Developing sensor technology innovations with business potential together with students: let's return to the master-apprentice approach

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Introduction

- Real world learning environments are becoming increasingly popular in higher education\(^1\)
- Successful student/tutor participation is key
- How you organise this participation effects success
- Case: ID3AS programme

\(^1\) Cremers et al, Design principles for hybrid learning configurations
ID3AS
## ID3AS

<table>
<thead>
<tr>
<th>Entities</th>
<th>Nr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student groups</td>
<td>&gt;20</td>
</tr>
<tr>
<td>Individual graduates</td>
<td>5</td>
</tr>
<tr>
<td>Total students (Engineering, Business, Law, IT, Communication, Lifesciences)</td>
<td>&gt;80</td>
</tr>
<tr>
<td>Lecturer/researchers</td>
<td>13</td>
</tr>
<tr>
<td>Companies and research institutions</td>
<td>24</td>
</tr>
<tr>
<td>Projects (Hanze only)</td>
<td>10</td>
</tr>
</tbody>
</table>
Challenges

Students

ID3AS

Lecturers

Work field

Innovation
## Interventions

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Intervention</th>
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<tbody>
<tr>
<td>1.</td>
<td>From fixed assignments to ‘What do you want to contribute?’</td>
</tr>
<tr>
<td>2.</td>
<td>Company and student share office, controlled by system under development</td>
</tr>
<tr>
<td>3.</td>
<td>Expert training of students by company</td>
</tr>
<tr>
<td>4.</td>
<td>Lecturers active as foreman</td>
</tr>
<tr>
<td>5.</td>
<td>Intensive project startup under guidance of AI-experts</td>
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<tr>
<td>6.</td>
<td>Expert guidance on establishing business cases</td>
</tr>
<tr>
<td>7.</td>
<td>Involving tutors and students in larger project meetings</td>
</tr>
</tbody>
</table>
Effects and discussion

- Students: more learning, ownership and motivation
- Tutors: more learning, responsibility, growth
- Companies: satisfied with better results
Effects and discussion

3 Stentoft (2017) From saying to doing interdisciplinary learning […]
4 Martin (2002) Agile Software Development

From saying to doing interdisciplinary learning: Is problem-based learning the answer?
Diana Stentoft
First Published February 1, 2017  Research Article
https://doi.org/10.1177/1498797417690610
Abstract
Problem-based learning is often characterised as an approach encompassing interdisciplinary learning; however, little attention has been explicitly paid to what a claim of interdisciplinary problem-based learning means in practice. Even less attention has been given to address the consequences of interdisciplinary problem-based learning for students, teachers and institutions of higher education. This article examines the intentions and principles of interdisciplinary learning and problem-based learning, respectively. This examination reveals considerable overlaps of the
Effects and discussion

- Scalability is valid concern
  - Lecturers gain experience and confidence
  - Economy of scale
  - Better results → companies more willing to contribute
Proposition and further research

- **Proposition**: in complex projects, a more hands-on involvement of lecturer-researchers and a different way of guiding students (‘master-apprentice’, agile) will give students a better learning experience while also bringing about better project results.

- We are planning further research in a controlled setting of Hanze UAS research group.