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

Average PMC mark
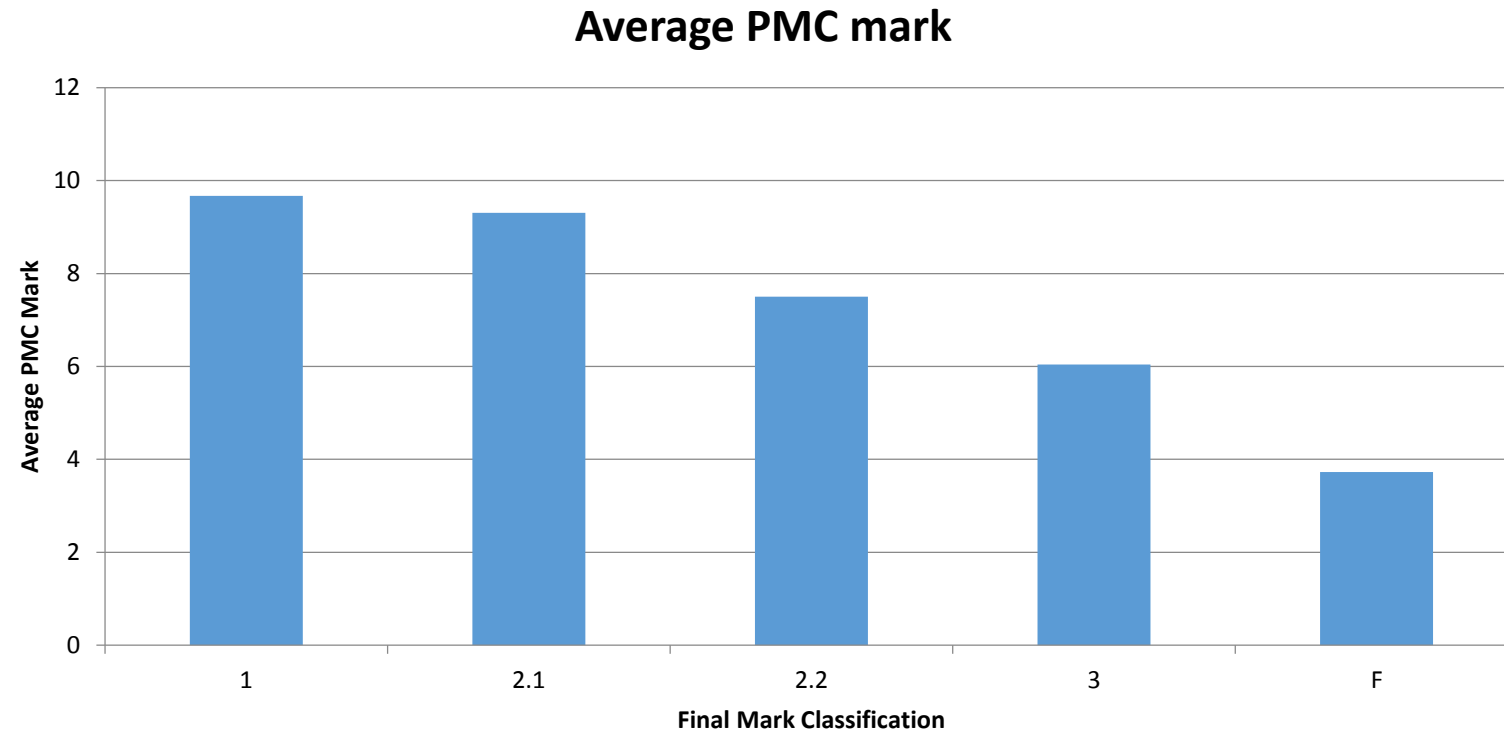
Measures taken

- 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
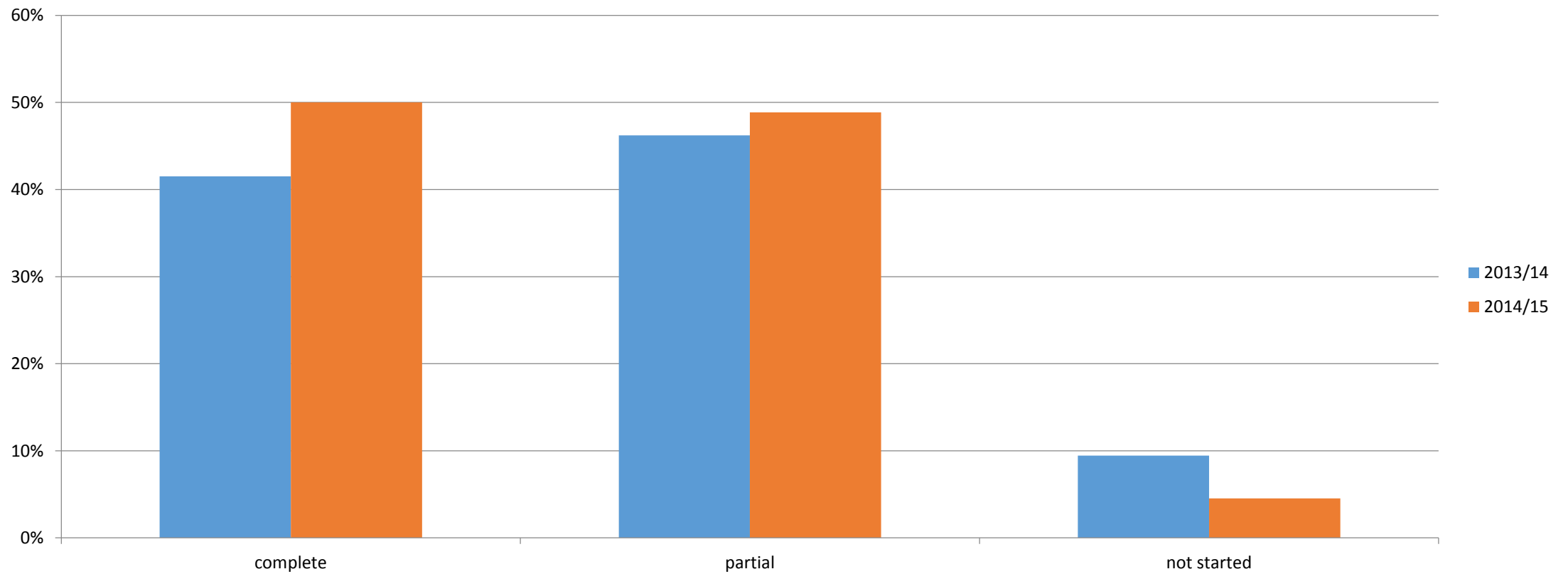
The impact of these measures
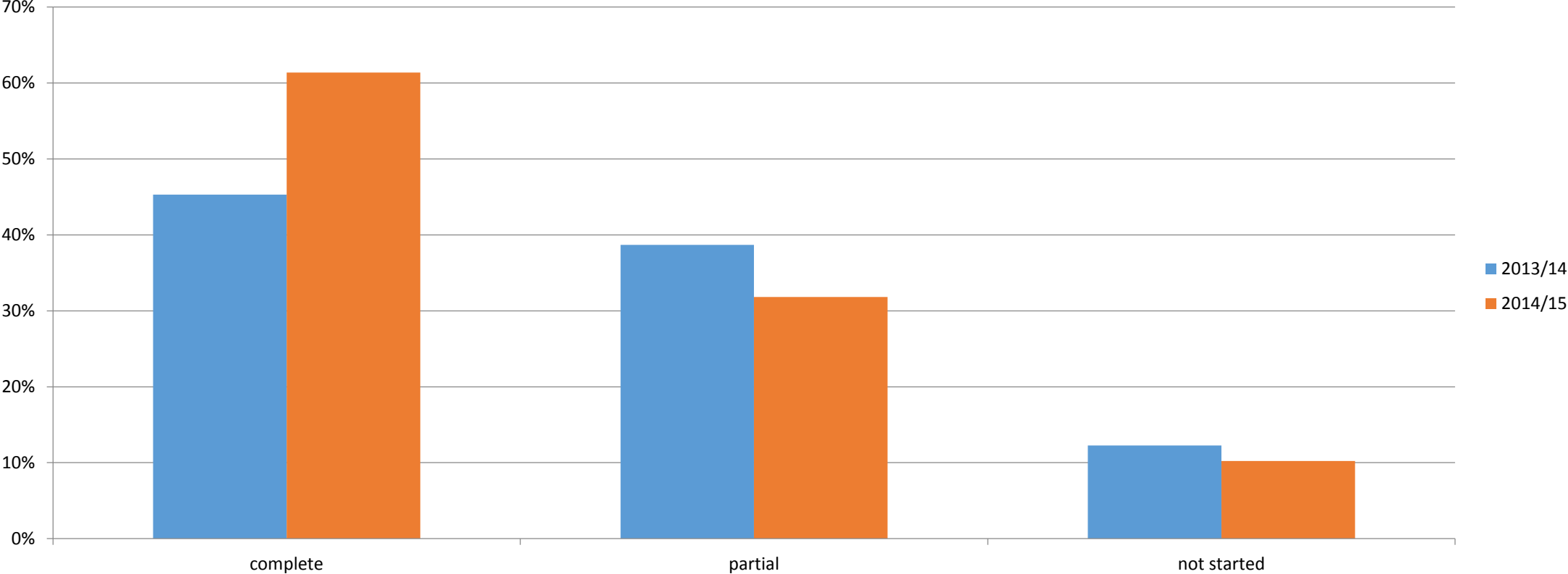

Status of Project Objectives at Interim Review
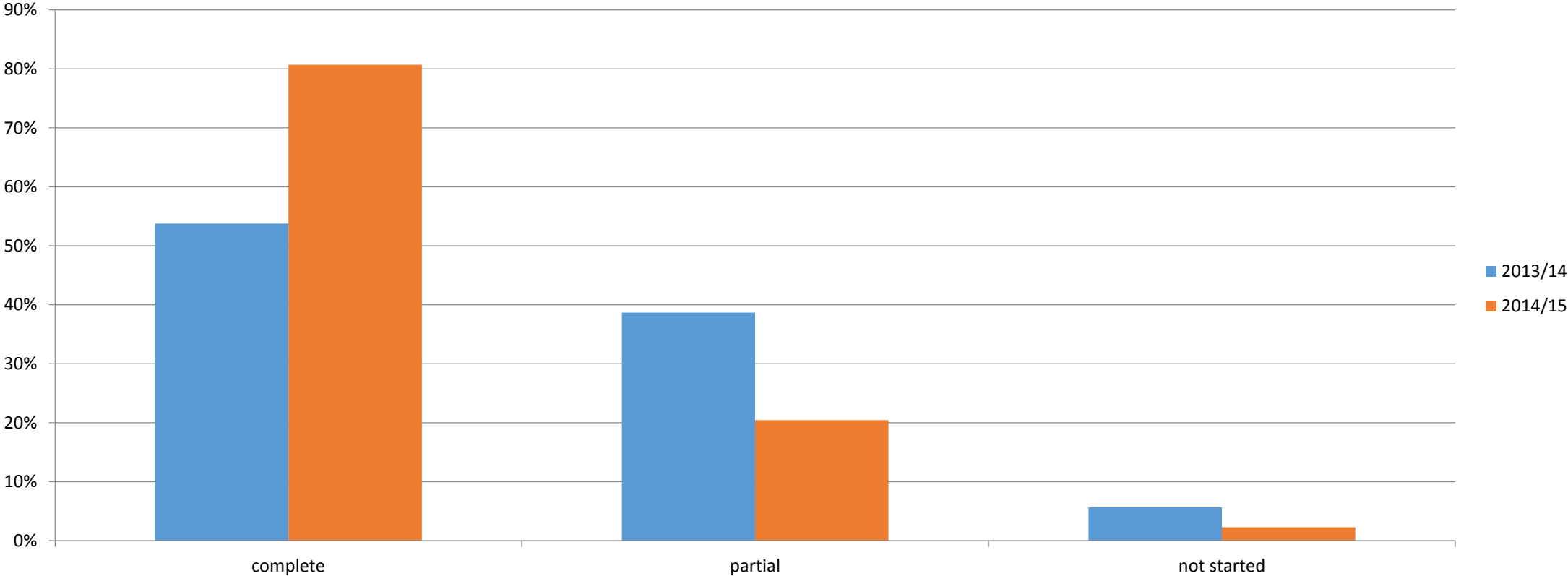
Status of Literature Review at Interim Review
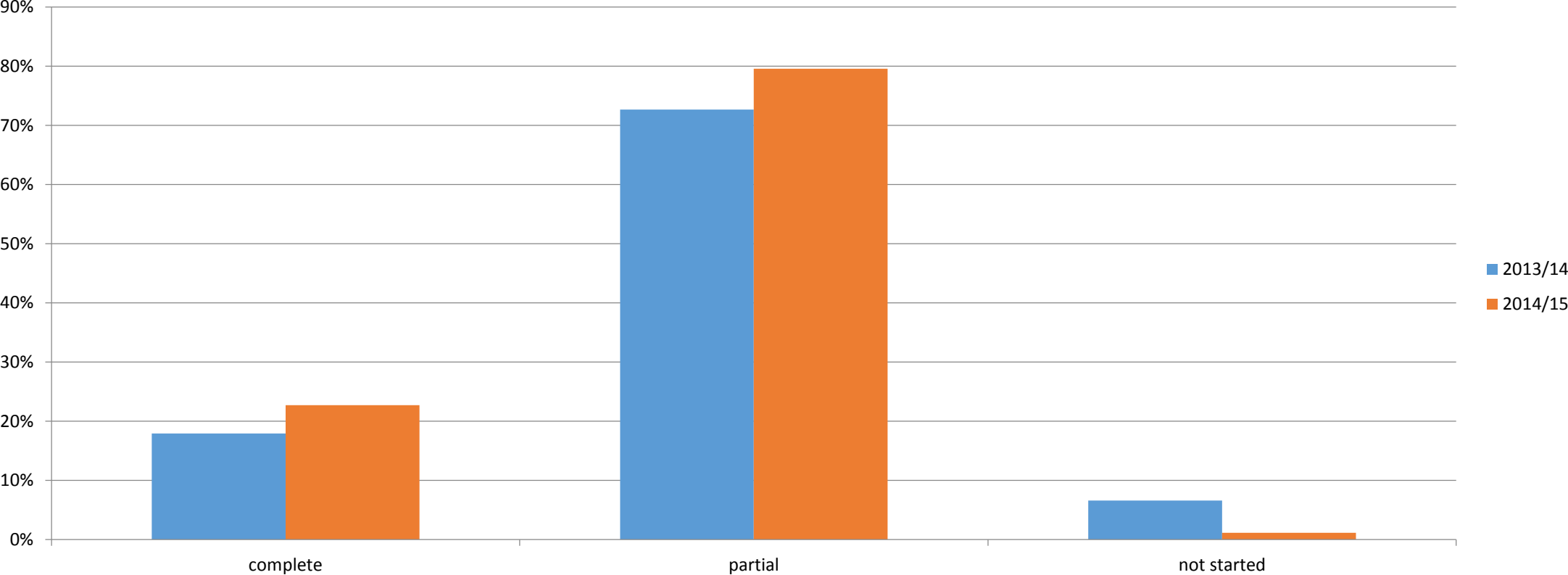
Status of Introductory Chapter at Interim Review

Status of Project Plan at Interim Review

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 years 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:

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