

Enquiry-based Learning in Undergraduate Midwifery Education

50

Sandy Wong
University of Hertfordshire
S.Wong2@herts.ac.uk

Abstract

Enquiry-based learning (EBL) describes an environment in which learning is driven by a process of enquiry owned by the students. Starting with a scenario or an object as a trigger, and with the guidance and support of a teacher as facilitator, students identify their own topics and learning needs. They examine the resources needed to research the topic/s, thereby acquiring the requisite knowledge. In this way, knowledge gained is more readily retained because it has been acquired through experience and in relation to real problems. Accordingly, students are encouraged to take responsibility for their group to organise and direct the learning process. Advocates of problem-based learning (PBL) and EBL claim that these approaches help to enhance content knowledge; and foster the development of communication, team-working, problem-solving, and self-directed learning skills. The paper considers the concept of EBL and its use in undergraduate midwifery education, within the School of Nursing, Midwifery and Social Work (NMS) at The University of Hertfordshire, and discusses some of the advantages and limitations of its application.

Introduction

In the 1960s, the traditional style of teaching, where students were often predominantly expected to reproduce fact-laden instructional materials (Bruner 1961), was perceived to be failing. Bruner (1961) argues that "practice in discovering for oneself teaches one to acquire information in a way that makes that information more readily viable in problem solving". This realisation led to a move to explore new approaches in teaching and learning. Inspired by the theory of constructivist learning (Piaget 1950) and the idea of experiential learning (Kolb 1984), a range of teaching practices emerged.

Enquiry-based learning (EBL) was born out of this 'discovery movement.' EBL is considered as a constructivist based approach to education which is student-centred and encourages active learning. Constructivism is an education theory based on the premise that learning is achieved by 'mental construction', whereby students learn by 'fitting in' new information to what they already know (Caine and Caine 1991). Therefore, learning is affected not only by the context in which the idea is taught, but also by the existing knowledge, beliefs and attitudes of students.

Within EBL, progress of learning is assessed not only by the amount of knowledge the students acquired, but also by how well they develop experimental and analytical skills during the process (Price 2003, Savin-Baden 2003). EBL involves a range of philosophical, curricular and pedagogical approaches to teaching and learning. Its core premises include the requirement that learning should be based around student enquiry (Khan

and O'Rourke 2004). EBL pedagogy and curriculum require students to work together on their own in small groups to solve problems, rather than just receiving direct instructions on what to do from their teacher (Bruner 1961).

In an enquiry-based learning environment, the teacher takes the 'back seat' and adopts a facilitator role. Instead of imparting knowledge, the teacher helps students with the process of discovering knowledge themselves. EBL has gained much popularity in recent years. However, there is still plenty of debate about its efficacy, as demonstrated in Mayor's (2004) thesis on the 'three-strikes rule' against pure discovery learning.

Characteristics of Enquiry-Based Learning

Learning within EBL is essentially student-centred, with an emphasis on group work using books, and other information resources. EBL emphasises constructivist ideas of learning. Knowledge is gained and built in a step-wise fashion. While incorporating some of the elements of problem-based learning (PBL), which was famously and extensively used by McMaster University in Canada (Camp 1996), EBL covers a wider spectrum of approaches (Kahn and O'Rourke 2004). EBL activities include small-scale investigations and project work. Kahn and O'Rourke (2004) suggest that these small-scale investigations allow scope for adaptation to a disciplinary context, which in turn can apply to a scale ranging from specific modules to an entire educational programme in curriculum design.

With Problem Based Learning (PBL), students are usually asked to investigate a single issue (Camp 1996; Savin-Baden 2003, 2007), whereas, through EBL's enquiry process, knowledge is integrated from different curricular themes or areas, thus helping students to clarify tacit knowledge (Kahn and O'Rourke 2004). The student-centred instructional strategy within EBL allows students to collaboratively solve problems and reflect on their own experiences. The underpinning philosophy of EBL is that students work together in a facilitated group. They identify issues relating to a scenario/trigger which they wish to know more about or learn in more depth. The process allows students the opportunity to explore aspects that they are interested in. There is clearly some overlap between the principles of EBL and PBL, in that both approaches are student-centred and encourage active learning in small groups. Albanese and Mitchell (1993), however, consider this overlap to be one of the main advantages of grouping these approaches to learning under the same umbrella term of enquiry-based learning.

Within EBL, the teacher does not begin with a statement, but instead with a question or a scenario/trigger to intrigue, stimulate and/or challenge the students. According to Bruner (1961), posing questions or a situation for students to solve, is in many ways, a more effective method of instruction. As mentioned earlier, within EBL, students define their own learning, and/or topics to be studied. Approaches used to solve the problems are determined by the students and not the teacher. This is an example of the 3rd level of the Herron's Scale (Herron 1971), which classifies inquiries into different levels de-

pending on the amount of guidance provided by the teacher, and whether there is an already existing solution to the problem or question.

In addition students not only investigate the question/s posed by the teacher, they also formulate their own research topics and convert that research into useful knowledge. In this way, deeper learning and understanding of the subject-matter is achieved (Marton and Säljö 1976). Students are given a defined time scale to work on their scenario/trigger and are expected to report back at a 'feedback' or 'outcomes presentation' session at a later date. Furthermore, the knowledge-development and leadership skills required for tackling complex problems, can be fostered through this learning process (Kahn and O'Rourke 2004).

This approach to teaching and learning does not mean that the teacher is then being made 'redundant'; enquiry-based teaching does not have to take on an 'all or nothing' approach. Schwab (1962) called for inquiry to be divided into four distinct levels. This was later formalised by Herron (1971) who developed the Herron's Scale to evaluate the amount of enquiry within a particular inquiry exercise. Since then, there have been a number of variants proposed. The consensus in the education community, however, is that there is a wide spectrum of enquiry-based teaching methods available (Savin-Baden 2007).

Benefits of EBL in the Teaching and Learning of Midwifery Education

In order to provide the highest standard of care to support women and their families with varying psychosocial issues, midwives are expected to work with other professionals such as doctors, health visitors and social workers. Working with a multi-disciplinary health care and social team to provide holistic care (NMC 2004) demands good interpersonal and communication skills for discussion, negotiation, and information sharing. Researching information for evidence-based practice and reflective practice are all crucial elements of the midwives' role (NMC 2004). The principles of midwifery education, therefore, are aimed at equipping student midwives to acquire knowledge and skills necessary for registration and practice. The educational programmes must be designed to enable students to become competent and confident midwifery practitioners in order to meet the required care standards (NMC 2009).

Fundamentally, within EBL, student midwives conduct discussions, exchange knowledge and formulate their learning goals (with guidance) as a group. This helps them to develop reciprocity and co-operation among each other and encourages active learning (Chickering and Gamson 1987). The process of EBL encourages team-working experience, which is essential as midwives are required to work in multi-disciplinary team settings (NHS 2010; NMC 2004, 2008). It also motivates students to do research themselves, thereby bringing with it a real research-orientated approach to the subject. The pattern of self-directed learning not only develops deeper learning (Marton and Säljö 1976), but also the key skills for postgraduate study. This may lead to original thought,

in turn, resulting in larger research projects, papers and publications in future. The EBL process also assists students to cultivate the skills for life-long learning (NMC 2005).

The EBL approach to learning gives students the freedom and the responsibility to organise their own work pattern, within the time constraints which the tasks allow. EBL also enables students to develop a more flexible approach to their studies. This is particularly useful as student midwives tend to be more mature and many have their own families. They learn to manage effectively their own learning processes, individually and collaboratively. This more flexible approach helps to respect diverse talents and ways of learning (Chickering and Gamson 1987) and may even allow students to enjoy their learning, making it more rewarding and fun.

For the teaching staff, EBL can also encourage contact between students and teachers. This helps teachers to communicate high expectations and to emphasise time on task (Chickering and Gamson 1987). The 'feedback' or 'outcomes presentation' sessions provide further opportunities for teacher and students to give and receive prompt feedback. The EBL process also offers the teachers opportunities to gain a better understanding of the learning process, the diverse and changing needs of the students. Indeed it can be argued that the EBL process encompasses the seven principles for good practice in higher education (Chickering and Gamson 1987).

EBL in undergraduate Midwifery Education at the University of Hertfordshire (UH)

Fitness for Practice (UKCC 1999) recommends the use of enquiry-based learning within pre-registration education. EBL is seen as an effective strategy to enable student midwives to develop communication and team working skills and the ability to link theory to practice. The EBL process also provides opportunities for student midwives to foster critical reflective and life-long learning skills. In essence, EBL has many features that are highly applicable and relevant to midwifery education.

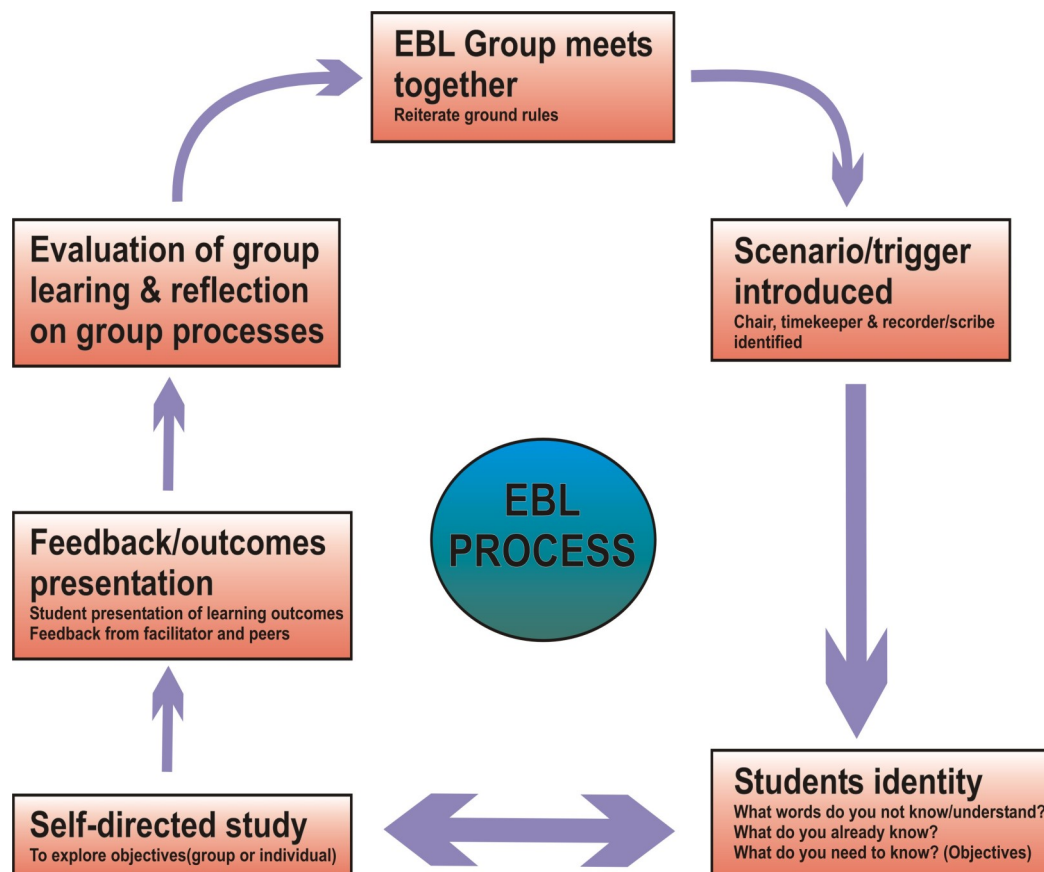
Within the midwifery department of the School of Nursing, Midwifery and Social Work (NMS) at the University of Hertfordshire, the EBL approach has been introduced into the undergraduate programme since September 2008. Currently, there are two modules running entirely on the EBL process, one in the first year and one in the second year. Some of the EBL principles are also applied to topics in other modules where appropriate. At the University of Hertfordshire, the midwifery department adopted a similar process to that adopted at The City University in London (TCU 2007). Students from the same cohort are divided into groups of 10 or 11 depending on the number of students. For example, there were 65 students in the September 2009 cohort; hence six EBL groups were formed. Students remain in their assigned EBL group throughout their study programme. This way, it allows the groups to come together to 'form, storm, norm and perform' (Tuckman 1965).

With each new scenario or trigger (which could be a poem, a picture or an object), students will have a face-to-face facilitation session with their teacher (see figure 1 for an

illustration of an EBL process). During this session, the students would be reminded of the ground rules they have previously set and agreed. A chair-person and a 'scribe' would be nominated within the group to monitor the progress of the task in hand, and to record the discussion respectively. Student midwives take turns in being the chair or the scribe. With the teacher (as facilitator) present to answer any queries, students 'brain storm' their ideas and decide on what topic/s to inquire or to investigate. They then divide the tasks amongst themselves.

At UH, student midwife EBL sessions are time-tabled on the training programme so that students can plan and organise their own learning at their own pace. They are encouraged to use self-directed time to work in small groups to investigate and reconstruct information about specific aspects of the scenario/trigger. Depending on the complexity of the subject being explored, student midwives are usually given one to two weeks to work on a task. The University of Hertfordshire managed learning environment, StudyNet, is also utilised for group discussion. Finally, students come back together to present their learning to their teacher and/or other group members. Feedback from teacher and/or peer helps students to reflect on both their team working and how their learning has taken place. This skill of 'reflection-on-action' (Schon 1987) is vital in helping students to develop into critical reflective learners and practitioners (Brockbank & McGill 2000).

Figure 1: An EBL Process



(Adapted from The City University (TCU 2007))

Advantages and Limitations of EBL in Midwifery Education

As with most teaching and learning methods, there are inevitably merits and drawbacks.

Advantages

EBL affords student midwives opportunities for team working and development of collaborative working skills (Albanese & Mitchell 1993) which form an integral part of midwifery practice. It also helps students to gain a better understanding of the topic/s being studied. EBL also encourages the skill developments in areas such as literature searching, problem solving and presentation of information to colleagues and others. These skills are all essential for clinical practice to support the public health role of midwives. Furthermore, the EBL process enables student midwives to develop skills in clinical reasoning, critical appraisal and information gathering. As students learn to relate theoretical knowledge to clinical practice, it helps in closing the theory–practice gap (Landers 2000).

Questioning, reasoning, and thinking critically about what they see, hear and learn, as well as weighing up evidence and the opinions of others all enable student midwives to reach their own conclusions. Such processes help to develop critical thinking and analytical skills (Price 2003, Savin-Baden 2003). This is evidenced in our second year students, as they demonstrate increasing confidence in articulating their learning outcomes from their enquiries.

The Nursing and Midwifery Council (2004) requires every midwife to be a reflective practitioner. Reflecting constructively on their own learning, and acting on feedback from their teacher/s and peers through the EBL process, student midwives will be able to nurture a culture of reflecting from an early stage of their midwifery career. Their reflective skills will also be enhanced by reflection sessions, facilitated by linked teachers, at their clinical placement sites.

The EBL process enables student midwives to understand and communicate more effectively with individuals from differing backgrounds and perspectives. This is of particular relevance as midwives work within a diverse population. Sharing their knowledge and experience with fellow students and staff also develop and enhance the students' presentation skills. This can be beneficial to student employability in the future when competing for jobs after qualification. Recent feedback (at a service and education meeting) from a recruitment officer of one of our training partners, indicated that midwifery graduates from the University of Hertfordshire out-performed other candidates in their performance at job interviews. As mentioned earlier, the EBL feedback or outcomes presentation sessions offer opportunities for students to receive prompt feedback and evaluation, from their teacher and/or peers, on their learning. Prompt feedback is important to help students to improve and/or consolidate their learning (Chickering and Gamson 1987). EBL also affords the teachers the flexibility to support students to foster a wide range of skills when engaging them in their learning process.

Limitations

Sweller (1988) proposed the theory of cognitive load to explain how novice learners react to problem solving during the early stages of learning. Certainly active problem solving is useful as students become more competent, and better able to deal with their working memory limitations. However, early in the learning process, students often find it difficult to process a large amount of information within a short period of time. Thus the rigors of active problem solving may become an issue for novice learners. This is supported by Mayor's (2004) view that guided discovery was more effective than pure discovery in helping students learn and transfer knowledge into practice. This view is substantiated by student verbal and written feedback and the process of module evaluation at the University of Hertfordshire.

To help students avoid cognitive loading issues, the teacher as facilitator can provide the 'scaffolding' by giving more guidance and support in the early stage of the process (Sweller 1988). Herron's (1971) model that classifies inquiries into different levels, ties in with the debate on the need for 'scaffolded'/guided inquiry when students of any age are new to the EBL process. Within the midwifery department of the School of Nursing, Midwifery and Social Work at the University of Hertfordshire, measures have been taken in the 2009/10 academic year to provide more 'scaffolding'/guidance to first year students. Although it is the students who determine their learning needs, the teacher can do much to assist in setting parameters to guide them to process within appropriate confines. Whilst the second year students are much more confident with the EBL process and require very little facilitation, the teacher only needs to ensure that the students stay on track during their 'brain-storming' discussion session. Facilitator guides are produced for teachers for each specific EBL scenario/trigger, helping to ensure equity and correct process across all groups.

Occasionally, conflicts between group members can arise and pose problems. Nevertheless, this could be avoided with good facilitation, early establishment of ground rules, and good team-building work to allow the group to 'form, storm, norm and perform' (Tuckman 1965). However, appropriate teacher training for EBL facilitation may become an issue with increasing constraints on resources.

One of the means of supporting student learning is through assessment. Indeed, assessment is often seen to be the driving force for the student learning experience (Gibbs 1999). Biggs (1999) emphasised that learning must align with achievement of intended/desired outcomes. However, given that most learning with EBL takes place outside the classroom, the assessment strategy must be robust. Facilitating the conduct of the enquiry with evidence of group work (i.e. record of meeting etc), discussions on StudyNet (or similar MLE) and due process is essential to ensure learning outcomes are met.

Unlike traditional teaching, some student midwives find the process of EBL uncomfortable. This is especially so in the beginning when they are not used to working in groups

and/or looking for information for themselves. To ensure success with the application of EBL in midwifery students at UH, preparation and the appropriate recruitment process of selecting the right calibre of candidates into the training programme are crucial. Within the midwifery department of the School of Nursing Midwifery and Social Work at the University of Hertfordshire, a new selection process with a short EBL session built in has been implemented to assist in this process.

Finally, while EBL may appear to sit well within some of the midwifery modules, its effectiveness must still be evaluated and monitored at regular intervals. Midwives must acquire certain skills in order to practice competently. In the author's view it would therefore, not be appropriate to apply EBL across the whole undergraduate programme. For example, it would not be appropriate in the teaching and learning of certain clinical skills. These skills can only be acquired through demonstration and practice. Therefore, a blended learning approach in line with the University of Hertfordshire teaching and learning strategy should be adopted.

Conclusion

Within EBL, students are encouraged to take responsibility for seeking evidence and analysing their knowledge with the purpose of making implicit reasoning and tacit knowledge explicit (Price 2003). The students are placed at the centre of the learning process. They are presented with greater independence in decision-making process relating to their learning, hence the term 'learner independence'. A key role of the teacher is to facilitate and support the learning process to enable students to work collaboratively. This allows students to pool together their collective knowledge and understanding, as they work together to create new knowledge for specific purposes.

In summary, EBL can be thought of as a broad umbrella term that describes a range of approaches to teaching and learning. It is guided by a process of supportive enquiry. It is structured to foster 'learner independence' through active, and usually collaborative engagement with relevant and meaningful problems and issues.

EBL creates an environment in which learning is driven by a process of enquiry shared by the students. It also enables student midwives to take increasing control of their own learning as they progress through their study programme. Moreover, it encourages them to acquire professional and personal skills which are essential for clinical practice, and are highly valued in the competitive labour market. Creativity, independence, team-working, goal-setting and problem-solving skills are all essential to the personal and professional development of our student midwives and acquisition of these skills enriches the capacity for 'lifelong learning'.

Although the EBL process may not be appropriate for implementation across the whole midwifery programme, it is nonetheless, a very useful tool in undergraduate midwifery education. Since its introduction to the midwifery department of the School of Nursing

Midwifery and Social Work at the University of Hertfordshire, positive feedback has to date outweighed any limitations. Having evaluated module feedback from students and staff involved with EBL, this learning and teaching approach appears to be a very viable alternative to traditional teaching and learning methods.

References

Albanese, M., & Mitchell, S. (1993). "Problem-Based Learning: A Review of the Literature on its Outcomes and Implementation Issues," *Academic Medicine*, 68(1), 52-81.

Biggs, J.B. (1999). *Teaching for quality learning at university: what the student does*. Philadelphia. Society for Research into Higher Education: Open University Press.

Brockbank, A. & McGill, I. (2000). *Facilitating Reflective Learning in Higher Education*. Buckingham. The Society for Research into Higher Education & Open University Press.

Bruner, J. S. (1961). "The act of discovery". *Harvard Educational Review*. 31 (1): 21–32.

Caine, R. N. & Caine, G. (1991). *Making Connections: Teaching and the human brain*. Alexandria VA. Association for Supervision and Curriculum Development.

Camp, G. (1996). Problem-Based Learning: A Paradigm Shift or a Passing Fad? *MEO* 1996; 1:2.

Chickering, A. W. & Gamson, Z. F. (1987). Seven principles for good practice in undergraduate education. *American Association for Higher Education Bulletin*, 39(7), 3–7.

Gibbs, G. (1999). Using assessment strategically to change the way students learn. In Brown, S. & Glasner, A. (eds.). (1999). *Assessment Matters in Higher Education*. Maidenhead: Society for Research into Higher Education and Open University Press, pp 41–53.

Herron, M.D. (1971). The nature of scientific enquiry. *School Review*, 79(2), 171- 212.

Kahn, P. & O'Rourke, K. (2004). *Guide to Curriculum Design: Enquiry-Based Learning*. London. Higher Education Academy.

Kolb, D. A. (1984). *Experiential Learning: Experience as the Source of Learning and Development*. Englewood Cliffs, New Jersey. Prentice Hall.

Landers, M.G. (2000). The theory–practice gap in nursing: the role of the nurse teacher. *Journal of Advanced Nursing*, Volume 32, Number 6, December 2000, pp. 1550-1556(7).

Marton, F. & Säljö, R. (1976). "On Qualitative Differences in Learning — 1: Outcome and Process" *Brit. J. Educ. Psych.* 46, 4-11.

Mayer, R. (2004). "Should there be a three-strikes rule against pure discovery learning? The case for guided methods of instruction". *American Psychologist* 59 (1): 14–19.

National Health Service (NHS) (2010). *Midwifery: Skills required*. London. NHS careers. http://www.nhscareers.nhs.uk/midwife_skills.shtml (accessed 04.06.10)

Nursing and Midwifery Council, 2004. *Midwives rules and standards*. London. NMC.

Nursing and Midwifery Council, 2005. *The Prep Handbook*. London. NMC.

Nursing and Midwifery Council, 2008. *The Code: Standards of conduct, performance and ethics for nurses and midwives*. London. NMC.

Nursing and Midwifery Council, 2009. *Standards for pre-registration midwifery education*. London. NMC.

Piaget, J. (1950). *The Psychology of Intelligence*. London: Routledge and Kegan Paul.

Price, B. (2003). *Studying Nursing using Problem-Based and Enquiry-Based learning*. Basingstoke: Palgrave.

Savin-Baden, M. (2003). *Facilitating problem-based learning*. Maidenhead: SRHE and Open University Press.

Savin-Baden, M. (2007). *Challenging Models and Perspectives in Problem-Based Learning*. In De Graaff, E. & Kolmos, A. (eds.). (2007). *Management of Change: Implementation of Problem-Based and Project –Based Learning in Engineering*. Rottendam. Sense Publishers.

Schön, D.A. (1987). *Educating the Reflective Practitioner*. San Francisco: Jossey-Bass.

Schwab, J. J. (1962). *The teaching of science as enquiry*. In J.J.Schwab & P.F. Brandwein (Eds.). *The teaching of science*. pp. 3-103. Cambridge: Harvard University Press.

Sweller, J. (1988). "Cognitive load during problem solving: Effects on learning". *Cognitive Science*. 12 (2): 257–285.

The City University (TCU). (2007). *Student Guide to Enquiry Based Learning (EBL) (for pre-registration nursing and midwifery programmes)*. London. The City University.

Tuckman, B. (1965). Developmental sequence in small groups. *Psychological Bulletin*. 63; 384-399.

United Kingdom Central Council for Nursing, Midwifery and Health Visiting (UKCC). (1999). *Fitness for Practice*: London. The UKCC Commission for Nursing and Midwifery Education.