Constructive Alignment of an introductory university Geographic Information Systems course

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Introduction

Framework for course development: Constructive Alignment

Course: GIS 1, a 2nd year course in a 4 year BSc Geomatics degree
What is Constructive Alignment?

Framework for
“deriving curriculum objectives in terms of performances that represent a suitably high cognitive level, in deciding teaching/learning activities judged to elicit those performances, and to assess and summatively report student performance” (Biggs, 1996)

Guides the total learning experience

Theoretical Framework

Constructivism
“learning is an active process of constructing rather than acquiring knowledge”; “instruction is a process of supporting that construction rather than communicating knowledge” (Duffy & Cunningham, 1996)

Student-centred learning to aid deep learning
Constructive Alignment

- Teaching / Learning Activities
- Curriculum Objectives
- Assessment Tasks

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Constructive Alignment

Teaching / Learning Activities → Curriculum Objectives → Assessment Tasks

Map Creation

Teaching/Learning Activities
- Group discussion
- Demo (colour wheel, examples of good & bad maps)
- Online tutorial

Curriculum Objectives
- Analyse map requirements, choose appropriate data
- Create map

Assessment Tasks
- Practical
- Exam
- Practical
Map Projections

Teaching/Learning Activities
- Lecture
- Development exercise with globe
- Tutorial
- Group discussion
- Lecture
- Demonstration
- Tutorial

Curriculum Objectives
- **Describe**: properties of sphere, process of map projection, distortion
- **Solve** spherical trigonometry problems
- **Relate** distortion theory to specific maps, **choose** appropriate projection
- **Relate** to GIS

Assessment Tasks
- Exam
- Exam
- Exam Practical
- Practical Exam

Constructive Alignment

Teaching / Learning Activities
- Curriculum Objectives
- Assessment Tasks
The “GIS Moment”

Teaching/Learning Activities
Curriculum Objectives
Assess. Tasks

Groupwork
After constructive alignment, improvements in:

- **Practicals / tutorial assignments**;
- **Group work**;
- **Lectures**
Evaluation

Before Constructive Alignment:
“There is a lot of theory to learn which is actually not needed”

After Constructive Alignment:
“The discussions that we had in class was good, how to solve real problems using GIS was great”

“It was good when you showed us, when you physically did something on the GIS, so we can see how it’s applied”

Conclusion

• Useful tool that provides guiding principles to develop students’ experience
• Constructive alignment difficult or impossible to achieve – important to be a reflective practitioner
• Students must engage in activities that achieve learning outcomes
Thank You