

COMMENTARY

## Teaching for effective learning in higher education: Focusing on learning and moving from a “based learning” mind-set

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# Teaching for effective learning in higher education: Focusing on learning and moving from a “based learning” mind-set

## ABSTRACT

Recent educational reforms in universities, and other institutes of higher education, have pressured educators to select newer content delivery methods and move away from “traditional” modalities. Whilst this is a favourable shift towards introducing a student-centred approach, it has led to the emergence of a culture of *based learning* techniques, with a strong emphasis on the method, rather than applying and understanding the pedagogical underpinnings – i.e. theories of learning. This issue has been exploited by the use of persuasive “marketing” techniques by the proponents of *based learning*. The popularity of such methods to busy teachers lies in the ready availability of a convenient “off the shelf” content delivery method. This article discusses the strengths, and limitations, of some popular *based learning* methods, and focuses on how to integrate the three important principles of learning when applying *based learning* methods or delivering content.

## INTRODUCTION

Institutions delivering higher education have undergone significant changes to their organisational structures, as well as to programs delivered, in recent times. The most major changes have been wrought to institutional funding, management and administration, fields of research, course content and modes of delivery of curricular content. These changes were recommended and carried out, at times with strong resistance from teachers and students, primarily to address the challenges faced in the 21st century (Gibbons, 1998). The rapid changes in technology, and the attributes of the tech-savvy generation Y students, have also contributed to the constant state of flux in higher education.

The reviews and reforms have consisted, mainly, of curricular changes and the development of innovative methods of teaching and learning. With diminishing budgets and increasing student numbers, the teachers in institutions of higher learning needed to adopt new teaching-learning methodologies. The “packaged” content delivery modalities, such as Problem-based Learning (PBL), Team-based

Learning (TBL) and Case-based Learning (CBL), became popular as they gave the user a ready-made, best-evidence teaching-learning method to employ in the curricula. This article provides a brief overview of the widely used *based learning* methods, and suggests why it may be time to re-evaluate the *based learning* practices and instead, integrate the basic principles of teaching and learning into the everyday learning environment.

## **RISE OF INNOVATIVE TEACHING-LEARNING METHODS: BASED LEARNING METHODOLOGIES**

In the beginning of the mid-20th century, institutions of higher education (IHEs) were looking for innovative and creative modes of content delivery. The imperative was to develop teaching-learning formats based on *small group* learning, breaking away from the traditional didactic *large group* lecture sessions. This, it was hoped, would promote student-centred, self-directed learning, which would lead to more effective learning, the acquisition of meaningful content and consequently, good educational outcomes. Furthermore, it was also thought that these learning formats would promote and develop domain-independent skills sets, such as team building, communication and research skills, professionalism/ethical behaviours or practices and lifelong learning skills (Gibbons, 1998; Alva, 2000; Harden, 1999; Vaugh & Baker, 2001).

One of the first and most successful, pedagogical innovations during this period was problem-based learning, PBL, which was initiated as a part of curricular reforms by some medical schools during the 1950s-1970s. Case Western Reserve University Medical School, Michigan State University and McMaster University Are thought to have been the pioneers of PBL, although there is some contention over which of them created PBL (Baden & Major, 2004). Donald Woods, of McMaster University coined the term, PBL, and McMaster is generally credited with bringing it to the forefront of education (Baden & Major, 2004). PBL aims to let students develop self-directed collaborative learning, whilst working on a problem/case given by the tutor. The students, in small groups, begin learning by using the problem as the trigger (starting point) for their inquiry, discussing the issues at hand in a stepwise manner to develop learning goals/objectives. They then individually, or in groups, engage in self-directed learning, research and discovery to complete the learning goals/objectives, before sharing their findings with the other team members in subsequent tutorials. The teacher functions as a facilitator of learning, “to expedite the intellectual and interpersonal process for the group” (Gresham & Philp, 1996), assisting students when or if they are in difficulty, or helping them to integrate knowledge. The tutor also assists the students to identify relevant learning resources for information gathering purposes. The success of PBL thus depends on student dynamics, the

effectiveness of the tutor's facilitator skills, the problem case and the design of the course curriculum. This curricular design could be entirely PBL-based, where the curriculum is based on a series of problems/cases, discussed through PBL tutorials, or it could be a hybrid, where traditional teaching-learning methods are incorporated along with PBL (Samasekera & Karunathilake, 2011). The curricular design in McMaster University in Canada and Maastricht University in the Netherlands are good examples of complete PBL curricula. The majority of universities and programs have globally employed the hybrid format. During the 1980's and 1990's, PBL became a very popular choice for curricular design, especially when revising existing formats. During the peak of PBL's popularity, some funding authorities and professional bodies even insisted that the higher education institutes should, or must, use PBL in their curricula. PBL might be one of the most researched and discussed content delivery modality of recent times. The globalisation of PBL has important cross-cultural implications, which were thought to impact strongly on its practice across Asia (Gwee, 2008). However, research has shown that learners gain immensely from PBL, when conducted properly, as they learn better, enjoy their learning and apply and transfer the learning successfully to professional settings and life events (Gwee, 2008; Tan, Gwee & Samarasekera, 2011). Furthermore, PBL provides better opportunities, through a more conducive learning environment for the development of domain-independent skills such as team-skills, respect and professionalism, communication, leadership and researching skills (Gwee, 2008; Albanese & Mitchell, 1993; Blumberg, 1992; Cockrell, 2000; Prince et al., 2005; Seneviratne et al., 2001; Vernon & Blake, 1993).

Team-based learning, TBL, was developed at the University of Oklahoma Business School in the late 1970's by Larry Michaelsen (Michaelsen et al., 1982), to address some of the resource limitations of PBL. The focus of TBL is to foster team learning in small groups in a large group teaching-learning session. Whilst PBL requires many tutors to facilitate small group sessions, TBL requires fewer tutors to direct the teaching and learning sessions. TBL is also known to promote and develop other domain-independent skills such as communication, problem solving and leadership skills. It has been shown that students enjoy TBL sessions and that learning is effective (Clark et al., 2008; Vasan, DeFouw & Compton, 2011). Since TBL is a teacher-directed activity, it has also allowed teachers to actively manage the learning situations of students.

Case-based learning, CBL, originated at the Harvard Business School, and quickly spread to other programmes and institutions of higher learning. CBL uses a real-life case or future practice scenario as the trigger for learning (Barnes, Christensen & Hansen, 1994; Christensen, Garvin & Sweet, 1991). CBL enhances the critical thinking, reflection and integration of course content

necessary for future practice. CBL is also used widely in settings with issues relating to ethics, professionalism, and interprofessional collaborative practice. In medicine, a slightly modified version is used for developing critical team skills in emergency situations.

Other modalities of content delivery, such as Theme-based Learning (TeBL) (Lonning, Defranco & Weinland, 1998), Simulation-based Learning (SBL) (Hammond, 2004; Kohn, Janet & Donaldson, 2000), Research-based Learning (RBL), and Narrative-based Learning (NBL) (Calman et al., 1988; Charon, 2001) have been described, and have been instituted by many programmes and IHEs. The benefits, and impact, of these teaching-learning methods have been studied by educational researchers (Greenhalgh & Hurwitz, 1999). Research has shown many challenges and limitations to the abovementioned learning methodologies (Vernon & Blake, 1993) – especially when they are put into practice with little planning as NBL to be impactful, the students and teachers need adequate time in the curriculum. Other limitations of NBL in professional courses like medicine are “destabilisation” and “doubt” of ones approach to his/her own practice and getting “carried away” without knowing when to stop the discussions (Kalitzkus & Matthiessen, 2009).

## **CHALLENGES AND LIMITATIONS FACED WHEN “BASED-LEARNING” METHODOLOGIES ARE IMPLEMENTED IN IHES**

One of the major challenges of implementation is in managing the change, e.g. assigning sufficient resources (trained facilitators, class-rooms and purpose-built learning spaces for students to do their independent learning and discussions) to support the newer learning methodologies. Support by the stakeholders, i.e. key teachers involved in the delivery of content, is essential for any of the *based learning* methodologies to be successful. Due to insufficient faculty development, however, poor management of the change process and the lack of dissemination of the intent and expected outcomes to the faculty stakeholders have been shown to engender resentment towards the new learning methods by both students, and faculty (Papinczak, 2010; Rees, 2004).

To compound the abovementioned problems, some teachers and inventors of based learning teaching- learning methodologies have utilised marketing techniques to promote their products, often overstating the benefits and understating, or hiding, the limitations and challenges. These contributing factors have led to faculty, and the students, of IHEs to be sceptical whenever a newer pedagogical method or design is introduced, or when a curricular revision is announced.

## **BACK TO BASICS: TEACHING FOR LEARNING**

The primary focus of any university or IHE is to educate its students and equip them with the necessary professional and other skills for life, and to impart the necessary competencies to attain those skills. Apart from domain-specific skills and knowledge, self-directed and lifelong learning, leadership and team skills, communication and professionalism are the more important domain independent skills necessary for a successful graduate.

Lack of proper resourcing to support the newer learning methodologies and inadequate training of teachers in designing and conducting *based learning* tutorials and classes are the main limitations to the successful implementation of some of these newer learning methodologies (Boud, 1998; Camp, 1996; Ferguson, 2005; Houlden et al., 2001). To overcome these limitations, one must carefully plan all teaching and learning strategies. If the institution is unable to resource adequately for a particular learning methodology, then one must effectively use the experience of trained faculty to guide in the design of the teaching-learning methods used for content delivery.

Irrespective of the teaching-learning delivery mode or the pedagogical method, the following basic learning principles should be followed in any teaching application, for student learning to be effective:

1. Activate learners' prior knowledge
2. Develop a conceptual framework to support learners' meaningful acquisition and integration of content
3. Develop learners' metacognition – i.e. *Knowing about knowing* – student being able to identify the learning areas where they are strong as well as being able to identify gaps and actively seek information or sources to bridge these learning gaps.

Furthermore, teaching faculty, actively engaging in the above learning principles in their teaching-learning environments, become very crucial, especially if IHEs are unable to resource adequately, or provide effective faculty/student training of a particular teaching-learning method.

### ***Activating Learners' Prior Knowledge***

Activating learners' prior knowledge, with regard to the subject area, is an important part of teaching. It is known that learning is effective when the learner has some prior understanding, or knowledge relating to, that particular subject area, i.e. foundation knowledge. This could be basic subject content,

learned during the previous year, or earlier phase of learning, general knowledge, cultural or situational understanding. When teachers activate learners' prior knowledge and actively link new information or content to existing knowledge, the new learning becomes meaningful and useful. The student will learn, as well as retain this, much better and will be able to retrieve effectively, when it is necessary to apply this new knowledge (Kujawa & Huske, 1995).

Teachers will also be able to assess the level of learners' prior knowledge and understanding of the subject area, as well as clear any misconceptions the learners may have, by actively engaging in the activation of learners' prior knowledge (Pressley et al., 1992).

### ***Developing a Conceptual Framework to Support Learners to Acquire, and Integrate, Content Meaningfully***

Learning, and development of expertise, occur in stages (Dreyfus, 1980). For the student, as a novice, it takes time to develop the relevant knowledge schemas (Schmidt, Norman & Boshuizen, 1990). The teachers, as experts, who have in-depth understanding of this discipline, as well as the practical experience, need to assist the students, by helping them to develop relevant conceptual frameworks, so that the students will be able to appreciate and comprehend the learned content. This leads to broader understanding of content learned by students, as well as to future applications to practice settings, or in problem solving.

### ***Develop Learners' Metacognition***

Training a student in self-directed and lifelong learning should begin at an early stage, and must be continued throughout their adult learning years. It is important for the student to identify the learning areas that need further support, and understand what his/her strengths are. Reflecting after each teaching-learning activity is important. The teachers need to ask students to reflect on questions like, "what did I learn from the session?", "what more do I need to learn?" and "from where should I get more learning and how should I get/seek this learning"? When learners' constantly engage in asking such questions and reflecting on their learning, and when teachers constantly support, as well as encourage, learners in this way, the learners are likely to develop metacognitive skills – i.e. learning about learning (Sandars, 2009). This serves as a foundation for developing self-directed learning, which would lead to constant updating of knowledge as part of lifelong learning (Tanner & Allen, 2004; Vos & de Graaff, 2007).

## **APPLYING THE 3 LEARNING PRINCIPLES IN PRACTICE**

The three principles discussed above could be applied to most teaching-learning methods effectively, thereby improving student learning.

### ***Lectures/ Large Group Teaching***

Applying the principles in large group, didactic teaching sessions, like lectures or seminars, could be challenging. With proper forward planning, however, one could effectively apply these principles in teaching practice, to effect. The presenter needs to activate *prior knowledge* of the learners by posing a few relevant questions at the beginning, and highlighting the correct responses during the latter part of the lecture (Cantillon, 2003). An Audience Response System or a handout with fill-in-the-blanks type responses could be used to make the lecture more interactive. During the lecture, one must build on the *foundation knowledge* with new information, aligning and constantly showing, the relevance to future practice. At the end of the learning activity, one could allow students to reflect on what they have learned, and what else that they need to learn. Teaching techniques like *One Minute Preceptor* where five-step microskill model is used in clinical teaching environments where the teacher first pose a question to the student then probe for supporting evidence to the answer and then teach the general rules with reinforcement and finally correcting the student's mistakes (Irby & Wilkerson, 2008). These teaching-learning techniques will facilitate the development of metacognition.

### ***Interactive, Small Group, Sessions***

These sessions are most effective when they are conducted in a non-threatening group atmosphere, with relevance clearly identified, together with integration of the intended curriculum (Steinert, 2004). Small-group sessions promote opportunities for students to ask questions, to work as a team, and to learn how to problem-solve. By asking questions, prior knowledge is activated. Through problem solving, the student learns how to apply the content learned, i.e. to transfer knowledge in different contexts. The role of the facilitator must be stressed, at this point – the facilitator must help in the development of *metacognition* by asking higher-order reflective questions. However, small group sessions are only as effective as the facilitator is good, i.e. in the tutor's ability to promote group interaction and problem solving (Steinert, 2004).

### ***Use of Technology to Enhance Teaching and Learning***

Generation Y is internet-savvy. The internet, therefore, provides a fertile ground for delivery of online learning programmes and support of formal programmes.

Web-based learning can reinforce what is learned in the classroom. For students who may not find the time spent in lectures and group teaching sessions adequate or beneficial, this is a bonus, since they can use online modules/resources to learn at their own pace and in their purported comfort zone. The *practical inquiry model* (Akyol, 2011) shows the private world as being 25% of the inquiry process. The internet can be used to tap into this vast private zone, which consists of exploration, leading to deliberation, which in turn leads to reflection – this ultimately leads to the development of metacognition.

## CONCLUSION

Reforms and changes in Higher Education are occurring rapidly. Whether the impetus for this change is the economic meltdown, or a whole new generation of highly-informed students, or the rapid technological advances that are inevitable, reforms are here to stay. We cannot turn the clock back. Incorporation of *best evidence* methodologies in teaching-learning, assessment and evaluation for curricular reforms into higher education is of prime importance (Samarasekera & Gwee, 2013). These form the basis for pedagogical advances, as well as the necessary skill sets for effective learning, and future practice, for 21st century learners. However, the basic principles of teaching should still be incorporated into the newer based- methods. Centuries of traditional teaching can't be all wrong. Neither, can it be said, are the based-learning methods. The truth lies somewhere in between - it is more a matter of providing the right training to the facilitators, i.e. faculty development, starting from basic pedagogical principles.

Despite the resource limitations engendered by the weak global economy, the academic leadership must recognise that, in order for the higher education system to be more effective, the trainers need to be trained first. This is an investment that would reap bountiful harvests of well-educated professionals, forming a community of educational scholars for the future.

## REFERENCES

- Akyol, Z. (2011). Assessing metacognition in an online community of inquiry. *The Internet and Higher Education* 14(3), 183-190.
- Albanese, M. A., & Mitchell, S. (1993). Problem-based learning: a review of literature on its outcomes and implementation issues. *Academic Medicine* 68(1), 52-81.
- Alva, K. D. (2000). Remaking the academy in the age of information. *Issues in Science and Technology* 16(2), 52-58.
- Baden, M. S., & Major, C. H. (2004). Foundations of problem-based learning (pp. 197). McGraw-Hill International.

- Barnes, L. B., Christensen, C. R., & Hansen, A. (1994). *Teaching and the case method*. 3ed. Boston MA: Harvard Business School Press.
- Blumberg, P. & Michael, J. A. (1992). Development of self-directed learning behaviours in a partially teacher directed problem-based learning curriculum. *Teaching and Learning in Medicine* 4(1):3-8.
- Boud, D. (1998). *The challenge of problem based learning*. 2nd ed. Routledge.
- Calman, K. C., Downie, R. S., Duthie, M., & Sweeney, B. (1988). Literature and medicine: a short course for medical students. *Medical Education* 22(4), 265-269.
- Camp, G. (1996). Problem-based learning: A paradigm shift or a passing fad? *Medical Education Online* 1(2):1-6.
- Cantillon, P. (2003). Teaching large groups. *British Medical Journal* 326(7386), 437.
- Charon, R. (2001). The patient-physician relationship. Narrative medicine: a model for empathy, reflection, profession, and trust. *JAMA* 286(15), 1897-902.
- Christensen, C., Garvin, D., & Sweet, A. (1991). *Education for judgment: The artistry of discussion leadership*. Boston MA: Harvard Business School Press.
- Clark, M. C., Nguyen, H. T., Bray, C., & Levine, R. E. (2008). Team-based learning in an undergraduate nursing course. *The Journal of Nursing Education* 47(3), 111-117.
- Cockrell, K. S., Caplow, J. A. H., & Donaldson, J. F. (2000). A context for learning: Collaborative groups in the problem-based learning environment. *The Review of Higher Education* 23(3), 347-363.
- Dreyfus, S. E., & Dreyfus, H. L. (1980). *A five stage model of the mental activities involved in directed skill acquisition*. California: University Berkeley Operations Research Center.
- Ferguson, K. J. (2005). Problem-based learning: let's not throw the baby out with the bathwater. *Medical Education* 39(4), 352-353.
- Gibbons, M. (1998). Higher education relevance in the 21st century. The World Bank Human Development Week '98; 4-6 March; Alexandria, Virginia.
- Greenhalgh, T., & Hurwitz, B. (1999). Narrative based medicine: Why study narrative? *British Medical Journal* 318(7175), 48-50.
- Gresham, C. L., & Philp, J. R. (1996). Problem-based learning in clinical medicine. *Teaching and Learning in Medicine* 8(2), 111-115.
- Gwee, M. C. (2008). Globalization of problem-based learning (PBL): cross-cultural implications. *The Kaohsiung Journal of Medical Sciences* 24(3 Suppl), S14-S22.
- Hammond, J. (2004). Simulation in critical care and trauma education and training. *Current Opinion in Critical Care* 10(5), 325-329.
- Harden, J. R. (1999). AMEE Guide No. 14: Outcome-based education: Part 5-From competency to meta-competency: a model for the specification of learning outcomes. *Medical Teacher* 21(6), 546-552.
- Houlden, R. L., Collier, C. P., Frid, P. J., John, S. L., & Pross, H. (2001). Problems identified by tutors in a hybrid problem-based learning curriculum. *Academic Medicine* 76(1), 81.
- Irby, D. M., & Wilkerson L. (2008). Teaching when time is limited. *British Medical Journal* 336(7640), 384-387.
- Kalitzkus, V., & Matthiessen, P. F. (2009). Narrative-based medicine: Potential, pitfalls, and practice. *The Permanente Journal* 13(1), 80-86.
- Kohn, L. T., Janet, C. J., & Donaldson, M. S. (2000). *To err is human: building a safer health system*. Washington, DC: National Academy Press.
- Kujawa, S., & Huske, L. (1995). *The strategic teaching and reading project guidebook* (Rev.

- ed.). Oak Brook, IL: North Central Regional Educational Laboratory.
- Lonning, R. A., DeFranco, T. C., & Weinland, T. P. (1998). Development of theme-based, interdisciplinary, integrated curriculum: A theoretical model. *School Science and Mathematics [online]* 98, 312-319.
- Michaelsen, L. K., Watson, W. E., Cragin, J. P., & Fink, L. D. (1982). Team-based learning: A potential solution to the problems of large classes. *Exchange: The Organizational Behavior Teaching Journal* 7(4), 18-33.
- Papinczak, T. (2010). An exploration of perceptions of tutor evaluation in problem-based learning tutorials. *Medical Education* 44(9), 892-899.
- Pressley, M., Wood, E., Woloshyn, V. E., Martin, V., King, A., & Menke, D. (1992). Encouraging mindful use of prior knowledge: Attempting to construct explanatory answers facilitates learning. *Educational Psychologist* 27(1), 91-109.
- Prince, K. J., van Eijs, P. W., Boshuizen, H. P., van der Vleuten, C. P., & Scherpbier, A. J. (2005). General competencies of problem-based learning (PBL) and non-PBL graduates. *Medical Education* 39(4), 394-401.
- Rees, C. E. (2004). The problem with outcomes-based curricula in medical education: insights from educational theory. *Medical Education* 38(6), 593-598.
- Samarasekera, D. D., & Gwee, M. C. (2013). Building an effective training continuum in surgery: Developing a safe practitioner. *Sri Lanka Journal of Surgery* 30(2), 2-10.
- Samarasekera, D. D., & Karunathilake, I. M. (2011). Hybrid PBL – Hub format an innovative design for effective small group learning. *South East Asian Journal of Medical Education* 5(2), 2-9.
- Sandars, J. (2009). The use of reflection in medical education: AMEE Guide No. 44. *Medical Teacher* 31(8), 685-695.
- Schmidt, H. G., Norman, G. R., & Boshuizen, H. P. (1990). A cognitive perspective on medical expertise: theory and implication. *Academic Medicine* 65(10), 611-621.
- Seneviratne, R. D., Samarasekera, D. D., Karunathilake, I. M., & Ponnampereuma, G. G. (2001). Students' perception of problem-based learning in the medical curriculum of the Faculty of Medicine, University of Colombo. *Annals of the Academy of Medicine, Singapore* 30(4), 379-381.
- Steinert, Y. (2004). Student perceptions of effective small group teaching. *Medical Education* 38(3), 286-93.
- Tan, C. H., Gwee, M. C., & Samarasekera, D. D. (2011). Student self assessment on acquiring competencies through problem-based learning in the preclinical years of medical education. *Journal of Medical Education* 15(4), 352-63.
- Tanner, K., & Allen, D. (2004). Approaches to biology teaching and learning: learning styles and the problem of instructional selection – engaging all students in science courses. *Cell Biology Education* 3(4), 197-201.
- Vasan, N. S., DeFouw, D. O., & Compton, S. (2011). Team-based learning in anatomy: an efficient, effective, and economical strategy. *Anatomical Sciences Education* 4(6), 333-339.
- Vaughn, L., & Baker, R. (2001). Teaching in the medical setting: balancing teaching styles, learning styles and teaching methods. *Medical Teacher* 23(6), 610-612.
- Vernon, D. T., & Blake, R. L. (1993). Does problem-based learning work? A meta-analysis of evaluative research. *Academic Medicine* 68(7), 550-563.
- Vos, H., & de Graaff E. (2007). Developing metacognition: a basis for active learning. *European Journal of Engineering Education* 29(4), 543-548.