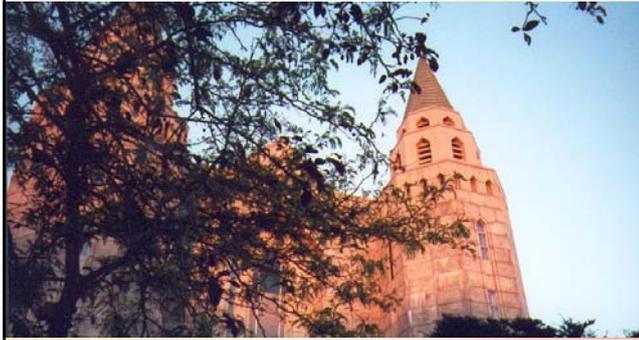


Evolution of Geomatics Curriculum :
*Adding new knowledge
without lengthening studies*



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MAIN MESSAGE



- **Science is based on accumulation of knowledge**
 - More and more knowledge in every discipline.
 - Pace of knowledge production is accelerating.
- **Academic programs are intended to educate, train, and develop competencies.**
 - It is not only about knowledge transmission.
- ***How can we keep our curriculum complete and adapted for new challenges and social concerns?***



INTRODUCTION



- Demands for new curriculum contents are increasing.
 - Faster and faster
 - Technology-driven / Society-driven
- Geomatics education programs are highly concerned by these demands.
 - Land is the base of society, economy, ..., happiness.
 - But we can not just keep adding new courses and, by doing so, lengthening the duration of our programs.
 - *How can we do more within the same time frame?*

PRODUCTION OF KNOWLEDGE



- M. Gibbons *and al.* (1994), *The new production of knowledge: the dynamics of science and research in contemporary societies*, Sage Editor
 - *"A new form of knowledge production started emerging from the mid 20th century which is context-driven, problem-focused and interdisciplinary."*
 - *"It involves multidisciplinary teams brought together for short periods of time to work on specific problems in the real world."*

Source:
http://en.wikipedia.org/wiki/Mode_2

PRODUCTION OF KNOWLEDGE



- **Mode 1 = Knowledge production is within a single discipline.**
- **Mode 2 = Solving practical problems requires the integration of different skills and knowledge – it is transdisciplinary.**
 - **Multidisciplinarity** is characterised by the autonomy of the various disciplines and does not lead to changes in the existing disciplinary and theoretical structures.
 - **Interdisciplinarity** is characterised by the explicit formulation of a uniform, discipline transcending terminology or a common methodology. The form scientific co-operation takes consists in working on different themes, but within a common framework that is shared by the disciplines involved.
 - **Transdisciplinarity** arises only if research is based upon a common theoretical understanding and must be accompanied by a mutual interpenetration of disciplinary epistemologies. (Gibbons et al, 1994).

Source:

<http://labspace.open.ac.uk/mod/oucontent/view.phpid=449234§ion=1.2>

IN THE LAST 25 YEARS



- **Introduction of Geomatics as an Academic Curriculum**
- **New courses**
 - Geo-computing
 - GIS, Remote Sensing, GPS, ...
 - Land Use Planning, Urbanism, Environment
 - Professional Ethics, Communication
- **Still pending demands:**
 - Aquatic botany (watercourse boundaries and delimitation)
 - Project Management, Advanced Land Analysis
 - Sustainable Development, Case studies, ...

EDUCATION PROGRAM



- Education programs can not just integrate new contents, resulting in a lengthening of studies.
 - Time frame is not a variable.
- Geomatics Sciences program
 - 8 semesters (over 4 years)
- Program adjustments almost every year
 - Marginal adjustments
 - Periodic revision (every 7 years)
- Program committee: Professors, Students, Professionals

STRATEGY ???



- Analogy between academic program and urban management
 - End of the Urban Sprawl = Densification
 - Creation of new space within a defined area
 - Air-space and underground developments
- *Can we densify education and knowledge transmission?*
 - New teaching and pedagogic approaches
 - *Is there a critical limit (or level) beyond which there is no learning gain?*

RENEWAL OF PEDAGOGICAL APPROACHES



- **Problem-oriented methods**
 - Practical exercises, term papers, ...
- **Case studies**
- **Written and Oral presentation / Different roles and responsibilities (team-work)**
- **Self-evaluation and Peer-evaluation**
- **Team teaching**
- **Mixing of students**
- **Competency and quality development**

PROFILES



- **Managerial**
 - Business skills, project management, assessment
- **International**
 - Foreign problems, new ways of learning
- **Sustainable Development**
 - Introduction of SD concerns in a specific discipline
- ***We must accept the fact that our graduates have different profiles!***
 - ***Same basic knowledge, with different training and competencies.***

CONCLUSION



- **The evolution of geomatics' curriculum is a constant concern at Laval University.**
 - This task is not the sole responsibility of the program's director.
 - It is a collective challenge, shared by the program's direction, the professors and teaching assistants, the students and the geomatics' professional community.
- **This task represents a wonderful challenge of thinking about the future, but also about the renewal of pedagogical methods and the ways we teach geomatics!**