The Missing Link in Promoting Quality Education: Exploring the role of pedagogical design in promoting quality in teaching and learning

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Abstract

A major premise of this keynote address is that pedagogical design plays an important role in promoting and assuring educational quality. Pedagogical design has to do with approaches to teaching and learning which comprise, how learners interact with the subject matter content, their learning activities, how their learning is assessed, and how feedback is provided to them.

Approaches to learning and teaching are informed by our knowledge and understanding of human learning and cognition, of which there are several major strands. These theories of how we learn help us develop models of learning and teaching which we believe are suitable for teaching particular kinds of subject matter, skills or attitudes.

Our views and perspectives on learning and cognition have been changing over time and this has impacted how we approach and conduct our teaching activities. Currently, the popular view is that learning is a constructive process, that learning and teaching is most potent when they are “situated” within a meaningful *context*, and in the *culture* and the *community* within which learners live. This view suggests that learning is a process of developing understanding through problem-solving and critical reflection within a meaningful context.

This paper discusses and demonstrates how this view and its attendant principles have been implemented in the *Master of Arts in Teacher Education* (International) *Program* (MATE–I) currently on offer in the distance education mode at the Open University of Sri Lanka. The MATE–I program utilizes a situated cognitive approach to learning and teaching called “Scenario-Based Learning”.

Key words

Educational quality, pedagogical design, scenario-based learning

Quality teaching and learning

There is growing interest in most tertiary education institutions in their quality of teaching and learning. As an integral part of this interest, most institutions regularly survey their quality of teaching with the goal of improving their practices.

A key focus of many of these surveys is on how well a course was taught, if the teaching staff showed interest and enthusiasm in the subject matter, if there was adequate use made of information and communications technology in the teaching of the course, and if students were satisfied with the quality of the learning experience in the course.

These are legitimate areas of concern in seeking feedback from students on the quality of teaching. However, they are tangential to the core process of teaching, which is pedagogical design, and that is concerned with the design of the learning experience in the course. This comprises, among other things, what the students are required to do in the course and how these activities are aligned with the intended learning outcomes of the course. Most surveys of the quality of teaching rarely focus attention on the specific aspects of these processes, and yet this is at the heart of any teaching activity.

Pedagogical design as an indicator of quality

Commonly known indicators of educational quality have to do with personnel, organizational, and administrative procedures and processes. Missing from this list is the design of the learning experience (see Naidu, 2004). Fundamentally, this has to do with how the learners are going to interact with the subject matter, how they are going to pursue the learning outcomes and how learning achievement can be assessed.

This comprises a major limitation in how we perceive and evaluate quality in teaching and learning. Concerns about the quality of the infrastructure and resources, and the tools and technologies of teaching and learning comprise tinkering at the edges of quality assurance. At the heart of the quality of teaching and learning is pedagogical design. This includes the design of the total learning experience, which includes how learners, teachers and other support staff and resources are going to interact within it, how meaning can be derived and how learning achievement can be ascertained.

Foundations of pedagogical design

The foundations of pedagogical design are in the theories of learning and cognition. There are several major perspectives on learning and cognition and they have their strengths and limitations for various things. A brief review of the major

perspectives on learning and cognition including their strengths and limitations is presented in the following.

Human beings are capable of learning in a variety of ways. Over the years, learning theorists have spent a great deal of time and energy in trying to understand how we learn. This work has led to the development of several perspectives and theories on human learning processes. A quick search on the web reveals a heap of literature on the subject (see for instance http://tip.psychology.org/theories.html; http://www.emtech.net/learning_theories.htm; http://www.usask.ca/education/coursework/802papers/mergel/brenda.htm; http://www.cloudnet.com/~edrbsass/edlea.htm;

While this very large volume of literature on learning could be viewed and used in a variety of different ways, the following table uses a commonly recognized approach to categorize and capture the major shifts in perspectives on learning, identify their key proponents and principles and point to some of their contributions to theories of teaching and designing instruction.

Perspectives	Key proponents	Key principles	Contribution to teaching
Behaviorism	Pavlov, Thorndike, Watson, Skinner	Stimulus-response association	• Classical conditioning (Pavlov) • Operant conditioning (Skinner)
Cognitivism	Gagne, Briggs & Wager, Ausubel, Tennyson, Anderson	Sensory receptors, memory storage and response generators	• Information processing (Rumelhart & McClelland) • Subsumption theory (Ausubel) • Schema theory, concept mapping & entailment structures (Pask, Novak & Gowin)
Constructivism	Vygotsky, Ernst von Glasersfeld, Brown, Collins & Duguid, Schank, Lave & Wenger	Problem-solving, critical reflection in and on action	• Situated cognition (Vanderbilt group, Brown, Collins & Duguid) • Learning by doing (Schank) • Case-based reasoning (Schank, Kass & Reisberg)

Table 1. Perspectives on learning

Behaviorism

The concept of behaviorism arose largely from the works of Pavlov, Thorndike, Watson and Skinner (see Bower, & Hilgard, 1981). Much of their work while carried out with animals (e.g., dogs, birds and mice), was later extrapolated and extended to human learning. A key tenet of behaviorism was the association between a 'stimulus' (e.g., the ringing of a bell followed by the presentation of food by Pavlov), and a 'response' (as in the dog's salivation upon hearing the bell). It also involved the use of positive and negative feedback and punishment (such as electric shocks used by Skinner with mice) to reward, reinforce or eliminate undesirable behavior. In relation to human learning a typical 'stimulus' might be the instruction, the

'response' could be the prescribed behavior such as a correct or a suitable response, the 'reward' could the feedback (e.g., praise, positive feedback or a good grade). 'Negative feedback' might be no response at all and 'punishment' might be some sort of penalty for noncompliance.

A major problem with this perspective of learning has been that it pays little attention to understanding what is happening within the brain of the animal or child. It treats the brain pretty much as a 'black box'.

Cognitivism

The realization by more and more researchers that the brain is a developing entity that is constantly processing information that it receives, led to the rise of a whole raft of 'cognitive' perspectives on learning led by Rumelhart, Ausubel et.al (see Bower, & Hilgard, 1981). These perspectives sought to focus attention on what happened to the information as it is being received by the brain, how it gets stored there or subsumed in prior knowledge ready to be reproduced when the need arises. This kind of thinking on learning led to the rise of interest in information processing models and theories of learning and the nature of expertise.

A key sticking point with these cognitive perspectives on learning has been their objective orientation of the nature of knowledge which takes the view that learning comprises capturing of information, and storing it in some meaningful form in the brain (such as in the form of a schema, concept map or entailment structure), ready for reproduction and reuse in novel situations. This seemed like a very mechanical process.

Constructivism

The human mind had to be capable of more than simply taking in information, storing it and reproducing it when it was needed. Something more had to be happening inside the brain because it was capable of creative activity and intuition? So where did that come from? How could that be nurtured and cultivated?

This view of learning as an active and recursive process is driven by a greater recognition of the pivotal role of the 'learning context' in knowledge construction. This is the constructivist perspective on learning (see McLellan, 1996). It argues that learning and the development of knowledge is a personal process which comes about as a result of learners acting upon authentic problem situations individually and in groups. It takes the view that learning is a process of developing understanding through problem solving and critical reflection, and that learning is most effective and efficient when learners are engaged in learning by doing.

Pedagogical designs that embody this perspective make use of learning scenarios, problems, incidents, stories and cases that are authentic (i.e., that reflect real life situations), to situate and anchor all learning experiences, and in which the assessment of learning outcomes is also closely tied to the learning context.

Evidence of this view on learning is reflected in the widespread use of scenario and problem-based learning in the study of medicine and related health sciences, case study-based learning in the study of law, business and economics, and the use of role-play in the study of the social sciences and humanities. Within these contexts, learners are increasingly being put into situations where they are required to think for themselves by reflecting in and upon their actions, drawing conclusions and defending their actions.

Popular views on pedagogical design

Following this line of thinking around the subject of learning, there now seems to be growing consensus among learning theorists and educational practitioners that learning is most efficient and effective when (see also Brown, Collins, & Duguid, 1989; The Cognition and Technology Group at Vanderbuilt, 1990; Wilson, 1996):

1. Learning is “anchored” or “situated” within real-world or authentic settings.
2. Learners are engaged in learning by doing, and involved in problem-solving activities.
3. Learners are active partners in the process rather than passive recipients of information and data.
4. Learners are engaged in critically reflecting in and upon their activities.
5. Learning is supported with scaffolds that promote cognitive apprenticeships.
6. Assessment of learning outcomes is closely aligned with the learning context and the learning activities.

Pedagogical designs that reflect this view

Prominent pedagogical designs that reflect this perspective on learning include scenario-based learning, problem-based learning, goal-based learning, learning by designing and role play-based learning. These pedagogical designs are based on the principles of constructivism and situated cognition (see Naidu, 2006).

Scenario-based learning is a pedagogical design in which a scenario provides the context and the anchor for all learning and teaching activities (see Naidu, Menon, Gunawardena, Lekamge, and Karunanayaka, In press; Naidu, Menon, Gunawardena, Lekamge, & Karunanayaka, 2005). An effective learning scenario is one that closely resembles a real-life situation. It will have the requisite variety and complexity of a real-life situation to afford learners adequate opportunities for the pursuit of the intended learning outcomes (see Gibson, 1977).

Problem-based learning and *goal-based learning* are somewhat similar designs in which the problem situations serve as the essential scaffold for all learning and teaching activities (see Barrows, 1994; Hmelo, Holton, & Kolodner, 2000; Naidu, & Oliver, 1996; Naidu, & Oliver, 1999). The distinguishing feature of *goal-based learning* is the pursuit of a goal by the learner within the context of a realistic setting (see Naidu, Oliver, & Koronios, 1999). This learning design has been popularized by Roger Schank and his collaborators (see Schank, Fano, Jona, & Bell, 1994).

Case study-based learning is a pedagogical design in which an authentic case provides the context for all learning and teaching activities (see Lynn, 1996: Rangan, 1995). Cases have been widely used in the study of Law, Accounting/Business and Organizational Behavior, among other areas.

Learning by designing is a pedagogical design in which the act of designing something such as a building or an exhibition serves as the context for all learning and teaching activities (see Naidu, Anderson, & Riddle, 2000; Newstetter, 2000). In *role play-based learning*, the act of role-play serves as the essential scaffold for all learning and teaching activities (see Linser, Naidu, & Ip, 1999; Naidu, Ip, Linser, 2000).

The role of context, culture and community

The one thing that the foregoing pedagogical designs highlight is the central role of the context and with it, the role of culture and community in learning and teaching. These pedagogical designs take the view that learning and teaching is most effective and efficient when it is taking place within a meaningful context.

In fact there has been growing support for the important role of the context, culture and the community in learning (see Brown, Collins, & Duguid, 1989; The Cognition and Technology Group at Vanderbuilt, 1990; Wilson, 1996). Proponents of this view on learning highlight the importance of situating all learning and teaching activities within a realistic context.

The ideal learning contexts are those with which the learners are likely to be familiar. These are also contexts that are authentic, and as such they mirror reality as best as possible. Furthermore, they are rich in complexity in order to be able to afford, both the learners the teachers the opportunities for learning and teaching the targeted concepts, procedures and principles (see Lave, & Wenger, 1991).

Suitable learning contexts also closely mirror or reflect the culture and the community within which learning and teaching is taking place. However, this does not mean that the learning scenarios or problems that are drawn from these learning contexts cannot have a broader appeal. In fact they have to afford opportunities for transfer of knowledge to similar situations. The importance of

context, culture and community is even greater in less formal educational settings such as continuing education, professional and vocational education.

Effective learning scenarios are not easily found or developed, which is one of the reasons why their use is not as widespread, and especially less so in tertiary education settings. The development of effective scenarios, whether these are problems, incidents, cases or role-plays require a great deal of creative effort. Once developed, they serve as powerful designs for learning. Poorly developed pedagogical designs can actually do more harm than good to learning and teaching activities.

Case study of "scenario-based learning"

The rest of this paper describes and discusses a program of study, in which one of these pedagogical designs was used, namely "Scenario-Based Learning". This is the Master of Arts in Teacher Education Program (MATE–I) at the Open University of Sri Lanka.

The MATE–I program of the Faculty of Education at the Open University of Sri Lanka was developed with financial assistance from Commonwealth of Learning (see Karunanayaka, Lekamge, Gunawardena, Naidu. & Menon, 2005a). The Commonwealth of Learning is an intergovernmental organization that has been created by the (British) Commonwealth Governments to support the development and sharing of distance education strategies, knowledge, resources and technologies across the Commonwealth countries. Its headquarters are in Vancouver, Canada.

The development of the MATE–I program began in 2003 with the bulk of the design and development work being carried out over the latter half of 2003 and the first half of 2004. The newly designed and developed program was first offered in 2005.

The MATE–I Program

The MATE–I program is a very unique program and as such it has many distinguishing characteristics. Foremost, it is aimed at improving the professional competencies of teacher educators. These are people who already possess teaching qualifications and who are currently engaged in the training of teachers in teacher training colleges and Universities (see Karunanayaka, Lekamge, Gunawardena, Naidu, & Menon, 2005b).

As such the MATE–I program does not aim to give students in the program who are already teacher educators, another dose of subject matter knowledge on Education. Instead, it has been designed to develop among such practicing

teacher educators competencies and practices in relation to teacher education (see MATE–I Program Handbook, 2004):

Program structure

The MATE–I program comprises six compulsory courses, and a portfolio project. The portfolio project was chosen in lieu of a standard master's thesis project because of the belief that a portfolio is better able to capture the experience of practitioners.

All students in the program receive a complete set of self-study materials, which comprise a *Study Guide* (including learning scenarios, learning and assessment activities, a study schedule), and a *Resource Pack* (including readings and other core study materials). These self-study materials are supplemented with face-to-face contact sessions, on-campus and at the local study centers, and also electronic communication via email and online forums (see MATE–I Program Handbook, 2004).

Scenario-based learning in the MATE–I program

All the six courses in the MATE–I program utilize scenario-based learning as their pedagogical approach which has been described in several other publications (see Naidu, 2004; Naidu, 2006; Naidu, Menon, Gunawardena, Lekamge, & Karunanayaka, 2005; Naidu, Menon, M., Gunawardena, Lekamge, & Karunanayaka, *In press*).

The basic attributes of scenario-based learning are as follows:

- A scenario that affords learning in the subject matter domain.
- Learning activities that allow learners and teachers to work alongside each other in the scenario.
- Assessment tasks which allow learners to demonstrate competencies in the identified skills, and which enable teachers and tutors to assess the achievement of the intended learning outcomes by students.

Each one of these scenarios has been painstakingly developed by the course teams to mirror the sorts of situations that teacher educators are encountering, or very likely to encounter in their work. As such they are realistic and authentic. They comprise a detailed description of the learning context and the roles of learners in the context in terms of what they are required to do. They include learning activities and an identification of resources that are required for completing them. These learning activities, which can be carried out individually and in groups, help provide learners with structure and pacing. They culminate into assignments, which are individually submitted and assessable.

The roles of students in scenario-based learning

Scenario-based learning and scenarios such as those in the MATE–I program promote a “learning centered focus”, which is a slightly different concept from a “learner-centered focus”. The concept of learner-centeredness stresses the important role of the *learner* in the learning and teaching process, whereas the concept of learning-centeredness emphasizes the centrality of the *learning activities* in the learning and teaching process.

In a learning centered focus, the learning activity provides the scaffolding for all learning and teaching activities. The scenario provides the context for learning and teaching, and the learning activities and the assessment tasks in the scenario provide learners the structure and scaffolding to pace their learning activities. In the process of completing these tasks they have access to a range of support services.

The roles of teachers and other stakeholders in scenario-based learning

Teachers, tutors and other support services staff such as librarians and local center staff in the case of distance education, comprise resources in a learning-centered environment. To the learners, they are all critical to the conduct of their learning activities. They serve to point learners in the right direction, and help them sift through essential and non-essential information. Some of them, such as librarians and information technology services staff may be the source of training and expert assistance with essential and specific tools and tasks which learners may need in order to be able to complete their learning activities. Teachers, tutors and other learning support staff may be the source of guidance and coaching in generic learning strategies and study skills.

Concluding remark

A major goal of his paper has been to explore the role of pedagogical design in promoting quality in teaching and learning. Its main message is that pedagogical design comprises an important indicator, perhaps the most important indicator of educational quality. Yet quite often, its central role in assuring educational quality is overlooked or inadequately recognized and addressed.

Careful attention to pedagogical design serves to ensure a meaningful and satisfying learning and teaching experience. Neglecting attention to pedagogical design runs the risk of a failed learning experience. The *Master of Arts in Teacher Education* program of the Open University of Sri Lanka shows what it means and what it takes to pay attention to pedagogical design. It shows how attention to pedagogical design can help develop a learning experience that learners are likely to find relevant, meaningful, useful, challenging and satisfying, and an experience that teachers are going to find rewarding and fulfilling.

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