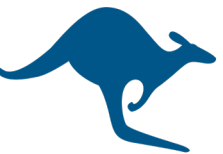


Innovation in business education?

A significant change in selected educational practices. It means doing new things and doing existing things better.

Why is it hard?

- Higher education systems are known to be rigid in management
- Universities have been referred to as 'dinosaurs' and the staff as 'men in their ivory towers'
- University personnel are not well trained in innovation practices.



Understanding Innovation Culture within the Context of Business Education



Understanding Innovation within the Context of Business Education

Leadership (Not Managers)

University leaders must have a clear vision and ask the hard questions.

Communication Strategy (with stakeholders)

University leaders must be clear and transparent in their communication with clearly defined objectives and outcomes.
They must also champion engagement of stakeholders by two-way dialogues.

Resource Allocation

Universities must invest in professional development opportunities.

Capacity, Structure & Process (Change the Mindset)

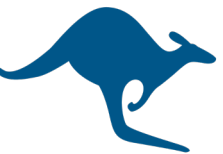
Universities should adopt a growth mindset where every member of their community is important for the success of innovation.
Correct structures and processes must be set-up.

Learning Piloting

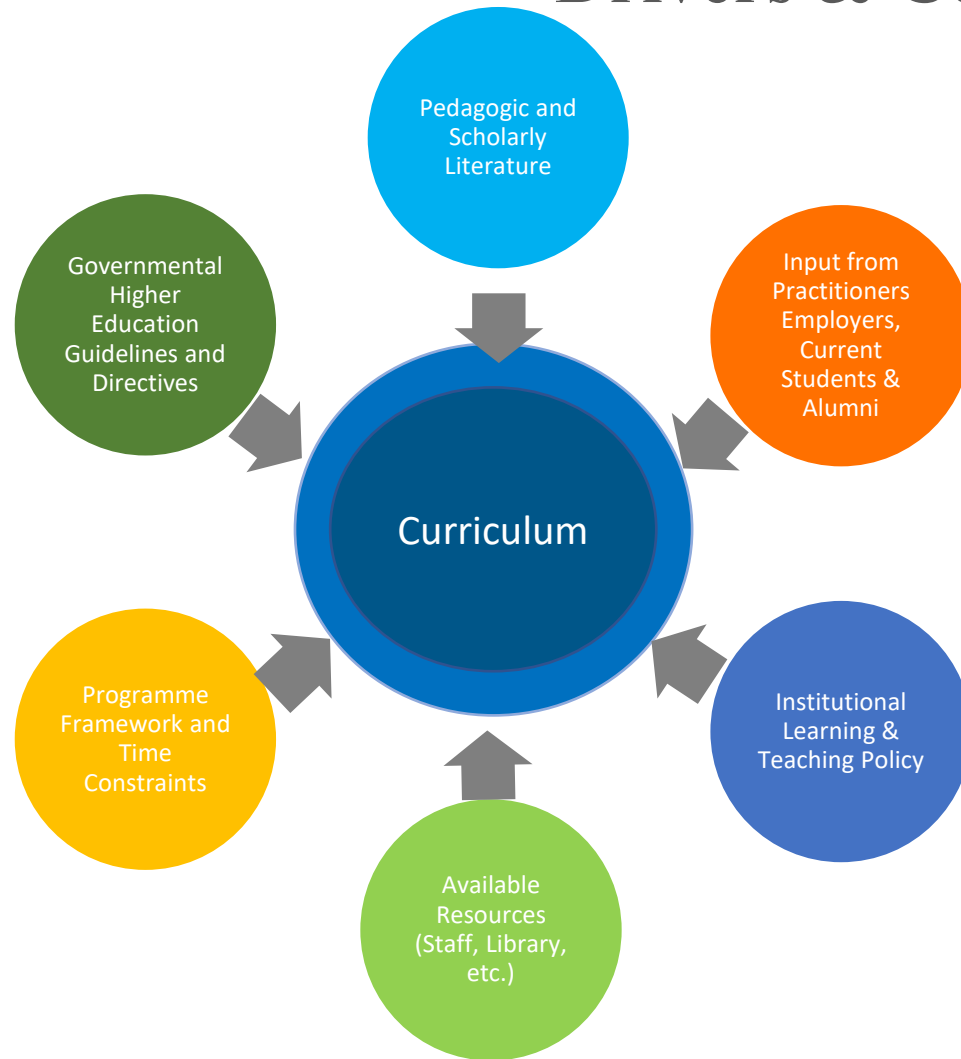
Change leaders should pilot small-scale version of change concepts before moving forward.

Rewards Policy

Leaders should work towards creating a policy environment that promotes and rewards innovative behaviors.



The Innovative Business Curriculum Development Drivers & Constraints



The way educational content is organized and presented in the classroom to meet different learning needs (Zhao 2006).

The curriculum is viewed as a political and social agreement that reflects a society's vision while considering local, national and global needs and expectations (UNESCO IBE 2021). Within the context of Higher Education.

https://www.researchgate.net/publication/283371058_Improving_International_Marketing_Programs_to_Reflect_Global_Complexity_and_Risk_Curriculum_Drivers_and_Constraints/download

The Innovative Business Curriculum Characteristics

- Reforming its paradigm from a teacher-centered model into a learning-oriented one.
- Curriculum to reflect local, national and global needs and expectations.
- Engages students and faculty in interdisciplinary education.

- Students at the forefront being drivers of their knowledge.

2.4.7 Critical thinking

- 2.4.7.1 *Purpose and statement of the problem or issue Assumptions*
- 2.4.7.2 *Logical Arguments and solutions*
- 2.4.7.3 *Supporting evidence , facts and information*
- 2.4.7.4 *Points of view and theories*
- 2.4.7.5 *Conclusion and implications*
- 2.4.7.6 *Reflection on the quality of the thinking*

- Inspiring creativity and analytical and **critical thinking**.

- Experiential learning environment.

- Learning to Transform Oneself and Society.

- Developing entrepreneurship **mindset**.

4.2.3 Entrepreneurship and relationship between enterprises, the economy & the global market

- 4.2.3.1 *Entrepreneurship opportunities that can be addresses by technology*
- 4.2.3.2 *Technologies that can create new products and systems*
- 4.2.3.3 *Entrepreneurial finance and organization*



The Innovative Curriculum Framework

- We designed a comprehensive innovative curriculum roadmap that can be used by business schools when they intend to reform their programs of study.
- It is dynamic and iterative and allows users to use each component independently and create tasks within them.
- It directs the thinking process and can be used to design/redesign a course, a project, assessment/assignment or an entire business curriculum.

Taking into consideration the teaching & learning dimensions

The Basis for Innovative Curriculum

The 7 Pillars of Teaching and Learning

- 1 Engaging and intellectually stimulating learning experiences
- 2 Integrate theory and practice
- 3 Learning experiences that develop socially responsible graduates
- 4 Be inclusive
- 5 Effective curriculum design, pedagogy and assessment strategies
- 6 Staff Professional Development
- 7 Informed Research



The Innovative Curriculum Framework

This framework should have an overarching quality assurance cycle that monitors, evaluates, and improves the implementation of the innovative curriculum

Stakeholders

Identify relevant stakeholders (policy experts, industry consultants, education experts, research champions etc..) for consultation

Leadership

Identify and assign curriculum leaders who will oversee the design, review, implementation, monitoring, and evaluation processes of the innovative curriculum

Program & Course Design

Develop intended learning outcomes
Design learning experiences intended to achieve those learning outcomes
Adopt student-centered approach throughout the design phase

Resources

Identify required resources and map clear requirements of each:

- Human
- Financial
- Facilities and Infrastructure

Identify and assign accountable stakeholders

Limitations

Understand and identify your limitations and the most efficient routes to mitigate them



- Keep in mind the competencies you want your students to develop in an active learning environment
- Programs should be geared towards learning how to learn and lifelong learning philosophies
- Develop flexible learning pathways to accommodate different demographics.
- Infuse technology within learning.
- Teaching processes should be guided by research-based learning

The Approach to Curriculum Design/Redesign

Three BIG questions

WHAT Knowledge, skills and attitudes should students possess as they graduate from university?	HOW Can we do better at ensuring that students learn these skills?
Disciplinary Knowledge Personal & Professional Skills Interpersonal Skills CDIO (Conceiving, Designing, Implementing, Operating) a product, process, system, service	Learning Context, Outcomes and Assessment Integrated Curriculum Teaching & Learning Methods Faculty Competence Learning Workspaces
WHY	

To meet the challenge by educating students as well-rounded Business professionals who understood how to Conceive-Design-Implement-Operate complex values-added business products, processes and systems in a modern team-based environment.

To achieve:

- Deep working knowledge and the fundamentals.
- Lead in the creation and operation of new products, processes and system.
- Understand the importance and strategic impact of research and technological development on society.



Adoption of an Innovative Model

The following sections will provide a pathway for innovating business programs in particular the learning outcomes and syllabus which should be used in conjunction with the Innovative Curriculum Framework

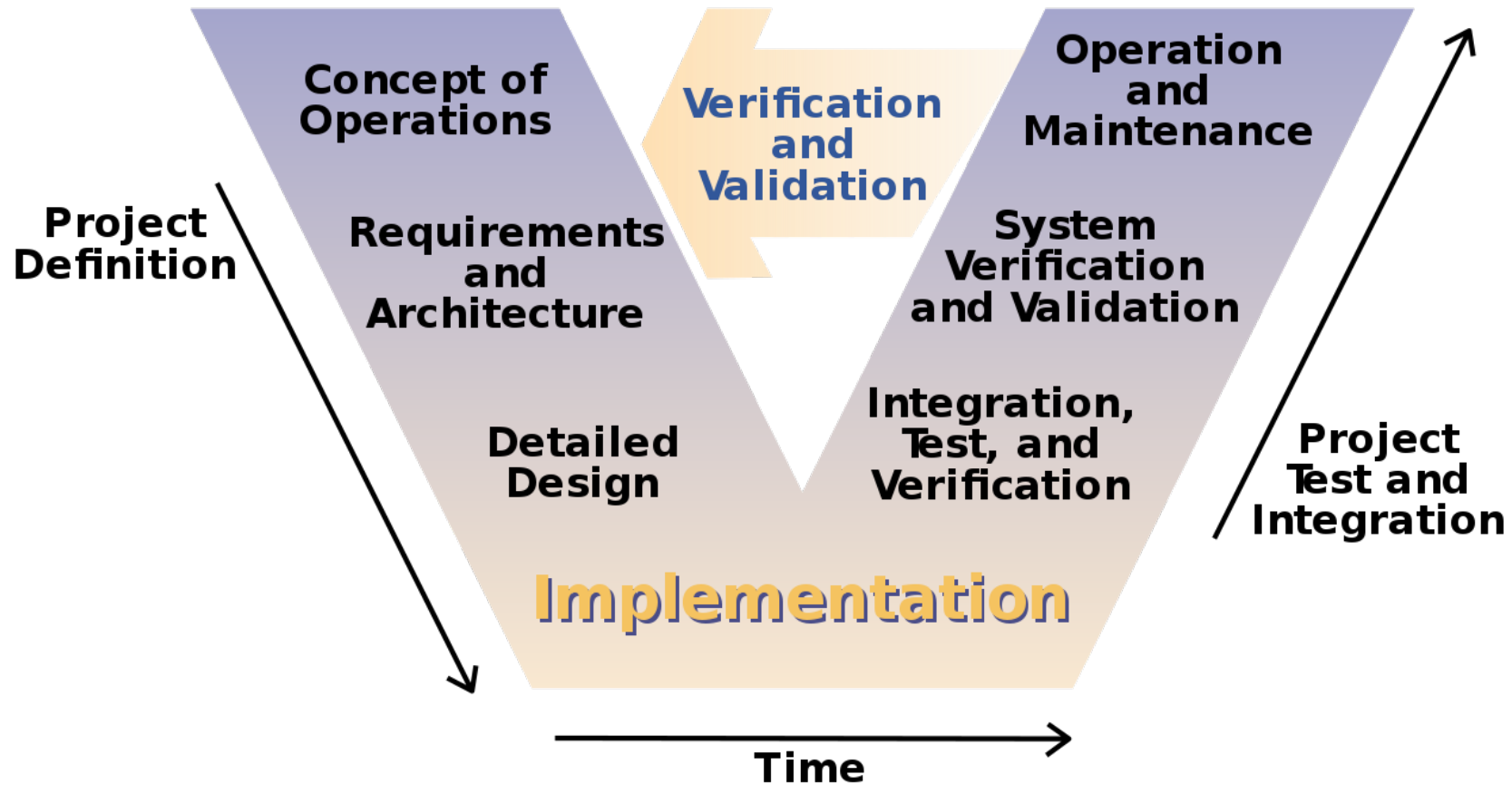


Development and implementation of the model was initiated by:

- Massachusetts Institute of Technology (MIT) in Cambridge, Massachusetts, USA.
- Chalmers University of Technology (Chalmers) in Goteborg-Sweden.
- The Royal Institute of Technology (KTH) in Stockholm- Sweden.
- Linköping University (LiU) in Linköping-Sweden.

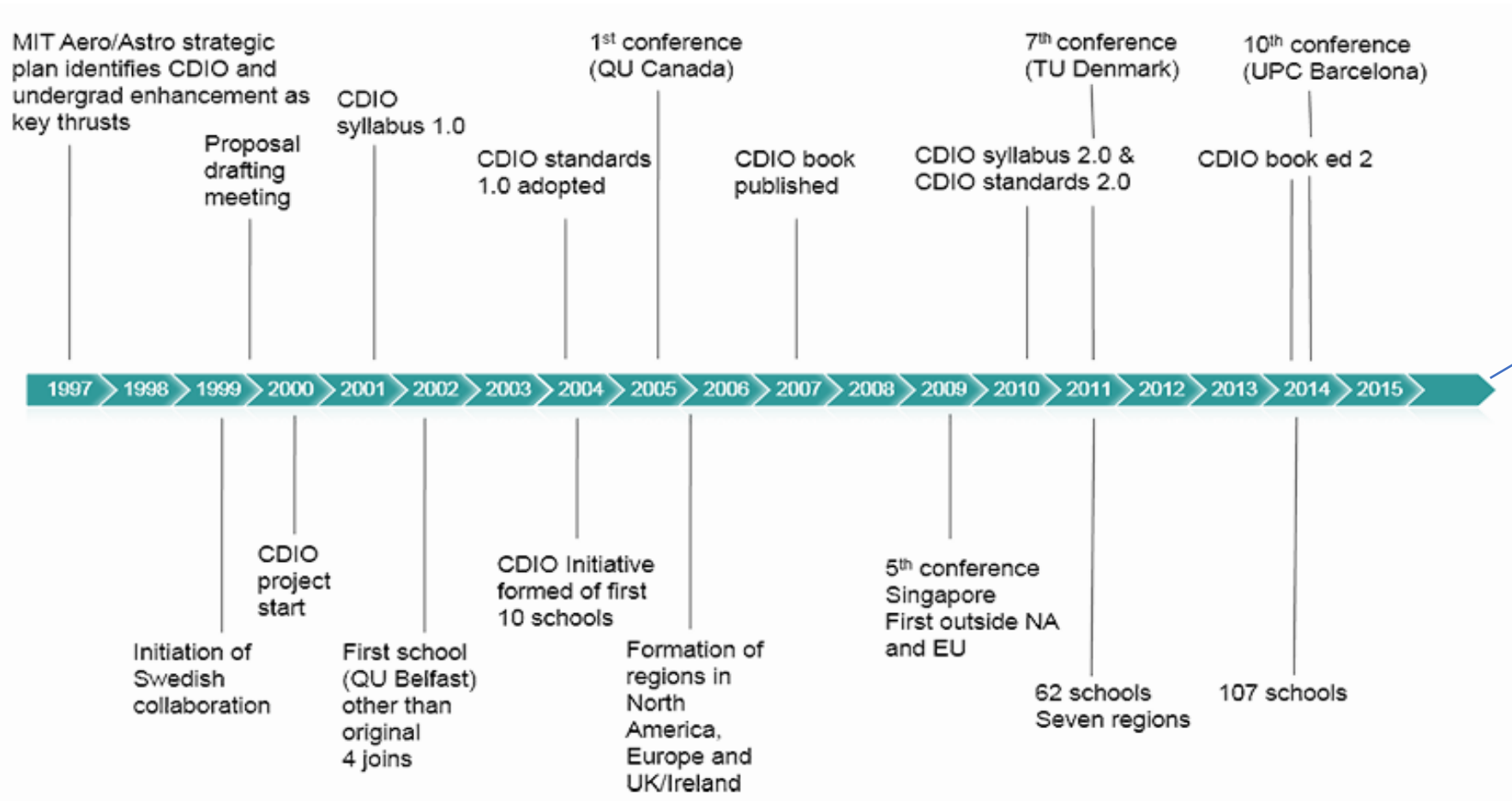
The Model is Called **CDIO**

V model of the systems Development process :



**V model of the systems Development process from:
“Systems Architecture Process” by Osborne, Brummond et al.**

CDIO Background



Current work is being done on Syllabus 3.0

ABET 2000

What is CDIO?

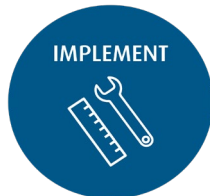
An education Initiative that stresses the fundamentals, set in the context of (System) development cycle; Conceiving – Designing – Implementing – Operating systems and products:



Conceive: customer needs, technology, enterprise strategy, regulations; and conceptual, technical, and business plans.
To understand business problems and be able to synthesize a solution.



Design: plans, drawings, illustrations, and algorithms that describe what will be implemented.
To take the conceptual idea and convert it to a practical solution.

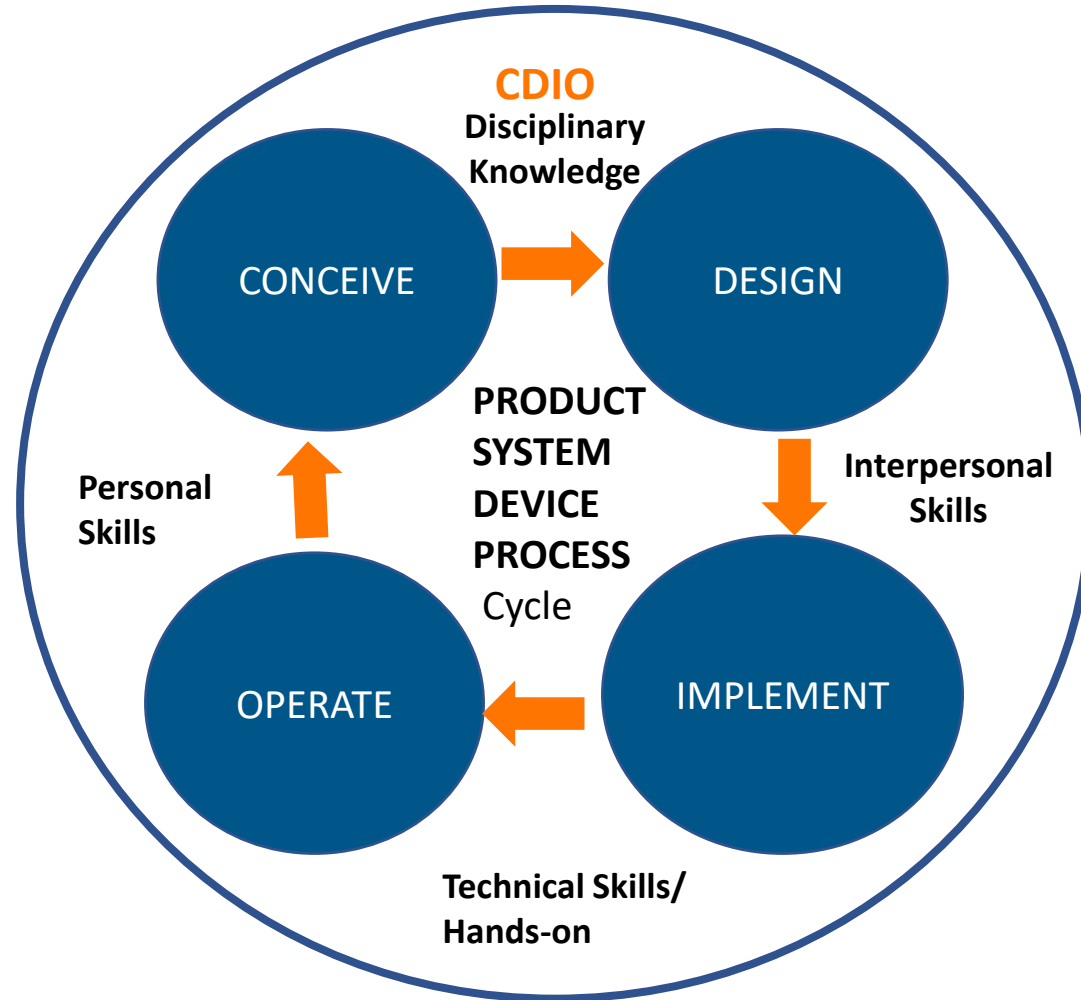


Implement: transformation of the design into the product, process, or system, including manufacturing, coding, testing and validation.
To construct and refine a physical solution.



Operate: the implemented product or process delivering the intended value, including maintaining, evolving and retiring the system.
To be able to show how the physical solution resolves the problem or challenge.

CDIO Framework



CDIO is one of the most interesting and innovative approaches that we found in the 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 workplace.

Conceiving Phase

Through this phase the students will have the skill to:

accept

assume

believe

perceive

realize

appreciate

apprehend

catch

compass

comprehend

deem

dig

envisage

expect

fancy

feel

follow

gather

get

grasp

imagine

judge

reckon

suppose

suspect

take

twig

And ready to demonstrate the use of these skills

Conceive Phase Leads to:

Through this phase the students will have the skill to:

Conceive	
Mission	Conceptual Design
<ul style="list-style-type: none">• Business Strategy	<ul style="list-style-type: none">• Requirements
<ul style="list-style-type: none">• Technology Strategy	<ul style="list-style-type: none">• Function
<ul style="list-style-type: none">• Customer Needs	<ul style="list-style-type: none">• Concepts
<ul style="list-style-type: none">• Goals	<ul style="list-style-type: none">• Technology
<ul style="list-style-type: none">• Competitors	<ul style="list-style-type: none">• Architecture
<ul style="list-style-type: none">• Program Plan	<ul style="list-style-type: none">• Platform Plan
<ul style="list-style-type: none">• Business Plan	<ul style="list-style-type: none">• Market Positioning
	<ul style="list-style-type: none">• Regulation
	<ul style="list-style-type: none">• Supplier Plan
	<ul style="list-style-type: none">• Commitment

And ready to demonstrate the use of these skills

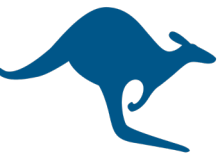


Design Phase Leads to:

Through this phase the students will have the skill to:

Design	
Preliminary Design	Detailed Design
<ul style="list-style-type: none">• Requirements Allocation	<ul style="list-style-type: none">• Element Design
<ul style="list-style-type: none">• Model Development	<ul style="list-style-type: none">• Requirements Verification
<ul style="list-style-type: none">• System Analysis	<ul style="list-style-type: none">• Failure & Contingency Analysis
<ul style="list-style-type: none">• System Decomposition	<ul style="list-style-type: none">• Validated Design
<ul style="list-style-type: none">• Interface Specifications	<ul style="list-style-type: none">• Integration

And ready to demonstrate the use of these skills

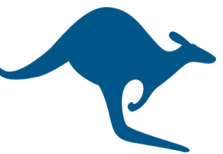


Implement Phase Leads to:

Through this phase the students will have the skill to:

Implement	
Element Creation	Systems Integration & Test
<ul style="list-style-type: none">• Hardware Manufacturing	<ul style="list-style-type: none">• System Integration
<ul style="list-style-type: none">• Software Coding	<ul style="list-style-type: none">• System Test
<ul style="list-style-type: none">• Sourcing	<ul style="list-style-type: none">• Refinement
<ul style="list-style-type: none">• Element Testing	<ul style="list-style-type: none">• Certification
<ul style="list-style-type: none">• Element Refinement	<ul style="list-style-type: none">• Implementation Ramp-up
	<ul style="list-style-type: none">• Delivery

And ready to demonstrate the use of these skills

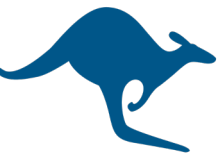


Operate Phase Leads to:

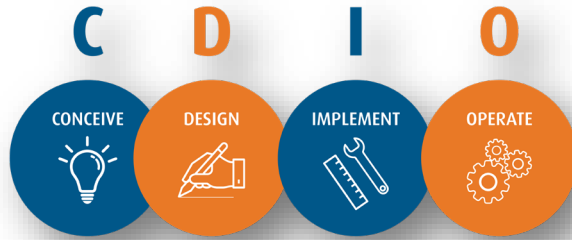
Through this phase the students will have the skill to:

Operate	
Lifecycle Support	Evolution
<ul style="list-style-type: none">• Sales & Distribution	<ul style="list-style-type: none">• System Improvement
<ul style="list-style-type: none">• Operations	<ul style="list-style-type: none">• Product Family Expansion
<ul style="list-style-type: none">• Logistics	<ul style="list-style-type: none">• Retirement
<ul style="list-style-type: none">• Customer Support	
<ul style="list-style-type: none">• Maintenance and Repair	
<ul style="list-style-type: none">• Recycling	
<ul style="list-style-type: none">• Upgrading	

And ready to demonstrate the use of these skills



The CDIO Model Is Based On:

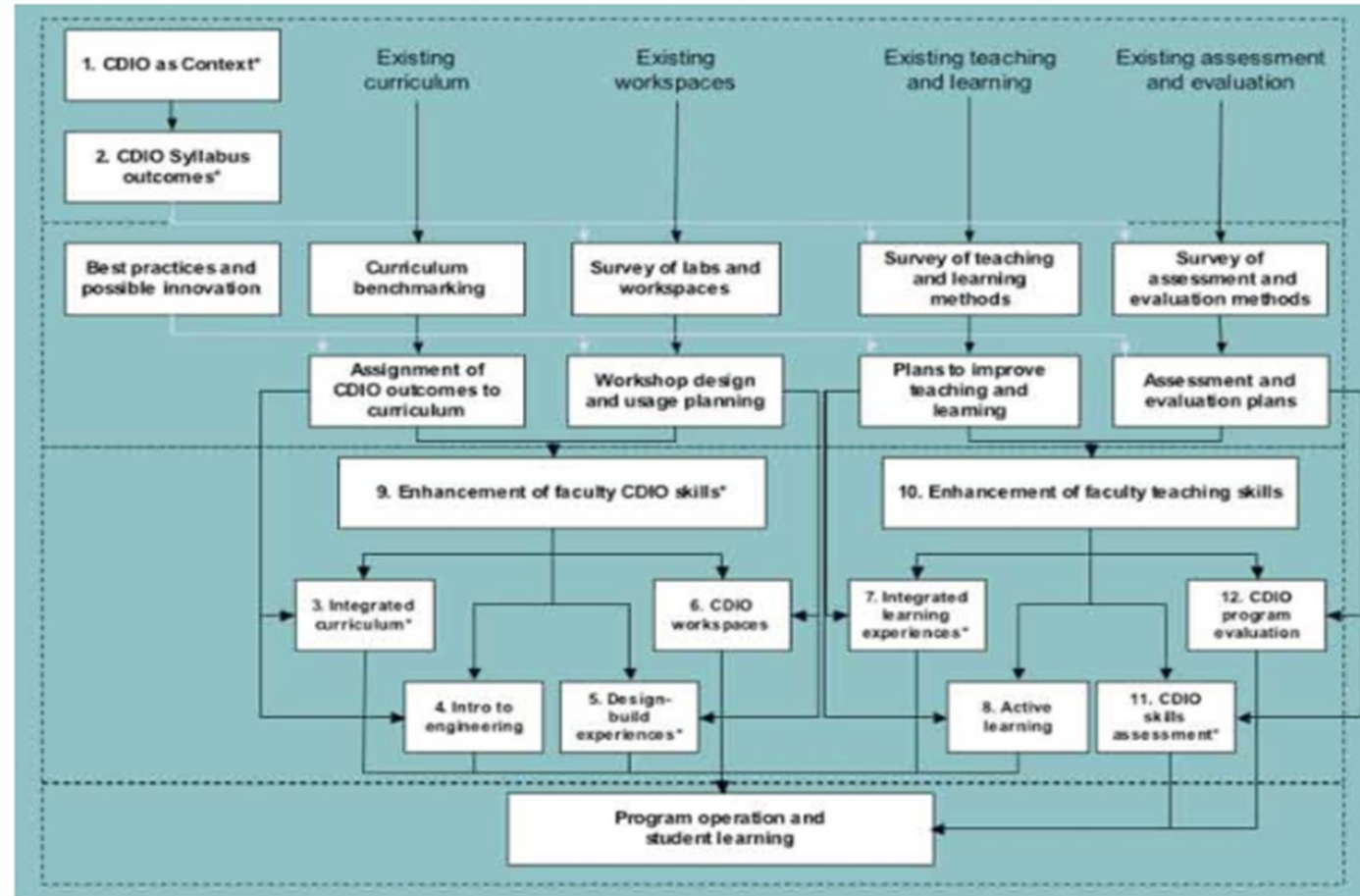


- I. Linking the education context with the profession practice context (**CDIO Context**)
- I. What to teach (**The CDIO Syllabus**)
- II. How to teach (**The CDIO Standards**)

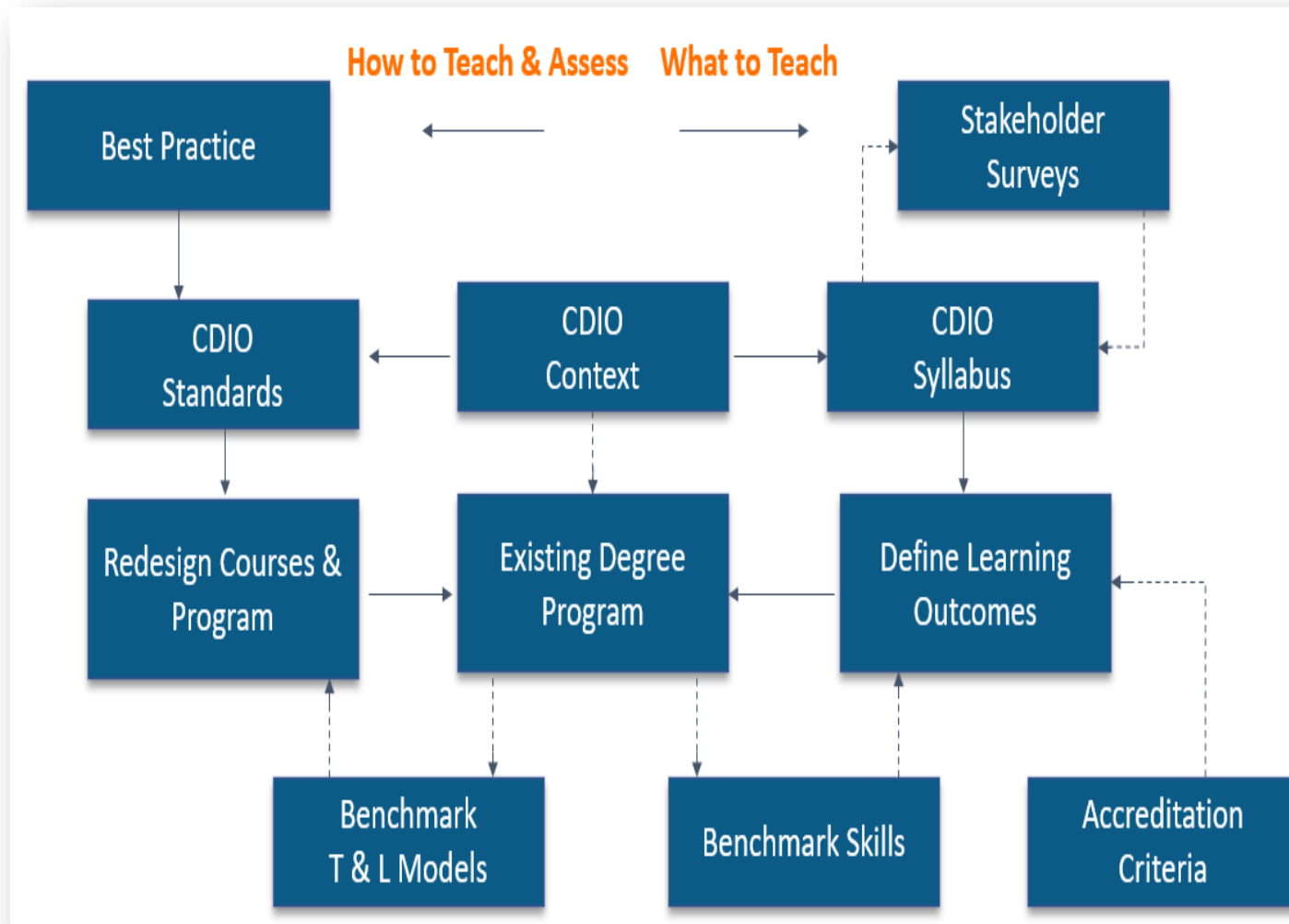
- **What is the professional role and practical context of the profession(al)? (need)**
- **What knowledge, skills and attitudes should students possess as they graduate from our programs? (program learning outcomes)**
- **How can we do better at ensuring that students learn these skills? (curriculum, teaching, learning, workspaces, assessment)**



Adopting the CDIO Initiative at Your Institution



CDIO Implementation



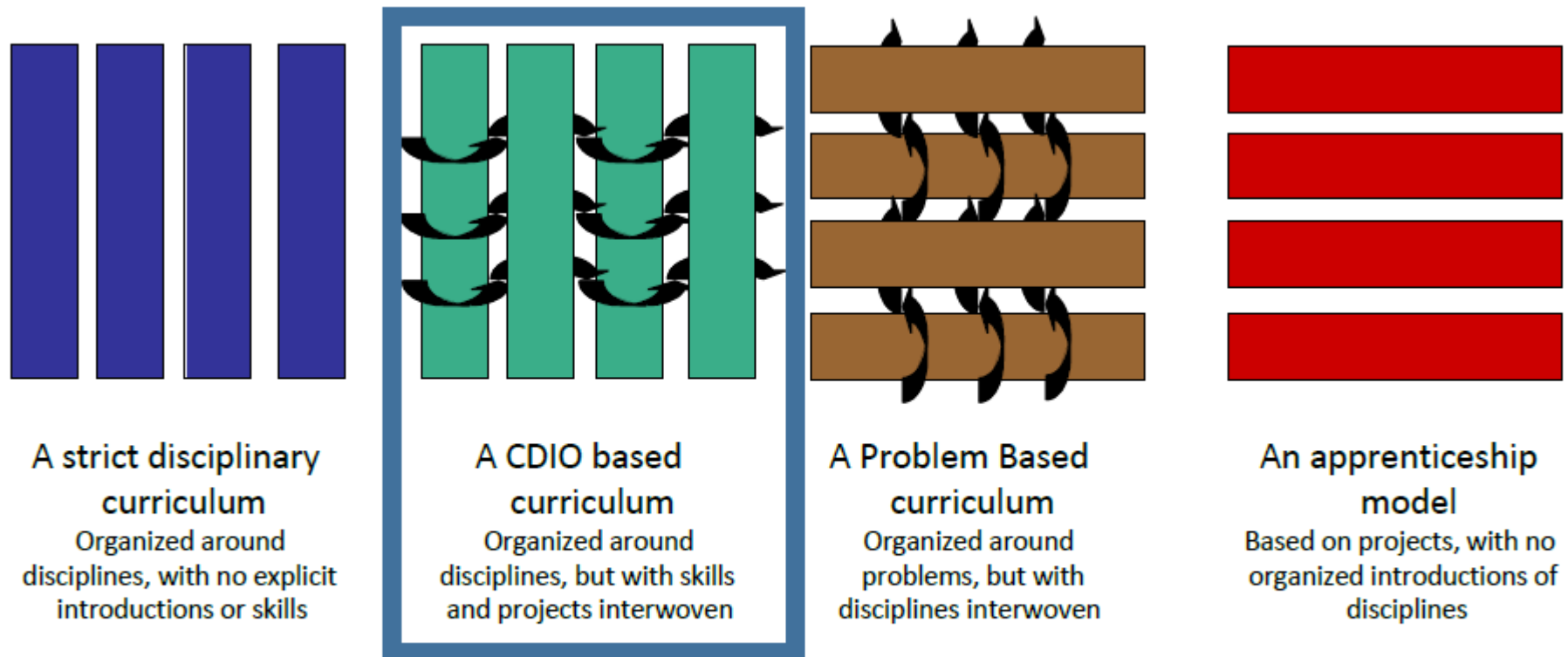
Over 150 universities worldwide and still growing!



CDIO | A Worldwide Innovative Educational Framework

Why CDIO

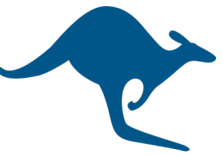
Disciplines run vertically; projects and skills run horizontally



Four Approaches to Curriculum Organization

CDIO Standards

- 1 Define the distinguishing features of a CDIO program
- 2 Serve as guidelines for educational reform
- 3 Provide a tool for continuous improvement.
- 4 CDIO Standards are used for:
 - ✓ Program design
 - ✓ Periodic program self-evaluation
 - ✓ Benchmarking, discussions and co-development with other programs
- 5 For each standard:
 - ✓ a description explains the meaning of the standard, highlighting reasons for setting the standard.
 - ✓ Rational explains why the standard has been selected and formulated
 - ✓ Rubrics for self-evaluation using the standards have also been developed.



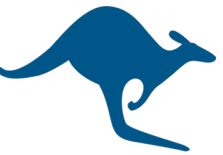
CDIO Standards

The 12 CDIO Standards address the following Issues in Business and Management Education:

CDIO Standards	
	Context
	Standard 1 Adopt CDIO as a context
Curriculum	Standard 2 CDIO Syllabus Outcomes
	Standard 3 Integrated Curriculum
	Standard 4 Introduction to Business & Management
	Standard 5 Design-Build Experiences
	Standard 6 CDIO Workspaces
Teaching & Learning Methods	Standard 7 Integrated Learning Experiences
	Standard 8 Active Learning
Enhancement of Faculty Competence	Standard 9 Enhancement of Staff CDIO Skills
	Standard 10 Enhancement of Staff Teaching Skills
Assessment Methods	Standard 11 CDIO Skills Assessment
	Standard 12 CDIO Program Evaluation

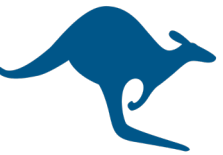
CDIO Syllabus

- The CDIO Syllabus is a list of knowledge, skills, and attitudes desired of graduating Business and Management Students.
- What is the full set of knowledge, skills, and attitudes that business students should possess as they leave the university, and at what level of proficiency? (five Levels)
 1. To have experienced of been exposed.
 2. To be able to participate in and contribute to.
 3. To be able to understand and explain.
 4. To be skilled in the practice or implementation.
 5. To be able to lead or innovate.
- It is rationalized against the norms of contemporary business practice.
- The principal value of the Syllabus is that it can be applied across a variety of programs and can serve as a model for all programs to derive specific learning outcomes



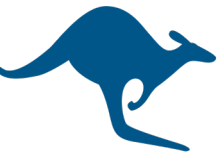
CDIO Syllabus Goals

- 1** The specific objective of the CDIO Syllabus is to create a clear, complete, consistent, and generalizable set of goals for undergraduate business education, in sufficient detail that they can be understood and implemented by Business and Management faculty.
- 2** These goals would form the basis for educational and learning outcomes, the design of curricula, as well as the basis for a comprehensive system of student learning assessment.
- 3** In addition, they would form the basis for effective communication, benchmarking, interuniversity sharing, and international correspondence.



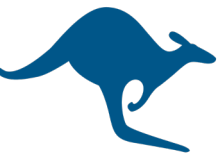
CDIO Syllabus Goals

- 4 Is to summarize formally a set of knowledge, skills and attitudes that alumni, industry and academia desire in a future generation of young Business and Management Professionals.
- 5 To define expected outcomes in terms of learning objectives of the personal, interpersonal and system building skills necessary for modern Business and Management practice
- 6 To design new educational initiatives, and it can be employed as the basis for a rigorous outcomes-based assessment process, and increasingly by other international accreditation processes as well

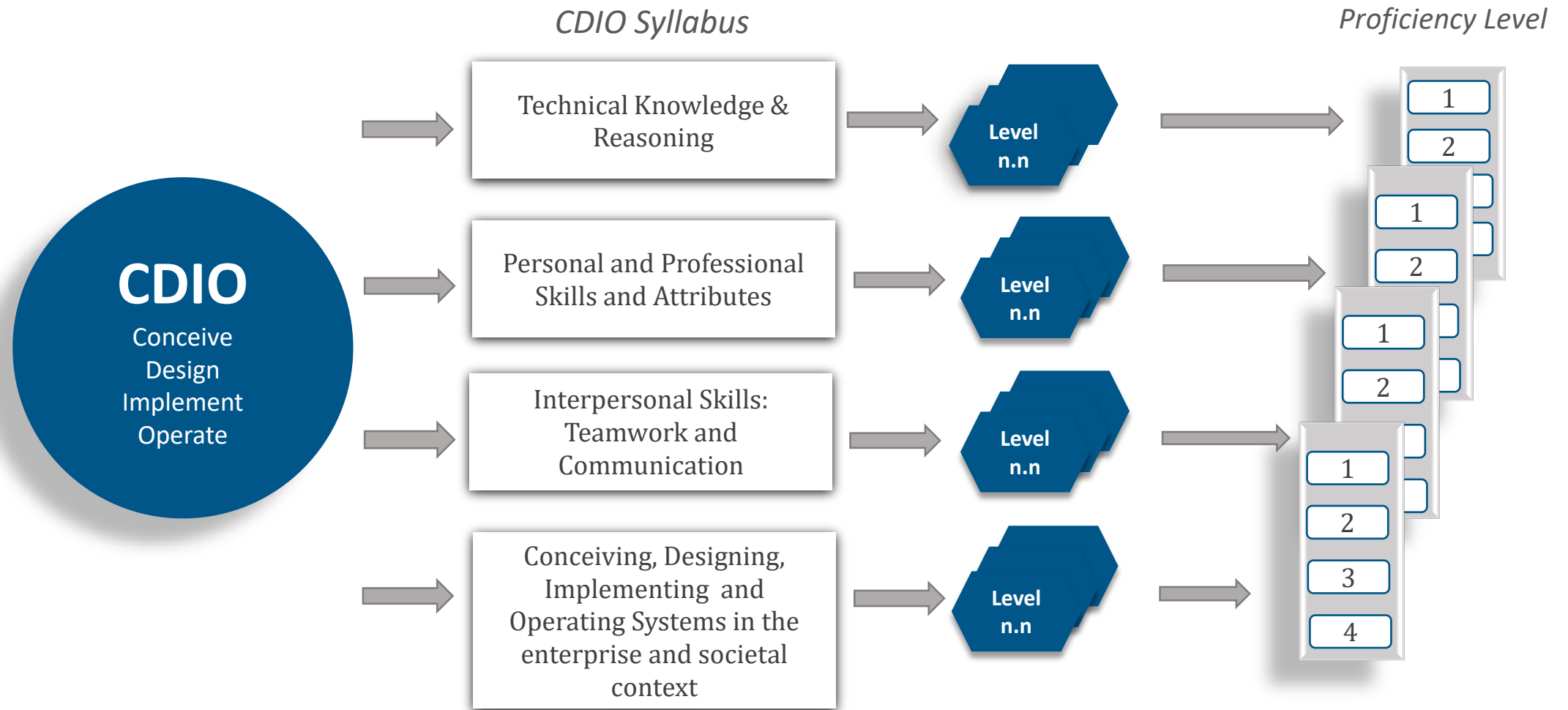


CDIO Syllabus Characteristics

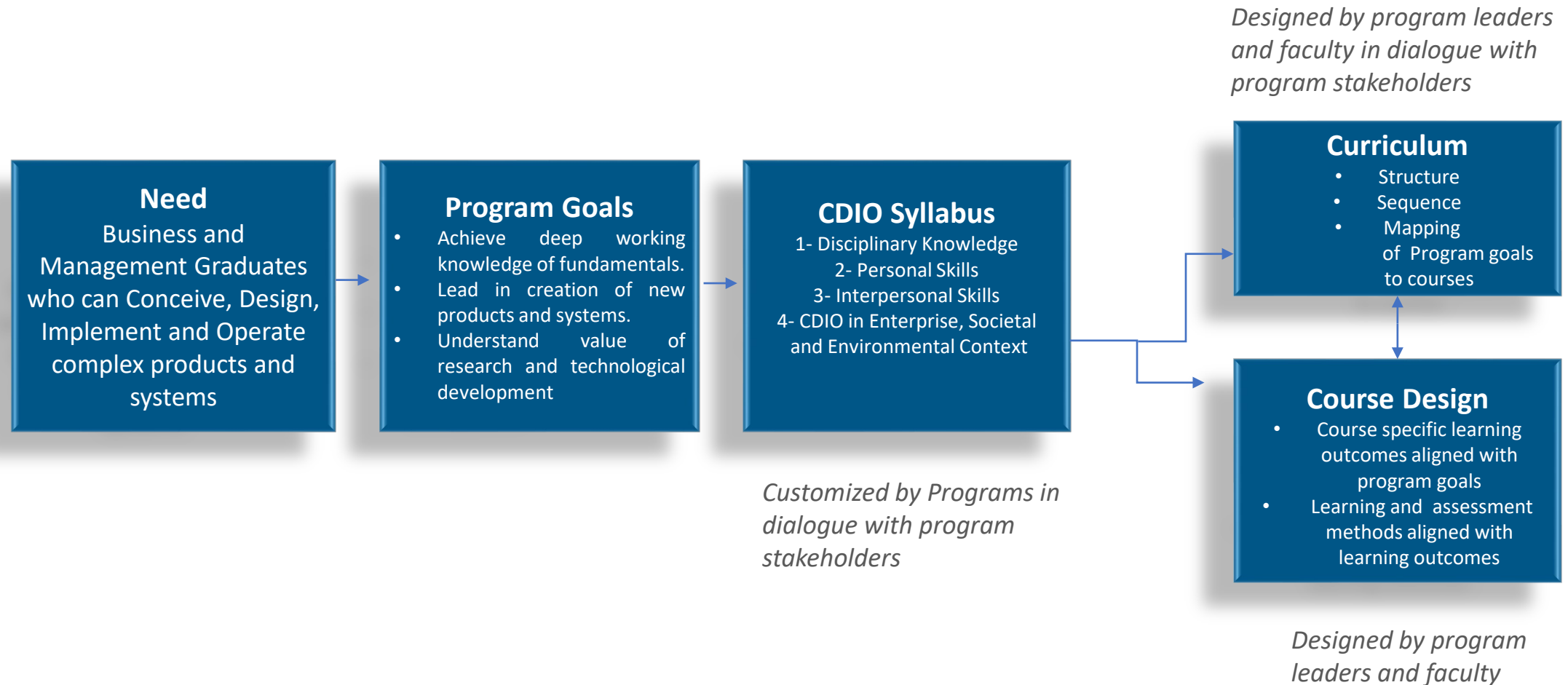
- 1 Comprehensive** — all relevant primary source material correlated and included.
- 2 Prioritized** by stakeholders — extensive survey of stakeholders to determine priority and level of accomplishment.
- 3 Reviewed by peers** — experts in each field reviewed materials and correlated with field-specific primary source material.
- 4 Appropriate** — filtered to those aspects appropriate to university teaching and learning.
- 5 Expressed as learning objectives or competency statements** in an appropriate taxonomy.
- 6 Basis for rigorous curriculum design and assessment processes.**
- 7 The content of each section was expanded** to a second level to a third level and to a fourth level.



CDIO Syllabus



Development and Integration of the CDIO Syllabus

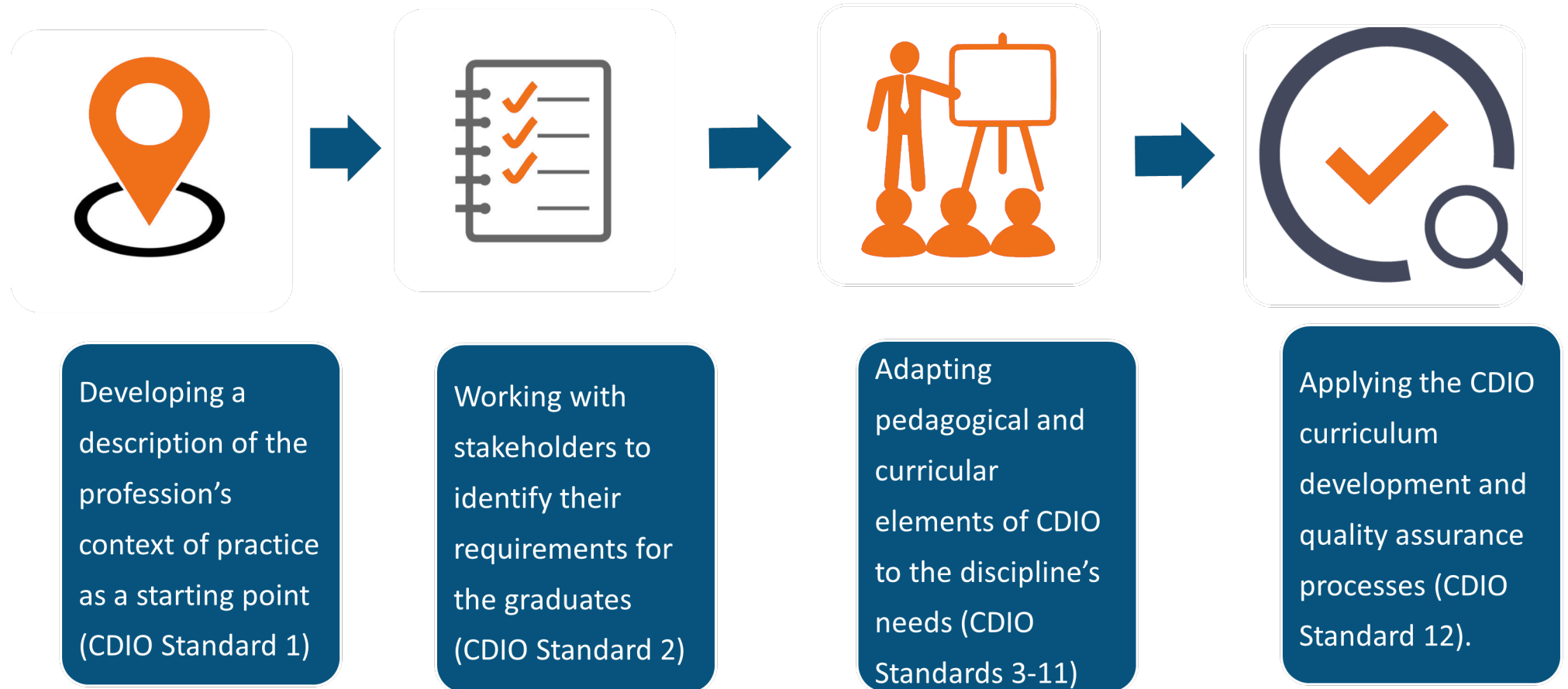


CDIO in a Business and Management Discipline Context

According to Crawley (2014) CDIO can be applied to program by:

- 1 Developing a description of the profession's context of practice as a starting point (CDIO Standard 1)
- 2 Working with stakeholders to identify their requirements for the graduates (CDIO Standard 2)
- 3 Adapting pedagogical and curricular elements of CDIO to the discipline's needs (CDIO Standards 3-11)
- 4 Applying the CDIO curriculum development and quality assurance processes (CDIO Standard 12)

Adoption of the CDIO Model into Business Programs



Organization of CDIO Syllabus

What is the full set of knowledge, skills and attitudes that a student should possess as they graduate from a university? At what level of proficiency? *Beyond traditional business education*

The CDIO Syllabus (First Level of Detail)

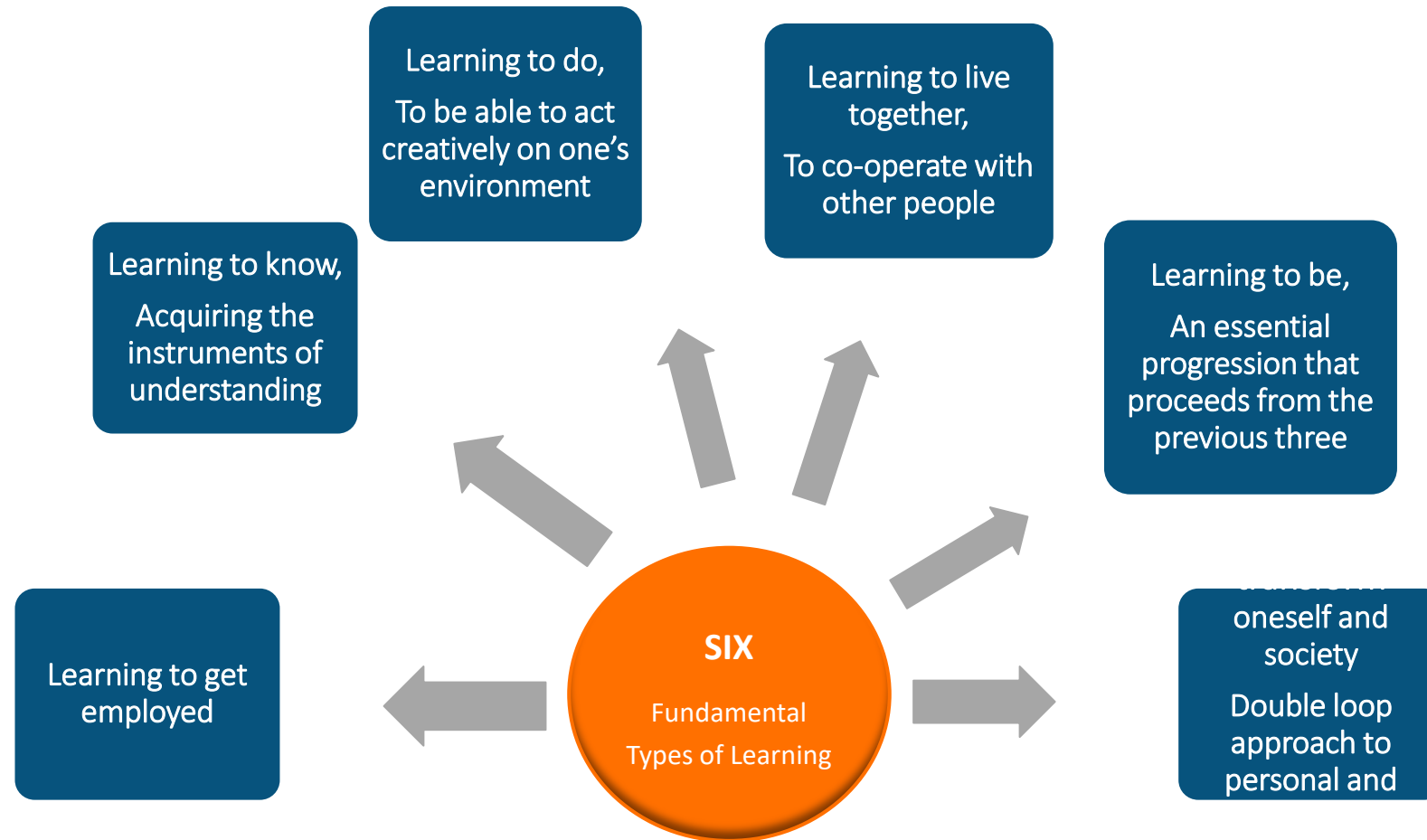
1. Disciplinary Knowledge and Reasoning

2. Personal and Professional Skills and Attributes

3. Interpersonal Skills: Teamwork and Communication

4. CDIO – Conceiving, Designing, Implementing, and Operating in Enterprise / Societal Context

Organization of CDIO Syllabus & UNESCO Learning Pillars

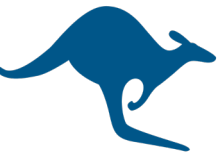


Business CDIO Model

The Syllabus and the professional tracks

There are at least seven different professional tracks that business people can follow, according to their individual talents and interests. The tracks are:

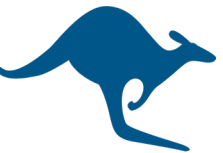
- 1 Management.
- 2 Marketing/ Sales.
- 3 Human Resources.
- 4 Finance/ Accounting/ Economics/Banking.
- 5 Management Information System.
- 6 Corporate Governance.
- 7 Entrepreneurship.



Relevance of CDIO Syllabus to Business Education

In the past ten years, the CDIO Syllabus has played a key role in the design of curriculum, teaching, and assessment in engineering education. We believe CDIO syllabus can be implemented within the business context since it:

- 1 Captures the expressed needs of program stakeholders
- 2 Highlights the overall goals of a business program
- 3 Defines these learning outcomes of Business Major
- 4 Provides a framework for benchmarking outcomes
- 5 Serves as a template for writing program objectives and outcomes
- 6 Provides a guide for the design of curriculum
- 7 Suggests appropriate teaching and learning methods
- 8 Provides the targets for student learning assessment
- 9 Serves as a framework for overall program evaluation, and
- 10 Communicates with faculty, students, and other stakeholders about the direction and purpose of a renewed business education that is centered on students and focused on outcomes.



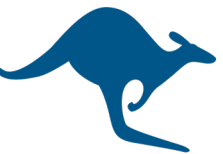
CDIO Standards Adjusted to Business Major

CDIO Standards	Generalized Business CDIO Standards	ACK as Case Study
<p>1. The Context</p>	<p>1. The Context: Providing students with business knowledge accompanied by hands-on learning opportunities, industry engagement, social impact and dedication to professional practice studies.</p>	<p>School of Business Vision: To produce business graduates who are capable of developing into effective managers that contribute to the success of any organization that employs them, and to the economic development and welfare of Kuwait or the country in which they work.</p>



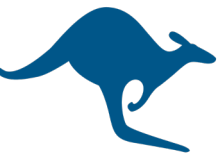
CDIO Standards Adjusted to Business Major

CDIO Standards	Generalized Business CDIO Standards	ACK as Case Study
<p>2. Learning Outcomes</p>	<p>A. Demonstrate an understanding of the importance of ethics and the legal environment of contemporary business</p> <p>B. Explain the major concepts in the functional areas of accounting and finance, HR, Marketing, MIS, Corporate Governance and Management and entrepreneurship</p> <p>C. Use quantitative and qualitative skills to facilitate management decision making and/ or problem-solving</p> <p>D. Evaluate human behavior and possess high level of Emotional Intelligence</p> <p>E. Evaluate the economic environments of businesses</p> <p>F. Apply knowledge of business concepts and functions in an integrated manner</p> <p>G. Apply academic knowledge in a professional setting</p> <p>H. Obtain through electives in-depth knowledge and understanding in more specific related areas, yet wider perspective</p> <p>I. Research a topic, develop an argument and organize supporting details</p> <p>J. Develop proficiency in business communication – oral, written, and non-verbal</p> <p>K. Develop business/ product plans</p>	<p>ACK developed learning outcomes for its School of Business majors (Marketing, Management and HR – both at Diploma and Bachelor levels) under the following graduate attributes:</p> <ul style="list-style-type: none"> • Professional behaviors • Communication and Teamwork Skills • Critical Thinking • Entrepreneurial skills • Planning & organizational Skills



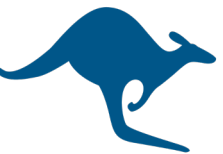
CDIO Standards Adjusted to Business Major

CDIO Standards	Generalized Business CDIO Standards	ACK as Case Study
3. Integrated curriculum	3. Integrated curriculum: A curriculum designed with inter-disciplinary subjects, with an explicit plan to integrate personal and professional skills and attributes, interpersonal skills, and <u>professional competence</u>	Developed a curriculum that includes electives, PBL, internships, entrepreneurship, and Business Integration final project
4. Introductory Course	4. <u>Introductory course</u> : that provides the framework for <u>professional practice</u> , and introduces essential personal and interpersonal skills	Introduction of courses on subdisciplines (Management, Marketing, Accounting, Economic etc.). Courses on business communication that are also integrated in all the other courses
5. Design-implement experiences	5. <u>Professional practice experiences</u> : Provide corporate internship opportunities	Internship opportunities, entrepreneurial competitions with local and regional institutions that foster the entrepreneurial application at young age



CDIO Standards Adjusted to Business Major

CDIO Standards	Generalized Business CDIO Standards	ACK as Case Study
6. Integrated learning experiences	6. Integrated learning experiences: that lead to the acquisition of disciplinary knowledge, as well as personal and interpersonal skills, and <u>professional competence</u>	Event management course based on PBL that requires the plan and execution management of an event from A-Z
7. Learning Assessment	7. Learning assessment: Assessments that target personal and interpersonal skills, and <u>professional competence</u> , as well as in applied disciplinary knowledge	Traditional assessments coupled with oral, job -shadows, evaluations, portfolios and project presentation
8. Workspaces for Professional Practice	8. <u>Workspaces for professional practice</u> : Workspaces and laboratories that support and encourage experiencing <u>professional practice</u> , disciplinary knowledge, and social learning ex: stock market simulation	Computer labs, plan for banking and stock market simulations



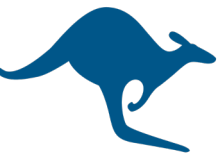
CDIO Standards Adjusted to Business Major

CDIO Standards	Generalized Business CDIO Standards	ACK as Case Study
9. Active learning	9. Active learning through applying student center teaching pedagogies and engaging activities	Courses include engagement activities like field visits, gaming, competitions, role play, peer review, debating, case-based learning, PBL etc.
10. Professional Competence	10. Professional development that enhances faculty competence in personal and interpersonal skills, and professional competence	Provision of in-house technical professional developments, Participation in discipline-related conferences, collaboration with local institutions for executive training programs



CDIO Standards Adjusted to Business Major

CDIO Standards	Generalized Business CDIO Standards	ACK as Case Study
11. Teaching and Learning Training	11. Enhancement of faculty teaching competence through teaching and learning training	Teaching and Learning Center conducting workshops on teaching pedagogies, planning annual forum that fosters teaching and learning excellence attended by distinguished international speakers, organizing seminars that target generic, personal and interpersonal skills (Change Management and Social and Emotional Learning, Online Learning and Effective Components of Instructional Design etc.)
12. Program Evaluation	12. Program Evaluation through internal/external audits and international accreditations.	The School of Business is accredited by the Accreditation Council for Business Schools and Programs (ACBSP). ACBSP is a leading specialized accreditation body for business education supporting, celebrating, and rewarding teaching excellence. The association embraces the virtues of teaching excellence. The College is also accredited by ISO, Private Universities Council in Kuwait.



The CDIO Standards 2.0 -Example

Standard 9 – Enhancement of Faculty Competence

Actions that enhance faculty competence in personal and interpersonal skills, and product, process, and system building skills

Description

CDIO programs provide support for the collective Business and Management faculty to improve its competence in the personal and interpersonal skills, and product, process, and system building skills described in Standard 2. These skills are developed best in contexts of professional Business and Management practice. The nature and scope of faculty development vary with the resources and intentions of different programs and institutions. Examples of actions that enhance faculty competence include professional leave to work in industry, partnerships with industry colleagues in research and education projects, inclusion of Business and Management practice as a criterion for hiring and promotion, and appropriate professional development experiences at the university.

Rationale

If Business and Management faculty are expected to teach a curriculum of personal and interpersonal skills, and product, process, and system building skills integrated with disciplinary knowledge, as described in Standards 3, 4, 5, and 7, they as a group need to be competent in those skills. Business and Management professors tend to be experts in the research and knowledge base of their respective disciplines, with only limited experience in the practice of engineering in business and industrial settings. Moreover, the rapid pace of technological innovation requires continuous updating of Business and Management skills. The collective faculty needs to enhance its Business and Management knowledge and skills so that it can provide relevant examples to students and also serve as individual role models of contemporary engineers.



The CDIO Standards 2.0 -Example

Rubric

Scale	Criteria
5	Faculty competence in personal, interpersonal, product, process, and system building skills is regularly evaluated and updated where appropriate.
4	There is evidence that the collective faculty is competent in personal, interpersonal, product, process, and system building skills.
3	The collective faculty participates in faculty development in personal, interpersonal, product, process, and system building skills.
2	There is a systematic plan of faculty development in personal, interpersonal, product, process, and system building skills.
1	A benchmarking study and needs analysis of faculty competence has been conducted.
0	There are no programs or practices to enhance faculty competence in personal, interpersonal, product, process, and system building skills.

CDIO Graduates Employability Outcomes for Business

Professional behaviors

Ability to implement professional behaviors in the workplace.

Communication and Teamwork Skills

Effectively use communication as a tool for negotiating and creating new understandings and interacting with others in a team environment.

Critical Thinking

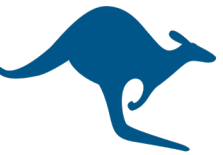
Ability to apply critical thinking and decision-making skills to solve complex and ambiguous problems.

Entrepreneurial Skills

Ability to work effectively in an environment characterized by uncertainty and risk, and a willingness to meet new challenges innovatively and independently.

Planning & Organizational Skills

Ability to plan, organize, and control professional projects.



CDIO Business Syllabus: First Level

- 1 BUSINESS KNOWLEDGE AND REASONING
- 2 PERSONAL & PROFESSIONAL SKILLS & ATTRIBUTES
- 3 INTERPERSONAL SKILLS: TEAMWORK AND COMMUNICATION
- 4 APPLYING KNOWLEDGE TO BENEFIT SOCIETY



CDIO Business Syllabus: Second and Third Level

2- PERSONAL & PROFESSIONAL SKILLS & ATTRIBUTES

2.1 BUSINESS REASONING & PROBLEM SOLVING

- 2.1.1 Problem identification and formulation
- 2.1.2 Modeling
- 2.1.3 Estimation and qualitative analysis
- 2.1.4 Problem analysis using statistical knowledge
- 2.1.5 Solution and recommendation

2.2 RESEARCH AND KNOWLEDGE DISCOVERY

- 2.2.1 Hypothesis formulation
- 2.2.2 Survey of print and electronic literature
- 2.2.3 Conducting survey/interviews (data collection)
- 2.2.4 Hypothesis test, and defense
- 2.2.5 Application of research in practice

2.3 SYSTEMATIC THINKING

- 2.3.1 Thinking holistically
- 2.3.2 Interdisciplinary interactions
- 2.3.3 Prioritization and focus
- 2.3.4 Trade-offs, judgement, and balance in resolution
- 2.3.5 Practical analysis/ case study

2.4 PERSONAL SKILLS AND ATTRIBUTES

- 2.4.1 Initiative and willingness to take risks
- 2.4.2 Perseverant and flexibility
- 2.4.3 Ethical behavior
- 2.4.4 Diligent/ hard working
- 2.4.5 Enthusiasm and passion for career
- 2.4.6 Creative thinking
- 2.4.7 Critical thinking
- 2.4.8 Awareness of one's personal knowledge, skills and attributes
- 2.4.9 Curiosity and lifelong learning
- 2.4.10 Time and resource management
- 2.4.11 Adaptability to complicated real situations
- 2.4.12 Cross-cultural/ diversity awareness
- 2.4.13 Emotional intelligence
- 2.4.14 Self-management skills

2.5 PROFESSIONAL SKILLS AND ATTRIBUTES

- 2.5.1 Professional ethics, integrity, responsibility and accountability
- 2.5.2 Professional behavior
- 2.5.3 Proactively planning for one's career
- 2.5.4 Entrepreneurship
- 2.5.5 Awareness & catch up with modern world's economy
- 2.5.6 Ability to work independently & in teams
- 2.5.7 Ability to self-motivate at work
- 2.5.8 Ability to develop and promote ideas and products
- 2.5.9 Customer and partner care skills



CDIO Business Syllabus: Second and Third Level

Learning Outcomes

4- APPLYING KNOWLEDGE TO BENEFIT SOCIETY

4.1 EXTERNAL AND SOCIETAL CONTEXT

- 4.1.1 Roles and responsibility of business graduates
- 4.1.2 The impact of business on society
- 4.1.3 Society's regulation of business
- 4.1.4 The historical and cultural context
- 4.1.5 Contemporary issues and values
- 4.1.6 Developing a global perspective

4.2 ENTERPRISE AND BUSINESS CONTEXT

- 4.2.1 Appreciating different enterprise cultures
- 4.2.2 Enterprise strategy, goals, and planning
- 4.2.3 Entrepreneurship and relationship between enterprises, the economy & the global market
- 4.2.4 Working successfully in organizations

4.3 CONCEIVING BUSINESS IDEAS

- 4.3.1 Set up business objectives (based on the market need and societal context)
- 4.3.2 Basic definitions, concepts, theories as foundation
- 4.3.3 Modeling of ideas and insuring goals can be met
- 4.3.4 Development of project management (risks, feasibility, costs, resources..)
- 4.3.5 Developing entrepreneurship (SMEs)

4.4 DESIGNING ECONOMICS/ BUSINESS PLAN/ PROJECT

- 4.4.1 Feasibility studies
- 4.4.2 Plan's or project's approach (approach methods, steps..)
- 4.4.3 Utilization of knowledge in developing the plan
- 4.4.4 Disciplinary plan/project design (tools, methods and relevant process..)
- 4.4.5 Multi-disciplinary plan/project design (relationships among tools, methods and processes, departments and sub majors)
- 4.4.6 Multi-objective plan/project design (designing implementation plan, testing, environmental factors, reliability..)

4.5 IMPLEMENTING BUSINESS PLAN/ PROJECT

- 4.5.1 Training/ coaching
- 4.5.2 Selecting resources for implementing plan/project
- 4.5.3 Organizing the implementation of plan/project

4.6 OPERATE & EVALUATE

- 4.6.1 Designing standards/criteria to evaluate performance/ outcomes
- 4.6.2 Evaluating performance/outcomes (economic- social- environmental..)
- 4.6.3 Adjusting/ upgrading plan/project
- 4.6.4 Creating new plans/projects



CDIO Syllabus at the 3rd level of detail for Business Education

Learning outcomes

3. INTERPERSONAL SKILLS: TEAMWORK AND COMMUNICATION

3.1 TEAMWORK

- 3.1.1 Forming effective teams
- 3.1.2 Team Operation
- 3.1.3 Team growth and evolution
- 3.1.4 Leadership
- 3.1.5 Ability to work with diverse teams

3.2 COMMUNICATION

- 3.2.1 Communications strategy
- 3.2.2 Communications structure (argument, idea arrangement, debate, negotiation)
- 3.2.3 Written communication
- 3.2.4 Digital/ social media communications
- 3.2.5 Presentations
- 3.2.6 Oral inter-personal communications

3.3 COMMUNICATION IN FOREIGN LANGUAGES

- 3.3.1 English- listening and speaking
- 3.3.2 English-reading and writing
- 3.3.3 Other languages

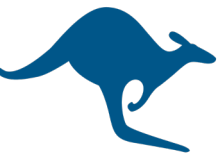


CDIO Business Syllabus: Fourth Level

2- PERSONAL & PROFESSIONAL SKILLS & ATTRIBUTES


2.4 PERSONAL SKILLS AND ATTRIBUTES


- 2.4.1 Initiative and willingness to take risks
- 2.4.2 Perseverant and flexibility
- 2.4.3 Ethical behavior
- 2.4.4 Diligent/ hard working
- 2.4.5 Enthusiasm and passion for career
- 2.4.6 Creative thinking
- 2.4.7 Critical thinking
 - 2.4.7.1** *Purpose and statement of the problem or issue Assumptions*
 - 2.4.7.2** *Logical Arguments and solutions*
 - 2.4.7.3** *Supporting evidence , facts and information*
 - 2.4.7.4** *Points of view and theories*
 - 2.4.7.5** *Conclusion and implications*
 - 2.4.7.6** *Reflection on the quality of the thinking*
- 2.4.8 Awareness of one's personal knowledge, skills and attributes
- 2.4.9 Curiosity and lifelong learning
- 2.4.10 Time and resource management
- 2.4.11 Adaptability to complicated real situations
- 2.4.12 Cross-cultural/ diversity awareness
- 2.4.13 Emotional intelligence
- 2.4.14 Self-management skills




Correlation between the ACBSP Accreditation Standards and CDIO Standards

CDIO Standards	ACBSP Accreditation Standards						
	Leadership	Strategic Planning	Student and Stakeholder Focus	Student Learning Assessment	Faculty Focus	Curriculum	Business Unit Performance
Context		Strong correlation				Strong correlation	
Learning Outcomes		Strong correlation				Strong correlation	
Integrated Curriculum						Strong correlation	
Discipline Introduction						Strong correlation	
Design Implement Experience	Strong correlation						
Integrated Learning Experience	Strong correlation						
Learning Assessments				Strong correlation			
Workspaces							Strong correlation
Active Learning	Strong correlation						
Enhancement of Faculty Competence					Strong correlation		
Enhancement of faculty teaching competence					Strong correlation		
Program Evaluation							Strong correlation

 Strong correlation

 Good correlation

 No correlation

Correlation between the AACSB Accreditation Standards and CDIO Standards

CDIO Standards	AACSB Accreditation Standards								
	Strategic Planning	Physical, Virtual, and Financial Resource.	Faculty and Professional Staff Resources	Curriculum	Assurance of Learning	Learner Progression	Teaching Effectiveness and Impact	Impact of Scholarship	Engagement and Societal Impact
Context									
Learning Outcomes									
Integrated Curriculum									
Discipline Introduction									
Design Implement Experience									
Integrated Learning Experience									
Learning Assessments									
Workspaces									
Active Learning									
Enhancement of Faculty Competence									
Enhancement of faculty teaching competence									
Program Evaluation									

Strong correlation


Good correlation


No correlation




Correlation between the AACSB Accreditation Standards and CDIO Syllabus

CDIO SYLLABUS 2.0	AACSB Accreditation Standards								
	Strategic Planning	Physical, Virtual, and Financial Resource	Faculty and Professional Staff Resources	Curriculum	Assurance of Learning	Learner Progression	Teaching Effectiveness & Impact	Impact of Scholarship	Engagement & Societal Impact
1. DISCIPLINARY KNOWLEDGE AND REASONING									
1.1 Knowledge of underlying mathematics and sciences				Strong correlation		Strong correlation	Strong correlation		
1.2 Core Business fundamental knowledge				Strong correlation		Strong correlation	Strong correlation		
1.3 Advanced Business fundamental knowledge, mathematics and tools				Strong correlation		Strong correlation	Strong correlation		
2. PERSONAL AND PROFESSIONAL SKILLS AND ATTRIBUTES									
2.1 Analytic reasoning and problem solving				Good correlation	Good correlation	Good correlation	Good correlation	Good correlation	
2.2 Experimentation, investigation and knowledge discovery									
2.3 System thinking									
2.4 Attitudes, thought and learning				Strong correlation	Strong correlation	Strong correlation	Strong correlation	Strong correlation	
2.5 Ethics, equity and other responsibilities				Good correlation	Good correlation	Good correlation	Good correlation	Good correlation	


 Strong correlation


 Good correlation


 No correlation

Correlation between the AACSB Accreditation Standards and CDIO Syllabus

CDIO SYLLABUS 2.0	AACSB Accreditation Standards								
	Strategic Planning	Physical, Virtual, and Financial Resource	Faculty and Professional Staff Resources	Curriculum	Assurance of Learning	Learner Progression	Teaching Effectiveness and Impact	Impact of Scholarship	Engagement & Societal Impact
3. INTERPERSONAL SKILLS: TEAMWORK AND COMMUNICATION									
1.1 Teamwork				Strong correlation	Strong correlation	Strong correlation	Strong correlation	Strong correlation	
1.2 Communications				Strong correlation	Strong correlation	Strong correlation	Strong correlation	Strong correlation	
1.3 Communications in foreign language									
4. CDIO SYSTEMS IN THE ENTERPRISE, SOCIETAL AND ENVIRONMENTAL CONTEXT- THE INNOVATION PROCESS									
4.1 External, societal and environmental context		Strong correlation		Strong correlation	Strong correlation	Strong correlation	Strong correlation	Strong correlation	Strong correlation
4.2 Enterprise and business context		Strong correlation		Strong correlation	Strong correlation	Strong correlation	Strong correlation	Strong correlation	Strong correlation
4.3 Conceiving, system Business and Management and management									
4.4 Designing		Good correlation		Good correlation	Good correlation	Good correlation	Good correlation	Good correlation	Good correlation
4.5 Implementing		Good correlation		Good correlation	Good correlation	Good correlation	Good correlation	Good correlation	Good correlation
4.6 Operating		Good correlation		Good correlation	Good correlation	Good correlation	Good correlation	Good correlation	Good correlation

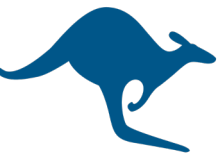
 Strong correlation

 Good correlation

 No correlation

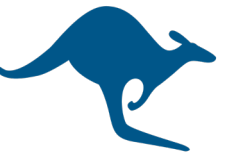
CDIO Faculty Development Program

- The implementation of CDIO in curriculum and course design requires supporting the faculty members to understand the concepts and methodologies of CDIO.
- Taking a cue from different faculty training activities carried out across the CDIO community, the CDIO faculty development course was organized in a modular framework.
- Using the learning objectives as a basis for course design, the CDIO faculty development course was organized in 3 modules.
- Each module is mapped to the learning objectives and the content is further mapped to the modules.
- The course is typically delivered using seminar presentations, case study presentations, workshops, active discussions, and laboratory & workspace tours.



List of Learning Objectives for CDIO Faculty Development Course

- L1 Explain the rationale of the CDIO approach to business education.
- L2 Apply the CDIO methodology to curriculum development, including
 - a) Formulating learning outcomes on the program level
 - b) Devising a curriculum to integrate disciplinary fundamentals with personal and professional skills and attitudes, in particular business and entrepreneurship skills
 - c) Giving examples of strategies to enable and drive program-driven course development
- L3 Apply the CDIO methodology to course development, including
 - a) Formulating learning outcomes on the course level
 - b) Developing appropriate learning activities for discipline-led learning and for problem based/project organized learning
 - c) Developing appropriate assessment methods aligned with the intended learning outcomes
 - d) Suggesting ways to address business and entrepreneurship skills on the course level



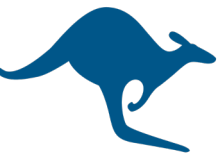
Faculty Development Program

1. Ability to apply CDIO philosophy adopting the principle that product, process, and system lifecycle development and deployment -- Conceiving, Designing, Implementing and Operating -- are the context for Business education (Standard 1 CDIO);
2. Ability to plan specific, detailed learning outcomes for personal and interpersonal skills, and product, process, and system building skills, as well as disciplinary knowledge (Standard 2 CDIO);
3. Ability to develop an integrated curriculum, designed with mutually supporting disciplinary courses, with an explicit plan to integrate personal and interpersonal skills, and product, process, and system building skills (Standard 3 CDIO);
4. Ability to develop and implement an introductory course within the integrated curriculum, that provides the framework for practice in product, process, and system building, and introduces essential personal and interpersonal skills of graduates (Standard 4 CDIO)



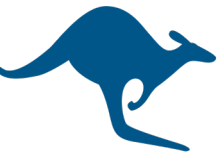
Faculty Development Program

5. Ability to organize design-built activities of students through the implementation in an integrated curriculum of at least two or more design-implement experiences at a basic and advanced levels (Standard 5 CDIO);
6. Ability to create Business and Management workspaces and laboratories that support and encourage hands on learning of product, process, and system building, disciplinary knowledge, and social learning (Standard 6 CDIO);
7. Ability to ensure integrated learning experiences that lead to the acquisition of disciplinary knowledge, as well as personal and interpersonal skills, and product, process, and system building skills (Standard 7 CDIO);
8. Ability to apply active learning methods (teamwork, case-study, games, problem-based learning, context learning) improving the quality of training and enhancing the level of acquired learning outcomes (Standard 8 CDIO);



Faculty Development Program

9. Ability for actions that enhance faculty competence in personal and interpersonal skills, and product, process, and system building skills (Standard 9 CDIO);
10. Ability for actions that enhance faculty competence in providing integrated learning experiences, in using active experiential learning methods, and in assessing student learning (Standard 10 CDIO);
11. Ability to assess student learning in personal and interpersonal skills, and product, process, and system building skills, as well as in disciplinary knowledge (Standard 11 CDIO);
12. Ability to evaluate educational program against all CDIO standards, and provide feedback to students, faculty, and other stakeholders for the purposes of continuous improvement (Standard 12 CDIO).



Faculty Development Program

Module 1 (M1)

Train and create awareness of CDIO initiative and how to implement CDIO in raw material related program and course development.

- a) CDIO Introduction, History L1
- b) CDIO Syllabus and Standards L1
- c) Methods for curriculum design L2 - a, b
Methods for course design L3 - a, b, c

Module 2 (M2)

Show examples and case studies to give ideas and inspiration to the practitioner to implement CDIO both at program level and course level.

- Case study on curriculum design L2 – c
- Case study on course design L3 - a, b, c
- Case study on involvement of Business and Entrepreneurship in Business and Management L3 – d

CHALMERS
UNIVERSITY OF TECHNOLOGY

CDIO Faculty Development Course

Implement
the CDIO approach
in your course

Date: 29th-30th October 2018

Location: VDL, Department of Industrial and Materials Science at Chalmers University of Technology



This activity has received funding from the European Institute of Innovation and Technology (EIT). This body of the European Union receives support from the European Union's Horizon 2020 research and innovation programme.

Faculty Development Program

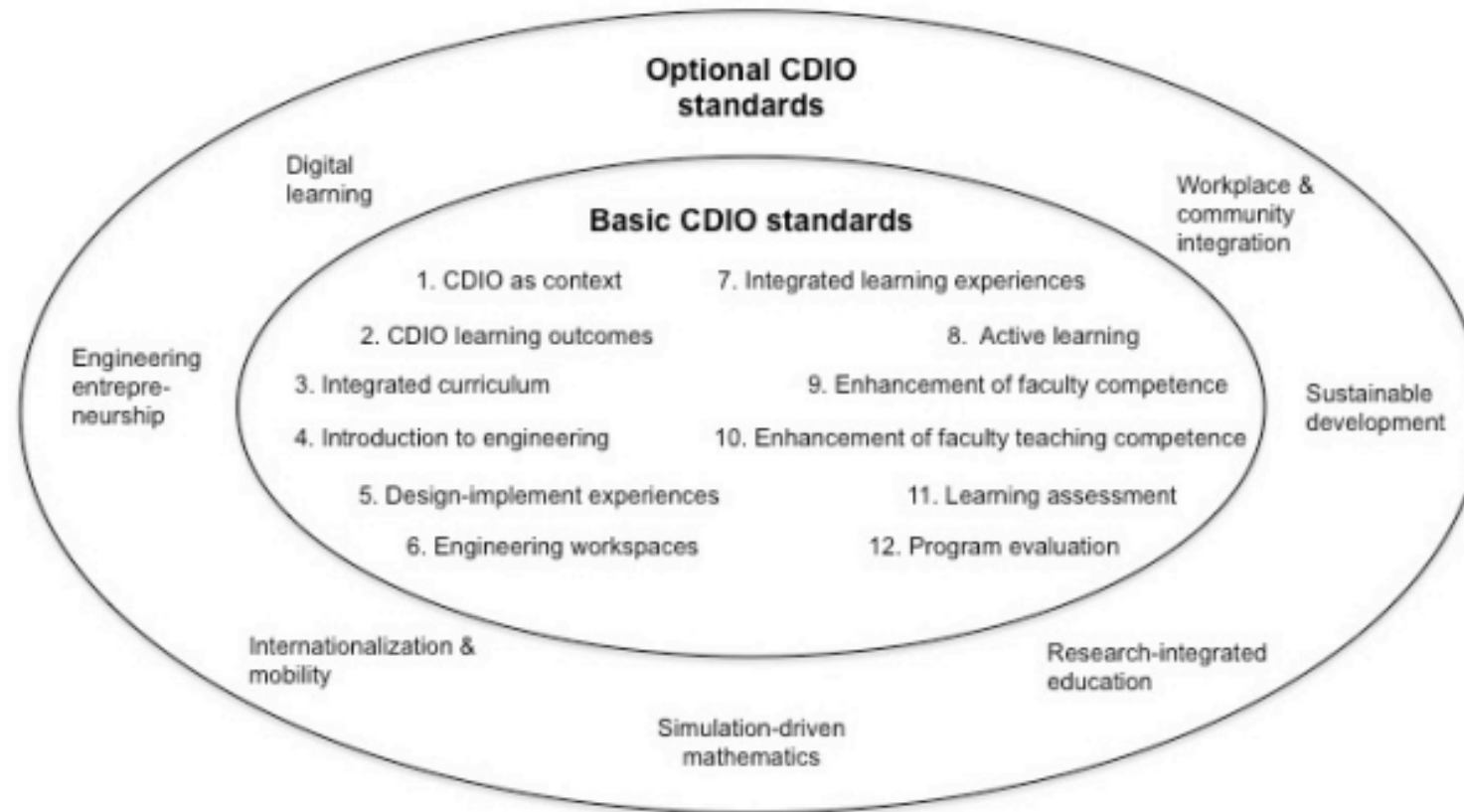
Module 3 (M3)

Developing CDIO based curriculum, courses and projects for the specific programs and courses related to the field of Business and Management aspects with industrial involvement.

- a. Workshop on curriculum design L2 - a, b, c
- b. Workshop on course design L3 – a, b, c, d



CDIO Optional Standards



Syllabus 3.0 Currently Under Review

Changes & Additions Related To:

Sustainable
Development

Digitization

Acceleration

Experiences
from CDIO
Community

Other Changes



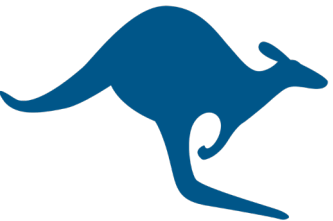
**Why don't you lead the
change?**

**If you don't change
You will be changed**





Thank you for your Patience



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