PBL - Future project

PBL competences moving into a digital age - challenges and possibilities

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1. Content Knowledge and 21st Century Themes
   Disciplines + Global awareness

2. Learning and Innovation Skills
   Creativity and Innovation
   Critical Thinking and Problem Solving
   Communication and Collaboration

3. Information, Media and Technology Skills
   Information Literacy, Media Literacy
   ICT Literacy, Computerization

4. Life and Career Skills
   Flexibility & Adaptability, Initiative & Self Direction
   Social & Cross-Cultural Skills,
   Productivity & Accountability
   Leadership & Responsibility
Engineering at CSU

Charles Sturt University

CSU Engineering - Hallmarks of Distinction

- Entrepreneurial graduates: This will be the only Australian Engineering School hosted in a Business faculty, providing technical excellence as well as communication, financial and management skills
- Embedded work experiences: Student Engineers will complete the first 18 months of their study on campus, before being embedded in industry for the remainder of the course. Our Student Engineers won’t just learn engineering as they study; they will live it
- An innovative curriculum: CSU will be at the leading edge of educational technology and pedagogy, meeting Student Engineers’ current and future learning needs

1. 18 month at university – doing projects and online courses
2. four year-long placements in industry + studying theory online
CHRISTINE ORTIZ, MIT – building up new engineering institution

Online courses

Projects

Both individual and team based

Connected to research lab and companies
Strength and challenges

PBL skills

Problems as drivers for the learning

Collaborative and communicative skills

The individual reflection might be missing....

System approach – with coordination of courses and projects
PBL future 2017-2020
A PBL response to the digital age

Past

Baseline studies
Sub project 1
Student centred problem design
Sub project 3
Individual PBL competence development
Sub project 4
Flipped semester

New PBL skills/competences
New PBL directions

June 2017
June 2018
June 2019
June 2020

Sub project 2
Emerging collaborative skills for digital age

PBL and ICT lab on methodology
The baseline study: PBL skills and competences

<table>
<thead>
<tr>
<th>Hmelo-Silver, 2004</th>
<th>Aalborg University</th>
<th>PBL skills and competences</th>
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<tbody>
<tr>
<td>Acquisition of flexible knowledge,</td>
<td>Problem analysis</td>
<td>No real definition… just lists of skills…</td>
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<td>Effective problem-solving skills,</td>
<td>Problem solving</td>
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<td>Self-directed learning skills,</td>
<td>Interdisciplinary collaboration</td>
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<td>Effective collaboration skills, and</td>
<td>Creativity and innovative thinking</td>
<td>The competences that comes out of a PBL curriculum</td>
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<td>Intrinsic motivation</td>
<td>Critical thinking</td>
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The baseline study

1) how the various educational programs organise and frame the PBL competences?
2) how the students’ projects interact with the courses?
3) how the students and facilitators understand the learning and progression in the development of PBL competences?
4) what kind of digital technologies are students currently using to support their studies at AAU?
1) What role does the process of student-led problem identification and analyses play in students’ learning in projects?

2) How do students and supervisors experience the self-directed process of identifying, formulating and modifying problems?

Subproject 2: Emerging PBL Collaboration Skills for a Digital Age
Subproject 2: Emerging PBL Collaboration Skills for a Digital Age

1) What is the impact of new technologies and hybrid spaces on students' collaboration in a PBL environment?

2) What are the PBL practices and collaboration skills that emerge out of this meeting and

3) How do these translate into wider PBL competences, that students develop or need to develop throughout their study?
Learning analytics - ethical considerations.. Students or staff?


Figure 4. Captured frame from all six cameras.
Subproject 3: PBL competence development by individual students

1) how individual students can identify the emergence of their specific PBL competences?
2) how this may benefit students’ development of professional identity?
3) how reflective tools can trace the progression of such individual competencies and
4) how individual students can communicate these insights to different audiences, including other group members, supervisors, external (national and international) stakeholders and future employers
Subproject 4: PBL in flipped semesters

50% courses

50% project

Courses 5 ECTS

Courses 5 ECTS

Courses 5 ECTS

Individual assessment

Individual assessment

Individual assessment

Individual assessment

Project 15 ECTS

Individual assessment in a group based exam

One semester – half year

1 ECTS (European Credit Transfer System)
= 30 working hours
Subproject 4: PBL in flipped semesters

1) What is the impact of a flipped classroom/semester strategy on the semester structure, for the students’ learning outcome and for the students’ projects?

2) How will the use of digital tools and a new structure of the learning environment influence the integration of courses and project work to support the PBL competences that students develop or need to develop?

Ruth Graham, 2017
The 21st century Aalborg PBL Model

Mandatory Courses

Individual assessment

Project 15 ECTS

Individual assessment in a group based exam

50%

Individual assessment
Elective Courses

Individual assessment
Elective Courses

Elective Courses
Elective Courses

Elective Courses
Elective Courses

New role for the facilitator

Can be online environment

Online environment

One semester – half year