

Utilising Action Research to Evaluate Problem-based Learning's Effectiveness

Ms. Jennifer Hussey, Dr. Mary T. Holden, and Dr. Patrick Lynch

Organisation: Waterford Institute of Technology

E-mail: jhussey@wit.ie

Abstract

This paper is situated in the context of the introduction of a new Bachelor of Science programme in the School of Business at Waterford Institute of Technology employing problem-based learning (PBL). Although PBL has been utilised in medicine since the 1960s, it is emergent in the business discipline, most especially in Ireland, and its effectiveness remains contested ground (Hallinger & Lu, 2011). The evaluation or determination of the value or worth of this innovative, andragogical approach is all the more critical, as James and Denyer (2009) have argued that there is a need for an evidence-based approach in education, from design through to evaluation, which will give educators greater confidence in “their shared endeavour, replacing uncertainty, and its accompanying anxiety, with greater understanding of what works in particular circumstances and why” (p. 368). However, PBL, as a “complex mixture of a general teaching philosophy, learning objectives and goals, and faculty attitudes and values” (Vernon and Blake, 1993, p. 560), presents particular “unique challenges” for evaluation, especially due to its dual focus on process and content. This paper argues that these challenges are accommodated by the adoption of an action research (AR) approach to programme evaluation. This paper presents the significant features of PBL (see Figure 1) and their match with AR for evaluation (see Table 1) before outlining some of the distinctive advantages of AR in this new BSc context.

Table 1 illustrates the following in relation to both PBL and AR: the aims, philosophy, role of the researcher/student, treatment of context, history, process and time. Indeed, McKernan’s (1988, p. 6) definition of action research as “a form of reflective problem solving, which enables practitioners to better understand and solve pressing problems in social settings” illustrates how well aligned AR is to evaluating PBL, that is, his definition emphasises problem-solving and reflection, illustrating their commonality in respect of their philosophical and theoretical underpinnings. Indeed, AR has several major parallels with PBL, as both are based on cyclical processes of action and reflection, actively encouraging stakeholder involvement while pursuing learning and insights for future development. Figure 2 illustrates the AR iterative cycles, where each cycle represents an intervention process including “evaluation of the outcomes to estimate what has been achieved and to plan subsequent interventions” (Bargal, 2008, p. 17) and, as Figure 3 illustrates, parallels can be drawn between the two concepts.

Critically, the literature suggests that AR is underpinned by diversity in theory and practice (McDermott et al., 2008), allowing it to deliver “situational-responsiveness, methodological flexibility, multiple evaluator roles, political sophistication, and substantial doses of creativity” (Patton, 1997, p. 17) – all of which are highly pertinent to programme evaluation. AR’s diversity accommodates the complexity of the PBL environment, and provides insights into “what kind of instructional conditions result in effective problem-based learning” (Gijssels, 1996, p. 13), thereby providing an evidence-base for decision-making in the future. Notably, AR offers the opportunity for a collaborative, two-way dialogue between stakeholders, thereby generating rich data detailing their respective opinions and perceptions to inform future programme development. In addition, each iteration of the AR cycle informs the next, as actions are taken to improve the practice.

AR’s pragmatic approach to the choice of data collection methods also matches Maudsley’s (2001, p. 311) demands that PBL evaluation should “highlight local curricular context and special features, balance process-measures with outcome-measures (including unplanned outcomes), and be eclectic in methods”. Furthermore, the AR approach also allows the evaluator to examine the trade-offs and accommodations that occur as PBL is implemented, capturing insights on the structural and contextual issues as they impact on student learning. Significantly, the literature suggests that AR can provide enhanced understanding of the context and accommodate the demand for meaningful interpretation of the PBL process to complement the “effort expended chasing elusive outcomes” (Maudsley, 2001, p. 321), while also adding to scientific knowledge. Indeed, the contribution of AR extends beyond the immediate and long-term needs of the educational institute, as the evaluator adopts a role as an agent of change and is highly involved in the ongoing process of evaluation in collaboration with other stakeholders (McDermott et al., 2008). Furthermore, as AR is closely linked to practice, its results are immediately applicable and relevant to a variety of audiences. It is also ideally suited to longitudinal studies due to it encompassing the past and present, while focussed on the future (McDermott et al., 2008).

In the case of the new BSc, the AR approach should provide a more rounded perspective on the phenomena of the interventions and any relevant, forthcoming changes; it is perceived to be a response to Patton’s (1997, p. 17) call for “a utility-focused, feasibility-conscious, propriety-oriented, and accuracy-based evaluation”, thereby realising a reliable evidence-base

on the effectiveness of PBL programmes, in this manner informing future PBL programme iterations.

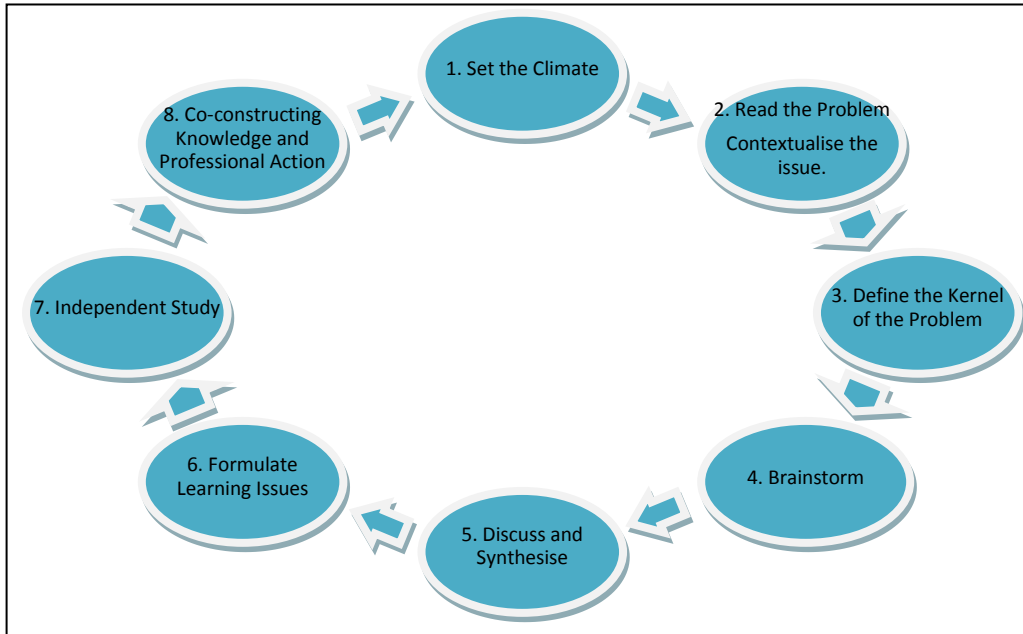


Figure 1: PBL Process Guide (Adapted from Barrett and Cashman, 2010, p. 9)

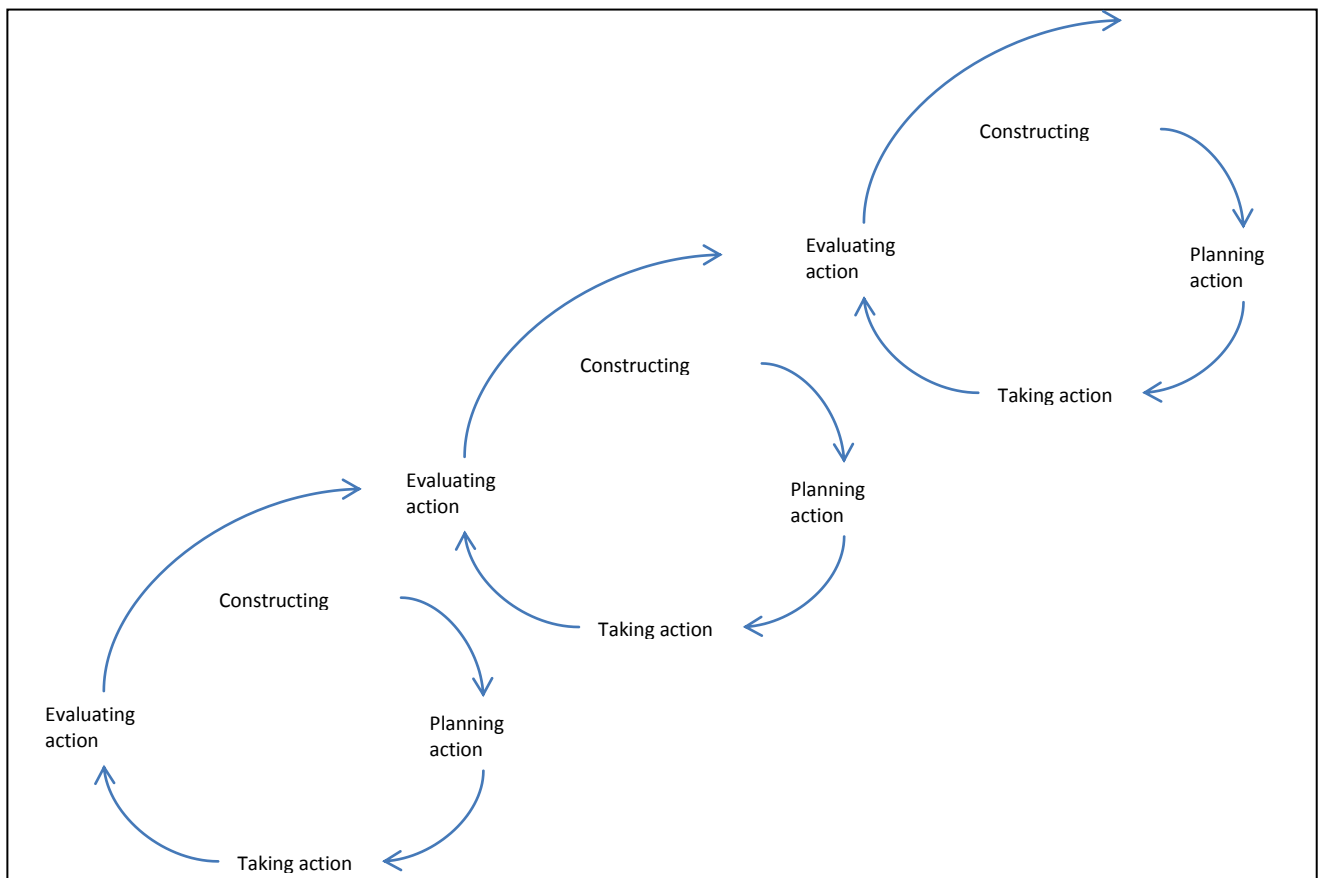


Figure 2: Spiral of action research cycles (Adapted from Coghlan and Brannick, 2010, p. 10)

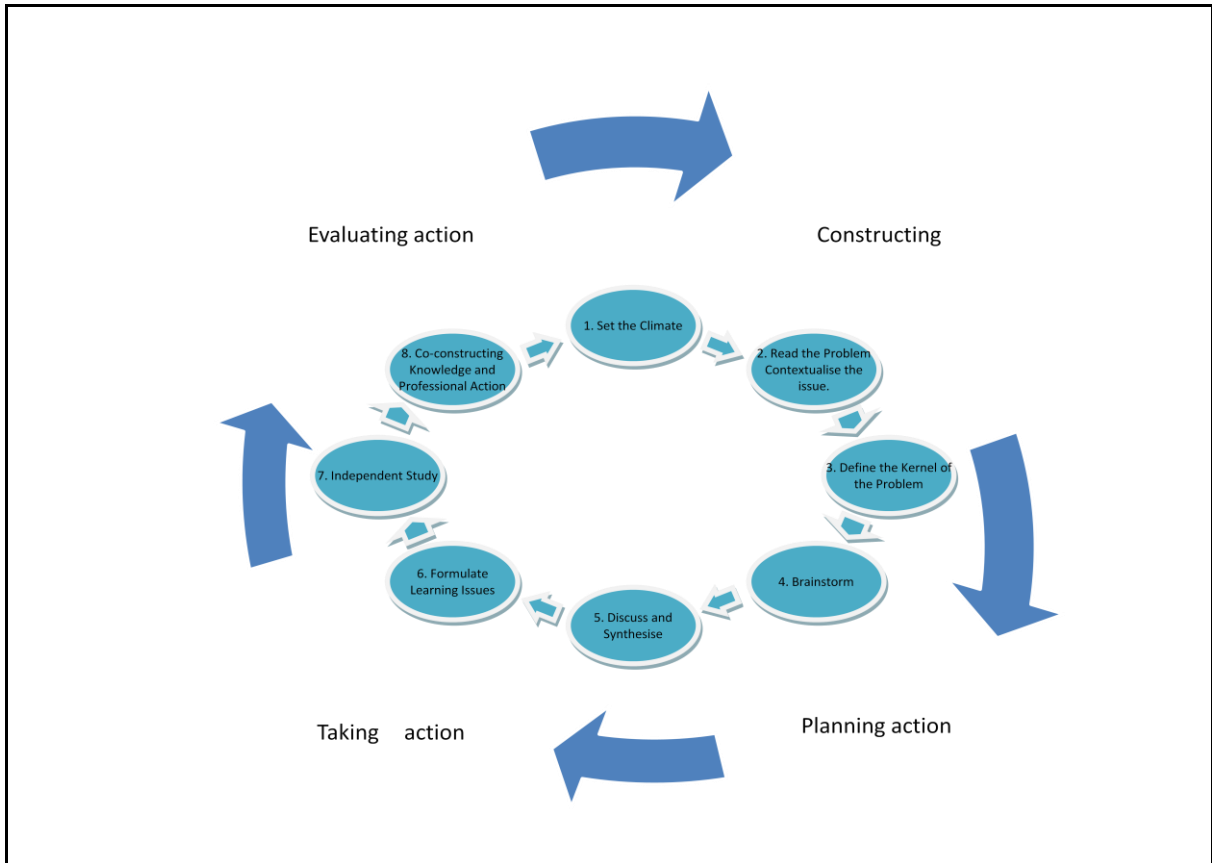


Figure 3: Alignment of AR with PBL

	PBL Characteristics	AR Evaluation fit
Philosophy	Underlying theory – action learning(AL) (Revans, 1983), Kolb’s learning cycle, Dewey’s experiential learning and Lewin’s (1951) constructivist theories.	Underlying theory - closely related to AL. Kolb’s (1984) learning cycle. Social inquiry linked to practice (Dewey, 1938). Lewin’s (1951) constructivist theories.
Aims, process	Student-centred problem-oriented approach employing both self-direction and group sessions to facilitate learning (Figure 1).	Problem-solving cycles with the goal of making action more effective while building up a body of scientific knowledge (Figure 2).
Orientation	Dual orientation – both process and content.	AR accommodates examination of both process and outcomes. Desired outcomes of AR are not alone the solutions to the problem but also learning outcomes – both intended and unintended and a contribution to theory.
Time, history	Developmental - understanding coming from interaction with the environment, social situations and cognitive conflict (what we know, what we don’t know). Learning – immediately applicable.	Emergent themes & stakeholder driven outcomes examined (what we know, what we don’t know). Historical and contemporary action, with future action emphasised. Immediately feeding forward formative information.
Assumptions	Examination of underlying assumptions part of the discovery process.	Examination of underlying assumptions – critical reflection.
Focus	Holistic – crosses disciplinary boundaries	Holistic – examines process, learning context & outcomes.
Role of relationships	Relationships critical to learning.	Stakeholder relationships & captures culture, time, developmental aspects.
Role of researcher	Students as active participants and tutor as co-learner.	Evaluator as an active participant or actor in change. An agent of action and reflection. Evaluator as co-learner.
Contribution	Situational, context-specific learning. Relevancy and utility-driven learning.	Contextual information, ‘local theories’ developed. Relevancy and utility-driven resulting in actionable knowledge, sustainable outcomes.
Professional aspect	Practice-based strategy for professional development.	Practice-based professional enquiry.
Perspectives	Multiple perspectives- self-awareness and awareness of peers.	Multiple perspectives – consensus sought- democratic basis.

Table 1: PBL characteristics and the AR evaluation fit (Adapted from McDermott et al., 2008).

Bibliography

Bargal, D. 2008. Action Research: A Paradigm for Achieving Social Change. *Small Group Research*, 39(1): 17-27.

Barrett, T. & Cashman, D. 2010. *A Practitioners' Guide to Enquiry and Problem-based Learning*. Dublin: UCD Teaching and Learning.

Coghlan, D. & Brannick, T. 2010. *Doing Action Research in Your Own Organization*. London: Sage Publications.

Dewey, J. 1938. *Experience and Education*. West Lafayette, IN: Kappa Delta Pi.

Gijsselaers, W. H. 1996. Connecting problem-based practices with educational theory. *New Directions for Teaching & Learning*, 68: 13.

Hallinger, P. & Lu, J. 2011. Assessing the instructional effectiveness of problem-based management education in Thailand: A longitudinal evaluation. *Management Learning*, 42(2): 1-21.

James, K. T. & Denyer, D. 2009. Historical Roots and Future Directions: New Challenges for Management Learning. *Management Learning*, 40(4): 363-370.

Kolb, D. 1984. *Experiential Learning: Experience as the Source of Learning and Development*. Englewood Cliffs, NJ: Prentice Hall.

Lewin, K. 1951. *Field Theory in Social Science*. New York, NY: Harper & Row.

Maudsley, G. 2001. What issues are raised by evaluating problem-based undergraduate medical curricula? Making healthy connections across the literature. *Journal of Evaluation in Clinical Practice*, 7(3): 311-324.

McDermott, A., Coghlan, D. & Keating, M.A. 2008. Research for Action and Research in Action. *The Irish Journal of Management*, 29(1): 1-18.

McKernan, J. 1988. The countenance of curriculum action research: Traditional, collaborative, and emancipatory-critical conceptions. *Journal of Curriculum and Supervision*, 3(3): 173-200.

Patton, M. Q. 1997. *Utilization-Focused Evaluation: The New Century Text*. Thousand Oaks, CA: Sage.

Revans, R.W. 1983. *ABC of Action Learning*. Bromley: Chartwell Bratt.

Vernon, D. T. & Blake, R. L. 1993. Does problem-based learning work? A meta-analysis of evaluative research. *Academic Medicine*, 68(7): 550-563.