Organizational learning and the effective management of complexity

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Purpose

• This is a case study to show:

  – An application of variety engineering in managing the complexity of a project
  – The relationship between structural design and the setting up of individual and organizational learning
  – The need of designing triggers to jump from single to double loop learning
Population: 43 millions  
Area: 1´138.000 km²  
Tropical country, no seasons  
Main exportations

Context

Universidad de Ibagué

5000 students  
17 undergraduate programs  
12 post-graduate programs  
140.000 m²

Tolima

Pop: 1,3 millions  
Area: 23.500 km² in 47 municipalities  
All climates

Colombia

Map of Colombia with Bogota highlighted.
Curricula reform

Improving applied research

Increasing access to higher education

Building relationships with schools

Developing social responsibility

Strengthening the use of ICT

Strategic plan

Universidad de Ibagué

Comprometidos con el desarrollo regional
Only 40% can go to higher education

Only 20% can go to higher education

How can we increase access to higher education?
How can we increase access to higher education?

Restrictions

• Students are geographically disperse (47 municipalities)
• Poor road infrastructure
• Low quality education at local schools
• Use b-learning instead of e-learning
• Families’ low income salary
A complex project

The University offers two year common courses per Faculty

Advantages

• Lower fees
• Reduce students´ cultural shock
• Allow students to make up their minds about their career
• Adjust the education process to a cultural context

Cu <<< Cs

Students move to Ibagué to finish their careers

How to manage the complexity of the project?
Variety engineering

I. Variety engineering

II. Amplification

A self-organizing mechanism

III. Attenuation

A self-regulation mechanism

IV. Situation

V. Task

VI. Organization

Performance criteria

Cs > Cp
The State is divided in regions.

High quality education

Complexity management

Each Faculty offers common courses for all programs

All courses are centrally designed in a day-to-day detail

Evaluations are homogeneous and centrally managed

Cs >> Cu

Professors are centrally trained

Students of different programs are united in the same class

In each region there is a CERES

Professors are locally chosen

Performance criterion

Complexity attenuator

Complexity amplifier
**Individual and organizational learning**

IL is a process by which an individual increases his/her action capacity in a particular domain of action.

Individual learning is a necessary but not a sufficient condition for organizational learning.
Types of learning

Set of norms, values and meanings that constitute our world-view and guide our actions.

Individual learning: Professors delivering courses in each CERES.

Organizational learning:
- Professors delivering courses in each CERES
- Re-designing a course with virtual objects
- Using Tech & Active learning
- Giving requisite variety
- Sinergy Comitte
- A Faculty offering common courses for different programs
- A Center providing methodological support and technological tools

Learning loops:
- Single loop
- Double loop

ÁVACO Unibagua
Assess obstacles that affect the learning process of his/her students

Professors delivering courses in each CERES

Observe the outcome of centralized evaluations of his/her students

Design adjustments in the process of delivering the course

Individual single-loop learning

Every semester

Implement changes in the following semester

At a higher structural level the performance of the professor is also evaluated
A Faculty delivering common courses for different programs

Observe reports from professors of higher level courses and evaluations of freshmen

Assess the competences that new students have to strength to follow an eng. programme

Sinergy Commitee

Assess the competences that new students have to strength to follow an eng. programme

Observe reports from professors of higher level courses and evaluations of freshmen

Organizational single-loop learning

Every year

Design new courses or adjustments to existing ones

Implement new courses

Produce reports, update curricula, share with other faculties at a higher structural level
Triggers to promote double-loop learning

Passive learning

Active learning

Challenge mental models, frameworks and practices

Traditional teaching tools

e-learning teaching tools

"I expect you all to be independent, innovative, critical thinkers who will do exactly as I say!"
Re-designing a course with AVAs

**Observe**
- motivation and performance of students

**Assess**
- the effectiveness of passive learning and traditional teaching tools

**Design**
- active learning classes with AVAs

**Implement**
- new courses

**Every course**
- Every year these experiences are shared with other professors to motivate change

**Individual double-loop learning**
A center providing methodological support and technological tools

Observe the performance of re-designed courses in comparison with traditional

Assess the effectiveness of the tools being used

Assess

Design new teaching practices with AVAs

Design

Implement new methods for redesigning courses

Implement

Every semester

Organizational double-loop learning

Produce technical reports about new practices, write academic papers, update a resources database
Final remarks

• Effective learning loops requires designing structural mechanisms with requisite variety

• Learning loops support the management of complexity of a viable organizational task