

Problem-Based Learning: solving the problem of preparing high-level students for undergraduate study.

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Accelerated Text Response (ATR)

- 20-credit EAP unit on the IFP+
- High level English, min. IELTS 7.0
- Focus on critically engaging with reading and listening texts

ATR

Situation: Same SoW and assessment as standard IFP

Problem: Students were bored, demotivated, wanted more relevant, discipline-specific texts

Solution: PBL

- Successfully used by Maxine Gillway on IFP, 2009
- (Re) Introduced 2017-2018, for ATR

Evaluation: Positive (tutors and students)

PBL Stage 1

Problem: How to teach students (and tutors) what it is

- Introduced using a PBL approach:
 - Students given the task: What is PBL?
 - Plus a reference list
 - Asked to research and present to peers
 - Mini problem: Presenting the potentially same info to the audience after grp 1's presentation
- In the students' own words:



PROBLEM BASED LEARNING

By: Shmesa, Kelsey, and Faten
(IFP, 2017-18)



Main Aspects

- Student led knowledge attaining method
- Measured by:
 1. *Activation of prior knowledge*
 2. *Encoding specificity*
 3. *Elaboration of knowledge*

Stages

- The problem is analysed.
- Responsibilities are allocated among the group.
- The members of the group share their findings.
- The problem is re-conceptualised and potential solutions are generated.
- The solutions are presented in front of an audience.

Benefits

- Improves retention of knowledge
- Improves social skills
- Learning issues are identified.
- Familiarity with research process.
- Increases responsibility.

References

- Gillway, M. and Bielenberg, B., 2006. Adapting problem-based learning for the first-year experience. *UGRU Journal*, 3(Fall 2006), pp.1-10.
- Gillway, M., 2009. The Potential of problem-based learning in IFPs and pre-sessional courses. *Inform* (Issue 4, October 2009), pp. 3-4.
- Maastricht University, 2017. *Problem-Based Learning*. Available from: www.maastrichtuniversity.nl/education/why-um/problem-based-learning [Accessed 6th December 2017].
- Schmidt, H.G., 1983. Problem-based learning: Rationale and description. *Medical education*, 17(1), pp.11-16.
- Wood, A. and Head, M., 2004. 'Just what the doctor ordered': the application of problem-based learning to EAP. *English for Specific Purposes*, 23(1), pp.3-17.

PBL: The tutor's role

- More 'guide by the side' or 'meddler in the middle' (McWilliam, 2009) than 'sage on the stage'

PBL Stage 2

- Problem: Finding suitable problems to work on
- From Wood and Head (2004)'s use of PBL in EAP at UBD: Students created problems for each other
- Students given the task and resource list
- Specifications (with mini problems):
 - Must be a good PBL problem: What is a 'good' problem?
 - Related to other students' disciplines: What are they?
 - Related to 1 of the Bristol Futures themes: What are they?

Example 1

Task:

You work in the testing department of a pharmaceutical company that develops drugs. You have recently **developed a new antibiotic** that kills antibiotic resistant bacteria, however it may have some harmful side effects. You are now looking to check if its advantages outweigh the side effects to figure out if it is worth marketing. In order to do so you will be **conducting tests on humans**, therefore ads were recently placed in public areas inviting volunteers to **participate in the testing for a monetary reward**. Due to economic circumstances, the majority of the volunteers were students and unemployed individuals.

Your supervisor is worried about a recent human testing experience that resulted in the death of a volunteer and believes that this is an **exploitation of those in need**. Consequently he has asked you to submit a **report about human testing including its pros and cons and whether or not it should be permitted**.

Sources:

Cancer Research UK, 2015. Advantages and drawbacks of taking part in a clinical trial [online]. Available at:

<http://www.cancerresearchuk.org/about-cancer/find-a-clinical-trial/what-you-should-be-told-about-a-clinical-trial/advantages-and-drawbacks> [s 12 February 2018].

Roxby, P., 2013. Northwick Park drug trial disaster - could it happen again? *BBC News*, [online]. Available at:

<http://www.bbc.co.uk/news/health-22556736> [Accessed 7 February 2018].

Rothman, D., 1987. Ethics and Human Experimentation, *The New England Journal of Medicine* [online] Available at:

http://www.nejm.org.bris.idm.oclc.org/doi/full/10.1056/NEJM198711053171906#article_citing_articles [Accessed 12 February 2018].

By Jason, Philip, Paul, Mai, IFP 2017-18

Example 2

Task:

You are a researcher in the synthetic biology department, whose focus has been artificial life. With the help of the groundbreaking progress of other scientists in the field, you believe you may be able to **create a real living cell synthetically**. However, your first attempt at funding and application for a grant fell through due to the belief that there are certain boundaries that science should not overstep, whether it be religious, social, ethical, or humanitarian. As the lead researcher in your team, **how can you convince the committee to grant you the funding for your possibly revolutionary research?**

Reading & Reference List:

Bedau, M., Parke, E., Tangen, U. and Hantsche-Tangen, B. (2009). Social and ethical checkpoints for bottom-up synthetic biology, or protocells. *Systems and Synthetic Biology*, 3(1-4) [Accessed 7th January 2018].

Dabrock, P. (2009). Playing God? Synthetic biology as a theological and ethical challenge. *Systems and Synthetic Biology*, 3(1-4) [Accessed 7th January 2018].

Moore, F. (1970). Therapeutic Innovation: Ethical Boundaries in the Initial Clinical Trials of New Drugs and Surgical Procedures. *CA: A Cancer Journal for Clinicians*, 20(4). [Accessed 7th January 2018].

By Fatin, Wissam, Kelsey, Hanan, IFP 2017-18

PBL Stage 3

- Students select a problem (how are they shared?)
- Students research the problem
- Students write a report (SPSE) & present, including an evaluation of the given problem & resources
- Students evaluate each others' reports & presentations (how?)

Student Feedback

(24 out of 38 students, 63% response rate)

Majority (over 70% agree/strongly agree) that PBL helped them to develop:

Academic language and literacy skills:

- synthesize information from a range of texts: 82%
- write a thesis-led report: 70%
- discuss ideas in a group (seminar skills): 76%
- present opinions verbally (presentation skills): 75%
- critically evaluate the work of peers: 78%

Student Feedback (cont)

Majority (over 70% agree/strongly agree) PBL helped them to develop:

Autonomy and collaboration

- work collaboratively with peers: 79%
- manage difficult situations in group work: 79%
- work independently of the tutor: 72%
- work independently of other students: 71%

Student Feedback (cont)

Plus, majority (**over 60%** agree/strongly agree) PBL helped:

- select suitable academic texts using the CRAAP test: 67%
- gain a deeper understanding of academic texts: 67%
- critically evaluate the ideas in a text: 66%
- critically evaluate own work: 67%
- develop & use appropriate reading and note-taking skills: 67%
- manage their time effectively: 63%

Feedback (cont)

For next year's IFP+ students felt:

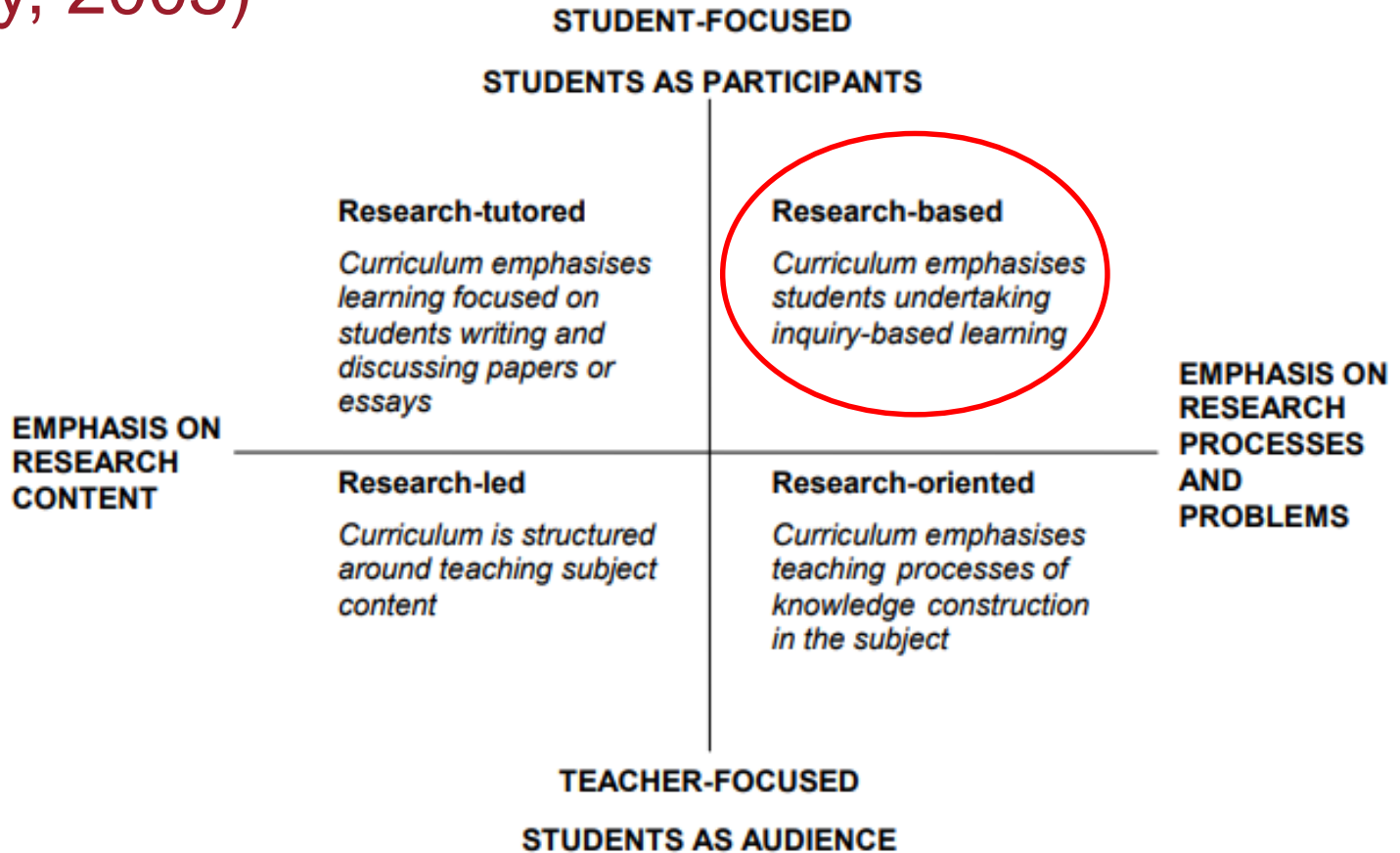
- PBL should be the continued (the same): 46%
- Increased: 29%
- Decreased: 17%
- Stopped: 8%

Tutors: positive, needs further development

IFP+ 2018-19

- New unit specifications:
 - PBL approach leading to SPSE and then IMRD reports and presentations
 - Collaborated with tutors and students on SoW

Curriculum design and research-teaching nexus (Healey, 2005)



References:

Gillway, M., 2009. The Potential of problem-based learning in IFPs and pre-sessional courses. *Inform* (Issue 4, October 2009), pp. 3-4.

Healey, M., 2005. Linking research and teaching exploring disciplinary spaces and the role of inquiry-based learning. *Reshaping the university: New relationships between research, scholarship and teaching*, pp.67-78.

McWilliam, E., 2009. Teaching for creativity: from sage to guide to meddler. *Asia Pacific Journal of Education*, 29(3), pp.281-293.

Schmidt, H.G., 1989. The rationale behind problem-based learning. In *New directions for medical education* (pp. 105-111). Springer New York.

Wood, A. and Head, M., 2004. 'Just what the doctor ordered': the application of problem-based learning to EAP. *English for Specific Purposes*, 23(1), pp.3-17.

Thank you for listening
Questions?