A NEW MODEL OF PROBLEM-BASED LEARNING
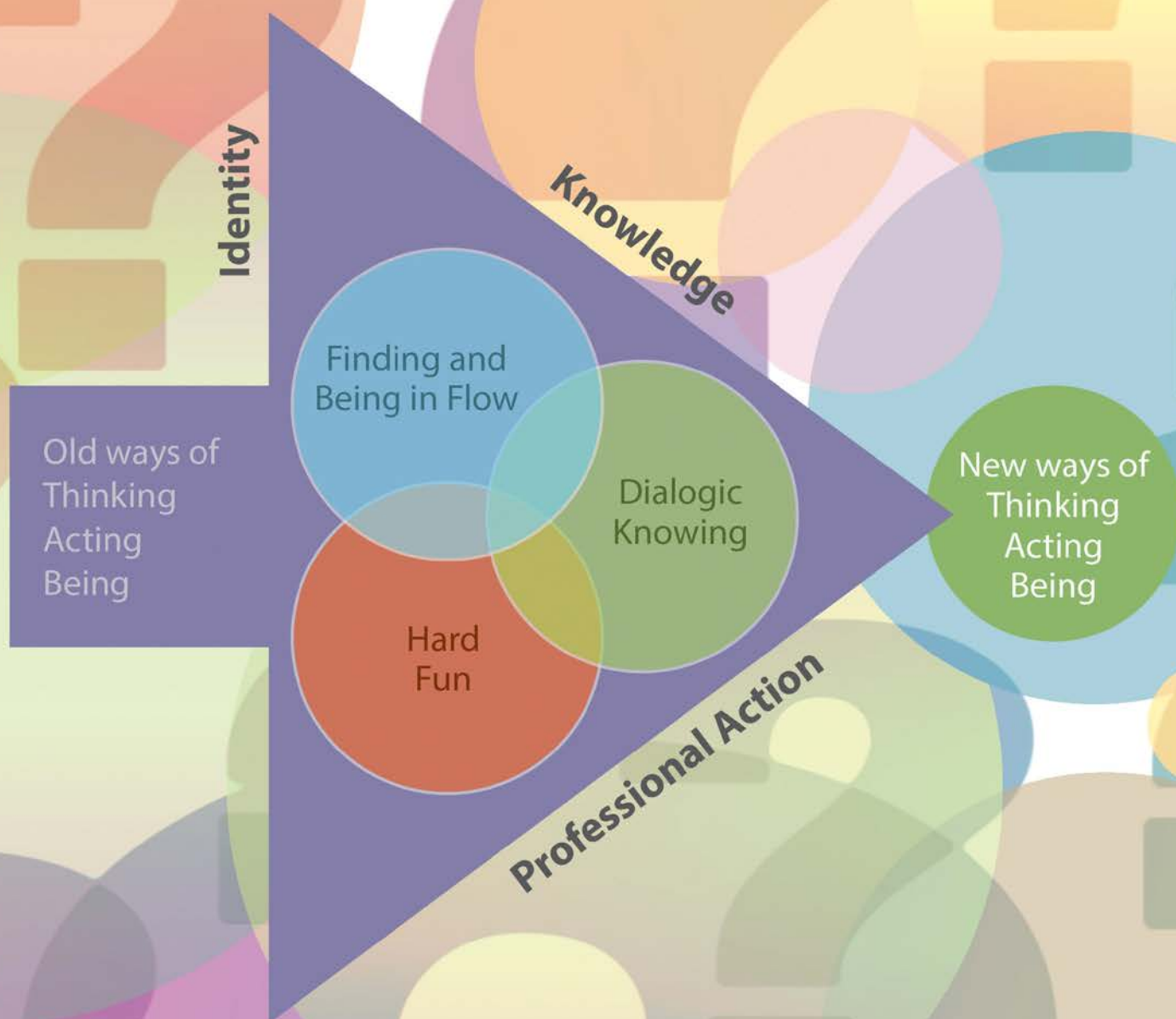
Inspiring Concepts, Practice Strategies
and Case Studies from Higher Education

Terry Barrett

Identity

Knowledge

Professional Action

Old ways of
Thinking
Acting
Being

Finding and
Being in Flow

Dialogic
Knowing

Hard
Fun

New ways of
Thinking
Acting
Being

AISHE

The All Ireland Society for Higher Education

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Terry was a founding member of the All Ireland Society for Higher Education (AISHE) and is the co-chair of Facilitate (The Irish Enquiry and Problem-based learning network) and a SEDA (Staff and Education Development) Fellow.

Acknowledgements

Dedication

May this book contribute to providing challenging, collaborative and creative learning environments for students across the globe and across a range of disciplines.

Contents

Chapter Three

Possibilities for promoting student dialogue and learning in tutorials

Introduction

PBL Practitioners' Vignettes

"Terry, let's plan to do some staff training for my PBL tutors for the PBL component of my statistics module with 100 students. They will be working with me as roving tutors in one large active learning room"

Jon Yearsley, Assistant Professor, Biology, University College Dublin

The practice strategies for effective tutoring discussed in that workshop are explored in this chapter. Some of the materials used in this workshop together with the responses of the workshop participants to two of the PBL tutor-training activities are presented.

"Terry, I realised I was cramming for preparing for lecturers. I want the students to engage intensely in their own learning."

Tara Cusack, Associate Professor, Physiotherapy Lecturer, University College Dublin

This chapter discusses the possibilities for students constructing their own knowledge and learning from one another in tutorials. Tara is module co-ordinator for a number of PBL modules. She draws on her experience of PBL leadership and tutoring to write the response at the end of this chapter.

Chapter Overview

This chapter will help you to:

- Think in new ways about how you as a tutor can help students to create knowledge together in PBL tutorials
- Use a new inspiring concept to shape some of your approaches to facilitating PBL tutorials
- Deepen your understanding of the PBL tutorial by making links with Paulo Freire's ideas
- Choose from a range of practical possibilities for promoting dialogic knowing in PBL tutorials
- Adapt these strategies for your specific contexts
- Use questions, triggers and further resources to develop your approach to tutoring
- Compile additional resources such as a PBL process guide to enable your students to become more independent learners.
- Decide on resources about the PBL tutorial to include in tutor and student handbooks

You bring your experiences of learning through dialogue as a student, teacher friend and family member to the reading of this chapter. So begin by tapping into some of this understanding from your prior learning,

Stop and Reflect

Think of a memorable good conversation you had with a group of people where you learnt something new.
- Why was the conversation so memorable?
- What made it a good conversation?
- How did you feel?
- What did you know after the conversation?
- How did you get to know this?
- Who was in control of the conversation?

Problem-based learning Tutorials

Problem-based learning tutorials are the pivotal learning site in PBL. In the first tutorial students are presented with a new problem/trigger. They discuss what they know about the problem, use their prior knowledge and brainstorm their ideas and define the kernel of the problem. A key part of the first tutorial is for students to name what they don't know as learning issues. I encourage students to phrase these learning issues as questions. Some people decide that all the students study all the learning issues decided by the team; this is often in undergraduate programmes. In some other situations, e.g. postgraduate programmes, sometimes all students study the one or two major learning issues as decided by the team, and they divide up the other learning issues. A third option is for all the learning issues defined by the team are divided amongst the students. It is key that the programme/module team have a clear rationale for which approach they are using and that the expectations are made clear to the students.

Students then come back to a second tutorial. A useful starting point for the second tutorial is the learning issues phrased as questions. At this tutorial students share what they have learnt from their independent study about the learning issues. They co-construct their knowledge through co-elaboration. The review phase, at the end of the tutorial is important to give time to, so that both the process and the knowledge acquisition can be evaluated. I often phrase one specific question either about knowledge or process to be the focus of the review phase. In PBL there has to be a minimum of two tutorials and one independent study period for each problem. Some modules have two tutorials per problem with other modules having several tutorials on larger problems. In some cases there is one tutor per PBL team, in other cases there is one or more roving tutors roving between two or more groups.

PBL is not simply giving students a problem and just expecting them to get on with it. Rather, there are three key elements that combine to provide an important scaffold for the learning process, namely:

1) The PBL process guide

2) The facilitative role of the tutor and

3) The specific student roles

It is very useful to give the student a process guide that they can use to help them with seeing the steps of working on the problem. This process guide can be guided by the seven-step approach (Schmidt 1993) and adapted to the discipline and context of your students. Here is a process guide Marie Stanton uses for students doing a masters programme in ultrasound.

Figure 3.1   Marie Stanton PBL process guide used in a masters programme in ultrasound

7 Step PBL Process Guide

The PBL Process

Set the Climate
- Assign roles
- Make / review ground rules
- Review thinking and learning processes

1 Read the Problem / Trigger
- Underline and clarify key and unknown terms / facts

2 Define the Kernel of the Problem / Trigger
- Initial ideas

3 Brainstorm
- Ideas / explanations
- Responses and examples in relation to your experience

4 Discuss and Synthesise
- Discuss the problem
- Summarise what you currently know about key themes

5 Formulating Learning Goals
- Name the key issues that you need to study further

6 Independent Study
- Work on learning goals
- Synthesise critically what this means for the problem

7 Academic Debate & Clinical Practice
- Debate learning issues from literature and practice
- Summarise the learning as it relates to the problem and clinical practice

© Barrett, O'Neill, Stanton and Cashman, 2007. Adapted from Barrows 1989 and Schmidt 1983

This seven step learning process mirrors the research process. The research-based process of PBL emphasises students experiencing the cycle of research, from defining research questions to evaluating research evidence (Healey and Jenkins 2006). It is therefore a very congruent process for developing evidence-based professional practice.   In PBL the reasons why there are specific tutor and student roles is to give the responsibility and the ownership of the learning to the students and to provide a scaffold for deep learning from their research and discussions. The practice of taking on the different roles e.g. chairperson, scribe etc. also builds students capacity for effectively taking on roles in teams in the workplace.

The Role of the PBL Tutor

The PBL tutor works as a facilitator of the PBL process, encouraging all students to talk about the problem, engage in high quality independent study, justify their ideas and arguments and create new knowledge together. It is vital that tutors and students have opportunities to understand and discuss the tutor role and the student roles. I give them the following as handouts.

Figure 3.2 The role of the tutor in PBL (Adapted from Barrett and Moore 2010, 10-11)

The role of the <u>tutor</u> is to:

- Encourage a welcoming, warm and challenging learning climate
- Organise the physical learning environment in a way that is conducive to teamwork
- Facilitate the PBL process so that students move through the various steps
- Ensure that the students (not the tutor) name the learning issues, that is the students' role
- Listen very attentively, actively and mindfully to what students are saying
- Observe the learning and challenges, enjoyment and frustration that are taking place in the team
- Intervene, where appropriate, with process interventions based on this listening and observation
- Expect students to be responsible to complete high quality independent learning and communicate this clearly to them
- Ask questions that encourage critical and creative thinking

- Ask students to provide the evidence for their statements
- Ask students to evaluate the resources that they used
- Challenge students to link theory and practice
- Stimulate debate about major issues
- Facilitate students to reflect on their learning, the development of key skills, and the performance of the team
- Confirm the team as a whole and individuals for particular inputs, strengths, gifts and high quality work
- Give feedback to the team on their performance, acknowledging high-level performance or challenging them to improve performance
- Resist the temptation to give a mini-lecture
- Observe the actions of the teams at a meta-level, seeing where they are in terms of the PBL process, their work on the problem and linked deliverables and timescales and make appropriate process interventions
- Facilitate the review process at the end of the tutorial

Student Roles in PBL Tutorials

In PBL various students take on different roles (in addition to contributing to the team through discussion and independent study) in order to help move the learning process forward. These often include chairperson, scribe, reader, timekeeper and observer.

Figure 3.3 Student roles in the PBL tutorial (Adapted from Barrett and Moore 2010, 10-11)

The role of the <u>chairperson</u> is to

- Encourage the participation of all team members
- Facilitate democratic social relations and democratic decision making, not being the boss nor making decisions
- Facilitate the team to make and work within agreed ground rules
- Stop one person dominating the group and encourage quiet team members to contribute.
- Avoid always talking first and talking at length.
- Encourage discussion of different viewpoints and welcome debate
- Encourage everyone to work on the learning issues and to contribute in ways that maximise prior learning, specific talents and different sources of information
- Use the PBL process guide as a scaffold for the team to work on the problem
- Ensure that someone summarises at the end of a tutorial.
- Check that everyone is clear what learning issues the team has

decided to research and that these are clearly phrased as questions
- Ensure that the team has a clear action plan
- Co-ordinate the team to complete their agreed action plan and the development of any products required for the work on the problem
- Encourage the team to review or add to ground rules as appropriate
- Monitor, summarise and feedback to the team the progress to date and work left to do on the problem

The role of the <u>scribe/recorder</u> is to:

- Record the ideas of the team on the whiteboard so that this information can be used as a shared learning environment
- Record the learning issues that the team decide to work on clearly and phrase these as questions
- Work both verbally and visually on the whiteboard and invite other team members to write on the whiteboard if they want to illustrate points
- Summarise and synthesise the learning from the problem on the whiteboard as all team members contribute to this synthesis.
- Co-ordinate electronic team communications effectively and efficiently in modes agreed by team members
- Make sure that he/she inputs his/her ideas and research and don't just record other students' inputs

The role of the <u>reader</u> is to:

- Read the problem aloud at the start of the tutorial, reading text, visuals etc.
- Re-read the problem again when the chair / team member /or the reader decides that this would be useful
- Encourage the team to read the problem to themselves quietly again before they start the work on their independent study
- Continue to read the problem in the deeper sense of the word by drawing the team's attention to key elements/words/deliverables of the problem

The role of the <u>timekeeper</u> is to:

- Help the team to manage the time in tutorials
- Remind the team at key stages about how much time is left in the tutorial
- Make suggestions to the team about prioritisation and time management

The role of the <u>observer</u> is to:

- Observe the workings of the team in terms of the learning process and team dynamics and the design and completion of outputs
- Feedback these observations to the team in terms of strengths and areas for development
- Make suggestions based on these observations.

These roles are the common student roles used in PBL but are not fixed or exhaustive. Teams may choose to assign other roles, e.g. project co-ordinator, editor, devil's advocate, etc. but if they do so, make sure that the responsibilities of the role are clear. Others choose to give students roles that correspond to different professional roles and/or perspectives. For example, Langford Korin and Wilkerson (2010) outline an approach used in medical education where students have the traditional student roles for the first tutorial until the point where the students are ready to finalise the learning issues. Then in order to see the problem from the perspective of the patient and all members of the healthcare team students take on the following roles: patient, the patient's student physician-presenter, postgraduate trainee-patient educator, attending physician, evidence based consultants and guideline consultant.

It is advisable for students to stay in the same roles for at least one problem so they develop their understanding, practice, follow-through and responsibility for the role. Over time students will develop their abilities to perfom the different roles. Students staying in the same teams for at least one module, helps them to develop effective ways of working together.
Jon Yearsley gave the following visual to the tutors during tutor training and to the students during the induction to the module to illustrate the student roles in PBL tutorials and the role of the roving tutors.

Figure 3.3 Jon Yearsley Key Roles and Steps in the PBL Process with Roving Tutors
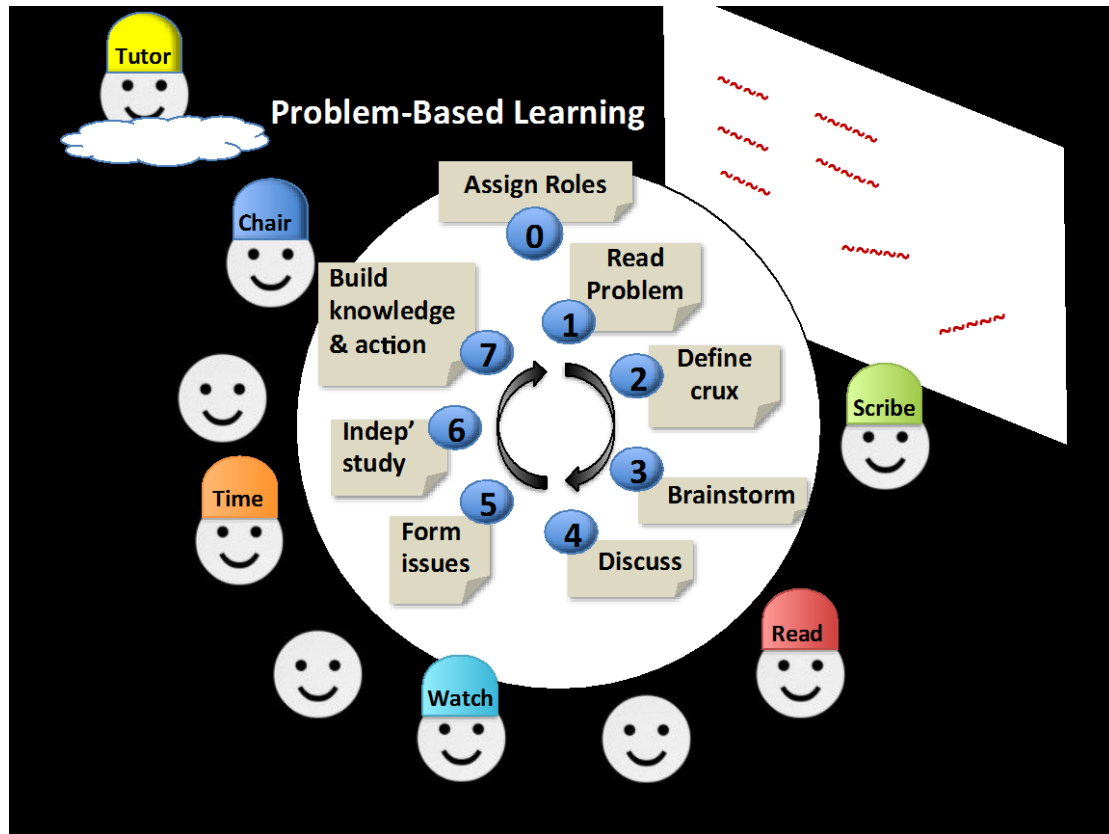
The Neuroscience of PBL Tutorials

Understanding three neuroscience concepts namely neuroplasticity, shared attention and mirror neurons provide us with key ideas for understanding how the brain works and how to enhance learning in PBL tutorials. The concept of neuroplasticity points to the factual ability of the " brain and nervous system to adapt and change as a result of training and experience over the course of a learning experience" (O'Connor 2012: 4). As thousands of new neurons are being born each day it is important that tutors challenge and stretch students and encourage them to make connections in their learning (Sadlo 2011). So with repeated engagement in PBL the brain can change itself.

Attention is key to learning. In PBL tutorials the team engage in *shared*

attention with the target being the learning needed to resolve or manage the problem (O'Connor 2012). The discovery of mirror neurons in the brain is crucial to understanding optimising learning in teams. Hence the importance of the PBL tutor modelling active listening, and asking critical questions together with facilitating students making connections in ways that integrate their learning. Students will then mirror some of these behaviours. Mirror neurons enable students to read their fellow team members, a vital skill for teamwork in professional practice (Sadlo 2011).

The illuminative Concept of the PBL Tutorial as a Potential Site for Dialogic Knowing

Before exploring how to facilitate PBL tutorials it is important to explore why we facilitate PBL tutorials, that is to promote deep learning and students engaging in dialogic knowing. I derived the illuminative concept of the *PBL tutorial as a potential site for dialogic knowing* from analysing students conversations in tutorials and from an understanding of Freire's (1972) concept of dialogic knowing. What does dialogic knowing mean? Why is it crucial? How is the PBL tutorial a potential site for dialogic knowing? How can this potentiality be realised?

As PBL tutors it is crucial that you understand what dialogic knowing is and facilitate this happening in tutorials. You will be able to do this because you will have a deep understanding based on research and theoretical perspectives as well as your own practice. You will not just be technically following a few pointers but will understand that you are aiming to foster a dialogue between the students that promotes new learning and this is the rationale underpinning the practical strategies you choose to use.

The Philosophy of Dialogic Knowing in PBL tutorials

Freire's concept of dialogic knowing best captures the nature of learning from one another in a PBL tutorial through working on a common problem or object. Dialogic knowing is the means by which people create and recreate

acts of knowledge together as "dialogue unites subjects together in the cognition of the object that mediates them " (Freire 1985: 49).

From this perspective dialogue is much more than a technique, it is a position or stance that sees knowledge as not something possesed by the teacher and static but something that is made and remade dynamically by students in tutorials through dialogue. This dialogue can promote learning through the waves and oscillations of the conversations in PBL tutorials.

> What is dialogue in this way of knowing? Precisely this connection, this epistemological relationship, the object to be known in one place links the cognitive subjects leading them to reflect together on the object. …Then instead of transferring the knowledge *statically,* as a *fixed* possession of the teacher, dialogue demands a dynamic proximation towards the object (Shor and Freire 1987:10).

Freire's elaboration of dialogic knowing provides us with a strong philosophical foundation for the purpose of PBL tutorials. The vital thing is to get students to think and to talk to one another. A key role of the tutor is to get the student dialogue going well.

It is interesting to look at what the word dialogue means in general and in the specific context of PBL tutorials:

> The Greek compound word *dialogos* means 'conversation between two people, and is associated with the pursuit of knowledge (reason, argument, discourse). It also has a connotation of *difference* (*dia* as 'apart'): the two or more who partake in dialogue are separate and distinct as individual beings, as speakers and as thinkers, but the conversation brings them together and fashions a unity of process through their joint engagement. Dialogue is an unfolding process, a search or quest for knowledge and understanding…….…….. (Rule 2004:320).

Rule (2011:930) asserts that "Freire argues that dialogue does not eliminate difference but troubles it, engages it, in an attempt to deepen understanding" For Freire the horizontal relationship of dialogue (rather than vertical relationship of anti-dialogue) is centre stage in education: "Without dialogue there is no communication, and without communication there can be no true education" (Freire 1972: 65). The practical possibilities in this chapter have

arisen from listening to the dialogue of PBL students in tutorials and in understanding Freire's concept of dialogue. These possibilities thus represent an applied philosophy of making dialogic knowing a reality in PBL tutorials.

Three Dimensions of the PBL Tutorial as a Potential Site of Dialogic Knowing

I have three crucial interrelated arguments about dialogic knowing in PBL tutorials. Firstly, dialogic knowing has to be *constructed* discursively in the language of the conversations of the tutorials; it does not happen *automatically* in PBL tutorials. Just because you design a PBL initiative, write problems and put students into small teams with a tutor does not mean *per se* that dialogic knowing will take place. Rather dialogic knowing can be constructed through:

1) A movement towards more democratic social relations

2) The co-construction of knowledge through co-elaboration and

3) The relinquishment of individual control and the embracement of shared control of PBL tutorials and the products produced

Students have to actively make dialogic knowing happen in tutorials and the tutor has a key role in facilitating this.

Figure 3.4 The PBL tutorial as a potential site for dialogic knowing
        Terry Barrett and Shelly Barrett

The second argument is that understanding the *three dimensions of the PBL tutorial as a potential site for dialogic knowing*, will encourage you as a tutor to use the tutorial site for realising dialogic knowing. Thirdly, combining understandings from how students talked about the PBL tutorial with Freire's concept of dialogic knowing provides inspiring ways of realising the potential of the PBL tutorial for dialogic knowing. These ways of realising dialogic knowing are presented as practical *possibilities* for facilitating PBL tutorials, for you to choose from according to your contexts.

In chapter two the concept of the problem as a provoker of a liminal space was elaborated. The problem provokes betwixt and between spaces between old states and new states. PBL problems provoke liminal spaces between 1)

current levels of knowing and new levels of knowing, 2) habitual forms of professional action and forms of professional action new to the learner and 3) satisfaction with current identities and a desire to explore other possible identities. PBL students move within and beyond the liminal spaces prompted by the problem in different ways. This chapter focuses on one of those ways of learning and growing in a liminal space, that is, students engaging in dialogic knowing in the PBL tutorials. (see figure 3.5) The last chapter focused on the PBL problem, this chapter focuses on the PBL tutorials where students work together on the problem. I have developed my earlier ideas about the PBL tutorial and dialogic knowing (Barrett and Moore 2010) both theoretically and practically by elaborating twenty-one practice strategies.

**Figure 3.5 Learning in a Liminal Space through Dialogic Knowing in PBL
Tutorials**
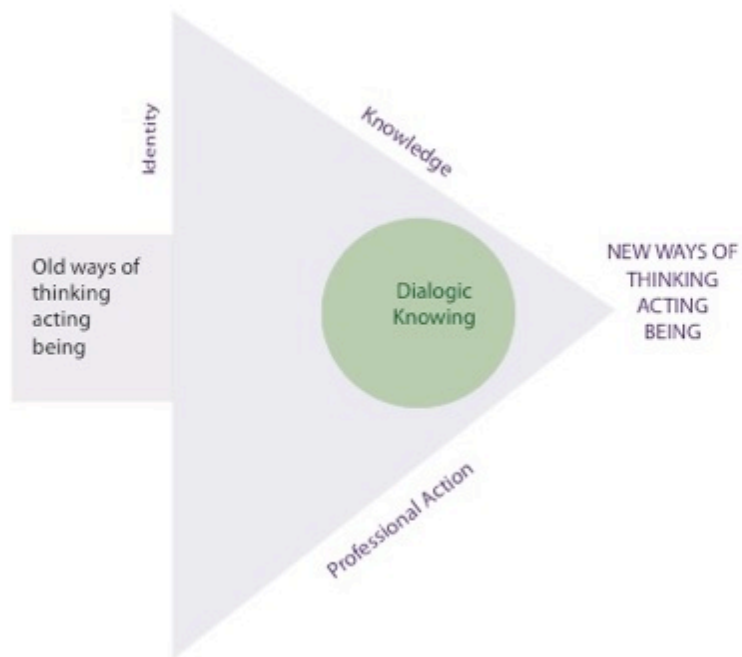
Chapter Structure

This chapter pivots on the idea that dialogic knowing is the key purpose of the PBL tutorial. Firstly, each dimension of this illuminative concept is discussed in turn, in terms of the research on students talking about this dimension (Barrett 2008). The students were lecturers working on problems about problem-based learning.The two teams of students have been given the pseudonyms of the Skelligs team and the Glendalough team and the students were also given pseudonyms. Secondly, a set of practical strategies for developing each dimension in tutorials are presented and discussed with examples. Thirdly, some case studies are explored. Fourthly further resources and questions will also help you to make an action plan for developing your tutoring

Figure 3 .6 Chapter structure
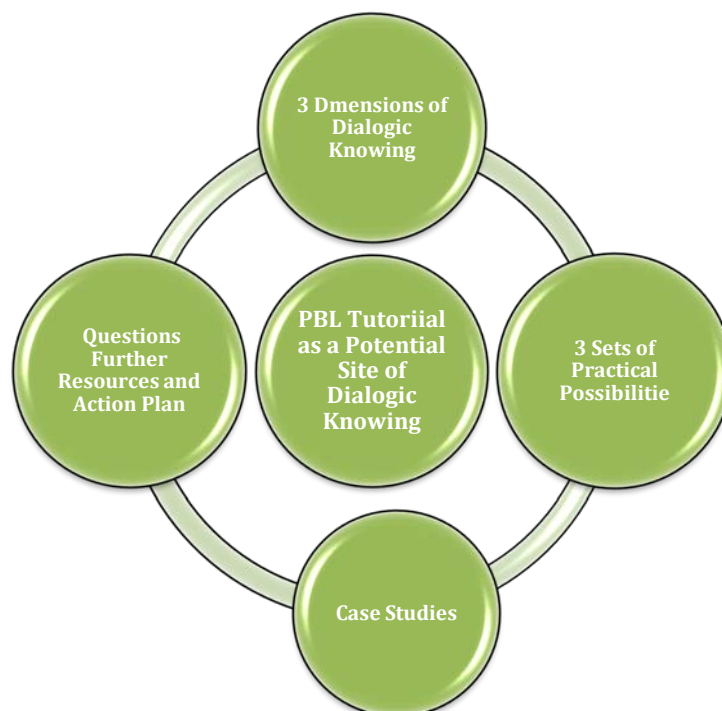
Movement towards more democratic social relations

The first dimension of dialogic knowing is movement towards more democratic social relations. Democratic social relations means that there is a

level of respect, openness, reciprocity and equality that facilitates the students to actively listen to other students' ideas and to freely express their own ideas, so that they can all contribute to the problem. It may seem obvious that democratic social relations is the first necessary step in creating dialogic knowing, but it is less obvious how to maintain these democratic social relations throughout the tutorials of a PBL module. This section begins by looking at how students in the study talked about movement towards more democratic social relations. Then practical strategies for promoting democratic social relations are outlined and illustrated with case studies

Listening to students' talk about movement towards more democratic social relations

The movement towards democratic social relations means a shift toward lower levels of social hierarchy and lower levels of social distance. Frank, the chairperson of the Glendalough team t talked about democratic social relations in terms of:

Em, free expression, collective responsibility.

The Glendalough team talked about the PBL tutorial in terms of movement

from a traditional committee meeting genre towards the PBL tutorial genre**.**

The following extract is from the opening minutes of an early tutorial of the

module and shows a traditional committee meeting genre. It also shows some

language that is not part of the traditional committee genre but rather the

language of the PBL tutorial. The first tutorial began with a long monologue by

the student chairperson, Frank

Frank: If I could say just a few words, I do write speeches and then don't say them but em just to kick us off, the thing that I am very aware of I think, I am very task orientated. I would be very aware of the time scale we have. .... We need to be aware of the group rules and keep

> reminding ourselves, try and be honest. ..Em, free expression, collective responsibility that touches on what I said before. Once we make a decision or once we are heading in a direction lets stick with it.... And if someone has a problem with the way we are going just say it to me maybe after a meeting or some other time, if you think there is something radically wrong.   A few things that I normally say at these stages for getting the ball rolling is that failure is not an option. Em. we need to produce a product we need to agree what the product is etc. We won't fail, we will do a good job and that is what we are going to do here. Em, what I would like to see at the end of the day is a good product produced. ... And we learn so much from this particular group project, we have another one directly after it and we can learn from all the mistakes we made and all the things we did right and we can try and do it slightly different the next time. Are you happy enough with that? That is all I got to say. I won't speak again unless I have to. But anyway, em, just on the agenda then we are going to do the minutes but its suggested, again this was just thrown out just to get you thinking and a few people came back to me which is great. *...(Monologue of 1096 words in total.)*

In the excerpt presented, my interpretation is that there are two genres in action, the traditional committee meeting genre and the PBL tutorial genre in as illustrated in the following figure.

Figure 3. 7 Traditional Committee Meeting Genres versus PBL Tutorial Genre

Traditional Committee Genre	PBL Tutorial Genre
'You are just going to have to trust me as chairman to make the right decisions.'	'we just have to trust each other'
'trust my judgement'	'And all that we can do then is to choose and trust your judgement'
'and if someone has a problem with the way we are going just say it to me after a meeting or some other time, if you think there is something radically wrong'	'Em free expression, collective responsibility'

Em, we need to produce a product, we need to agree what the product is etc.' 'Em, what I would like to see at the end of the day is a good product'	'Its getting there and making the best of it we can learn so much from this group project, we have another one directly after it and we can learn from all the mistakes we made and all the things we did right and we can try and do it slightly different the next time.'

Frank, in his talk, was inviting in the genre of the traditional committee meeting, a genre he was familiar with to the genre of the PBL tutorial, which he was unfamiliar with. In this excerpt, there are actions and interactions associated with a traditional committee meeting, these include the chairman's address, discussion about an "agenda" and "minutes" being read, and a discussion about a "product" being produced. In this same excerpt, there is also talk about "learning" in the PBL tutorials from the work on one "group project" to inform ways of working on the next group project and this interaction is associated with a PBL tutorial. We can see the hybridity in the text, where there is both the talk of the traditional committee meeting genre and the talk of the PBL tutorial genre in one short extract

In the following tutorials the students' language of traditional committee meetings (e.g. 'agenda' and 'minutes') was transformed through the following tutorials into a language of the PBL tutorial (e.g. 'action-plan' and 'whiteboard'). The traditional committee meeting was viewed as emphasising "product", whereas, the PBL tutorial was seen as giving importance to "process "and "product". The PBL tutorial mode was seen as being more democratic "with everybody sharing"

Sue:	One of the different things that I found about it was the PBL process was group, and there were group decisions and the group action plan. And with the agenda it was maybe one person's agenda and what was going to happen and some of the items on it may have become unimportant overnight and didn't need to be discussed, but we were very much saying in the group we must follow this agenda and then eventually the realization came in, instead of the agenda lets follow last week's action plan and take up from there and use that as a starting point to the following week. So again it was just bringing the group in rather than one person being the hierarchy and leading it and everybody sharing together.

In the students' talk in the tutorials there is evidence that they moved from a traditional committee meeting with one person's agenda and a strong hierarchy to a common action plan with democratic social relations. Democratic social relations are the basis of effective PBL tutorials. The next section discusses practical strategies for fostering democracy.

Possibilities for facilitating movement towards more democratic social relations

These practical possibilities are suggestions for tutors to choose from for facilitating movement towards democratic social relations:

Possibilities for facilitating movement towards more democratic social relations

1. Give attention to the physical learning environment
2. Give time to students to make and review their own ground rules
3. Speak little so the focus is on students' talk
4. Encourage everyone to participate and use student roles effectively
5. Encourage students to use the whiteboard as a shared learning environment
6. Listen to the words the students use to see where they are in the movement towards democratic social relations

Possibility One: Give attention to the physical learning environment

The physical environment effects the learning environment. As well as students being able to sit around a table together it is vital that they have a whiteboard (or other surface) that they can all see as a shared learning environment. This can be an electronic whiteboard, an ordinary whiteboard or a flipchart. A cheap approach is to bluetack a few pages of flipchart paper on a wall so this can reflect the work of the team. Giving attention to the physical environment is a key part of the tutor's role in providing a welcoming learning environment. Where the entire programme or most of it is PBL it may be

possible for each team to have a "home" room. Tutors and students can make efforts to make the learning environment physically conducive to team learning.

Possibility Two: Give time to students to make and review their own ground rules

In order to foster democratic working relationships the tutor can encourage the team to make their own ground rules, that is the rules about how they will work as an effective learning team. The tutor should not make the ground rules. Students can draw on their previous experiences of being in sports teams, learning groups etc. to make the ground rules. At the first meeting it is a good idea to give sufficient time to this task so that students have the opportunity to discuss what ground rules they need as a team and to agree these. The tutor can encourage them to make ground rules about the major areas that effect the tutorial including ground rules about behaviour in the tutorials, independent study work and sharing independent study resources electronically. Students often make rules about: timekeeping, mobile phones, listening and respecting others, everyone participating, the effort expected for independent study, attendance, circulating information etc., For example, if they have not made any ground rules about independent study the tutor can ask "What ground rules about independent study and sharing the resources from independent study do you want to make?" Students or tutors can encourage the team to review or add to their ground rules as the need arises. The tutor, chair or other students can use the ground rules to encourage better engagement, attendance or independent study if issues arise.

Possibility Three: Speak little so the focus is on students' talk

In order to realise the potential of the tutorial as a place where dialogic knowing can really take place it is vital that students talking to one another is the centre of gravity for learning, rather than tutors' talk. Tutors should learn to keep quiet and "zip it" initially in the tutorial so that the conversation can gather momentum from students' talk. Tutors need to resist the temptation to give a mini-lecture. Their role in the tutorial is *not to teach content* but to facilitate students learning and doing the work of brainstorming ideas,

reasoning through the problem and marshalling evidence for their arguments. This does not mean that they do not use their expertise but they use it in ways that enable them to listen to the students, monitor their learning, ask challenging questions, encourage students to: make effective connections, marshal evidence for their arguments and summarise and review their learning. Nor does this mean that tutors do not talk in tutorials, a misconception some people have. Rather tutors should let students start the talking and intervene later with *process* rather than *content* interventions to facilitate students creating knowledge together. For example a tutor can ask a question to get students to think more deeply about the problem. Savery (2015: 9-10) captures the challenge well of moving from knowledge transmitter to facilitator of learning:

> The challenge of any instructor when trying to adopt a PBL approach is to make the transition as knowledge provider to tutor as manager and facilitator of learning.

Possibility Four: Encourage everyone to participate and use the student roles effectively

It is important if there is to be real democracy in the team that everyone contributes to the learning. Sometimes there is a very domineering student or a very shy student. The tutor should intervene early if the student chair or others have not dealt with the issue of a domineering student. Interventions I have used include saying something like "Paul we have heard your ideas about the problem and now it is important to hear from other people who have not had the chance to express their ideas. Mary what are your ideas about the problem?"

The tutor's effective use of body language and eye contact is very important. Once when students all looked to me, I turned my body and my eye contact to the chair and encouraged the chair to start a conversation on the emerging issues. One way of encouraging everyone including shy students is to give everyone five minutes of silence to write down their ideas and then to do a round asking each student to give one idea. The tutor can choose wisely which student to start with and thereby when the domineering or shy students will take their turn.

The student roles help people to participate. Different students taking on the various roles e.g. chairperson, scribe, reader, timekeeper and observer gives them a specific job to do. The role of the chairperson is to see that the work on the problem is progressed and that everyone is involved. The role of the scribe is to record the main ideas on the whiteboard/flipchart and to manage the communications of the team. The role of the reader is not only to read the problem aloud at the start of the tutorials but also to draw students' attention to key elements of the problem. The timekeeper needs to remind people of the time so that they complete the essential work of each tutorial. The observer's role is to observe how the team have been working and to feedback to the team the strengths of the teamwork and suggestions for further development. The tutor can actively encourage students to perform their roles effectively e.g. "There are many good ideas being expressed, Joe as scribe would you like to capture them on the whiteboard?" or " Mary as chair would you encourage everyone to give their ideas about the problem?" All students should actively participate in the discussion and those with specific roles do this in additional ways to their general participation in the tutorials and independent study. I have found it useful to encourage the team to keep the same roles for all the work on the first problem and then get different students to take on the various roles for subsequent problems. This encourages students to be active in their role, knowing that they have to stay in this role until the completion of the problem. Sometimes I have encouraged an over-talkative student to take on the role of scribe or observer or a less vociferous student to take on the role of chairperson. I have also sometimes set aside specific time in the review phase for us all to give the chairperson feedback on how they have performed in the role. The tutor can also feedback at the end of the tutorial to the team on her/his observations of the team dynamics and how students have performed their roles or ask the team what they are going to do about encouraging everyone to participate.

Possibility Five: Encourage students to use the whiteboard as a shared learning environment

In traditional teaching it is the teacher who writes of the board and controls the ideas and words that are focused on. In PBL tutorials it is important that tutors

encourage students to use the whiteboard as a shared learning environment by writing and drawing their ideas, words and communal work on the problem. Even though one person in the team is the named scribe this should not stop anyone else in the team going to the board and writing or drawing to express their ideas or to build on or connect with the ideas of others. It is not a question of one person acting as a secretary and taking notes that others cannot see; rather the scribe is dynamically constructing a record of the group's ideas and work on the problem. This means that this is constructed and edited together and belongs to the team as a summary of their democratic work. The following photograph shows two students in a PBL team I facilitated working together to make sure the whiteboard reflects the work of the whole team.

Figure 3.6 Two students working together to make sure the whiteboard reflects the work of the whole team

The students should write the learning issues, the questions they have decided to research further on the whiteboard. It is important that the team decide this democratically after the process of identifying issues, agreeing,

disagreeing, drafting, erasing, and redrafting questions. The tutor should never articulate, decide or write the learning issues. A crucial part of learning is defining the problem and naming the research questions and this is the students' work and vital first steps to deep learning. These learning issues phrased as questions and written on the whiteboard can be a good starting point for the next tutorial. This can engender more democratic discussions than a traditional paper agenda and a secretary taking notes that only he/she can see. All students can receive copies of the whiteboard as a record of their team learning and development. This can be done in many ways including a student taking a photograph of their whiteboard with their smartphones/ipads and circulating this.

Possibility Six: Listen to the words the students use to see where they are in the movement towards democratic social relations

Are your students talking in terms of "I" and "my" or we" and "our"? Are you seeing a change in their language during the tutorial or over a course of a few weeks? Sometimes it is useful to give this as feedback to the team on this in order to notice effective movement or to encourage more democracy.
If there is a problem with the level of democracy the tutor may decide to pro-actively use one or more of the first five possibilities.

The first dimension of dialogic knowing, namely, movement towards more democratic social relations provides a firm foundation for the second dimension, namely, the co-construction of knowledge through co-elaboration, which I will now discuss.

The co-construction of knowledge through co-elaboration

The second dimension of dialogic knowing is the co-construction of knowledge through co-elaboration. In PBL tutorials, it is not a case of individuals just elaborating their knowledge by making links between their own prior knowledge and the current problem, rather it is a question of students co-elaborating together, with one person's elaboration of prior knowledge building on another person's elaboration**.** Schmidt (1993:428) views the "elaboration on prior knowledge through small group discussion" both before and after new knowledge has been acquired as a cognitive effect of PBL on student learning. In PBL tutorials students can construct knowledge that is new to them together by elaborating on and building on one another's' prior knowledge and independent study. Freire emphasises that, in the final analysis, knowing is a social event. For Freire, knowledge is viewed in terms of "our" knowledge rather than "my" knowledge, knowing is "…not strictly a 'I think' but a 'we think': "It is not the 'I' think that constitutes the 'we' think' but rather the 'we think' that makes it possible for me to think" (Freire, 1985: 99-100). This is what I mean by the co-construction of knowledge through co-elaboration, which is at the heart of dialogic knowing. What a better place to start learning about this co-construction of knowledge through co-elaboration than by listening to students doing this in the naturally occurring talk in tutorials. Firstly, this section will begin by considering what we can learn from analysing how students talked about this in tutorials. Secondly, specific practical possibilities for fostering the co-construction of knowledge will be discussed with examples.

Listening to students' talk about the co-construction of knowledge through co-elaboration

The PBL students in the study (Barrett 2008) talked about building their knowledge together ("group knowledge") through

elaborating their own "ideas", listening to new ideas from other students, linking what one student said to what other students said and "editing" their work together. This co-construction of knowledge through co-elaboration contrasts with an individualistic view of knowledge creation and Philip, from the Skelligs team, distinguished between the two perspectives as follows:

> Well, my opinion of the idea of the PBL working in groups, if I was working independently I couldn't have been as creative as the group has been. And the number of ideas that were thrown around and developed by the group is very, very, I think it creates a whole new dynamic.

This co-construction of knowledge meant that there was a greater "number of ideas" being considered by the team compared to when someone works individually to construct knowledge. Philip said that this co-construction of knowledge was more "creative" as many ideas were "being thrown around" and were bouncing off one another. The PBL students in the study made use of ideas and prior knowledge on various topics to exploit the potential of PBL tutorials for co-elaboration and co-construction of new knowledge. In Philip's words, the group discussions in the PBL tutorials created " a whole new dynamic." compared to "working independently".

The Skelligs team decided to do a shadow acting presentation. This was in response to the "Help" problem about giving a presentation to Heads of School about their experience of the PBL process. After the shadow acting presentation, the tutors and the students from the other team asked the Skelligs team questions arising from the presentation.

> *Ann:* Could I ask you, you were saying that individually there was a sense in which you couldn't maybe produce the final product up to the standard that you would require yourselves? I am just wondering in relation to PBL what are your reflections around that?....
>
> *Betty:* I think what that question is more addressing is control as opposed to the standard. As an individual you have control over the start and finish of a product whereas you need to give this up as this is group knowledge and it's a group process, you don't have control over it, what the finished piece is. That is different, it's different, ……. *…..*
>
> *Michael:* But I think the group gives a value to this, it's almost like an editing process. like when you get an idea you can go off on a tangent and develop it yourself, so you are in a situation where you hand up a thesis to the tutor, they mark it, correct it, it becomes very, very closed system almost. And often you get a tutor who likes what your approach is, this is brilliant, maybe the research isn't that great. But then maybe you get a tutor who hates what you are doing and then you can get a worse mark or you get a roasting over it because he doesn't like what you are saying or she doesn't like what you are saying and doesn't like your research methods. Whereas in a group like this you can feel, like sometimes you put in something and its rubbish and the group will tell you pretty quickly. You feel okay, that idea didn't work, or that was a crazy idea and then you think about that, and then maybe that is a new good idea, so it helps if a lot of people are thinking the same way, it validates your idea better. I think that is the strength of the group work.

These students talked about giving up individual control for a sense of shared control and " group knowledge" in the way that they co-construct their knowledge together in the PBL tutorials. They talked about the PBL tutorial being like an "editing process", where the group, rather than the individual, decides which ideas to run with and which not to pursue. Through the co-elaboration of ideas, the PBL students as a group validated some ideas as the most appropriate to develop to work on the problem and to further their knowledge.

Kelson and Distlehors (2000:176) summarise the reasons why work on PBL problems in tutorials can foster this type of co-construction of knowledge through co-elaboration

Put simply for most of us acting individually, problem complexity triggers a tendency to come to simplistic resolutions out of our present state of ignorance. The more novice the problem-solver, the greater the tendency. The collaborative problem-solving group, however provides the ideal situation for remedying this, while developing expertise in problem-solving through the interaction between reasoning and attuning to problem affordances.

Individuals bring varying expertise to the group. They see different facets of a complex problem and bring unique needs for completeness and tolerance of ambiguity. A group of such individuals, committed to a common goal - the problem's optimal resolution - can collectively enlighten each other regarding multiple perspectives, complex affordances, and reasonable versus reckless uncertainty.

The focus of the PBL tutorial was students working together on a problem "where there is no simple correct answer but multiple reasonable interpretations or solution paths which can be argued for" and discussion on a PBL problem in tutorials can promote dialogic practices (O'Connor and Michaels 2007, 285).

These students characterised the individual research project in terms of 'my knowledge and control' and the PBL tutorial in terms of 'our knowledge and control.' Genres vary in terms of purpose and social interaction. The students were saying that, in an individual research project, the purpose is to produce a product that shows individual ideas, research and learning. This was contrasted with the purpose of the tutorial which is to produce a group product that reflected the group's ideas, research and learning to co-construct knowledge together. In terms of social interaction, the individual research project was characterised, as a "closed system" with the only interaction mentioned as that occurring between the student and the supervisor. In regard to the social interaction of the PBL tutorial, the students talked about it in wider social terms, for example, "sharing ideas", "shared ownership", "group knowledge", and "group process". They talked about the individual research project as a "closed" form of interaction between the supervisor and the student and contrasted this genre with the more open interaction of the PBL tutorial where various students co-elaborate their ideas to produce

"group knowledge". Dialogue is the means by which these students together created and recreated new knowledge. The establishment of democratic social relations encourages dialogic knowing, as participants can move beyond their current level of knowledge by making a new form of "our knowledge" together. In order to do this, they must have respect and reverence for the words of others and for their own words.

Freire's understanding of dialogue

This conversation can be understood more deeply by returning to Freire's understanding of dialogue. Freire built his understanding of dialogue on the foundation of Buber's (1964) understanding of the "I-Thou" relationship. For Freire, dialogue goes beyond being an epistemological position of how knowledge is viewed, to being a particular ontological stance of what it means to be human. Dialogue from this Freirian perspective is at the centre of the process of being authentic human beings who are subjects not objects in the world (Freire 1972). Human beings as subjects name their word and their world. In PBL tutorials students name their words and listen to others doing so. This dialogic process is underpinned by values of "mutual respect, humility, trust, faith, hope, love and critical thinking" (Rule 2009, 929).

I agree that the particular and unique contribution of Freire to the conceptualisation of dialogic knowing:

> is not only the central place it is afforded within critical pedagogy, but more importantly because of the extent to which it is considered to be a creative and aesthetic act. In speaking, challenging and overcoming the word, Freire like Buber, argues that one is defining and redefining the relationship between oneself and the world. This is the tension between "being and not being" … or being and being more human
> (Curzon-Hobson 2002:189).

Freire views dialogic knowing as a creative process of becoming more human and of developing a sense of personal identity. It is so important for students to have the opportunity to work in small group tutorials and for their higher education experience not to consist only of very large group lectures. They

need a place where their word can be heard, where they can listen and learn from other students and where they can develop and be nurtured as social human beings. Freire's concept of dialogic knowing is underpinned by Vygotsky's (2002) concepts of thought-language and proximal development. Vygotsky's understanding of the interfunctional relationship between thought and language is key to understanding co-elaboration and co-construction in dialogic knowing:

> Word meaning is a phenomenon of thought only in so far as thought is embodied in speech, and of speech only in so far as speech is connected with thought and illuminated by it. It is a phenomenon of verbal thought, or meaningful speech-a union of word and thought (Vygotsky 2002: 212).

Through socially constructing new knowledge together in thought-language, PBL students can move from their current zone of development (ZCD), where they can acquire new knowledge unaided, to a wider zone where they can acquire greater knowledge through their discussions with others in PBL tutorials. Vygotsky said the Zone of Proximal Development (ZPD) is the:

> distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers (Vygotsky 1978. 86).

Let us now look at practical strategies for cultivating dialogic knowing in tutorials

Possibilities for promoting the co-construction of knowledge

I suggest three sets of practical pointers for promoting the co-construction of knowledge namely 1) setting the learning climate 2) asking questions and 3) staff and student induction. The first set is a range of possibilities we have for setting up an environment conducive to team learning.

Possibilities for promoting co-construction of knowledge through co-elaboration - Setting the Learning Climate

7. Convey the high standards of information literacy expected
8. Encourage students to share their learning from their independent study
9. Encourage students to share their new learning from the research of their independent study electronically to free up the tutorial for discussion
10. Facilitate students to listen actively and mindfully with respect
11. Prompt students to name and summarise their new learning

Each of the these possibilities will be discussed in turn.

Possibility Seven: Convey the high standards of information literacy expected

The quality of the dialogue in the tutorials is dependent on the quality of the independent study that the students complete, cognitively process and share with their peers. At the induction and during the module the tutor should be clear about the high standard of information literacy expected and what is acceptable and not acceptable in this regard. Naming the learning issues as research questions is an important part of information literacy. The tutor should encourage these to be written as precise questions rather than vague topics. The tutor should *never name the learning issues*. This is the work of the students and vital for developing their critical thinking and information literacy skills. Sessions on information sourcing and evaluation led by you and/or a librarian are key. The tutor however has an important role in monitoring and encouraging the on-going development of information literacy in tutorials. Sometimes in the review phase the tutor can ask each student to evaluate his or her current information literacy skills used on the problem.

Tutors can give feedback at the review phase whether the information literacy is up to the expected standard or not.

Possibility Eight: Encourage students to share their learning from their independent study

For the second or subsequent tutorials on a problem, a useful starting point is for the scribe to put up the learning issues (phrased as questions) that were decided on in the previous tutorial and to use these as triggers for the conversation. If there is an initial silence, this can be constructive as students are gathering their thoughts and the tutor should be comfortable with a little silence and not rush in to rescue the students. We learn new things by making connections between our prior learning and our new learning (Ausbel 2000) so it is vital to access this prior learning and to link this with new learning. A tutor can encourage the team to explore how their new learning from their independent study relates to their prior learning. Students can learn so much from the shared reading and the discussion of the shared reading.

Possibility Nine: Encourage students to share their new learning from the research of their independent study electronically to free up the tutorial for discussion

It is crucial that the precious tutorial time is not used up with people reading out big chunks of text from papers. Tutors should encourage students to share their research and other documents electronically using dropbox or whatever the team decides to use. It is the scribe's job to set up and co-ordinate this. This frees up the tutorial time to discuss *what the research means in terms of working on the problem.* A student can say for example "I read x paper which I put in dropbox. The key point of the paper was Y and therefore I think in relation to our problem we should consider/do Z" In a visual I designed for the PBL process for a PBL module in the independent study phase I wrote "*Synthesise what this means for the problem critically*" In

the co-constructing knowledge and professional action phase I wrote
"Summarise the learning as it relates to the problem and professional practice"

The focus of the tutorial should be students talking to and learning from one another. The following photograph is of a student sharing her learning from her research and two other students listening attentively, in a tutorial I facilitated.

Figure 3.9 A student talking about her research from her independent study with other students listening attentively.

Possibility Ten: Facilitate students to listen actively and mindfully with respect

Tutors need to establish an atmosphere that encourages students to give their full attention to the dialogue in the tutorial, to be mindful and to actively listen. Tutors can encourage students to turn their mobiles off or on silent

(whatever the ground rule is on this). They can facilitate students to show respect for their fellow students by listening to them and showing that they have listened to them. They can encourage students to build on one another's ideas. The tutor can model this mindful, respectful listening. I often take five minutes of quiet time to myself calming my mind and centering myself before a tutorial, so I can be as fully present as possible.

At the end of the tutorial, or during the tutorial, the tutor can comment on what they noticed about students listening (or not listening), talking and learning. At the review phase the tutor can sometimes ask the students to name one new thing they learnt from listening to another student and the tutor can do this also. As tutors listen attentively to the language students are using, and mindfully watch the body language of students, they can monitor where the students are in terms of the co-construction of knowledge and intervene appropriately to advance this further.

Possibility Eleven: Prompt students to name and summarise their new learning

Reviewing learning aids knowledge acquisition and learning to learn skills. The tutor can ask one student to summarise the new knowledge constructed during the tutorial. Or a tutor can ask each person in turn to name the main new thing they learnt during the tutorial and how they learned it. The tutor can ask a student to summarise the main learning during the tutorial.

The second set of possibilities for promoting the co-construction of knowledge focuses on the types of questions the tutor can ask to prompt co-elaboration.

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Possibilities for promoting co-construction of knowledge through co-elaboration – Asking Questions

12. Ask the big questions
13. Ask questions to facilitate co-construction of the *depth* of knowledge
14. Ask questions to facilitate co-construction of the *breadth* of knowledge
15.Ask questions to facilitate co-construction of the *application* of knowledge
16. Ask students to make visualisations of their team's knowledge on a topic

</div>

Possibility Twelve: Ask the big questions

Tutors asking appropriate questions can facilitate the co-construction of knowledge through co-elaboration. By asking specific questions the tutor is modelling effective ways of constructing knowledge. In this way problem-based learning is a form of cognitive apprenticeship (Hmelo-Silver 2004, 2009). The questions can operate as prompts for students to elaborate their knowledge from their prior learning and independent study.

Sometimes if students are stuck or are getting bogged down in detail it can be helpful for the tutor to ask some of the big questions like: What is the purpose of Y? What do you know about the client/customer/audience? Why are you proposing Z? What outcomes are you aiming for? Why do you think that? So what?

Possibility Thirteen: Ask questions to facilitate co-construction of the

***depth* of knowledge**

Sometimes when I am facilitating tutor-training people ask about sample questions to ask. A tutor can model the types of questions that are helpful, or students themselves start by asking very insightful questions. Problem-based

learning aims to promote deep learning where students have a robust and personal understanding of the topics.

Figure 3.10 Sample questions to promote the depth of knowledge

What is the kernel of the problem?

How do you define the problem? Why?

How will you phrase your learning issues as questions?

Why do you argue for x?

Why would you use that procedure/approach/technique?

What is your research evidence for X?

What are the counterarguments for X?

Why do you think that is a good argument?

Why did you choose those particular sources?

What are the claims in that research paper?

What are the crucial points of the paper?

And what do these points mean for working on the problem?

What are the advantages and disadvantages of Y?

What are the most important issues here?

What are your main arguments?

What are the main arguments for and against this?

So what?

What are the links between your arguments?

How has your understanding of this key concept developed from your

research and from working together in the tutorial?

What new things do you now know about Z?

How did you learn them?

What readings would you most recommend to your peers on this topic and why?

What more have you learnt about problem-solving from working on this problem?

Stop and Reflect

These are only sample questions, not a definitive list and would need to be adapted to and added to for different situations. What other questions would you suggest to promote depth of knowledge?

Possibility Fourteen: Ask questions to facilitate co-construction of the *breadth* of knowledge

In problem-based learning students study a problem in context. This provides many opportunities to broaden their knowledge making connections and using networks.

Figure 3.11 Sample questions to promote breadth of learning

What are the important social, ethical, cultural and political issues to consider in relation to this problem?

How do all these factors interconnect?

Whose voices do you hear in the problem statement? Whose voices do you not hear in the problem statement?

What professional or other networks would be useful to you in researching

this further?

What understandings would interprofessional viewpoints bring to the

problem?

How is this problem dealt with in other countries?

What other areas of literature do you need to explore to get a broader

viewpoint?

What are the main debates about this topic in the literature?

Who are the key theorists/researchers/leaders in this area?

How has your understanding of the problem broadened from the discussions

in the tutorials?

Will you represent a synthesis of what you have learned together about the

problem visually on the whiteboard?

Stop and Reflect
These are only some suggestions. What other
questions would you suggest to promote breadth of
knowledge**?**

Possibility Fifteen: Ask questions to facilitate co-construction of the

application **of knowledge**

One of the aims of PBL is to facilitate students to be able to transfer their knowledge and apply it to different situations**.**

Figure 3.12 Sample questions to promote application of knowledge

What is the most crucial thing to do and why?

How exactly would you do that in practice?

If you and your team could only do three things, what would they be and why?

How do you think all the stakeholders feel?

What are all of the ethical issues involved in this situation?

What is the appropriate empathetic response to this situation?

What would be a more cost effective/ environmentally effective/ inclusive way of working?

How have you extended your repertoire of professional interventions from working on this problem?

How would you use what you have learned in different situations/ future placements/ work settings?

What specific skills do you need to develop further to work with these kinds of problems?

How is your professional practice developing?

Stop and Reflect

Many questions about applying knowledge are profession/discipline specific.

	What other questions would you suggest to promote application of knowledge?
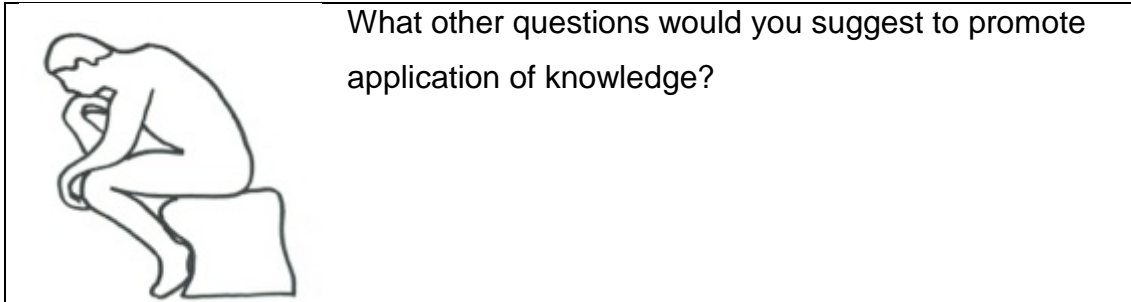
Strategy Sixteen: Ask students to make visualisations of their team's knowledge on a topic

Many of us learn well through using visualisations. In PBL, "visualizations become early models of understanding both the problem space and the solution space" (Segelstrom and Holmlid 2009: 7), Visualisations can take different formats including drawings, concept maps and photographs. They can be powerful means of critical and creative thinking and a clear synthesis of learning. Tutors should encourage students to work visually as well as textually on the whiteboard. In the tutorial the tutor can challenge students with a question like: "Can you draw a concept map to illustrate the knowledge you are developing from working on this problem?" This can encourage them to work on a collaborative concept map. Tutors can also encourage students to work with visual metaphors as an aid to learning. When students are giving presentations on their work on the problem they can sometimes be given the freedom to work in any media to synthesise their learning.

The third set of possibilities for promoting dialogic knowing in PBL tutorials focus on tutor training and student induction.

Possibilities for promoting co-construction of knowledge through co-elaboration – Organising tutor training and student induction

17.Organise initial and advanced tutor training initiatives
18. Adapt strategies for roving tutors
19.Organise student induction

Possibility Seventeen: Organise initial and advanced tutor training initiatives

Tutor training is a key success factor for problem-based learning initiatives (Savin-Baden and Major 2004). Initial tutor training needs to start with understanding what problem-based learning is and the philosophy that underpins it. It needs to give space to exploring the purposes of PBL generally and the tutorial in particular. New tutors need to be introduced to the stages of the PBL process and to the PBL tutor and student roles. Tutors watching DVD clips of the PBL tutorial in action can be very helpful in this regard (see the further resources section). Exploring the concept of *the tutorial as a potential site for dialogic knowing* can be illuminative and inspiring for tutors. Tutor training should not stop after an initial training session. After tutors have been trained in PBL as an education approach and in tutoring skills it is very helpful

> for the tutors to meet, discuss and reflect, both formally and informally. The existence of such Communities of Practice seem to be of great importance in order to enhance and continuously inspire the tutoring in PBL groups (Lyberg-Ahlander, Lundskog and Hanssonl 2014:24-25).

Case studies of Problem-based Learning Tutor Development Activities

I argue that one of the best ways of training PBL tutors is for them to experience the PBL tutorial as a student first before experiencing it as a tutor. I always include this important element in any PBL staff development initiatives I facilitate. Below is a photo of a team of lectures from different disciplines undertaking a module on problem-based learning in higher education that I facilitated experiencing PBL tutorials as students.

Figure 3.10 Lecturers experiencing a problem-based learning tutorial as PBL students during a PBL staff development module

After experiencing PBL as students first, then staff can experience PBL as tutors (facilitators) as part of their training. Salinitri et al (2015: 76) make this link well in describing an early part of a PBL tutoring programme:

> The facilitator trainees are the learners during the training, but their role as facilitators and the key skills required to achieve the goals of facilitation should be modelled and emphasised by experienced facilitators...

I co-facilitated a tutor-training workshop with Jon Yearsley for a group of tutors who were preparing to facilitate PBL tutorials for a statistics module for science students. What they learned about the PBL process and the role of the tutor from having experienced a PBL tutorial as students was recorded on flipcharts.

Fig 3.11 Jon Yearsley's PBL science tutors responses about what they learned about *the PBL process* from just having experienced a tutorial as students

What have you learned about the PBL process?

- Good to get different ideas since members have different backgrounds

- Roles help everyone to get involved

- Gets you interested, like a puzzle, makes you curious

- You have to think broadly and from a different perspective

- Got into it, created a "buzz"

- Time constraint drives the engagement

- Group more productive than individual

Fig 3.12 Jon Yearsley's PBL science tutors responses about what they learned about *the role of the PBL tutor* from just having experienced a tutorial as students

What did you learn about the role of the tutor?

- Ask probing questions

- Remind group to look at process guide

- Useful to recap on roles

- Clarify the assessment

- Some tutors find it hard not to talk too much

- Tutor should not 1) give their own ideas or 2) define the learning issues

- Try "think-pair-share" or round robin to get all to contribute

I co-facilitated a tutor-training workshop with Naomi McAreavey for tutors who were working on an English literature module for 500 first years in small teams. We gave them the experience of being a student or a roving tutor as the reality was they would be working as a roving tutor with more than one team in the room. For one session in the workshop we gave the participants specific roles written on cards e.g. "You are a very interested conscientious student", "You are a domineering student, who talks a lot ", "You are a very shy student", "You are a very sociable student who helps the group to gel", "You are a student who has done no independent study", "You are a student who does not like group work". Hitchcock and Anderson (1997) recommend using role-playing of different dysfunctional group scenarios for tutor training. Participants then debriefed about what they learned about the PBL tutorial and the role of the tutor from their experience of just having been a PBL student or tutor in a tutorial. We had very rich discussions about the role of the tutor. This is what was recorded on the flipchart about what they learned from these lived experiences about the role of the tutor. We circulated this to all tutors afterwards.

Figure 3.13 Naomi McAreavey What did you learn about the *role of the tutor*?

What did you learn about the role of the tutor?
- Asking facilitative questions is important

- Confirm good work, challenge to do more

- Timekkeeper and time management is important

- Remind students not all work is done in the tutorial and get them to summarise the focus of their independent study

- Remind students that groupwork is intensive

- Tutor should sit with students at table when roving as a tutor rather than standing

- Tutors should be approachable

- It is difficult not to focus a lot on the content and to think of also focusing on the process

- Open questions

- Throw issues back to group

- Difficult to decide how much time to spend with different groups

Another informative approach is to get some PBL students to share their experiences of PBL with the tutor-training group and to highlight what tutor behaviours they consider enhance or inhibit learning. A panel of first year students were invited to come as the experts on the student experience of PBL and to take questions from all the lectures in a school that had decided to expand the PBL initiative beyond first year.

Participants taking turns being the tutor and this being video-recorded can also be a very powerful experience. They can get feedback from an education developer and other participants on their tutoring. I facilitate that the feedback starts with the tutor giving auto positive feedback and then others including myself give positive feedback. Then I ask the tutor to give her/himself developmental feedback i.e. what they would like to improve about their tutoring. Lastly, others including myself give the tutor developmental feedback. The sequence of giving the feedback is important in terms of confirming tutor strengths and the tutor being open to hearing and working

with developmental feedback. Often when a new PBL initiative starts, time and energy is invested in tutor training. However as new tutors come on board it is important to organise further training for both the old and the new tutors (Azer et al 2013). For experienced tutors I have asked them to each bring a DVD of themselves as a PBL tutor and we discuss each video in turn (including mine) to develop together our understanding of becoming a better PBL tutor.

I have found critical incident work very helpful in tutor training. The critical incidents include: a very domineering student, shy students, a bullying student, very poor independent study completed and the review phase at the end of the tutorial is done very superficially. Watching DVD clips of the incidents is followed by discussing the strategies tutors would use to deal with these situations. (see the further resources section for DVDs of critical incidents).

Once tutors have some experience of PBL, they can do peer observation of teaching of one another. The model of peer observation of teaching I use is where the tutor is in control and chooses who observes her/him, what the focus of the observation is and how the observation will be recorded. This model involves a pre-meeting to discuss these issues, an observation meeting and a post-observation meeting to give feedback and make an action plan (McMahon, Barrett and O'Neill 2007). Another tutor training strategy that has been useful is people discussing key research papers on PBL tutoring and papers on the philosophical, psychological and neuroscientific dimensions of PBL as well as evaluation studies. Tutors researching their PBL initiatives and presenting these at conferences is effective for networking nationally and internationally and re-energising tutors.

Possibility Eighteen: Adapt strategies for roving tutors

The pointers elaborated here can be adapted to situations where there is a roving tutor. In addition to interventions with different teams, he/she/they can listen to how the teams are progressing and take time at the start or end of

the session to highlight some key relevant pointers to the larger group. This topping and tailing of the session with the larger group is very important in facilitating the smaller teams to continue to learn to work more effectively together, In large group situations the co-ordinating lecturer can meet regularly with tutors to discuss facilitation of the process, emerging issues and to brief tutors on the problems.

Possibility Nineteen: Organise student induction

The time spent on student induction is a very worthwhile investment and a key success factor for PBL initiatives. They need to understand what PBL is and why PBL is being used for the course. Having a visual of the PBL process guide used by the course in question is very useful. In addition to discussing this in detail students are encouraged to bring this one page visual to tutorials and to use it to help them work on the problem. It is key to give an overview of the different student roles and the role of the tutor and to allow sufficient time for discussion on these roles. Seeing students working with these roles on video is very helpful (see further resources section). Students enjoy seeing videos of PBL students in different countries and this helps to reinforce the idea that PBL is now well established across disciplines and across the globe. Some of the same key areas mentioned for tutor-training need to be covered in student induction except from the students' point of view. For example, when I am doing critical incident work with students I ask them the question " What can you do as students when this happens in your team?" It is very useful to get other experienced PBL students to talk about the experiences of being PBL students and to take questions from students starting PBL. Sometimes we design different fun and games for students to understand the importance of teamwork and information literacy as well as giving them a small problem to work on to learn the PBL process.

Having discussed the co-construction of knowledge though co-elaboration, let us now look at the third dimension of realising the PBL tutorial as a site for dialogic knowing, namely, movement towards shared control.

Movement towards shared control

This section begins by listening to PBL students talk about issues of control (Barrett 2008). It then elaborates some practical pointers for movement towards more shared control. I argue that unless there is some degree of shared control then the potential for the PBL tutorial being a site of dialogic knowing will not be fully realised. A third dimension of the PBL tutorial as a potential site for dialogic knowing is shared control.

Listening to students talk about shared control

A student contrasted this shared control with individual control:

> Betty: As an individual you have control over the start and finish of a product whereas you need to give this up as this is group knowledge and it's a group process, you don't have control over it, what the finished product is. That is different, it's different.

If there are democratic social relations and co-construction of knowledge through co-elaboration then it is possible for some degree of shared control to follow. Without some degree of shared control there is no real dialogic knowing. Shared control was seen by some participants negatively, as having to give up control while preferring to be in control. Shared control was seen positively by some participants as a sharing of ideas and a sharing of ownership.

> Philip: I feel the whole process is very messy and a lot of time was wasted at our group meetings. I would much prefer to be in control of a learning and discussion or decision making myself.
>
> Maura: No, I don't really agree, I enjoyed the whole process of discussion and sharing of ideas, workload and presentation. I feel a form of shared ownership in the solution of the problem.

Participants of the Skelligs team discussed the issue of shared control at the participant validation session where the findings of the research were presented back to the participants. Having experienced this lack of individual control as enhancing their learning as students, they were as tutors consequently more open to giving more control to their students.   At the participant validation session when I fedback my findings to the team Betty, who teaches design added her further insights (Barrett 2008). She discussed Freire's concept of dialogue and highlighted the fact that "context, students and tutors are all variables and that is why dialogue and conversation are important. They are not static. That is why we are saying we don't have control." She continued to elaborate:

> We have lack of control. We really don't know what the end product is, we are less afraid. That is difficult for designers not having control. We are helping colleagues not to be afraid and concerned about not being in control.

Possibilities for promoting movement towards shared control

What are practical ways of promoting shared control in PBL tutorials?

Possibilities for promoting movement towards shared control

20. Students reviewing their teamwork as a whole, individual contributions and power and control issues

21. Tutors discussing issues of power and control in tutor training

Possibility Twenty: Students reviewing their teamwork as a whole, individual contributions and power and control issues

One strategy is to ask the observer to give feedback on his/her observations of how he/she saw the team working in the particular tutorial in question and generally and to name some strengths of the team and some suggestions for ways forward in relation to participation, decision making and control. Another strategy is for the tutor in the review phase to ask each member of the team to name one thing they have contributed to the team so far and an additional new thing they will contribute in the future, in terms of participation and shared control. When substantial issues of power and control emerge and are not being discussed or dealt with by the team, the tutor can hold a mirror up to the team by summarising his/her observations to the team asking them how they are going to deal with it.

Possibility Twenty-One: **Tutors discussing issues of power and control in tutor training**

Another key to tutor training is to discuss issues of power and control. When participants have experienced PBL as students and tutors and we are discussing what they have learned for this experience the issues of power and control always come up. Having just had the experience of being in a tutorial is fertile ground for discussing these issues as they relate to tutor beliefs, behaviours and attitudes.

Another strategy is to give quotations about power and control from lecturers who have experienced PBL as students and who have implemented PBL with their own students as triggers for discussion. I also ask experienced tutors to talk about these issues to new tutors. A quotation from Freire about dialogic knowing can trigger discussion about power, control and democracy in higher education.

New tutors need opportunities to understand the educational values underpinning PBL and the congruence or dissonance this has with his or her own beliefs about teaching and learning. Williams and Paltridge (2016:5) argue that it is important that new tutors:

are provided with professional development opportunities to help them reflect upon and question their beliefs, and understand what it means to facilitate learning rather than transmit knowledge,

Research has indicated that there can sometimes be discrepancies between PBL tutors' espoused beliefs and their actual behaviour in tutorials (Assen et al 2016). Two of the key factors in whether the espoused beliefs translate into tutor behaviour are " the confidence teachers have in the self –directed capabilities of students and the self-confidence of teachers regarding their own facilitation skills (Assen et al 2016:12).

Conclusion

Sometimes the tutorial can seem like mixed weather as students are forming and storming as they build their teams. There are bright times of ideas and new knowledge created and dull times where things seem to drag. There are times of thundering conflict or domineering students. Sometimes there are flashes of real insight. The concept of *the PBL tutorial as a potential site for dialogic knowing* makes me think also of the metaphor of a building under construction where workers together are creating a building with different members of the team taking on different roles in a project that involves much hard work.

Figure 3.14 PBL tutorial metaphors

Mixed weather or new building under construction ?

(Black 2007)

(Joliffe 2011)

The essential skills of dialogic knowing: listening, expressing ideas, reading other team members, questioning, making connections with different perspectives, giving and receiving feedback, brainstorming, finding and evaluating information, synthesising knowledge, making arguments, debating issues and presenting research are not just vital for professional life but also for personal life and active citizenship. The following figure summarises the practical possibilities from which to choose when aiming to develop dialogic knowing in PBL tutorials.

Figure 3.15 Practical Possibilities for developing dialogic knowing in PBL tutorials

Dimensions	Possibilities
Democratic Social Relations	1. Give attention to the physical learning environment 2. Give time to students to make and review their own ground rules 3. Speak little so the focus is on students' talk 4. Encourage everyone to participate and use student roles effectively 5. Encourage students to use the whiteboard as a shared learning environment 6. Listen to the words the students use to see where they are in the movement towards democratic social relations and to facilitate them to move towards more democracy

| **Co-Construction of Knowledge**

Setting the Learning Climate
7-11

Asking Questions
12-16

Organising Tutor Training and Student Induction
17-19 | 7. Convey the high standards of information literacy expected
8. Encourage students to share their learning from their independent study
9. Encourage students to share their new learning from the research of their independent study electronically to free up the tutorial for discussion
10. Facilitate students to listen actively and mindfully with respect
11. Prompt students to name and summarising their new learning
12. Ask the big questions
13. Ask questions to facilitate co-construction of the *depth* of knowledge
14. Ask questions to facilitate co-construction of the *breadth* of knowledge
15. Ask questions to facilitate co-construction of the *application* of knowledge
16. Ask students to make visualisations of their team's knowledge on a
17. Organise initial and advanced tutor training initiatives
18. Adapt strategies for roving tutors and tutorless groups
19. Organise student induction |
| **Shared Control** | 20.Students reviewing their teamwork as a whole, individual contributions and power and control issues

21.Tutors discussing issues of power and control in tutor training |

Further Resources

Here is a list of some resources that you might like to choose from to work with your tutors and students on deepening their understanding of promoting dialogue and learning in PBL tutorials

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PBL tutorials in practice

Problem-based Learning at Stenden University

https://www.youtube.com/watch?v=-5omNEmWicU

PBL at Maastricht University

https://www.youtube.com/watch?v=lZS2MbxBGCM

FH Wein, University of Applied Sciences,

Austria http://www.youtube.com/watch?v=gE04TbxQWS8

DVD clips of critical incidents in PBL tutorials
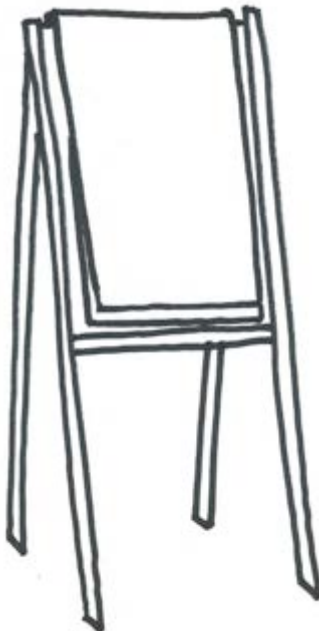Critical incidents in PBL tutorials
Facilitate, the Irish national problem-based learning network
(freely available online for use in tutor training and student induction)
www.facilitate.ie

Reflect and Plan

On your own and with your team think of a specific problem-based learning initiative you are currently designing or re-designing

- What specific possibilities for facilitating dialogic knowing do you think would be most appropriate for your context?
- What are your ideas for adapting these strategies for your context?
- What additional possibilities do you see for facilitating dialogic knowing?
- What resources about the PBL tutorial do you want to make available to your students and tutors?
- How will you develop PBL tutor training?
- What further reading or resource viewing have you been inspired to follow-up?

A PBL Practitioner Response by Tara Cusack

Response to the chapter by Tara Cusack, Associate Professor, Physiotherapy, University College Dublin

I have been a lecturer in physiotherapy for many years and have experience of delivering teaching across a range of professional areas, through a range of different teaching methods. A number of years ago an experienced clinical colleague came into my office having delivered three hours of lectures and said, "this

lecturing really is a waste of time, there must be a better way". I thought about what she had said for some time and reflected on how I had just spent several weeks "cramming" rheumatology in order to deliver a series of lectures for physiotherapy students…when in fact I had completed my PhD in rheumatology…I began to question why I was feverishly researching the latest publications and learning resources, when in fact it wasn't me who needed to be sourcing and studying the latest publications, it was the students. I needed to find a way to make this happen….for me PBL was that way!

I have now extended my PBL practice to modules which include professional practice education within physiotherapy and an inter-professional learning module which includes student from across the health science disciplines (medicine, physiotherapy, nursing and diagnostic imaging). Within the physiotherapy curriculum we have developed a spine of PBL modules, which are positioned in each year of the programme. These modules are designed to help students to link theory and practice. Student feedback has shown that they really value the opportunity to work together, to bring what they know to the table and feel that it is valued. Now when I induct students into the PBL process, I say to them that we know they have not come to us as a "blank canvas", and what we want them to do now, is to share what they already know with their colleagues, and to then identify within their PBL group what else they need to learn to respond to the problem.

Terry has worked for many years with PBL practitioners "at the coalface" like me. She has heard and experienced the issues, which commonly arise for PBL practitioners (how do I get the group to…. talk; contribute; complete their work; share), and has helped us to navigate our way through these issues ultimately improving the PBL experience for both our students and ourselves. When preparing new PBL facilitators for my modules we now work together to introduce facilitators to the roles presented in this chapter, we then give them an opportunity to practice the roles as PBL group participants. The participants follow the PBL process guide presented in this chapter. Each member of the group can secretly be given a persona, which they adopt during the practice tutorial offering an added dimension for all participants. This is fun, while also offering Terry and I an opportunity to provide feedback before they have to do it for real.

While this chapter develops a new understanding of the theory underpinning the PBL tutorial it also has valuable "roll up your sleeves and get down to it" possibilities for enhancing the tutorial. The first of these possibilities, "give attention to the physical environment" is to me, essential as it immediately signals to students, in this place you will be doing something different, here you will be learning in a different way. I think the atmosphere in a PBL tutorial should be different, students should feel comfortable to contribute, to discuss, to disagree, and to question this chapter presents possibilities for enabling this process.

I think one of the most important roles of a facilitator is simply asking the key questions, in this chapter Terry presents lots of examples of questions to

promote depth, breadth and application of learning. These levels of learning are particularly important for students in a professional programme as you are continually seeking to encourage students to bridge the practice theory divide, and to think critically about how their learning will inform their practice. The key to successful PBL is good organization, everyone (students and facilitators) needs to know and understand his or her role within the PBL process. Preparation should be complete in advance of the first PBL tutorial, module outcomes should be outlined, problems designed, students inducted and facilitators trained so that once the module commences it runs seamlessly. This chapter offers many and varied possibilities for enabling successful PBL.

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