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**Problem Based Learning: a reflective account of its application in Health  
Professional Education**

**Authors**

Carl Covill – RGN, DN, BSc (Hons), MSc, Fellow of the Higher Education Academy,  
Senior Lecturer: University of Huddersfield,

Vicky Kaye – RGN, DN, BSc (Hons), MSc, Fellow of the Higher Education Academy,  
Senior Lecturer: University of Huddersfield

Dr Rob Burton – RNLD, BSc (Hons), MEd, EdD, Fellow of the Higher Education  
Academy, Principal Lecturer: University of Huddersfield

**Keywords**

Problem based learning, reflection, health professional education.

**Abstract/Summary**

This article is a critically reflective account discussing the practical application of Problem Based Learning (PBL) in Health Professional Education (HPE). The authors reflect upon their experiences as Nurse Teachers introduced to PBL as an educational approach. The processes of PBL including group formation, trigger development and facilitation skills will be discussed. The experience was found to be challenging, but it is recognised that learning about and implementing PBL was worthwhile and rewarding.

**Introduction**

The process of reflection in nursing is not a new phenomenon. Schön (1983) identified that nurses should engage with reflection 'in' their practice and 'on' their practice. In order for nurses to keep up to date with new technologies and developments in practice they must be capable of thinking critically about their own practice and ensuring that appropriate learning is maintained, (Thick, 2002). The aim

of this discussion is to reflect upon initial experiences of the application of PBL and evaluate its use as an approach in Health Professional Education (HPE) particularly Nurse Education.

Rowan et al (2007: 132) suggest that PBL is:

*'A method and philosophy which aims to structure knowledge for use in clinical situations, develop clinical reasoning, effective self directed learning and increase motivation for learning.'*

This is based on a description put forward by Barrow et al. (2002). They suggest that instead of being passive recipients, students should be able to practice dealing with problems, recognise what they need to learn in relation to them, identify the resources needed for learning, and apply what they have learned to the problem with support and guidance from a tutor/facilitator. PBL is described as a process that encourages self development and allows practitioners to develop skills of resource finding leading to deep learning (Wilkie and Burns, 2003). These are important requirements and skills in modern health care. McLoughlin and Darvill (2007) argue that health care professions could be considered a modern, dynamic and fulfilling career for individuals. The ability to adapt as the profession develops by understanding how to solve problems and deal with changing circumstances as they arise is important, as the pace of change and development is considerably rapid in the field of health care.

Historically PBL was first implemented at Mc Masters University in North America in the late 1960's and delivered to small groups of medical students (Barrows and Tamblyn, 1980). Barrows is renowned as a leading proponent of PBL. PBL as a pedagogy has since being utilised in educational institutions across the world and has been applied in medical and health education settings (Darvill, 2003).

Since its origins the process has been further developed. The Maastricht approach identifies seven steps in the PBL process which can be seen in table 1:

**Table 1: The Maastricht Process of PBL (Wood, 2003: 326)**

Step 1—Identify and clarify unfamiliar terms presented in the scenario; scribe lists those that remain unexplained after discussion.
Step 2—Define the problem or problems to be discussed; students may have different views on the issues, but all should be considered; scribe records a list of agreed problems
Step 3—“Brainstorming” session to discuss the problem(s), suggesting possible explanations on basis of prior knowledge; students draw on each other's knowledge and identify areas of incomplete knowledge; scribe records all discussion
Step 4—Review steps 2 and 3 and arrange explanations into tentative solutions; scribe organises the explanations and restructures if necessary
Step 5—Formulate learning objectives; group reaches consensus on the learning objectives; tutor ensures learning objectives are focused, achievable, comprehensive, and appropriate
Step 6—Private study (all students gather information related to each learning objective)
Step 7—Group shares results of private study (students identify their learning resources and share their results); tutor checks learning and may assess the group

According to Price (2003), PBL has been increasingly incorporated into Nurse Education as a way of developing lifelong learners who are reflective, self directed practitioners. This process requires student involvement in tutorial groups where they use clinical scenarios/problems as a basis for discussion, engage in self directed study to seek knowledge that relates to the solving of such problems, and then identify, analyse, evaluate and share relevant knowledge. It is an approach that should mimic the experience of how problems manifest in practice (Price, 2003). It is recognised that this is sometimes more easily said than done. Nurses however, may work in teams or as independent practitioners, therefore many of the skills used in

the process of PBL such as working in tutorial groups and seeking knowledge related to dynamic clinical scenarios can be applied in a range of practice settings.

### **The Experience**

The authors are Nurse Teachers with experience of traditional teaching methods within HPE. PBL is recognised as an established approach in nurse education, yet due to a lack of familiarity, a lack of knowledge and understanding of its mechanisms, the authors had some initial anxieties in utilising it as a basis for nurse education. These thoughts and apprehensions can be equated to Benner's (1984) concept of transition from novice to expert. It was acknowledged that as the concept of PBL was new to them, the level of knowledge and skills of the authors were at the novice stage in relation to this.

The authors undertook this exploration as part of a master's degree level course in utilising PBL. The focus of the experience was on the implementation of the PBL approach, which included the development of a "trigger" (see appendix 1) and the facilitation of the processes of PBL followed by reflective observations (Savin-Baden & Howell Major, 2004). PBL can be considered a non traditional pedagogical approach which differs greatly from didactic teaching (Savin-Baden & Howell Major, 2004). The use of reflection allows critical analysis of the PBL approach in order to identify any contradictions between its theory and its practical application (Howatson-Jones, 2010).

As students we were requested to develop and participate in a series of facilitated PBL sessions in peer tutoring groups. Wilkie and Burns (2003) argue that the appropriate composition of a group leads to increased learning, as motivation and support are catalysts to self actualisation. Our group was composed of peers from a range of health professional backgrounds with an interest in nurse education. The group members were each required to develop a trigger or scenario that would initiate the PBL process and then act as facilitator guiding the group through to completion of the activity. This would be undertaken by all participants reviewing and managing data appropriately and developing methods of enquiry, both as a group, and as individuals. This enabled the group to gather information and progress from developing hypotheses about the initial problem to understanding

facts and knowledge required in relation to it (Crosson et al, 2004). It gave the participants opportunity to experience the stages of the Maastricht process highlighted above (Wood, 2003). It also highlighted the challenges of implementing PBL.

To promote group cohesion ground rules were developed as a consensus and roles such as a chairperson and a scribe were identified within the group (see Appendix 4). According to Das Carlo et al. (2003) this allows the group to have structure and promotes mutual respect and co-operation, thus ensuring active participation of all members as long as everyone has an opportunity to experience all roles.

It was recognised by the authors that the size of group affects the process and what is learned. Small groups such as the 4-5 students in our group allowed for flexibility and the ability to rotate roles, as recommended by O'Neill (1998) and Barrow et al. (2002). However, Alavi (1999) argued that it is not group size that is important, but how the group is structured and managed. On reflection it might be suggested that large groups allow for people to opt out of involvement, especially if they are threatened by a process that is alien to their past experience of educational approaches (Biley and Smith, 1998).

### **Trigger Development**

According to Newman (2004) the scenario/trigger in PBL should be based on as authentic a situation as possible. This is due to the fact that the supporting information required to solve 'real life' contextual situations can be vast. In order for the group to be actively engaged in the solution, relevant questions and answers are required. The facilitator needs to be able to manage and direct the group by providing appropriate supporting dialogue and cues without providing the actual answers (Savin Baden & Howell Major, 2004). In so doing the students should develop deeper learning skills, as opposed to being directly provided with superficial knowledge, compared with more traditional didactic teaching approaches. However, a counter argument is that contextual scenarios can be too complex, as the rich tapestry of required information could be considered too multi faceted to promote learning (Feletti, 1993). However, Wilkie and Burns (2003) argue that it is exactly these types of complex and difficult scenarios that nurses have to deal with in their

professional life. Therefore the PBL approach reflects the kind of decision making and learning that a nurse must develop in their everyday approach to practice. Saylor (1990) identified that PBL demonstrates specific skills relevant to nursing. These include the ability to engage in reflective thinking and self-evaluation in order to support and improve clinical competency. Conway (1994) suggested PBL is evidenced based in nature, resolves ethical issues, is related to fact based delivery of care and supports the concept of theory and practice working in unison. As the authors practised in primary care backgrounds a contextual scenario which mirrored this field was developed to be used within the experiential exercise to reflect the authentic requirements of a trigger.

According to Wilkie & Burns (2003) a trigger in PBL can be developed using any media source such as written, visual, or electronic including audio or video examples. This is considered the key to identifying facts and hypothesis building. Therefore it was important to choose a medium that was easily accessible, transportable and had the appropriate factual details relevant to this process (Wilkie, 2002).

Choon-Eng Gwee (2009) identified that PBL is a highly resource intensive process and needs to be appropriately managed. Within the experiential exercise there were potential resource limitations and group expectations needed to be realistic. Unfortunately, as a number of groups were operating in the same learning environment due to rooming constraints it was difficult to use audio/visual or power point techniques as these would impact on the other participating groups. Therefore a pictorial trigger was used in this particular situation (this can be seen in appendix 1). The picture captures a cyclist crashing which can therefore prompt discussion related to injuries sustained and responses needed. It was hoped the trigger would encourage group discussion and allow individuals to interact and develop a cohesive group approach inclusive of all the group members in the experience. The use of this type of resource resolved several issues related to trigger development such as time, dependence on equipment, space and accessibility (Newman, 2004). As the trigger was a pictorial presentation, it required no equipment (other than the photograph itself); it was easily accessible, easy to use, had a minimal cost implication and presented a “real life” authentic situation (Biley and Smith, 2001).

By utilising the pictorial approach/trigger it allowed the process to flow in a manageable and structured way as it immediately created discussion and hypothesis formation amongst the participants (Wilkie and Burns, 2003) (see appendix 2).

### **The PBL Process**

Once the trigger was introduced the PBL approach began. A 'scribe' was appointed to document the process as the group started to make deductions and hypotheses from the information whilst establishing facts. The paper was divided into a grid, based upon the process suggested by Barrow and Tamblyn, (1980) in order to record and collate these initial facts being derived, and to develop the hypotheses (see appendix 3). Other formats can also be used to monitor proceedings. A list of learning issues/needs where knowledge of the topic was deficient was also developed. This would form the basis of the areas used for self directed study which the participants would eventually bring back to contribute to the refining of the hypotheses or in solving the problem. Savin-Baden & Howell Major (2004) suggested that with each student identifying aspects of the work they can develop individually, it will allow the group to share information and challenge each other in relation to the scenario. Some issues arose with this sharing as the groups did not remain consistent in consecutive weeks, mainly due to work commitments or absences. This made it difficult to follow the process in its purest form but highlighted the challenges faced in maintaining consistency in 'real world' health care scenarios. Choon-Eng Gwee (2009) suggested that motivation for the PBL process can disrupt deep learning if it is not consistent across all group members.

David and Patel (1995) support the concept that the process can only be reviewed if one is involved in the setting of the learning needs. The knowledge gained through self directed study related to these needs should cover the expectations or learning outcomes for the process. This needs to be carefully managed by the facilitator. Looking back at the process we noted that often we felt lost and unsure of what it actually was that was being explored, an issue identified by Biley and Smith as a common factor (1998). However we felt that the prepared pictorial scenario trigger although abstract, was suitably clinically focussed and expressed a real life situation that would allow the group to develop critical thoughts and work collaboratively

(Choon-Eng Gwee 2009). This would lead to the individual students processing the information gleaned at a deeper level (McCombs, 1991 cited in Barell 2007).

### **The Role of The Facilitator**

The process requires facilitation in order to progress the groups understanding of the necessary course of action and modes of enquiry required in order to achieve successful completion. Savin-Baden & Howell Major (2004) suggest that the facilitator is usually regarded as the expert in the subject matter. However on reflection it could be argued that this does not necessarily need to be the case as the facilitator needs only to have the skills to deflect inappropriate enquiries and promote appropriate questions (Carey et al., 2002).

It has been suggested that PBL is over reliant on resources and time, due to the requirement for breaking down larger groups into smaller ones each requiring a facilitator (Wilkie and Burns, 2003). It could be argued that the use of transferable roles as identified by Das Carlo et al. (2003) can counter the latter argument as the students themselves can eventually adopt the facilitator role, so freeing the tutor into more of an observing role and allowing for cost effective management. Willkie's argument may be countered if an appropriate approach is used such as the autonomous style of facilitation (Heron, 1993) as opposed to the hierarchical approach which fails to relinquish power. In taking on such roles students develop the responsibility for their own learning. This can be challenging for teachers particularly if they consider themselves an expert on certain topics and if they appear to be providing little input.

The role of facilitator is to act as a catalyst and direct the group without leading them. On reflection the process was reliant on using leading questions and summarising the findings. It was instinctive for us to guide the students to where we believed they should be. Saylor (1990) supported the notion that whilst the facilitator is continually reflecting on their actions through the process, they may tend to adopt a supportive style which cossets the group. Jarvis (2006) noted that this appeared to be a common indulgence of facilitators and that it was due often to their inability to break from the confines of traditional educational approaches as identified earlier.

This role may be more difficult from a nursing perspective as nurses used to the traditional form of education are taught to share information to understand holistic outcomes to treatment (Quinn and Hughes, 2007). Therefore the concept of answering a question with a question (an approach often used by facilitators in PBL) did provide a sense of unease. Jarvis (2006) suggested that this sense of unease is due to nurses not usually being the profession that takes the lead and asking probing questions. However this does not always appear to be true especially when considering the role of an autonomous practitioner, such as a community nurse, where questions being asked about patient care are a priority.

The role of facilitator is the key to developing group actions, by ensuring that the group is able to develop, plan and action the progression of the scenario. Groups for the inexperienced facilitator should be small. Biley and Smith (1998) suggests that the most effective size of group is between 6-10 students, which allows the facilitator to be able to directly manage the processes and to encourage team decision making. One of the limitations identified was that due to our inexperience and the small size of the group (4 students plus one facilitator) this directly affected our ability to remain independent.

The role we adopted as facilitator made us feel an outsider to the group. We had to relinquish the expert knowledge in order to allow the group to flourish. Benner (1984) suggested that this may be due to the fact that as practitioners we were working as experts within our fields yet the new experience as a PBL facilitator had moved us towards the novice stage in this process. Savin-Baden and Howell Major (2004) identified that this feeling is common and is generally due to inexperience of the appropriate format. The only way to develop confidence and comfort in the role is to use several types of facilitation and identify which fits easiest with the scenario adopted. Again this identifies that there is a required element of previous experience and knowledge of the PBL process which would suggest that the facilitator would need to be at the proficient stage in Benner`s hierarchy and not novice (Benner 1984).

## **Discussion**

As assessment in PBL is ongoing, it sometimes can be difficult to identify the differing needs of the individual from the group. We identified that due to the lack of continuity of the group membership in conjunction with the group size, it was difficult on occasion to keep individuals motivated and expectations realistic. There was a tendency even in this small post registration group for certain members to take the lead and delegate themselves a lot of the self directed work. This could be identified as an issue with some members being more transient than others, meaning that some members took ownership of roles and were reluctant to release that role to others. This can be regarded as a criticism of PBL in that those who are motivated tend to want to search out all the answers and those who are not are often able to hide behind the group's collective identity (Savin-Baden and Howell Major, 2004). It was also identified as a general criticism that PBL has been used to identify student's development from novice to expert. In the short space of time available this could not be achieved as they would never have the experience to develop the practical aspects required. Astin et al (2000) suggest it is the processes involved in the scenario building that are important and not the actual knowledge gained in respect of student learning. This we would agree with, as it was the learning of new ways of researching that became the focal point of the process and not the actual development and conclusion of the scenario in itself. Savin- Baden and Howell Major (2004) go on to further suggest that the assessment of what has been learnt should come from the group and that by using peer group assessment the feedback would be honest and reliable.

A major concern was that the students may not achieve the learning objectives that had been created and may come to a differing conclusion than the one that was expected. Again this may have been due to the lack of experience that we possessed as facilitators. Savin-Baden & Howell Major (2004) suggest that the facilitator's role is to be able to think freely and appreciate the process of learning and not be so focused on the outcomes. It has long been identified that whilst attempting new processes, nurses were often aware of the theoretical aspects yet found it difficult to apply knowledge in the practice area. We found from an educationalist perspective that the most difficult and frustrating aspect of PBL is that it does not allow you as a facilitator to presume the knowledge the students are

developing is uniform. The students were from differing professional health backgrounds and had their own ways of investigating the scenario, which we found frustrating at times as it challenged our own pre conceived ideas of the outcomes. Quinn and Hughes (2007) advocated that it is often difficult for facilitators who lack experience to assess what it is that adult learners need to know in order to keep them on track and resolve potential conflicts of ideas.

### **Conclusion**

Woods (1994) cited by McLoughlin and Darvill (2007) present the idea that reflection is the final action within PBL, allowing the students and facilitator to reflect on the knowledge gained, how the trigger/scenario has been tackled, the subsequent development of the action plan/care plan and finally how the group dynamics have worked. This view is supported by Barell (2007) who also comments that reflection should occur throughout the process rather than at the end. Students can realise that they have learned more than the resolution of the trigger/scenario, for example working collaboratively in teams, the ability to analyse complex problems using a structured approach, and presenting new ideas are skills they may develop as a 'by product' of the process. Ehrenberg and Haggblom (2007: 68) support Barell (2007) by suggesting that PBL is encompassed by 'guided reflection' and 'supervised reflection' and it is the combination of the two that assists the deeper learning within the cognitive, affective and psychomotor domains highlighted by Bloom (1956). As experienced practitioners we found that the process of reflection was inherent as the previous real life scenarios in our professional roles allowed us all to draw from a wealth of lived data as suggested by Schön (1983).

Biley and Smith (1998) advised that if the group dynamics and roles are not established early on in the process then the students with little PBL experience may become overwhelmed and stressed so that the group does not function. PBL relies on mutual consent to work, so the group has to establish early on the rules that are required in order for it to function effectively. Amos & White (1998) recommended that the initial rules for the group include the concept of the roles to be adopted, the frequency of meetings and the resources required to research and collate the information once gathered. This should, with the guide of an experienced facilitator,

the balance between support and student motivation is maintained ensuring that the process remains exciting and positive for the learner (Edwards et al.,1998). De Lowerntel (1996) identified that as educators there needs to be an understanding that with PBL not all students will consider it a success as they may prefer the more established pedagogical approaches of “talk and chalk” didactic principles of learning.

PBL is a useful approach for delivering education to health professionals; it offers a student centred activity, firmly placing the responsibility of learning with the student, which is congruent with adult education. The evidence for supporting the application of PBL has been examined; advantages and disadvantages have been highlighted. It is not an easy approach to teaching. Choon-Eng Gwee (2009) suggests PBL is resource-intensive, needs commitment from the organisation, students and lecturers alike, requires careful planning but a more holistic approach will strengthen health professional education.

### **Recommendations**

The authors in this discussion paper identify that the facilitator needs to feel confident in the role and to establish support mechanisms with preceptorship from an experienced tutor in the techniques of PBL would be helpful. The groups need to be constant and allow for the formulation of group trust and honesty, this type of transparency would allow for the application of knowledge and the appreciation of the group dynamics. Any student group that were to come into contact with PBL would need to have a structured introduction to the aims and objectives which requires them to all be participants in the actual process. The ground rules must be consensual and established at the beginning of the process. The establishment involved needs to fully endorse and commit to PBL due to the intense resource implications.

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## Appendix 1

### The Trigger



## Appendix 2

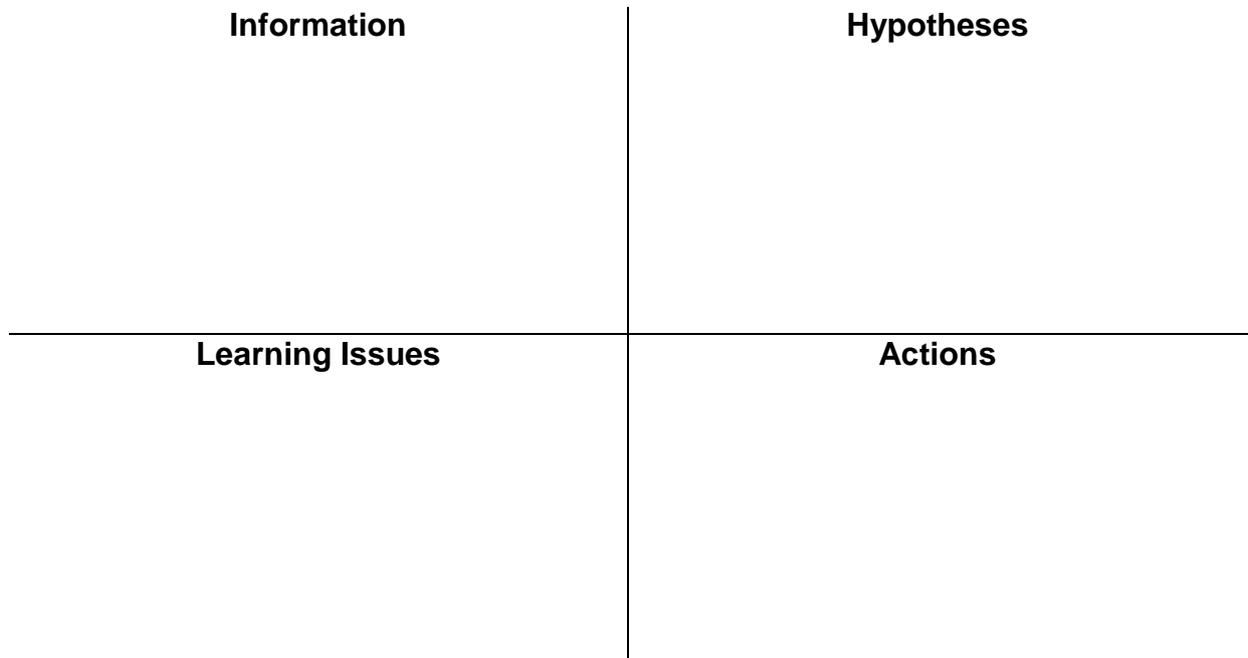
### The Process

<b>Part one – Trigger Introduction Session</b>
<b>The first part of the PBL process involved these five steps</b>
Search the problem as a group, explore, identify and define the issues involved, elaborate.
Ask each other questions and explore existing knowledge and application to clinical practice in relation to the issues raised.
List what you know and test and question this knowledge within the group and test this evidence against your prior knowledge.
Find out what the group does not know, then identify learning needs in order to improve the situation.
Outcomes/goals and objectives based on these learning needs can be set, identify resources you need, all members clarify their expectations in relation to knowledge development and presentation, allocate group members to tasks for self study and group study and preparation.
<b>Part 2 Trigger Review Session</b>
Review group learning, share information already gained and review level of understanding, list issues for further exploration.
<b>Part 3 Presentation of the Evidence Session</b>
Disseminate knowledge through presentation, share and question new knowledge and apply this to existing knowledge, clinical practice and the scenario. Self and group assessment of the learning. Reflect of the process.

Newman, M (2004).

## Appendix 3

### Grid



(Barrow and Tamblyn, 1980)

## **Appendix 4**

### **Ground Rules & Roles**

- Everyone's views are important
- Respect each other's opinions
- Don't be personal
- Discuss the issues rather than argue
- Focus on the issues we are discussing (avoid being side tracked)
- All take responsibility for the work
- All do our 'fair share'
- All participate
- Minimise interruptions (mobile phones should be turned off)
- Attendance and punctuality is expected (no excuses)
- Roles allocated (scribes, recorder, facilitator)