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Student Engagement in Final Year Independent Project Work

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Introduction

• The final year project is a key component of many degree programmes

• This is particularly true in Engineering where project work is seen as a key indicator of employability by demonstrating a student’s ability to work independently on a technically challenging project faced with:
  • Technical uncertainty
  • A need to comply with codes of practice and industry standards
  • An need to work with both academic and technical literature
Our “Research Question”

• How do we best support students from a wide range of backgrounds without removing the opportunity for independent, self guided work?

• Challenges inherent in the module:
  • Lack of centralised contact with Module Leadership
  • A broad range of Engineering Programmes (Mechanical, Automotive, Manufacturing and Electronic and Electrical)
  • Considerable diversity in the nature of the projects within and across the programmes
  • A wide range of cultural and educational backgrounds in the student population
How we found the module

• Good documentation describing what is required
• Little centralised support
• Significant independence
• “Light touch” interim review process
• Unstructured assessment criteria
• Few industrial/research instigated/inspired projects
Our backgrounds

• Derek Dixon:
  • 13 years Industrial experience as an Engineer
  • Teaching FE and HE within an FE college for 11 years
  • University of Sunderland since December 2012.

• Mike Knowles
  • HE teaching at all levels as Teaching Assistant (University of Birmingham) and Associate Lecturer (Open University)
  • Research and industrial engagement as a Postdoctoral researcher at University of Sunderland, alongside teaching and supervision.
  • Some experience of bringing external context to project supervision at MSc level.
Other drivers

• Professional Body Accreditation
  • In Spring 2013 the Undergraduate Engineering Suite received accreditation from the Institute of Engineering and Technology up to partial CEng standard.
  • This accreditation derives directly from the requirements for Chartered Engineer status.

• The department was advised to look at how the “excellent guidelines” for the final year projects were implemented and evident in the student’s project submission

• We were also advised to look at the marking criteria and provide a more detailed breakdown of how credit is allocated.
The changes we made

• First year
  • Formalised Mark Scheme
  • Increased monitoring of indicators of engagement across the on campus cohorts

• Second year
  • Changes to introductory(?) sessions
  • Developing an objectives ‘checkpoint’
Observing engagement levels

• Using a hand in from the interim review to provide data on how students were approaching the project.

• This form allowed us to capture data on how students were approaching and progressing their projects based on the degree of completion evidenced in:
  • Project Objectives
  • Literature Review
  • Introductory Chapter
  • Project Plan
Observations

• A relatively small number of students had completed these activities, most notably:
  • Project Objectives (54% of students completed)
  • Project Plan (45% of students completed)

• We also recorded overall progress
  • In 87% of cases the markers rated overall progress as satisfactory or better

• What did this data tell us?
Student Engagement

• The available data suggested different ‘types’ of engagement that might be at play here

• The literature suggested three types of engagement:
  • Cognitive, Behavioural and Emotional [1,2,3]

• Our results suggested the following pattern:
  • Students were, in the main, working hard on their projects (“Behavioural Engagement”)
  • The low levels of completion of objectives and plan suggested a lack of understanding and awareness of what a “project” actually is (“Cognitive Engagement”)
Further Evidence

• Upon completion of the projects we looked the objectives presented in the final report and classified them into “Good” and “Bad” objectives:

• Good Objectives are:
  • Itemised (More than 1, not presented as Prose)
  • Not focussed on the ‘Product’

• The average mark for students with “Good” Objectives was 60.7%
• The average mark for students with “Bad” Objectives was 45.5%
Project Management

• We also looked at the relationship between the average Project management and control (PMC) mark and the final mark classification.
Measures taken

• In order to encourage students to engage with their project work on a deeper level we put the following measures in place:
  1. Extended the contact the students have with their supervisors by starting supervision several weeks earlier
  2. Asked students to submit a list of objectives after 4 weeks of supervision
  3. Used interactive lecture sessions using mobile technology to encourage students to reflect on their own objectives prior to the supervised phase commencing
Interactive lectures

• The “Socrative” app was used to allow the class to vote and comment on various different sample objectives

• The aspects covered were:
  • Objective vocabulary and Phrasing
  • SMART
  • Inclusion of Evaluative Components
  • Ensuring an outcome exists for objectives
The impact of these measures

Status of Project Objectives at Interim Review

- **Complete**
  - 2013/14: 50%
  - 2014/15: 80%

- **Partial**
  - 2013/14: 40%
  - 2014/15: 20%

- **Not Started**
  - 2013/14: 0%
  - 2014/15: 10%
Status of Project Plan at Interim Review

- Complete (2013/14): 45%
- Partial (2013/14): 30%
- Not Started (2013/14): 10%

- Complete (2014/15): 20%
- Partial (2014/15): 30%
- Not Started (2014/15): 50%
This years module feedback

• Positive feedback regarding interactive (Socrative...) sessions
• Requests for example work
• Requests for list of contents that must go in reports
Future work

• Evaluate these measures against this year’s results
• Disseminate and share good practice with off campus partners
• Identify areas for further improvement:
  • Guidance on report writing – all ready trialled this year using Socrative
  • Literature Review / Research
  • Documenting Project Management in the Report.
Thanks for your attention

References:

