

Learning Design as an Indicator of Quality in Teacher Education

A/Professor Som Naidu

The University of Melbourne, Victoria, Australia

ABSTRACT

This paper suggests that a rich and resourceful learning experience, along with sound administrative processes, is and ought to be seen as a core indicator of quality assurance processes. Focusing attention on learning design comprises orchestrating the entire learning experience of the students to ensure that their learning is meaningful and motivating. It means modelling the learning experiences of students to reflect authentic and real-life situations, and the kinds of situations that they are most likely to encounter in their workplace. This paper argues, that educational systems cannot claim to have taken seriously their attempts at quality assurance without careful consideration of what their learners will do in any educational program, and how their progress with learning is going to be monitored and assessed.

INTRODUCTION

Although learning and teaching activities are at the heart of any educational experience, indicators and measures of quality in teacher education specifically, and education more generally, tends to focus attention on organizational and administrative processes. Pick any book on quality assurance in teacher education, in both open and distance learning settings, and in conventional systems, and you will find that QA is targeted at the usual criteria. These comprise organisational policies and practices and infrastructure. Very few of these focus attention on the learning and teaching experiences. At times when there is some attention being paid to learning and teaching, the emphasis is on the quality of the teachers, their training, and on the support that they might be receiving. The quality of the learning experience is seen to have been assured with qualified personnel. This is not necessarily the case. In fact, in a larger number of educational settings, and even in the presence of qualified teachers, the students' learning experiences are particularly poor.

This comprises a serious limitation of quality assurance practices in general. As such it poses a major problem. Unless quality assurance practices adopts a comprehensive

approach to the educational process, assuring high quality standards is always going to be incomplete. So the first step in the process is to review the indicators and measures of quality in teacher education. However, that is not the goal of this paper. Its goal is to articulate what it means to focus attention on learning design as an indicator of quality in teacher education, and furthermore, what steps can be taken to assure quality in teacher education with innovative learning design, along with other indicators as well, of course.

Learning design refers to the orchestration and arrangement of students' learning experiences in a way in which the opportunities for learning are optimised. Clearly there is no major dispute with the suggestion that we learn in a range of ways. Approaches to learning are not something that can be easily canned, distributed and reused. However, there is a great deal of agreement with the suggestion that some approaches to learning are more productive, enjoyable and meaningful than others (see for instance Brown, Collins, & Duguid, 1989).

Take a look at a few course syllabi around you, and you will find that the majority of them take on a distinctly content centred approach. In this approach the starting point of learning is the subject matter in a linear sequence of topics. I am looking for instance, at a course outline on curriculum development in which the topics are arranged in such a fashion, which is as follows: Concept of a curriculum; Theoretical bases of curriculum design and development; models of curriculum design and development; organizational principles in curriculum development; implementation and management of a curriculum; and curriculum review and revision. The goals of this subject are to develop in teacher educators, competencies in the design, development, implementation, and evaluation of a curriculum. Presumably, in order for them to be able to develop these competencies, they would need to have actually engaged in designing, developing, implementing and evaluating a curriculum project. Yet in this line-up of topics on the subject, students are not being exposed to any such experience. Instead, they are being exposed to a lot of what others have said on the subject and then being asked to write reports on it. How can they possibly develop the targeted competencies?

SITUATED LEARNING: AN ALTERNATIVE APPROACH

A meaningful alternative approach would be to put these students in an authentic scenario such as one that they might encounter in their workplace, and for which they are being asked to design, develop, implement and evaluate a segment of a curriculum. In order to be able to complete this task they can be required to access much of the same material that they were being prescribed to read previously. The difference with this approach is that they will be reading that same material to inform their own work on a realistic task, which they are completing as part of the

assessment requirements of this subject, and not reading to reproduce someone else's thinking on the subject.

There is growing interest in education on such learning designs that focus attention on supporting learners who are engaged in critical reflection and problem-solving activities within some authentic context. This more learner-centred focus represents a major shift away from conventional approaches to learning and teaching. Viewing learning *within a context* means two somewhat related yet different things. On the one hand it means that the social, interpersonal and cultural surroundings within which learning occurs affect both the learning processes and outcomes. It also means that the skills, strategies, and learning processes are seen as being tightly connected to their immediate contexts of practice rather than as neutral tools available for varied general application. In other words, they are seen as being highly *situated* (Lave & Wenger, 1991).

The concept of situated learning is grounded in the belief that learning is most efficient and effective when it takes place within the context of realistic settings in which learners are clear about the reasons for learning (Cognition and Technology Group at Vanderbilt, 1991; Brown, Collins, & Duguid, 1989). This is not a new concept. The roots of this view of learning are traceable to experiential learning (Dewey, 1938), and problem based learning (Barrows & Tamblyn, 1980; Naidu & Oliver, 1996; Evensen, & Hmelo, 2000). Using what Brown et al. (1989) call "authentic tasks" situated learning enables students to immerse themselves in the culture of the subject matter, much like an apprentice carpenter is immersed on the building site with the master builder. Learning experiences can be designed to engage learners into "cognitive apprenticeships" which immerse them in the total ecology of their subject matter.

Situated learning requires a radical redefinition of learning, thinking, and what it means to be intelligent. With the emphasis not on memory but on perception, knowledge is no longer simply something stored in the head; rather, it comprises one's ability to interact in a specific context in which intelligent activity is meaningful and appropriate. Context in this case includes people, machines, design artefacts, environments, and other objects and agents, which may interact to establish ecological problem-solving relationships. It also includes a shared culture, understanding, and motivations. Such a redefinition of learning contends that knowledge is the outcome of an active relationship between an agent and the environment, and learning must take place during the time the student is actively engaged with a complex, realistic instructional context.

ASSESSMENT OF SITUATED LEARNING

As the nature of learning becomes more collaborative, situated and distributed in its context, conventional methods of assessment of learning outcomes become inadequate. These have to be replaced by cognitive tasks and assessment procedures that can be focussed on the processes of learning, perception and problem solving. In addition, assessment can no longer be viewed as an add-on to an instructional design or simply as separate stages in a linear process of pre-test, instruction, and post-test. Assessment must become an integrated, on-going, and seamless part of the learning environment.

More than formative and summative evaluation, the entire instructional design process must be changed from a serial stage model in which assessment enters and leaves, toward a model in which the processes that serve as instructional stimuli also serve to provide data to a multivariate model. Such a model could then provide important feedback to both teacher and student, and serve as a partner in the process of learning. Situated learning must encourage the construction of instruction and assessment as one.

Assessment must not only be integrated with instruction, but must focus on the learning products. When learning changes from direct instruction to situated learning, the assessment of successful and less successful learners (or experts and novices within a domain) must change from an emphasis on right/wrong responses toward an emphasis on the information that each student perceives in the situations (s). The affordances that each student perceives can be detected by the types of information to which they attend (eg., video scenes replayed), the path taken towards solution, the types of analogies and transfer that occur, and the types of errors that are made.

CHARACTERISTICS OF SITUATED LEARNING ENVIRONMENTS

Not all situations afford learning. Three suggestions for the type of evidence one should look for in a suitable learning situation are:

1. *The ability to afford transfer to novel situations*
2. *The ability to provide meaning for learning, and*
3. *The ability to accommodate "anchored instruction"*

Transfer

Near and far transfer situations as well as situations that afford the use of both domain-specific knowledge and higher-order skills (planning, discriminating the relevant from the irrelevant, metacognitive monitoring of progress etc.) would constitute the range of transfer situations needed to determine successful learning. Such a determination could be made continuously using dynamic assessment techniques that are completely integrated into the initial generator set of solutions.

Meaning for learning

When Brown et al. (1989) discussed situated cognition and cognitive apprenticeships, they relied heavily on real-world apprenticeships (eg, apprentice tailors) as the model for their analysis. While real-world experiences are perhaps the best situations, conventional classrooms cannot provide many such situations. Some classes are fortunate enough to be able to take instructional advantage of field trips. The hallmark of such events is the meaning they provide to students for their academic disciplines. As designers begin to construct learning situations with the aid of technology, an essential standard should be the meaning students attach to their activities within those environments. Students should be able to provide meaningful answers when asked questions about why they are doing certain things.

Anchor situations

“Anchored instructions” is a term coined by the Cognition and Technology Group at Vanderbilt (1990) to describe a special type of situation for learning. It is possible to situate learning in two ways. The first is exemplified by many law school courses, where a separate real-world case is used to explain each new dimension of law. In this manner, it is possible to encounter several cases in a single course. Such situations can be considered micro-contexts of each specific topic to be learned. In contrast, it is also possible to select “macro-contexts” that are sufficiently rich and complex to be meaningfully viewed from several perspective’s.

Designing situated learning environments

A situated learning perspective presents an instructional designer with four basic tasks:

- *First*, the proper generator set situations that will afford learning in the domain of interest must be selected.
- *Second*, scaffolding that allows novices and experts to perform alongside one another in the learning situation must be designed.

- *Thirdly*, the instructional design task must include training teachers to understand and perform using the situation as well as support their role in the classroom with technology that can facilitate guiding and assessing students as they work within an instructional situation.
- *Fourthly*, assessment must be integrated with instruction so that the situation provides both instructional and assessment opportunities and information.

This approach to instructional design must include a new approach to assessment, moving away from static assessment to situated assessment that incorporates both the affordances of the environment as well as the abilities brought to the situation by the student. In fact, it is the interaction of the two that constitutes knowledge from the learning perspective, and therefore it is this interaction that must be assessed and rated as intelligent or underachieving. It also suggests that new matrices for the evaluation of situations must be adopted. When instruction takes place in a complex, realistic and authentic context, then measures of success of the instruction must include transfer, the meaningfulness of learning, and a capacity to anchor instruction across the curriculum.

Schank and Cleary (1995) have argued that the design of such a learning experience takes the form of a storyline in which students play a key role such as being a manager of an e-business or e-learning organization. These roles are carefully selected to reflect those that students of such a program might actually do in real life, or might need to know about because they will very likely manage or collaborate with others who might be performing those roles. Students work in small groups in these scenarios with the help of detailed information about the simulated context, together with project details. Supporting materials and resources are also available, and online mentors are available to answer questions and point students in the right direction on a needs basis (Schank, 1990; 1997). This is the main point behind the story-centred curriculum (SCC) popularized by Roger Schank and his team (Schank, Fano, Jona, & Bell, 1994).

The story in this instance is the simulated context in which the student plays a major role. The story in this curriculum serves as the essential scaffold. These researchers argue that stories have always been a part of human existence. Humans have always told stories, and the most powerful of all stories shape the way in which we relate to our world. Furthermore, we tend not to forget these life-changing stories. There is good reason then to make powerful stories the centre of educational practices. These stories must involve students as well as their peers, because that is how their work situation is most likely to be. A story-centered curriculum is goal-based, and the goals are those that the student has for entering school and following a curriculum in the first place. A story-centered curriculum is also activity-based. Students work through these activities to learn the critical skills they require in order to complete their mission and successfully accomplish their goals (Naidu, Oliver, & Koronios, 1999). This is what is at the heart of the concept of “learning-by-doing”. Learning designs such as these focus attention on improving the quality of the student learning experience. They ensure that

the student learning experience is situated in authentic learning activities that reflect real life situations, that it is meaningful, and therefore inherently motivating for the student.

EXAMPLE: MASTER'S IN EDUCATION (CARNEGIE MELLON-WEST)

Carnegie Mellon University in the United States has recently embarked on developing a series of masters degree programs using the foregoing approach at its new campus in San Jose, California (see <http://west.cmu.edu/masters/ls/index.htm>).

One of these program is in Learning Sciences. This program is designed for the e-learning professional in either the corporate training or the school sectors. Its goals are to develop among students an understanding of the relevant economic and technological concerns, as well as the fundamental principles of human learning that underlie effective education and training. This program's curriculum is structured in a way so that it serves to model many of the design principles it teaches. Students work in teams as they would in a typical job setting. They receive frequent advice and feedback from experienced staff and other practitioners.

Curriculum design

Course development comprises the creation of authentic learning scenarios in the form of stories in which students take on key roles. This story is one that provides challenges of various sorts to students depending on the field being pursued. Each challenge relates to the one before and builds upon it. Students work on these problems and must usually build something or analyse something and report on what they have done. They work in teams with mentors readily available to point them in the right direction. Mentors teach Socratically, never telling, only suggesting directions, forcing harder thought about issues and criticizing submitted work. Work is submitted multiple times until it is right.

The story-centred approach represents a dramatic departure from traditional master's degree curricula, which tends to be content driven. The effect of the approach is that as students work through the story to achieve the missions the story puts forth, they learn the critical skills required to successfully accomplish their tasks. This approach is about the elimination of a curriculum that is content driven in favour of one that tells a story — a meaningful story in which the student takes on roles that he or she is likely to play in the real world after graduation.

The corporate track in the program, for instance is designed to provide students with a deeply pragmatic, active learning experience. From the outset, students are thrust into the role of learning consultants for a fictional company, and dive into a set of

realistic projects. In each project, they perform a series of tasks that typically include needs analysis, evaluating off-the-shelf and outsourced solutions, recommending e-learning infrastructure and delivery strategy, designing and developing customised solutions, and developing plans for learning-assessment. These projects vary along several dimensions, covering the teaching of soft skills and hard skills, use of both entirely technology-based solutions, and hybrid, human-mentored solutions, live, distance, and blended delivery options, and training for audiences ranging from entry-level workers to senior executives. Students also learn the “business side” of e-learning via strong emphasis on return on investment analysis, budgeting, and project planning and tracking. The academic track in the program is meant to emulate the real like experiences that someone working in a school might encounter.

Scenario Building

The building of scenarios to situate learning is not an easy or simple task. Good scenarios cannot be pulled out of thin air either. For them to be able to provide the opportunities for learning that the students need, learning scenarios have to reflect reality, which means that they have to be authentic. Furthermore they have to have the richness and variety in them that mirrors reality; otherwise they would fail to offer the opportunities for learning that students would need. More importantly, scenarios have to be interesting and motivating so that learners would want to be engaged with it. Here is a simple strategy that could be useful for developing meaningful authentic scenarios.

Steps in the process

- Step 1: Determine the career goals of the students.
- Step 2: Determine key attributes of the person who has achieved these goals.
- Step 3: Based on these attributes, develop the learning outcomes for your learners.
- Step 4: Determine the key events that might occur in the life of a person who has achieved these learning outcomes.
- Step 5: Develop a story that will be able to provide the opportunities for these events.
- Step 6: Develop the tasks that your students will be required to complete within the context of this story.

EXAMPLE OF SUITABLE STORY: DANCE ACADEMY

The *Dance Academy* is an internationally renowned school of dance. It is widely acclaimed for its very high academic and professional standards, quality of teaching, student intake and small classes. Getting acceptance into the Dance Academy is a

highly rigorous and competitive process. Students of dance from all over world aspire to gain acceptance into this school. Although the Academy continues to thrive and attract the best teachers and the best students over the years, it is beginning to face increasing competition from a number of fairly reputable dance schools. The Dance Academy (DA) cannot afford to rest on its past performance and glory. It must work hard to give its students the best and that too at an affordable cost; otherwise it risks losing some of the best students of dance to other equally good schools.

Problem: While the quality of dance instruction in DA remains excellent, several observers from within and without the Academy are concerned about the wholeness of the total learning experience that students encounter at the Academy. Many argue that, there is too much focus on dance instruction and not enough on other basic skills that professionals in the field will need to possess in order to survive in the world of dance. These are skills in reading and writing, music composition and professional ethics etc. Of course these commentators are right, but others argue that, all a good dancer needs to know is how to dance well, that's all there is to it. What good will being able to read and write in some language do to dancers, if that's not what they are going to do most of the time to be able to make a living in the field. The teachers at the Academy are equally divided over this issue and unsure of which path to take. Is it better to focus attention on dance alone and attract the best of the dancers, or to aim to offer a more complete education to its students while retaining high standards in dance?

Precipitating event: The foregoing dilemma that confronts the Academy was brought to a head recently when some Faculty members argued that one of the Academy's star dance students from the current cohort should not be allowed to graduate because he had not passed his courses in reading and writing. This event has obviously thrown the faculty and the Academy into turmoil as it raises the issue of what is important and what kind of curriculum it should have its students follow. It needs to resolve this controversy promptly in order to assure parents, a new crop of students and the profession that the Dance Academy is still the place to be, if you are aspiring for fame and fortune in dance.

Solution action: The good news is that the Dance Academy has decided to seek professional help with this situation. It has acquired the services of a consulting firm, which specialises in advising high profile educational providers such as DA on issues related to the nature of their curriculum, and their teaching and learning activities. DA's consultants are a group known as Learning Science Consultants (LSC) and they comprise a small group of experts covering all aspects of education and training. They too are widely known for their competencies and how they have been able to turn around the fortunes of many fledgling educational providers. So it seems that DA have sought to seek advice from the right people.

Your role: You are a very senior faculty member at DA and because of your more middle of the road approach on this issue; you seem to have the respect of the majority of the teachers at the Academy. You have been asked to set up a small task force of the Academy staff and work with LSC consultants. You will lead this project and draw upon whoever and whatever you will need to build consensus among DA staff and resolve the problem that confronts DA.

Example subject: The Teacher as a Professional

Step 1: Career goals of the students:

Able to demonstrate leadership within a professional context

Step 2: Key attributes of a graduate:

Able to adopt and display a rational approach to professional issues

Step 3: Learning outcomes:

Able to manage people

Ability to manage people in conflict

Able to build consensus

Step 4: Key events in the life of a graduate:

Identifying the problem and defining the nature of the problem

Exploring alternative solution strategies and adopting suitable strategy

Implementing solution strategy and managing its execution

Arriving at an amicable solution and validating the solution

Building consensus around the preferred solution

Step 5: Develop a suitable story:

The Dance Academy

Step 6: Develop the required tasks for students:

See the following

Assessment activities

In light of the learning outcomes of this course, students will be required to complete the following tasks. These tasks will also comprise the assessable items for the course.

Task 1: Identify and defining the issue

- *Goal:* As part of this, students are required to identify and articulate the nature of the problem or issue that confronts them in order to be able to demonstrate that they know how to approach a problem.
- *Output:* Statement of the issue or problem.

Task 2: Exploring solution strategies with LS Consultants

- *Goal:* This task will involve exploring various options with internal or external consultants, in order to demonstrate competency with problem solving.
- *Output:* Briefing document for LS consultants.

Task 3: Implementation of the solution strategy

- *Goal:* This task will comprise managing the consultation process in order to demonstrate competency at project management.
- *Output:* A schedule of activities with a time line and deliverables.

Task 4: Achieving a solution and validating the solution

- *Goal:* This activity will comprise the achievement of a solution in order to demonstrate ability to bring matters to a close within a specified timeframe.
- *Output:* Draft solution and a plan for its validation by the stakeholders.

Task 5: Building consensus around the proposed solution

- *Goal:* This task will entail the development of a plan to ensure stakeholder support in order to demonstrate competency with consensus building.
- *Output:* Plan for consensus building.

Task 6: The final proposal

- *Goal:* This task will comprise the development of the final proposal in order to able to demonstrate competency with accommodating the views of the majority.
- *Output:* Proposed solution that has the support of the majority.

CONCLUDING REMARK

If this approach to designing learning environments is that good, why aren't we all doing it? Simply put, because it is harder to develop, and it means more work for the teachers. Situated learning environments require a good deal of creative thinking on the part of the teachers, for instance, in the development of interesting and resourceful learning scenarios. It also requires thinking creatively about authentic, meaningful and enjoyable assessment activities for the students. These are time consuming and harder to develop than many of the conventional assessment tasks such as report and essay writing, and tests and examinations. Innovative assessment activities also mean more time needed by the teachers for marking and providing meaningful feedback to students.

Most teachers themselves are products of conventional learning and teaching practices and they feel more comfortable with those practices. Therefore they like to remain with what they are used to, and with practices and processes for which they have developed coping mechanisms.

Students also, not all of them, find situated learning environments all that attractive, because it means more work for them as well. These innovative learning environments require students to be fully engaged with the learning and teaching processes. Not all students are that enthusiastic about this level of engagement. Many would prefer to do the minimal amount of work that is possible in order to be able to get away with a pass mark. Many have already developed coping mechanisms for working with conventional teaching practices such as lectures and taking examinations. They are comfortable with these practices, which suit their increasingly busy lives that include study and several part time jobs in order to be able to support themselves.

On closer look however, we must ask if these are good enough reasons for neglecting innovative learning and teaching practices? This paper suggests that *they are not good enough reasons* for neglecting innovations with learning and teaching. To do so, would be to perpetuate a poorer quality of educational provision, which will lead to mediocre performance, incompetence, and untapped potential among both, teachers and students.

REFERENCES

Barrows, H. S., & Tamblyn, R. (1980). *Problem-based learning: An approach to medical education*. New York, Springer.

Brown, J. S., Collins, A., & Duguid, P. (1989). Situated cognition and the culture of learning. *Educational Researcher*, January-February, pp. 32-42.

Dewey, J. (1933). *How We Think: A restatement of the relation of reflective thinking to the educative process*. Boston: Heath.

Evensen, D. H., & Hmelo, C. E. (Eds.). (2000). *Problem-based learning: A research perspective on learning interactions*. Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Lave, J., & Wenger, E. (1991). *Situated Learning: Legitimate peripheral participation*. New York. Cambridge University Press.

Naidu, S., & Oliver, M. (1996). Computer supported collaborative problem-based learning (CSC-PBL): An instructional design architecture for virtual learning in nursing education. *Journal of Distance Education*, Pages, XI(2), 1-22.

Naidu, S., Oliver, M., & Koronios (1999). Approaching clinical decision-making in nursing practice with interactive multimedia and case-based reasoning. *The*

Interactive Multimedia Electronic Journal of Computer Enhanced Learning [On-line]. (<http://imej.wfu.edu/>).

Schank, R. (1997). *Virtual Learning: A revolutionary approach to building a highly skilled workforce*. NY: McGraw-Hill.

Schank, R. C. (1990). *Tell me a story*. Evanston, Illinois: Northwestern University Press.

Schank, R. C., & Cleary, C., (1995). *Engines for Education*. Hillsdale, New Jersey: Lawrence Erlbaum Associates. <http://www.ils.nwu.edu/~e_for_e/> Engines for Education ("hyper-book").

Schank, R., Fano, A., Jona, M., & Bell, B. (1994). The design of goal-based scenarios. *The Journal of the Learning Sciences*, 3(4), 305-345.

The Cognition and Technology Group at Vanderbilt (1990). Anchored instruction and its relationship to situated cognition. *Educational Researcher*, Volume 19, August-September, No 6, pp. 2-10.

The Cognition and Technology Group at Vanderbilt (1991). Technology and the design of generative learning environments. *Educational Technology*, May, pp. 34-40.