

The dangers of PBL (and other instructional fads): Beware the epistemological hole in the practice of PBL

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Educators in their haste to apply (popular) PBL methodologies cannot afford to ignore the difficult yet fundamental questions that underpin PBL and that is what is knowledge, how is it acquired, what is its extent, and what standards or criteria can be used to reliably judge the truth or falsity of our knowledge? This paper specifies how ignoring the philosophical underpinnings rips the heart out of PBL and reduces it to an instrumental fad and a set of instructional techniques empty of the liberal values encapsulated in the various ideas that make-up PBL. The paper also makes the case that an epistemological hole in the practice of PBL threatens the very outcomes promised by PBL, namely graduates with: integrated knowledge base; problem-solving abilities; effective self-directed learning skills; and, social adeptness. A failure to consider the philosophical basis of PBL places the educator in the perplexed situation perhaps akin to a nomadic wanderer who drifts from one pedagogical fad to the next detached from any anchor of what constitutes good teaching and learning.

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Introduction

Educators are currently quite taken with problem-based learning. However, in their haste to apply PBL methodologies teachers cannot afford to ignore the difficult yet fundamental epistemological questions that underpin PBL: what is knowledge, how is it acquired, what is its extent, and what standards or criteria can be used to reliably judge the truth or falsity of our knowledge? This paper specifies how ignoring the philosophical underpinnings of PBL reduces it to an instrumental fad and a set of instructional techniques empty of the liberal values encapsulated in the various ideas that make-up PBL. I do this by tracing the inter-relationship between epistemic beliefs, and the practice of teaching and learning.

I conclude this paper by identifying an epistemological “hole” in PBL. This hole can be characterised as an implicit belief in objectivism which when played out in the classroom leads to a reproductive pedagogy. A reproductive pedagogy threatens the very outcomes promised by PBL, namely learners emancipated from the constraints of learning. I further suggest that an epistemology stance focused on constructivism leading to an autonomous and reflective pedagogy is more consistent in achieving the aims of PBL. I also suggest how a failure to consider the philosophical basis of PBL places the educator in the perplexed situation perhaps akin to a nomadic wanderer who drifts from one pedagogical fad to the next detached from any anchor of what constitutes good teaching and learning.

The Popularity of PBL

One need only look around at this conference to see the huge interest in Problem-based learning (PBL). A quick search on the internet and a browse through educational journals and books further attest to the current popularity of PBL. It’s difficult to pin down what are the reasons for this enormous interest. Camp (1996) and Engel (1992) suggest PBL is a response to the failure of traditional formats of teaching, addressing in particular problems of students memorising, an inability of students to apply or integrate knowledge, and the general resistance students have towards learning. Saven-Baden (2003) claims PBL is appealing because it is beneficial for all stakeholders in education (students, teachers, employers, governments). Bernstien (1996) suggests PBL has become popular for those “less fortunate” in the rank ordering of higher learning institutions because it allows them to market their pedagogy as a means of distinguishing themselves.

Perhaps the fundamental significance of PBL is its affinity to a vision of a modern liberal education (Barnett 1994, Habermass 1978, 1979). In this vision education entails inquiry based on reasoning as well as research. It encompasses the formation of character centred on the mind and the body. It is a commitment to an emancipation from the current prevailing constraints of education through:

- students accessing and considering claims of disciplines other than the one the student is studying in;
- taking seriously the activity of critical reflection to include a philosophical and sociological critique of what is being learnt; and
- the fostering of student independence and responsibility for learning.

The PBL Community

PBL is not a new idea (Maudsley 1999) but in its modern incarnation PBL has a specific methodological approach to learning. In its “pure” (Camp 1996) or “authentic” (Wee & Kek 1999) form PBL is described as learners encountering a problem at the outset of their learning process. Based on their prior knowledge learners identify the facts and generate possible ideas to solve the problem. They determine what they do not know but need to learn in order to address the problem. They share their information resource plan and conduct self-directed learning. After self-directed learning, they synthesize what they have learnt to develop a possible solution to the problem and elaborate on new knowledge. After solving the problem, they reflect and generalize their learning for future applications (Barrows and Tamblyn 1980). The outcomes of PBL have been described as integrated knowledge base; problem-solving abilities; effective self-directed learning skills; and, social adeptness (Distlehorst and Robbs 2003).

Despite the broad acceptance of this general description of PBL and its associated outcomes, Maudsley (1999) and Savin-Baden (2003) point out the enormous variance in the way PBL is conveyed and practised. Savin-Baden suggests that the differences within the community of problem based learning is essentially rhetorical rather than a fracture in pedagogy. However, the differences may also be interpreted as an incongruity of epistemological positions.

Epistemology

Epistemology is the study of what is knowledge, how is it acquired, what is its extent, and what standards or criteria can be used to reliably judge the truth or falsity of knowledge. What counts as knowledge depends on whatever criteria and rules are applied. Epistemological rules are based on presuppositions of what form of knowledge is supremely valid (Barnett 1990). In science the rules of knowing are bound by principles of observation and measurement. But as Kuhn (1970), Foucault (1980) and Habermass (1978) have pointed out these rules only verify knowledge that is observable and measurable. Other forms of “knowing” are refuted because they are not consistent with the pre-arranged rules which are determined by those who have an interest in ensuring certain forms of knowledge over others. This creates a bind where declarations of knowledge cannot exist without a presupposing theory of knowledge.

One response to this dilemma is to treat knowledge as a given; in this instance the rules that define knowledge are implicitly accepted, especially scientific knowledge. The processes of what is knowledge in its broader epistemological sense is regarded as being largely unproblematic, “we know what we know because there is proof and evidence”. One example of this approach to knowledge can be defined as objectivism. Jonassen (1991) provides a summary of objectivism:

Knowledge is stable because the essential properties of objects are knowable and relatively unchanging. The important metaphysical assumption of objectivism is that the world is real, it is structured, and that structure can be modelled for the learner. Objectivism holds that the purpose of the mind is to "mirror" that reality and its structure through thought processes that are analyzable and decomposable.

The meaning that is produced by these thought processes is external to the understander, and it is determined by the structure of the real world (p.28).

Another response to the epistemological bind is to think of science and other ways of knowing as a dynamic discourse which defines knowledge within various contexts. This response, described in its most extreme form, is subjectivism. In subjectivism reality is understood to be both “pluralistic and plastic-pluralistic”- pluralistic in the sense that any reality is expressible in a variety of symbol and language systems (e.g., societies and cultures); plastic in the sense that reality is stretched and shaped to fit the purposes and intentions of the people involved (Pratt 1998). One theory premised on this general epistemological position is constructivism. Constructivism suggests knowledge is both socially and cognitively constructed. The knower interprets and constructs a reality based on his experiences and interactions with his environment. Rather than the standard of knowledge being truth in respect to its match to an ontological reality, knowledge rests on the notion of viability: "To the constructivist, concepts, models, theories, and so on are viable if they prove adequate in the contexts in which they were created" (von Glasersfeld 1995:7).

These two responses represent two opposite extremes of an epistemology continuum.

Epistemology and Teaching and Learning

Pratt (1998) suggest these epistemological beliefs form part of a larger system of beliefs about teaching and learning.

Every perspective on teaching stems from epistemology – a philosophy of knowledge – that is either implicitly or explicitly presupposed. Epistemic beliefs have to do with assumptions about the nature and use of knowledge and its validation, how it is reproduced. These assumptions will significantly shape, define, and limit a given perspective of teaching. For example, a teaching perspective that holds knowledge to be objective, outside the learner, will likely have little difficulty with evaluation of learning since there are right and wrong or better and worse answers. Since there is usually a high degree of agreement among content experts within a specific field on the nature of its particular realities, evaluation of learning becomes a matter of judging how well a student has re-presented or reproduced those realities. On the other hand a teaching perspective that holds knowledge to be subjective, constructed individually, will use different methods of evaluating learning for reality will differ from individual to individual. (p72)

Savin-Baden (2003: 29-30) describes four different teaching or pedagogical stances facilitators may take in particular educational environments.

1. Reproductive: where tutors see themselves as suppliers of legitimate knowledge and that teaching is about the effective transfer of information from the expert to the learner.
2. Strategic: is where the tutors offer students activities or cues that allow students to address what specifically they are supposed to learn.

3. **Autonomy:** Tutors offer students learning activities that will give them a means of meeting their own personally defined means but encouraging independence in making decisions about what and how they learn while also ensuring they pass the course by meeting certain requirements.
4. **Reflective:** Tutors assist students in realising that learning is a flexible entity that there are other valid ways of seeing things besides their own perspective.

Each of these domains can be linked back to a particular epistemological position. Stances 1 and 2 are grounded in terms objectivism where learning is literally characterised as an object (whether it is a thought or a behaviour) that can be passed from the expert to the learner via various means. Stances 3 & 4 characterise learning as an abstraction of meaning not the discovery of truth. In this manner knowledge about the world is constructed in ways meaningful to the learner. The fourth stance in particular accentuates learning not only as an interpretive process aimed at understanding the world but in addition is focussed on how the meaning is dependant upon the complex relations between self, cultural and historical factors or in other words the shared meaning of others.

Epistemic Beliefs and PBL

The inter-relationship between epistemological beliefs, learning and teaching form a powerful set of beliefs that influence how approaches to learning, like PBL, play out in terms of curriculum design, classroom facilitation and assessment. Savin-Baden (2003) in her description of PBL communities suggests there are five different models of PBL. Using her models let me illustrate how PBL might operate at these three levels (curriculum design, classroom facilitation and assessment).

Model I: Problem based learning for epistemological competence.

By epistemological competence Savin-Baden means students becoming competent in applying knowledge in the context of solving a problem. In this model curriculum is created and defined in the form of specific learning objectives (they could be behavioural or cognitive). PBL problems are designed so students explicitly address the knowledge of the discipline. The expectation is that students will be able at the end of the appointed time derive the correct solution. The facilitation is focussed on giving hints so that students address the required content. The facilitator may use questioning but with the purpose of directing students to the desired behaviour or thinking. Summative assessment is focussed on measuring the extent to which students reached the solution, while formative feedback addresses the gap between students and the correct answer to the problem. Essentially this model of PBL is objectivist and reproductive.

Model II: Problem based learning for professional action

This model focuses on the “know how” of professional practice. The curriculum is designed around getting students active in participating in problems like professionals. PBL problems in this model are typically (though not exclusively) crafted using real world scenarios that require students to apply and practise professional competencies. The implications are that associated with each problem are definitive sets of skills that can be methodically applied to successfully address the problem. Facilitators in this

model assist students by modelling for the student how an expert would think or behave in the scenario or at the very least guiding students to the appropriate competencies so they can practise and get feedback about how well they are able to apply. Where possible, assessment is focussed on authenticity (knowledge and skills are assessed in pseudo-professional settings) where professional competence is “directly” measured rather than inferred from pencil or paper tests. This model is also largely objectivist and reproductive and /or strategic.

Model III: Problem based learning for interdisciplinary understanding

In this model the emphasis is upon students appreciating the differences between disciplines in what is known and how this knowledge can be applied. The curriculum is still organised around objectives. However the objectives tend to be broader in nature and focus on principles that cut across disciplines. PBL problem triggers are designed so that students are required to compare differences in the way different disciplines solve the problem at hand. The facilitator is more strategic in their facilitation because they use activities to resituate the problems within different contexts. Assessment is intended to test students’ ability to see knowledge as contextual. This model of PBL is objectivist and strategic. Objectivist because despite the appreciation students may have about the contextual nature of knowledge there is still the sense that within these different contexts there are well defined expected responses.

Model IV: Problem based learning for transdisciplinary learning

Similar to the model above the emphasis is upon students appreciating the differences between disciplines. However, there is also an expectation that students will see these disciplinary divisions as illusory. The curriculum in this setting is less defined in that the objectives while grounded in a discipline are specified as broad encompassing principles. PBL problem triggers are likely to be open ended (some might even call vague) and invite students to transcend established boundaries. The facilitator will encourage students to develop their own stance towards knowledge and do not try to reinterpret what students have to say in established disciplinary frameworks. However at the same time they will point out where students have challenged accepted ideas and encourage them to consider how they arrived at their positions thus encouraging them to be independent in their decision making about how they learnt. Assessment in this model centres around assessing the process of learning and ability of students to demonstrate their awareness of the processes of meaning making. This model draws upon subjectivism and autonomy.

Model V: Problem based learning for critical contestability

This model is focussed on students examining the underlying structures and belief systems implicit within a discipline or profession itself not only to understand the discipline but to give it credence to the learner. The curriculum is not just trans-disciplinary but it’s directed at the sub-text of disciplines like who are these ideas benefiting, why do we accept them they way we do, are there alternatives? The PBL problem triggers will often focus on contradictions, dilemmas, quandaries and conflict. The purpose is not about resolving these problems but about exploring the very nature of the problems. One could imagine students in this type of PBL asking the question: “Is

this problem really a problem”? Students are invited to challenge the authority of teacher and the text and consider texts as evidence of a paradigm (Kuhn 1970). The facilitator in this model adopts a reflective approach. The key characteristic of this type of facilitation is to engage in the problem as a learner, admitting to the precariousness of the discipline as it is constructed and forgoing the privileged position of the person in control. It is about welcoming the scrutiny of their knowledge and the deficiencies that exist. Assessment is essentially formative in nature however it is something to be negotiated with the learner. Summative judgements about learning are seen as social constructs in themselves and are regarded as being a “necessary evil” but somewhat divorced from the inquiry process of reasoning and reflection. This model is premised upon constructivist theories and reflective pedagogy.

The Epistemic Hole in PBL

So far I have described the relationship between epistemological beliefs and teaching and learning. I have, using Savin-Badens work, suggested how these epistemic beliefs play out in the various models and practices of PBL. It is perhaps beginning to be obvious (or not) how in certain models of PBL, premised on subjectivism and reproductive pedagogy, when compared against liberalist ideals of higher education, there exists a gaping hole. I call it an epistemological hole because what is missing is a realisation of how epistemological beliefs play out in the way PBL curriculum is designed, classes are facilitated and students assessed. Objectivism, reproductive and strategic pedagogies in PBL undermine liberal education values because they fail to do exactly what constructivist, autonomous and reflective pedagogies set out to do: emancipate the learner from the constraints of learning encompassing the formation of the students as a whole, allowing students to access and consider claims of a variety of disciplines, take seriously the activity of critical reflection by including a philosophical and sociological critique of what is being learnt and the fostering of student independence and responsibility for learning.

The question remains, why is there this epistemological hole? Or rather why do people practice PBL when their epistemological beliefs, do not reconcile with liberal education values? I put forward two possible reasons. The first is that there are those that argue PBL is a rationale method for promoting objectivists vision of educations, however the rhetoric of PBL practitioners and the claim of what PBL can do for learners simply does not reflect this vision. The second reason is that teachers are largely unaware of their epistemological beliefs and operate more at the level of methods. By reducing PBL (and perhaps other philosophical instructional theories) to a set of teaching methods that are justifiable in themselves, there is no apparent reason to make explicit the epistemic foundations of this belief. When this occurs education initiatives become fads.

The lack of accessibility (readability) of educational philosophy literature maybe partly to blame here, but the epistemological hole is perhaps more symbolic of a more fundamental problem in higher education, and that is the failure of teachers to question in a systematic manner the basis of their own knowledge as teachers and the implications of their knowledge beliefs in the way they teach. It is likely that a teacher that does not question the epistemic position of their own discipline is even less likely to question

knowledge beliefs in the context of their teaching practice. Suggesting, at least for PBL facilitators, teachers must indeed become learners to truly become a teacher.

An explicit philosophy of teaching grounded in the beliefs of what is knowledge and learning, while also taking into the account the context within which a teacher operates, can provide the basis of a conviction for ones actions, an anchor that can secure the teacher when faced with the opposition that naturally occurs in trying to enact a vision of a better education. This is especially so for those trying to implement or sustain PBL in the hallow halls of reproductive pedagogy. Without a philosophical basis of PBL the educator is placed in a perplexed situation of trying to defend the house built on sand with the tide washing in. In deciding to flee from the un-winnable fight he becomes akin to a nomadic wanderer searching the waste lands of instrumentalism drifting from one pedagogical fad to the next but being unable to establish a foundation long enough to ensure when the next wave of “what is good education” hits the beach that they are not swept up by it.

I wish finally to finish on an optimistic note (it is the academic staff developer coming out of me). This epistemological hole is neither unfathomable or unfillable. In fact there are many tools teachers can use to help make explicit their beliefs so that these beliefs can be checked against desired practice. Research suggests beliefs and practices exist in a reciprocal relationship with each other (e.g., Brickhouse, 1990; Czerniak & Lumpe, 1996; Meyer, 1997; Varrella & Burry-Stock, 2001). In my own institution we encourage all staff to write a teaching philosophy statement. To help them get started writing this statement we ask them to complete the Teaching Perspectives Inventory (Pratt & Collins 2001). Instead of dabbling in the educational flavour of the month I recommend looking for answers that can only be found when one looks inward and questions their beliefs of what is knowledge and the implications this has upon what they think learning is and what they do when they teach.

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