Introduction

Sustainability science has both **disciplinary depth** and **interdisciplinary breadth**.

**Systems Analysis** is central to sustainability science.

Interdisciplinary research is on the rise, although it may take time to have an impact.

Some fields and geographies are more interdisciplinary.

**How interdisciplinary are you?**

[Screenshot of a news article titled: How interdisciplinary are you?
http://www.nature.com/news/how-interdisciplinary-are-you-1.18362](http://www.nature.com/news/how-interdisciplinary-are-you-1.18362)

Sustainability science has emerged as a key discipline that embraces both disciplinary depth and interdisciplinary breadth.

The challenge is to design University courses that convey both properties without sacrificing either of them.

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### Key competencies for Masters programs in Sustainability

Sustainability programs aim at achieving three types of competencies:

1. **Intellectual**
2. **Interacting**
3. **Self development**

Our course is presented together with a theories course, and we focus on:

1. **Intellectual competencies**
   1.1. Analyzing, evaluating and crafting future
   1.2. Systems and analytical thinking
   1.3. Research and ICT skills
2. **Interacting competencies**
   2.1. Practical skills
   2.2. Communicative skills
3. **Self-development competencies**
   3.1. Normative competency

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### Course Objectives

1. **Knowledge**
   - **Sustainability Perspectives**
     - Introduction of SD
     - Themes
     - Solutions
   - **Modelling and Indicators**
     - Principles
     - Themes
     - Examples

2. **Key lessons**
   - Mathematics were challenging for a part of the students, but still doable
   - Learning curve was steep
   - Students had higher experience with Excel than other modelling platforms
   - Excel exercise received the highest and lowest grades, and students found it time consuming but also indicated that they learned the most
   - Netlogo was the favorite exercise, because plug-and-play software was perceived as better to bring conceptual models to mathematical formulations

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### Conclusions

1. **Relate to students background**
2. **Use of-off-the-shelf software**
3. **Key challenges: concepts of systems analysis and the applied mathematics behind it**
4. **The goal is to demonstrate process**
5. **Can be complemented with programming**
6. **Learning while doing**