



A Systems View on Courses - and on Universities

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Introductions

- Name and institution
- Please mention one educational development effort that you are (or were) involved in at your institution.

Introducing some concepts:

- **Approaches to learning**
- **Constructive alignment**
 - Relations between objectives, activities and assessment
 - Using constructive alignment to guide course design

Using these concepts to propose the idea of

- **System alignment**

Approaches to learning

- Qualitatively different ways of **experiencing and dealing** with the learning task.

Deep approach to learning

” Well, I read it, trying to concentrate on what it means. I really try to read it slowly. There is a lot of meaning behind it. You have to really get into it and try to really think ‘What does it mean?’ You mustn’t regurgitate what David is saying because that’s not the idea of the exercise, so I suppose it’s really original ideas, kind of getting it all together.”

Surface approach to learning

” Getting enough facts so you can write something relevant in the exam. What I normally do is learn certain headings. In the exam I can go: ‘Introduction’ and I know what I’ve got to write about it without really thinking about it really. I know the facts about it. I go to the next heading and regurgitate.”

These two extracts involve the same student on two different courses. The student has responded strategically to the perceived demands of the courses.

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Deep approach to learning

- Intention: learning, seeking meaning
- Gives well-structured knowledge, long retention
- Positive emotions
- Intrinsic motivation

Surface approach to learning

- Intention: passing the course
- Gives poorly structured knowledge, quickly forgotten
- Negative emotions
- Extrinsic motivation

Spectacularly different outcomes

- The outcomes of students engagement with a learning task differed spectacularly, because the nature of their engagement with that task differed spectacularly.

Surface approach: a means-ends reversal

- *Demonstrating learning*
(passing assessment, recall)
becomes an end in itself instead of
indicating the intended outcomes
(insights, capabilities, understanding).

Factors that correlate with a surface approach

- inadequate previous knowledge
- time constraints
- an over-demanding syllabus
- frequent assessment for credit
- lack of feedback
- assessment methods that emphasize recall
- previous rewards for learning of this sort

[Bowden & Marton 1999]

Factors that correlate with a deep approach

- teaching and assessment methods that foster active and long-term engagement with the learning tasks
- clearly stated expectations
- teacher's commitment to the material
- emphasis on meaning and relevance to students
- opportunities for students to exercise choice in how and what to learn
- interest and background knowledge
- previous rewards for learning of this sort

[Bowden & Marton 1999]

KTH or Chalmers student:

Deep approach

"The things I remember from a course is the parts we had assignments on. Then I really sat down with the problem and worked out the solution myself. If you work on old exams, you check up the correct answer right away, and then move on without really learning."

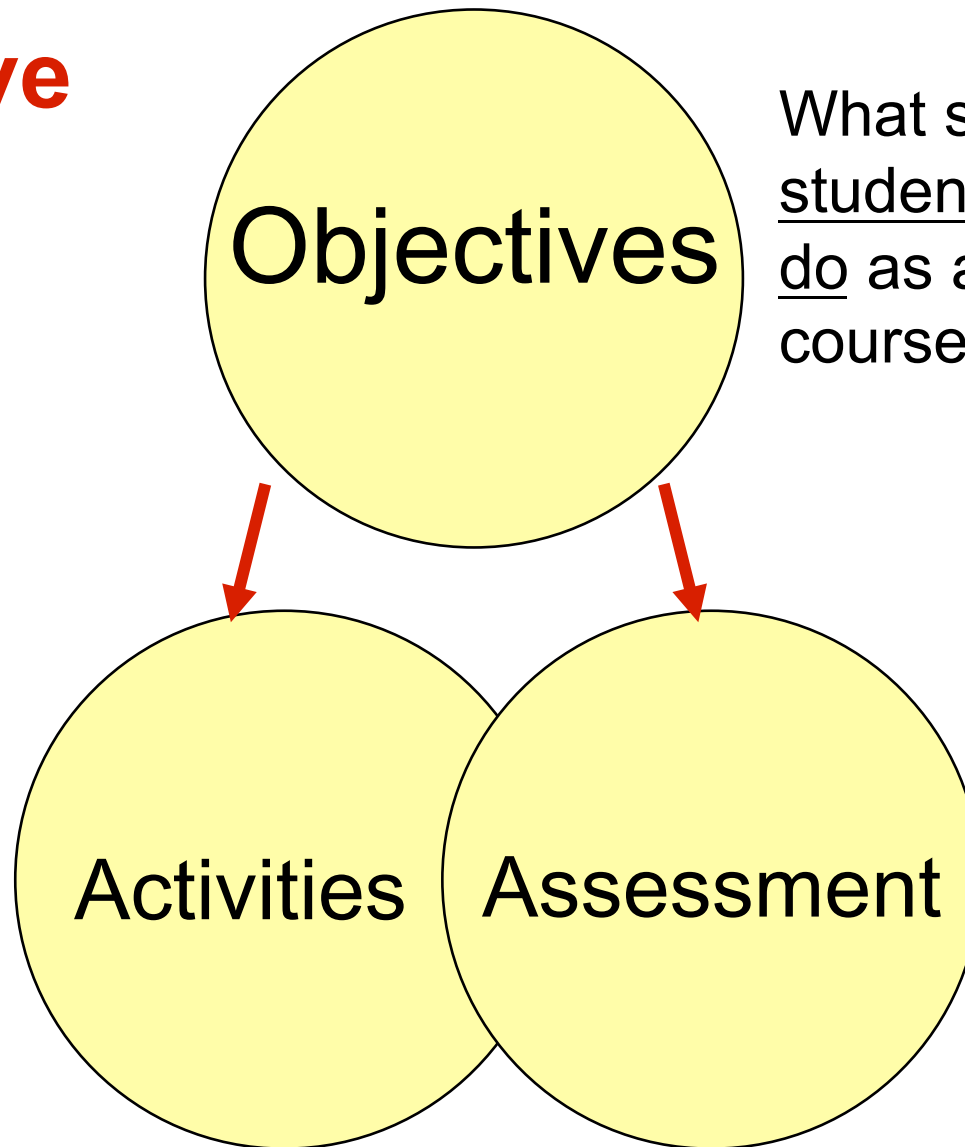
Surface approach

- The same student can use both deep and surface approach - in the same course!
- Assessment affects what strategy is adopted. Here, doing assignments is associated with a deep approach, while studying for the exam is associated with a surface approach.

[Edström & Törnevik 2003]

Constructive alignment

[Biggs 1999]



What should the student be able to do as a result of the course?

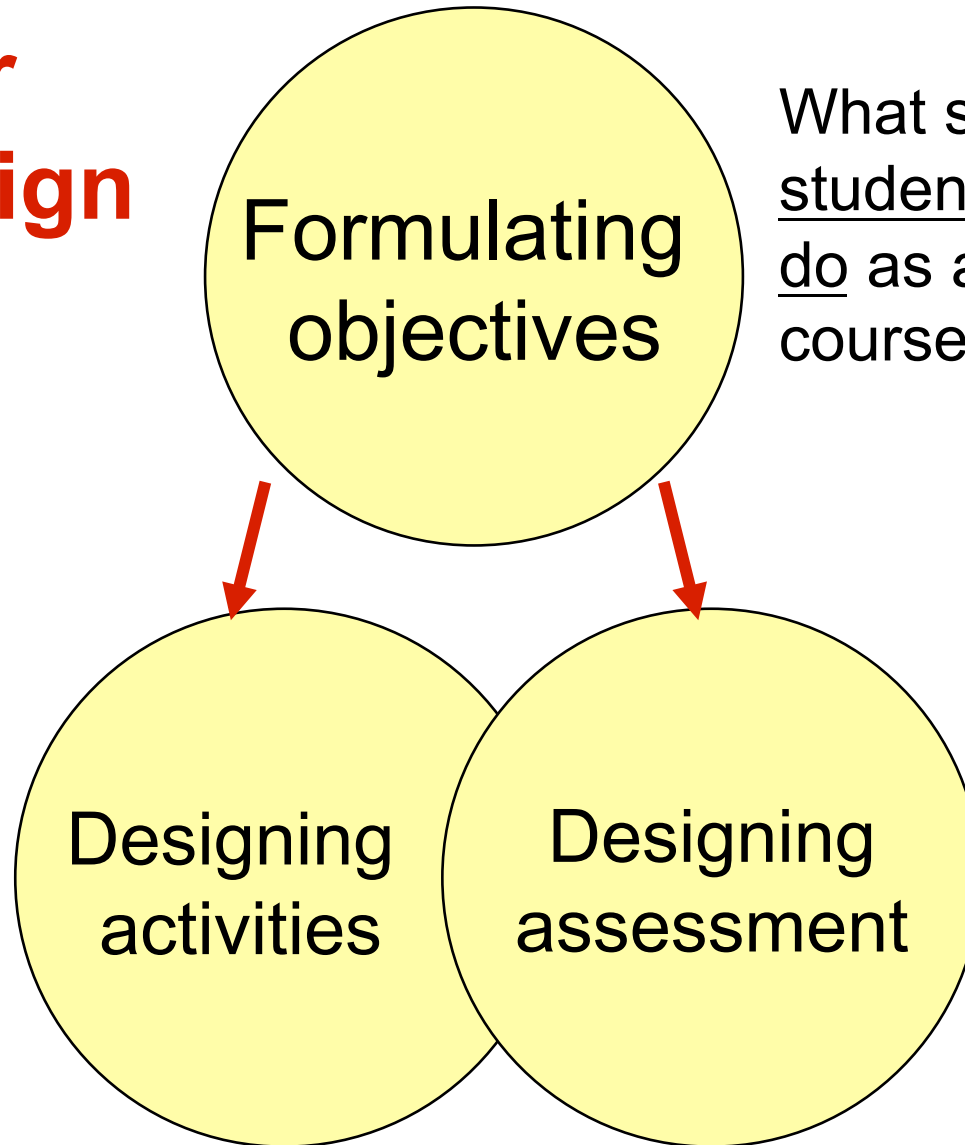
What work is appropriate for the students do to reach the objectives?

What should the students do to demonstrate that they reached the objectives?

Constructive alignment

- Let's think about the **course as a system**. The system as a whole should **influence the student** to use a **deep approach** to learning.
- This means that the course components must be **aligned** to each other and conducive to a deep approach:
 - intended learning outcomes
 - learning activities
 - learning assessment
 - course evaluation [Edström 2007]

A model for course design



What should the student be able to do as a result of the course?

What work should the students do - to reach the objectives?

What should the students do to demonstrate that they reached the objectives?

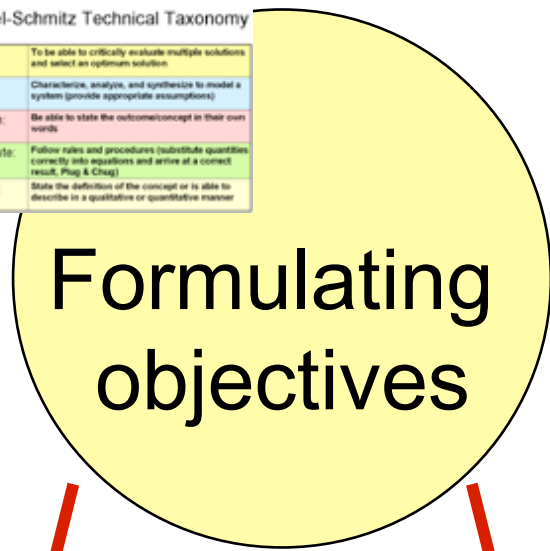
Feisel-Schmitz Technical Taxonomy

Judge:	To be able to critically evaluate multiple solutions and select an optimum solution
Solve:	Characterize, analyze, and synthesize to model a system (provide appropriate assumptions)
Explain:	Be able to state the outcome/concept in their own words
Compute:	Follow rules and procedures (substitute quantities correctly into equations and arrive at a correct result, Plug & Chug)
Define:	State the definition of the concept or is able to describe in a qualitative or quantitative manner

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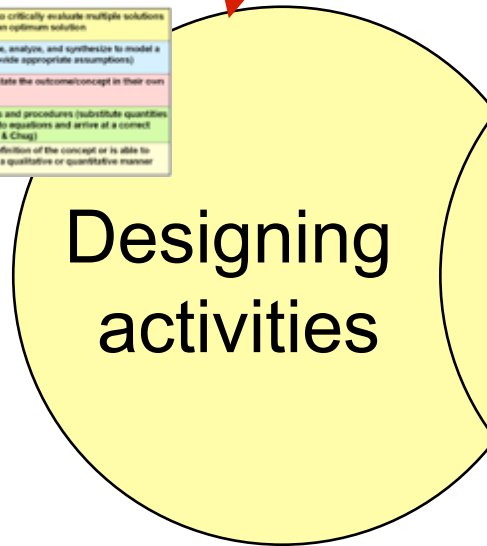
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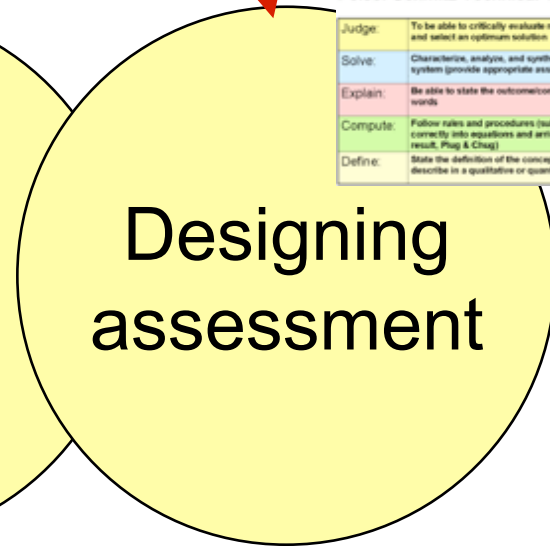
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What should the students do to demonstrate that they reached the objectives?

Returning to the development effort that you mentioned in the introduction

- *How much of the change will "stick" for 10 years?*
- *What may cause the results to erode?*
- *What may make change more sustainable?*

What factors influence the teaching and learning environment?

Sorting the factors into categories



“If you want to learn about a system, try to change it”

(after Le Chatelier’s principle)

**Why is it so hard to make
sustainable change?**

Working against the system



- The change is not sustainable if we must always keep applying force in the system (leadership, resources) to keep the programs from reverting to the "natural" state.

Where the rubber meets the road

The way the university works as a **system**:

- how the university is organized,
- how recruitment & promotion processes are designed,
- how power is assigned,
- how resources are allocated,
- and how status is earned,
- (what matters to people, the real, hard, end-of-the-day, bottom-line stuff)

is more shaped to accommodate the disciplines and research, rather than education or student need.

Sustainable change



- In the long run, we must be prepared to **change the system itself** so it is **aligned** - not only with disciplines & research - but also **with the educational experiences we want to create.**

Reminder:

Constructive alignment

- Let's think about the **course as a system**. The system as a whole should **influence the student** to use a **deep approach** to learning.
- This means that the course components must be **aligned** to each other and conducive to a deep approach:
 - intended learning outcomes
 - learning activities
 - learning assessment
 - course evaluation

System alignment

- Let's think about the **university as a system**. The system as a whole should **influence the teacher** to engage appropriately in the teaching task.
- This means that the system components must be **aligned** with each other and conducive to appropriate ways to approach teaching.

Conclusions

- The concept *system alignment* is proposed, a parallel to constructive alignment, *but on the system level*.
- The components that create the conditions for teaching and learning must be in alignment, with each other, and with the long-term direction we wish the university to move in.
- The system components of a university are any macro-level structure such as organisation, infrastructure, work processes and policies, especially those that regulate issues such as hiring, promotion, funding.
- The system alignment concept helps us analyse the different processes at the university, and identify clashes that need to be addressed.

Two cases

- KTH: Course evaluation system
- Chalmers: Agreement on course delivery between programme director and vice head of department – a new form

KTH case



The Course analysis policy at KTH

A course analysis consists of:

- Quantitative data (number of students registered, completion rate).
- Students' views on the course, appropriately documented, for instance through a questionnaire, minutes from a meeting with student representatives, or interviews.
- An analysis by the teacher, with a brief comment on the quantitative data and the results of the survey, including proposed measures and deadlines.

The course analysis should clearly show a course's development from one year to the next.

The course analysis should be communicated to the vice dean of education and the dean/board of the school.

The term **course analysis** was chosen because:

“To many teachers and students the concept of course evaluation is associated only with questionnaires to the students in the end of a course. These traditional course evaluations often focus on the performance of the individual teacher. Experience shows that they are of limited value for long-term improvement of the course. The working group introduces the concept course analysis, which includes more than the traditional course evaluations, although these can be part of the data.”

From the report “Proposal for course analysis”, October 1995

But there is another policy...

From **policy on hiring and promotion**,
template for teaching portfolio:

"course evaluations should be included"

Why use the term course evaluations?

Perhaps here it is actually the students' views on the teacher's performance that should be presented?

[KTH Handbook 4]

The two purposes of evaluation:

Development or **audit**

(quality enhancement or quality assurance)

Thesis 1

There is a fundamental tension between
audit and development

Development:

find out how things can
be improved
(things can be
improved \approx problems)

Course analysis

develop the course

Audit:

create a basis for a
fair (advantageous)
judgement

Teaching portfolio

be promoted

Thesis 2

Evaluation can only function as a tool for development if it is free from audit

(not always, but here, because the teachers are themselves responsible for evaluating their own work)

Thesis 3

Evaluating for development or for audit
calls for different kinds of inquiry

Posing the questions

How did you like the lab instruction booklet?

- Very good
- Good
- Not so good
- Bad

Result

How did you like the lab instruction booklet?

Very good 12%

Good 52%

Not so good 27%

Bad 8%

What did we find out?

64% thought it was good.

...oh.

Then what?

Fire alarm function only.

Posing the questions

Alternative 2

Give your views on the lab instruction booklet, especially how it could be improved?

Result

Give your views on the lab instruction booklet, especially how it could be improved?

- hand it out in the beginning of the course (>10)
- basically good (>30)
- tell us what to do step-by step (>10)
- do a spellcheck, fix typos etc (>10)
- unnecessary theory (>10)
- theory part not enough to understand the lab (<10)
- theory in the book is better, just refer us there (a handful)
- figure 2 difficult to interpret (a handful)
- misunderstanding about the first measurements (a few)
- add table of contents (1)

What did we find out?

We got several interesting suggestions on how to improve the booklet.

We also had suggestions that may reveal

- *surface approach*
- *immature attitude towards knowledge*
- *naive conceptions of student and teacher roles*

It is valuable to know about them...

but it would be counterproductive - from a learning perspective - to satisfy them!

Conflicting policies:

Course analysis policy

Hiring and promotion policy

- Both policies have the same long-term purpose - to improve teaching at KTH.
- The tension between audit and development creates a conflict between the two policies (on the level of the individual teacher).
- The *Hiring and promotion policy* affects the *Course analysis policy* negatively.
- The *Hiring and promotion policy* risks counteracting its own long-term purpose because it is misaligned with the *Course analysis policy* .

Chalmers case: Agreement on course delivery

Since 2005 new organisation: Clearer roles of ordering and delivery.

Principal actors:

- Programme director and
- Vice head of department

Agrees on qualities and costs for delivering a course.

Programme director orders the course

- with specifications to fit in the programme,
- to correspond to learning outcomes fulfillment
(according to programme design matrix)
- With certain pedagogical features, e.g. form for assessment
- With some integration of e.g. development of Communications competence

Vice head of department

- Nurtures teachers' growing pedagogical competence, seminars on educational quality at the department
- Follow-up on course evaluations
- Reports on teachers achievement to head of department for yearly individual salary decision.
- ..

Each year

- New agreement in the autumn for the forthcoming 1,5 year
(Forthcoming financial year + forthcoming academic year)
- Follow-up on the last agreement late spring.

A new arena is established

The course agreement process is a new arena with several possibilities to enhance good teaching quality

- Payment to department according to teaching quality – or not
- Enhancing department's engagement in the quality of the whole programme – or not
- Rewarding the teacher's development as a teacher (merits, salary) – or not

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