

Project Teaching in Biomedical Engineering

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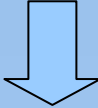
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Summary

- Introduction
- Case study
 - Introduction
 - Study group
 - Themes
 - Objectives
 - Learning outcomes
 - Methodology
- Results
- Conclusions

Introduction

- Background
 - Teacher centered education (undergraduate studies) vs. Student centered education (higher education studies)
- 
- 1st year students lack autonomy and important skills (oral presentation, group organization, debate, etc)
-
- Biomedical Engineering
 - Recent scientific field
 - Broad spectra

Case Study

- *Introduction*
 - **Biomaterials** and **Electromagnetism** proposed an **interdisciplinary** assignment to the 2nd year Biomedical Engineering BEng students attending both courses
- *Study Group*

Students	1 st time enrolment	2 nd time enrolment
Female	10	- - -
Male	3	2
Total	13	2

Table 1

Case Study

- *Themes*
 - Responsive drug delivery system
 - Pacemaker
 - Artificial heart
 - Dialysis system
 - Neuromuscular functional simulation
 - Cardiopulmonary bypass
 - Biomedical micro-machines

Case Study

- *Objectives*
 - Learn about the device's main components and their function
 - Understand device interactions both with host and environment
 - Know device's biocompatibility problems
 - “Improve” the device and compare it with the original solution

Case Study

- *Learning Outcomes*
 - Search for the necessary knowledge using reliable sources and put that knowledge to good use
 - Approach a real life problem
 - Critical analysis

Case Study

- *Methodology*
 - “Game plan”
 - Checkpoints (frequency adjusted according to the groups progress)
 - Presentation
 - Web e-learning platform

Results

- *First checkpoint*

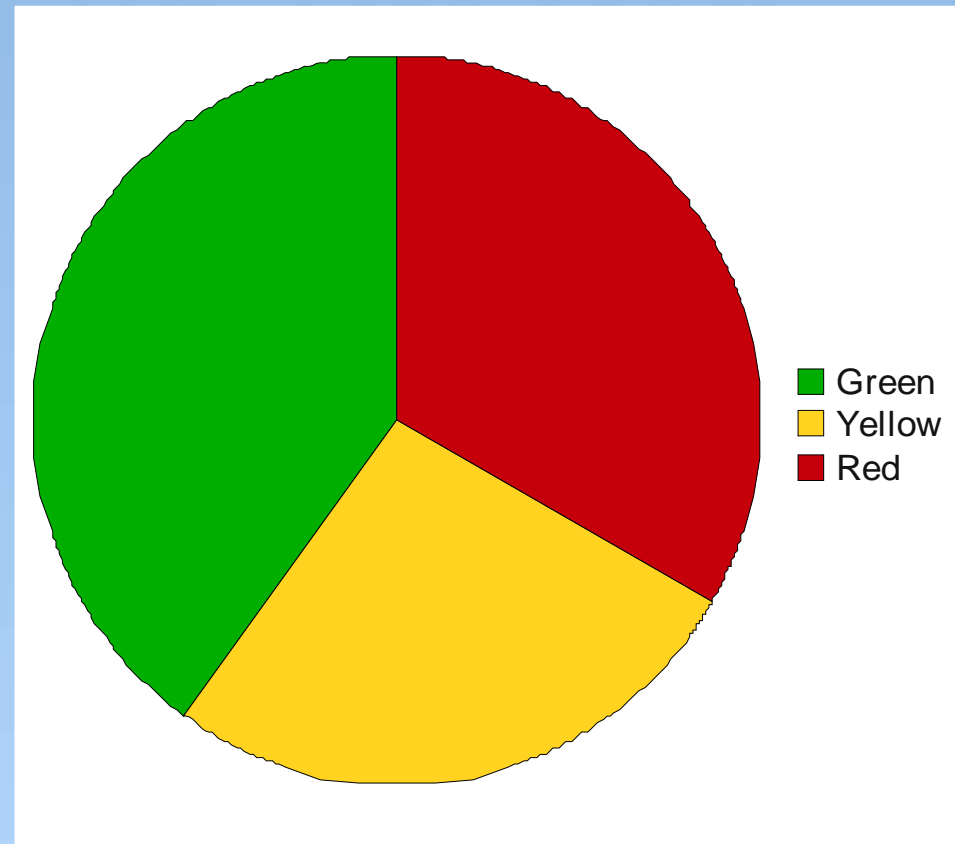


Figure 1 – First checkpoint grading

Results

- *Final grades*

Final Grades	Green	Yellow	Red
10-11			4
12-13		2	
14-15	2	2	
16-17	4		
Not approved			1

Table 2 - Final grades in terms of the first checkpoint grading

Results

- *Comparative Final Results*

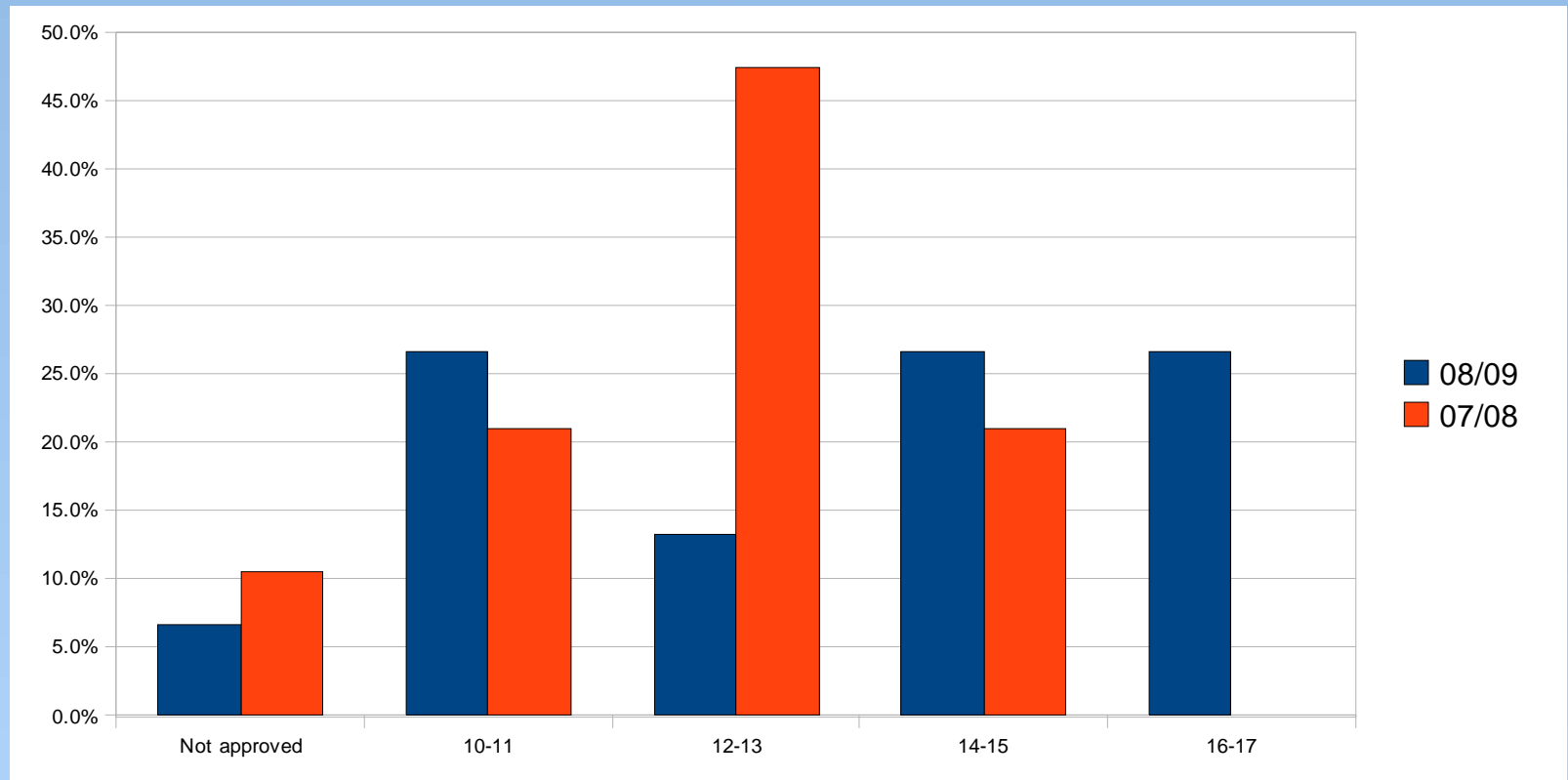


Figure 3

Conclusions

- Student-based learning achieved by Project-based learning
- Interdisciplinary Project – Biomedical devices
 - Interdisciplinary (Biomaterials and Electromagnetism but also physiology, electronics, etc)
 - Real life problems
 - Critical analysis
- Results
 - Better results overall
 - Better results in terms of knowledge and enthusiasm

Thank You



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