



# Plant Sciences Pedagogy Project

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## Project Aims

Development of learning approaches and resources to enhance the efficacy of supervisions in Part IB Plant and Microbial Sciences:

- Improve learning outcomes
- Engage students better
- Enhance student recruitment

## Questionnaires

### Value-Practice Gaps

**Top 5 highly valued practices that are not carried out often enough in supervisions:**

1. Assessment criteria or model answers are used to help me understand how well I am doing in my studies
2. Supervisions help me to have a clear idea of how the course as a whole is structured and what is expected of me
3. Supervisions help me to focus on the importance of integrating concepts rather than just learning rules and laws
4. Supervisors provide enough helpful feedback on my progress
5. I receive enough useful comments (orally and/or in writing) on my work

**Bottom 4 often used but not valued practices:**

1. Supervisions are more about me showing how much I have learned rather than developing my understanding
2. I am assessed on what I have memorised rather than what I have understood
3. I am mainly asked questions which require recall of facts
4. The emphasis in teaching in supervisions is on techniques and procedures rather than arguments and reasoning

### Self-Efficacy Survey

A measure of student academic self confidence after completing the IB Plant & Microbial Sciences course.

- Given a scale of 1 to 9 (with 1 being not confident and 9 completely confident), the average overall score for all questions was 6.7 with a low standard deviation of 1.5 (n=31)
- Females were significantly more confident about plant science specific aspects of self-efficacy ( $t = 6, df = 370, p < 0.05$ )
- Students who have chosen to continue with plant sciences next year were significantly more confident about plant science specific questions ( $t = 2.06, df = 127.2, p < 0.05$ )

## Interviews with Supervisors

- To identify successful supervision activities for each lecture topic
- To highlight areas where extra resources are likely to be useful for students and supervisors
- To get ideas for new types of resources

## Threshold Concepts

In the process of identifying topics which students find particularly troublesome in the IB Plant and Microbial Sciences course, certain concepts emerged as potential 'Threshold Concepts' (Meyer & Land, 2006); this work has given rise to the EPSRC/ESRC funded 'Transforming Perspectives' project currently underway at Caret.

## Workshops

Student workshops during free practical sessions:

- Teach key skills such as "reading a paper", "writing an essay", "how to learn"
- Help link different parts of the course together
- For revision

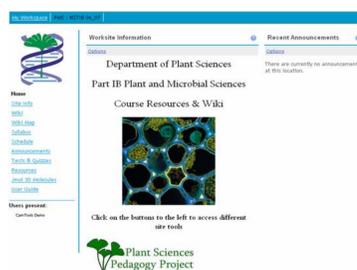
Supervisor workshops:

- Introduction to supervisions in Plant Sciences
- Introduction to CamTools
- Opportunity to ask questions and to share experiences

## CamTools

An integrated online learning environment, the IB Plant & Microbial Sciences online course materials are now housed in a new CamTools site, presented dynamically via the Wiki tool.

- On-line searchable lecture notes
- Glossary definitions of key words with student input
- Direct links to online papers referenced in lecture notes
- Links to other web resources
- Integration of interactive learning tools e.g. MolStruc, animations, videos and self tests
- Past examination questions sorted by topic
- Annotated exemplar essays for each lecture topic



## Student Focus Groups

Where a small group of students is led in a discussion to identify and evaluate learning practices, such as:

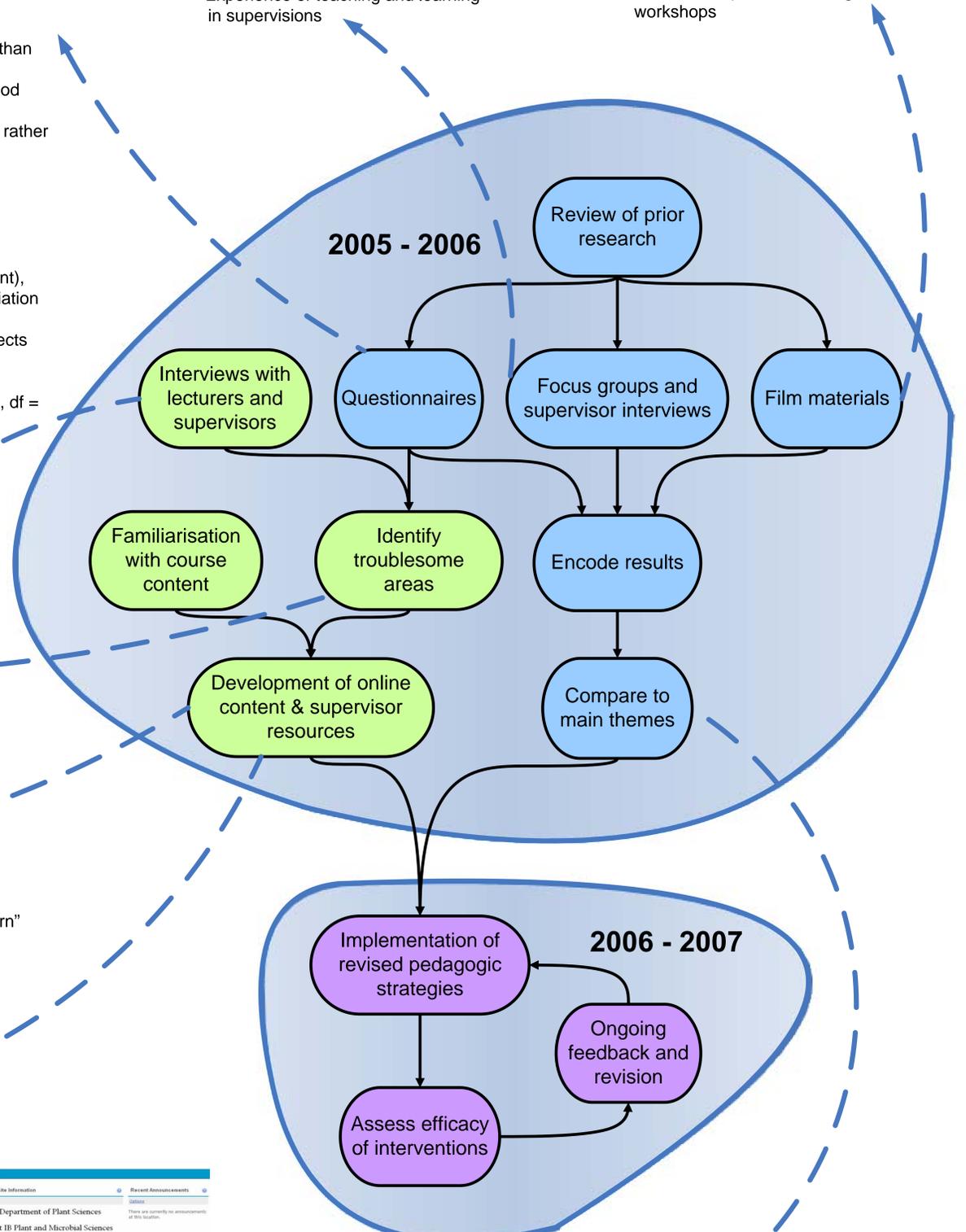
- Experience of and attitudes towards assessment
- Prior experience of learning and dispositions towards specific teaching and learning strategies
- Experience of teaching and learning in supervisions

## Video Analysis of Supervisions

To identify which teaching practices are currently used in plant sciences supervisions:



- Comparison with other institutions and departments
- Highlight themes in teaching
- For use in supervisor training workshops



## Main Themes

As a result of the focus groups, questionnaires and interviews, the educational researchers at Caret have found that the following main themes are emerging as most important:

- Transparency and accountability
- Making learning explicit
- Constructive alignment, synthesis & throughlines
- Contingent teaching
- Authentic learning
- Self regulation and independence