

Engineers in Transition



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S. GREGORII DE ANTONINA DUXIT



HEY, MOM, CAN YOU PLEASE COME & HAND ME THAT
BOOK "LAZY STUDENT'S GUIDE TO MOTIVATION"
I DON'T FEEL LIKE GETTING UP.



**“I taught him everything I know
and he’s still stupid.”**

“... redesigning an educational system is a relatively easy exercise. Changing one’s own teaching, especially when it has been acclaimed as successful by all the old standards, is very much harder ...”

Edwin Mason in “Collaborative Learning”

Re-Designing Our First Year Experience

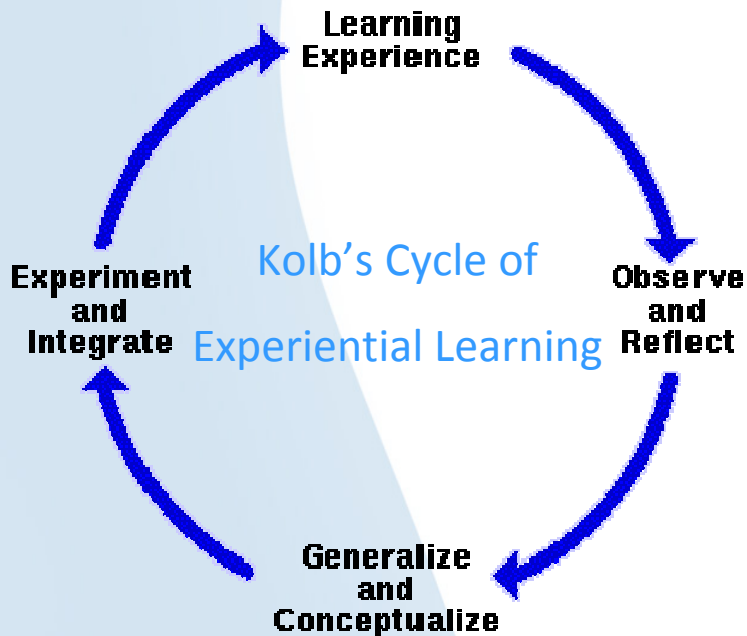
- **Active, collaborative learning**
- **Constructivism**
- Student centred
- Significance

Active (Collaborative) Learning

“...learning is the process whereby knowledge is created through the transformation of *experience*...”

D Kolb in “Experiential Learning”

Experiential Learning



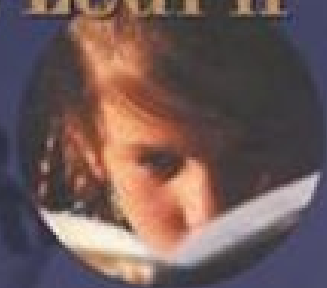
- Experiment (**concrete experience**)
- Analyse (**reflective observation**)
- Hypothesis (**abstract conceptualisation**)
- Testing (**active experimentation**)

Constructivism

- A method of teaching which accepts the idea that knowledge is not 'learned'; rather, it is constructed
- A method of teaching that sees the students as actors rather than spectators

Expanded Edition

How People Learn



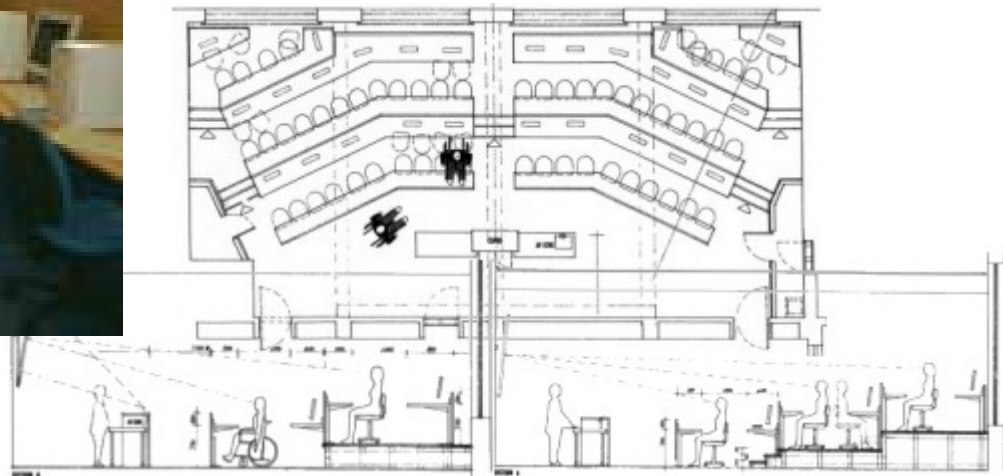
**Brain,
Mind,
Experience,
and
School**

NATIONAL RESEARCH COUNCIL

Active Learning Environments



- Weir Teaching Cluster
- InterActive ClassRooms
- Studio Teaching





Studio Teaching



The InterActive ClassRooms



Personal Response System Copyright by Avation Manufacturing Ltd.

File: Answers... Q1 (Select) Screen: Q1 (Select) ID (Choose) Graph Options

Q1 01:29 14

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Eden H	Fox M	Glass V	Chan RB	---	---	---	---	---	---
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New Approaches to
Teaching & Learning
in Engineering



Classroom Clickers

Cps was created with the busy teacher in mind.

Our templates are easy-to-use and require little technical knowledge. Browse through the following pages to see how simple it is to build class rosters, create questions, and grade tests!



cps
RF



7% of which Irish crop goes into the production of Guinness?

- ① Wheat
- ② Potato
- ③ Barley 😊
- ④ Hops

iml

iml

o response



- key features:**
- Immediate feedback promotes student achievement.
 - Teachers can easily disseminate curricular materials.



**Series 8
H-ITT**



Why do you like that class?

“ ... with 100 people in the class you normally just sit there without being involved... and add to your notes. In that class **everybody's involved**, you have to think about what's being said...you have to stay awake...but it's more fun, you get more from it...better than just sitting taking notes...”

“... what **fun** it can be, it can be **light-hearted** yet you still learn a lot ...”

“... how quickly a two-hour class passed compared to other one hour lecture classes...”



WebCT

Puzzles

Warm-ups

JUST-IN-TIME **TEACHING**

Good-fors

Drum-Beats

Physlets

Homework-Helpers

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Re-Designing Our First Year Experience

- Active, collaborative learning
- Constructivism
- **Student centred**
- Significance

'Student-Centred' Learning?



Our Educational Culture



Wooded Student Centre



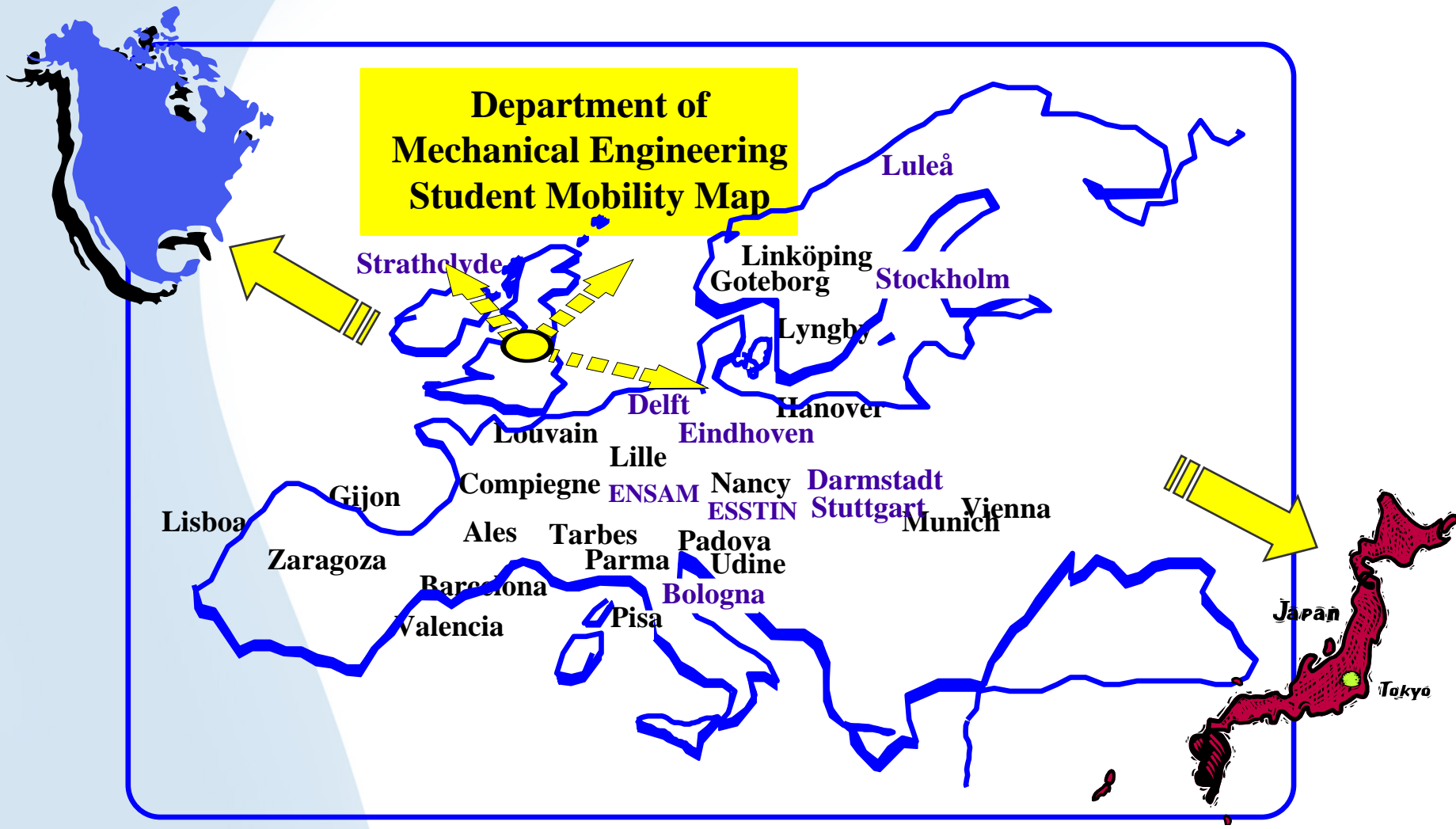
Problem Based Learning

In the same way that students of medicine learn the workings of the human body through clinical dissection, engineering students can learn a great deal about engineering components by *mechanical dissection*.





Department of Mechanical Engineering Student Mobility Map





Aero-Mechanical Engineering students on the Glider Flight Test





Student Parabolic Flight Campaign

European Space Agency





Re-Designing Our First Year Experience

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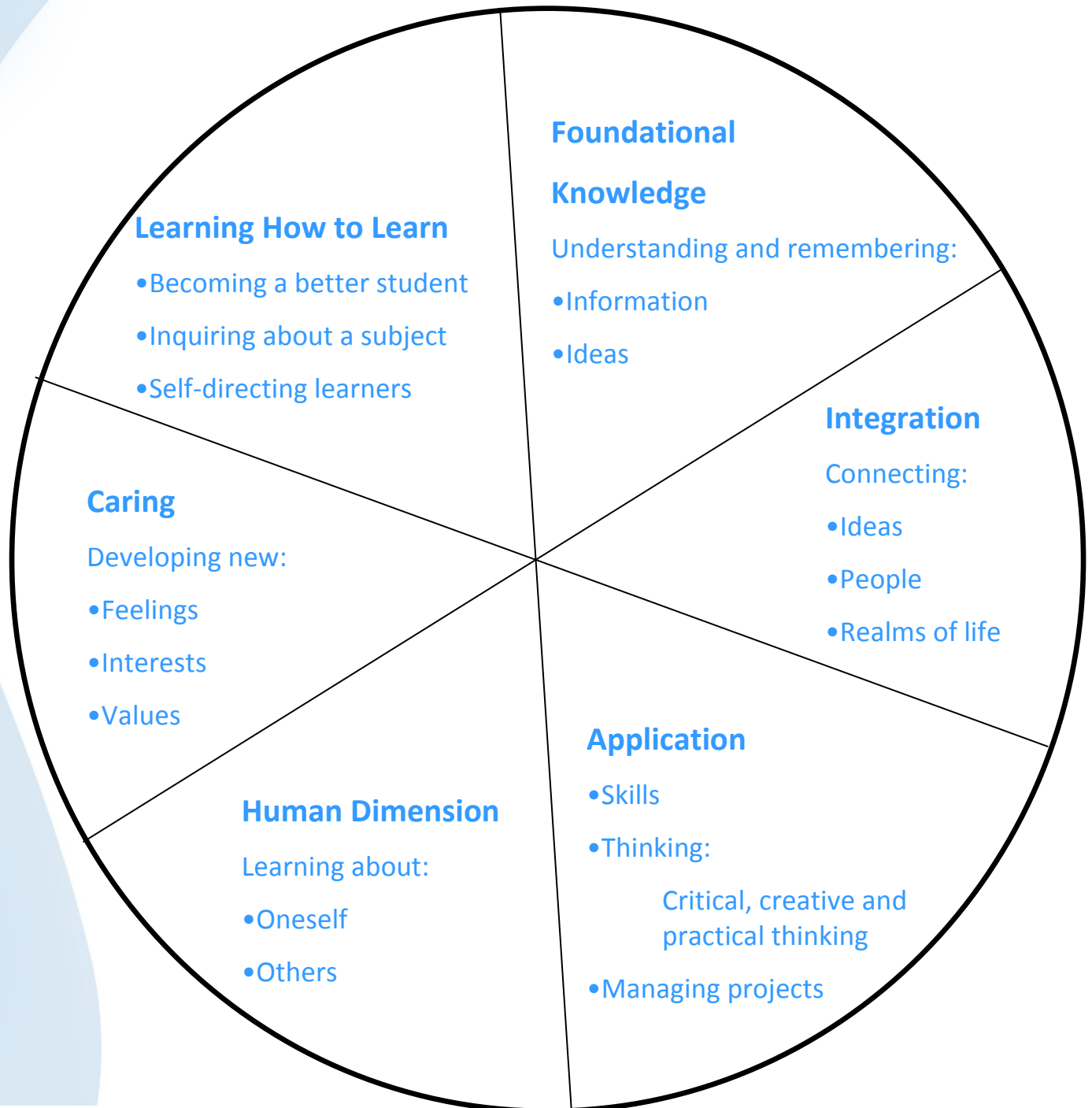
L. DEE FINK

CREATING SIGNIFICANT
LEARNING EXPERIENCES

*An Integrated Approach to Designing
College Courses*

Fink's Taxonomy of Significant Learning

- **Process**
 - Students are engaged in their learning
 - Class has a high energy level
- **Results, Impact, Outcomes**
 - Significant and lasting change
 - Value in life





ACHIEVING and SUSTAINING
**INSTITUTIONAL
EXCELLENCE**

for the FIRST YEAR OF COLLEGE



Betsy O. Barefoot

John N. Gardner

Marc Cutright

Libby V. Morris

Charles C. Schroeder

Stephen W. Schwartz

Michael J. Siegel

Randy L. Swing

Foundations of

Excellence in the First Year of College

1. The first –year experience is a high priority.
2. Leadership , operating at multiple levels, is essential to achieving excellence.
3. Excellence flourishes in a culture that encourages idea generation , pilot projects and experimentation
4. Excellence in the first year is achieved through efforts designed for all or for a critical mass of first-year students.

5. Assessment is an essential component of moving toward and sustaining excellence.
6. Clarity of institutional identity and mission and a concomitant respect for students are essential.
7. Excellence relies on the direct involvement of an institutions faculty
8. Excellence requires attention to pedagogy in 1st year courses.

9. Creative acquisition and judicious use of financial resources are necessary to achieve excellence.

10. A central component is a steady “outward gaze” – the willingness to learn from and share with others.

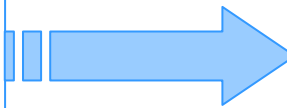
11. Excellence rests on an intentional first-year curriculum and on supportive curriculum structures.

12. Excellence thrives in an environment where divisional walls are down.

Changing Expectations



Don't expect too much of us, and we won't expect too much of you



What we expect our students to do – we must also be willing to do ourselves



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