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Changes in students' perceptions of PBL after one semester's experience.

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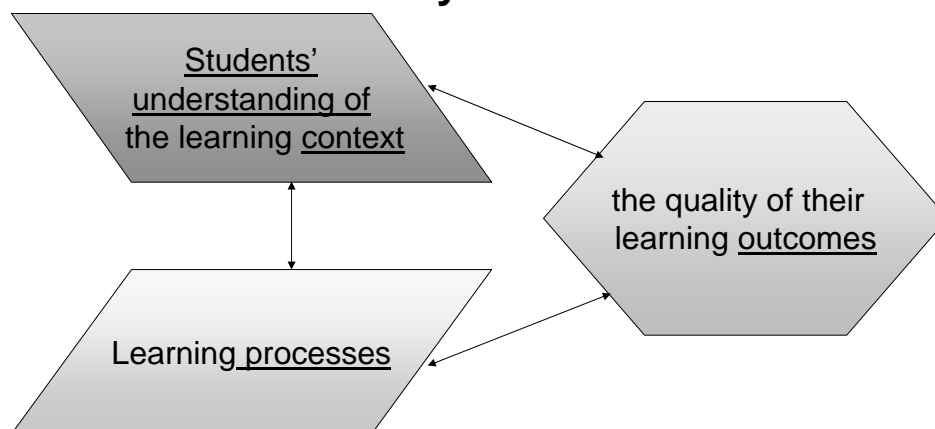
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Theoretical framework: SAL Theory^{1, 2}



1. Ramsden, 2005; 2. Biggs, 2003

Problem Based Learning (PBL)



PBL: aims to achieve meaningful learning through authentic activities, modelling and coaching, interaction, collaboration and reflection.^{3, 4, 5}

Some evidence students may not always understand PBL as planned^{6, 7, 8} →

So we may not achieve our curriculum goals of students collaboratively constructing their knowledge in context, ie, they may not learn to think and act as dental practitioners.

3. Brown et al, 1989; 4. Savery and Duffy, 1995; 5. Brophy, 2002; 6. Duke et al, 1998; 7. Forbes et al., 2001; 8. Caplow et al., 1997.



Aims:

- Identify changes in dental students' understanding of PBL over sem 1
- Compare students' understandings of PBL with curriculum intentions



Participants

- First-year dental students, 2003 (n=57) and 2004 (n=63)

Methods

- Open-ended survey, beginning and end of semester 1:
 - Tell a friend who has never done PBL before who asks you to tell them: What is PBL, what it involves?
 - What do you think you will learn/ have learnt from PBL packages?
- Analysis: inductive process → identify themes and patterns



Results

- High response rate (95.8%; 115/120); adequate analysis rate (74.2%; 89/120), ie, match of responses for the beginning and end of semester.
- Key themes:
 - Purpose and processes of PBL
 - Activities in which they participated
 - Who was responsible
 - Outcomes of PBL
- Variations in perceptions of PBL and learning outcomes → some were consistent with our PBL design while others diverged.
- Change over the semester: clearer, more accurate and complex descriptions of PBL processes, activities, responsibilities and outcomes.

Results: Beg sem 1



▪ Purpose and Processes:

- Majority: PBL = group problem-solving ie application of knowledge

'You are given a dental clinical problem and you have to apply some basic concepts... You have to participate in the group discussion to identify the problem and find a way to solve it. It is very practical as you are applying your knowledge on a real problem.' (21.03 ie student 21 in 2003)

- 25%: PBL = learning with real situations
- Very few: PBL = model of professional practice → consistent with planned PBL processes

Results: Beg sem 1



Activities

- Focus on research and group work, ie, sharing information.

Responsibilities

- Students responsibilities: learning course content and development of independence.

Learning outcomes:

- Majority: identified process outcomes, eg, teamwork, communication and study skills
- Approx 50%: identified knowledge outcomes as well

Results: End of Sem 1



Purposes and Processes

- Majority (75%): accurate description of PBL processes, ie systematic research based investigation → consistent with planning
- Minority (13%): perception changed from simply finding solutions → PBL being about learning oriented to patient needs

'1 Actively engaging yourself in the presented clinical scenario.

2 Learn how to describe what you can see in the clinical photo before making judgements

3 A clinical scenario is given and you have to systematically derive information and prioritise them (sic) in order of importance.

4 You have to take into account various patient factors (behaviour, age, compliance, socio-economic factors) to establish disease/problem and outline management strategies

5 As a group, you have to identify a learning issue and investigate it, make sure everyone knows/understand the learning issue and can discuss it to some degree.

(21.03)

Results: End of Sem 1



Activities

- Focussed on learning-related activities eg, analysis, group discussion and research → consistent with design.
- Rarely noted key design aspects of collaborative learning and evaluation
- Examples: analysis -
 - some students clearly linked PBL steps to the clinical context, indicating use of prior learning → consistent with design.

'... integrating knowledge into the package using the skills and knowledge you have and looking at skills and knowledge you require in order to handle the patient....It involves....a patient coming to you with a problem where you look at clinical photographs/ bitewings presented and assess the situation.' (50-04)

Results: End of Sem 1



Activities cont.

- discussion within groups,

'learn from discussing in a group. You share your ideas with others. You also listen to other's opinions. Learning through knowledge of different people.' (49-04)

- research.

'need to do our own research base on the learning issues that we derive ourselves [...] a problem is given and we try to sort out the cause(s) of that particular problem by doing our own research.' (14-03)

Results: End of Sem 1



Responsibilities

- Similar student responsibilities but clearer descriptions:
 - *'learning issues we derive'* (13-03),
 - *'do own research'* (14-03); *'conduct their own learning'* (31-04), and
 - peer teaching and learning, ie, *'draw information and knowledge from each other'* (27-04).
- Facilitator roles: 'guide' to package investigation or group processes → as planned.
- Facilitator involvement was not consistently noted at the beginning or end of semester.

Results: End of Sem 1



Learning outcomes:

- More students identified process outcomes, eg SDL, systematic approach → as planned, eg,
 - group dynamics and processes

*'how to involve people who do not normally participate' (39-03),
'group work-task definitions, task delegation' (48-03)*

- self-directed learning and managing oneself

'learn a lot about identifying what I need to learn (until now I've always been told in lectures) and also the motivation and skills needed to do this. I've learnt a lot about finding resources (normally, all the info needed for exams was in essential textbooks we were told to get), including use of journals and internet resources' (16-04)

- systematic approach

'learnt how to work through patient scenarios in a sequential, structured manner' (20-03)

- Fewer students identified both process and knowledge outcomes

Discussion



- Students perceptions of PBL and learning outcomes varied.
- Understanding of some aspects of PBL
 - developed over the semester &
 - became more consistent with curriculum design, eg,
 - students showed improved understanding of the systematic PBL steps,
 - clearly identified their independence as a key feature of their learning and
 - that their learning involved group interactions.
- Some perceptions consistent with meaningful learning, ie, an understanding of the contextualised, constructivist and collaborative nature of learning in PBL.⁹
 - How these perceptions relate to quality of learning outcomes and develop in later years, needs review.

Discussion cont.



- Variations in dental students' perceptions were similar to other reports, ie, ranging from those who consider PBL is:
 - simply about solving problems or learning topics in isolation,
 - to students who view PBL as learning to become a practitioner.^{6, 7}
 This is despite variations in PBL implementation in different curricula.
- Variations in perceptions "results from interaction between students' prior experiences of similar learning and teaching situations and the particular context within which they are placed".¹⁰

Implications for practice



- Contextualised learning: develop and support this, eg,
 - regular discussion of what discipline of dentistry is about, what it means to think and act as a dentist and why this is important for students to learn this,⁹
 - regular review and discussion of contextualised active learning strategies¹ and related assessment activities.¹¹
- Prior learning experiences and contexts:
 - compare and contrast students' prior experiences to current experience.⁶
- Role of facilitators (model thinking, coach, interaction etc):
 - explicitly and regularly discuss facilitators' and students' differing roles and responsibilities in PBL and contrast with prior experiences.

Further Investigations



- Investigate relationships between 2003-04 students academic results and understanding of PBL
- Investigate perceptions of PBL and learning context, and outcomes achieved in different PBL curricula → to identify contextual factors that are associated with alignment of student perceptions with curriculum design and quality outcomes (collaborative project with Malmö University, Sweden (dental students) and University of Sydney (dental and medical students)).
- Investigation of student experiences of groups (cross-site study with students at Dublin Dental School).

Conclusions



- Current findings similar to other reports ^{6, 7}
- Majority of students' descriptions of PBL and learning outcomes developed to be consistent with many aspects of curriculum design
- A few students perceive PBL as planned ie linked PBL and learning to practitioner roles - a key curricular outcome → use these latter students' understanding to inform how we support development of other students' in our program.

6. Duke et al, 1998; 7. Forbes et al., 2001

Acknowledgements



- First year students - 2003 and 2004

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