

Design of Rich Learning Environments for Diverse Learning Contexts

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Background

The profound impact of ICT on all aspects of human interaction has also created a general agreement that education and learning methodologies need to also change from models and practices of the pre-ICT era. Interconnectivity, available of all information everywhere, and its potential accessibility to everyone, with new modes of processing, understanding and modelling tools have brought about a situation, in which 'learning' needs to be organized differently, than the current dominant model of 'physical infrastructure based institutionalized teaching' as represented by the physical school system.

The key findings of a major Learning Sciences research project on 'Optimising Learning' by the Centre for Educational Research & Innovation (CERI) of OECD, in 2008 led to the following recommendations:

'The most effective learning environments will have the following characteristics:

Customised Learning

Each child receives a customised learning experience.

Availability of diverse knoweldge sources

Learners can acquire knowledge whenever they need it from a variety of sources: books, websites, and experts around the globe.

Collaborative Group Learning

Students learn together as they work collaboratively on authentic, inquiry-oriented projects.

Assessment for deeper understanding

Tests should evaluate the students' deeper conceptual understanding, the extent to which their knowledge is integrated, coherent, and contextualized.'

While there is general agreement that the current schooling system needs to undergo a major transformation, and there are many experiments world-wide to find better sytems for organizing learning, there is yet to emerge a model which works to meet all the different learning needs:

'The science of designing learning environments is currently remarkably under-developed (Feilden R, *The Impact of School Environments: A Literature Review*, 2005)'. There is thus a major need worldwide to define the characteristics of 'Rich Learning Environments' and the way physical infrastructure of the current school system can be transformed into rich learning environments. While 'anywhere-anyplace-free for anyone' online learning models are emerging; they cannot be a substitute for real life learning in the real world, as physicality, collaborative learning together with other learners, and experiential learning cannot be fully substituted by an education system based on virtual learning, and individuals learning alone.

Meaning of two terms needs to be elaborated before proceeding further: 1. Physical Infrastructure Based Institutionalized Teaching; and 2. Rich Learning Environment.

Physical Infrastructure Based Institutionalized Teaching

This term is used to describe the current dominant model of imparting education in physical campuses, which have various buildings or a building complex for various functions of carrying out teaching of selected students; including the administration function. The teaching normally is carried out by appointed teachers to perform the act of educational content delivery to students in class-rooms or laboratories. The students are segregated in various classes according to the educational programme, where various subjects are taught according to a specified curriculum by allotting time for various subjects. Educational delivery for various subjects by the teacher is in time slots called 'periods', usually of 45 minutes to 1 hour duration.

Classrooms are one of the most common environments for imparting education, and the physical infrastructure of the classroom usually consists of benches and seats for students in an arrangement in which they sit facing the teacher and the blackboard. All classrooms are usually the same by way of physical infrastructure; and are usually empty rooms with furniture where teaching sessions can be held. In such an environment, the learning activity is only activated by the presence of the teacher in the classroom, as the empty classroom does not by itself support any learning. Students sit idle waiting for the teacher. Being teacher-dependent, the quality of education is directly related to the quality of the teacher, and the manner in which they teach. An absent or indifferent teacher, or a poorly trained teacher can severely affect the learning outcome. Shortage of good teachers puts a severe limitation on the quality of education delivered in such schools.

To run and administer the functions of teaching, in such schools the activity of imparting education is institutionalized by a framework of rules and procedures framed by the school as well as the board of examination it adopts: time-tables, teaching pattern, assessment, allocation of various students in various disciplines, rules for examinations and proceeding further in one's education. The rules and controls are primarily framed to facilitate the act of teaching.

The flaws of institutionalized teaching have been written about by many scholars and pedagogists, the primary argument against this system being its lack of efficiency in producing excellence, and poor results by its own examination system. The true function of educational establishments should be 'to support' the learning process. However, in institutionalized teaching, the main function becomes a 'control function' where every aspect of the learning process is controlled by the school. Such a system is not capable of delivering the desired outcome of producing highly creative individuals with their own aspirations, according to the needs of the knowledge era, in which the innovative and creative ability of its citizens is the most important wealth generating asset of a nation.

Rich Learning Environments

A rich learning environment is that which abundantly supports learning, whether a teacher is present or not. Such environments are active, dynamic and full of stimuli and opportunities of many kinds, so that a learner can self-learn many things just by being in it, through the acts of observation and active engagement with the environment. Presence of other learners in the same environment increases the pace of learning. Examples of rich learning environments are forests and flower gardens (where one can learn a lot by just observing), playgrounds, activity clubs, markets, laboratories, libraries etc. Learning groups working together to learn about a specific phenomena of their interest would learn more effectively if the learning is carried out in an appropriate learning environment for that field of activity.

An important distinction needs to be made between the activity of ‘Teaching’ which needs a teacher for any learning to happen, and ‘Learning’ which needs only the learner with interest in a specific activity. While the path of online virtual learning will continue to have its value in the emerging scenario for educational delivery and will grow; a very important activity is to transform all the existing institutionalized teaching institutes for various disciplines and vocations into rich learning environments; so that a new and more effective eco-system for learning is created.

A Project to define Rich Learning Environments

It is proposed that a major effort be directed towards comprehensively defining and detailing out the components of rich learning environments, added and enabled by ICT to replace current institutionalized teaching. The attempt should be to define this across the whole learning spectrum and for all learning contexts: from pre-primary to post doctoral and life-long learning. This act of defining the components in the form of detailed manuals of operations and procedures, will enable not only transformation of current educational institutes; but will also help in planning future learning environments and policy planning for human resource development. **The transition will be from the current and boring ‘single goal and fixed learning outcome’ nature of present educational systems to a ‘multi-goal and unpredicated outcome’ nature of organic growth systems – a model based on nature’s design which keeps the world so interesting all the time, by a combination of diversity, infinite variety and unpredictability.**

The project activity can be initiated with teams carrying out research and formulation of guidelines in specifically chosen representative learning disciplines to cover the entire learning spectrum. Specific approaches, methodologies, objects and components of physical infrastructure will have to be developed and documented as an outcome of the learning research.

While the purpose of education in the Material and Physical economy is to produce skilled workers to run the social system, equipped with needed proficiencies in various domains; the purpose of education in the Knowledge Economy shifts to providing the ideal environment for development of highly creative and innovative individuals, who will pursue their own paths according to their innate inclinations and excel in them. This constitutes a qualitative change in the capability of a nation, where excellence in innovation and problem solving is a core requirement for wealth creation.

Through the thousands of years old Indian tradition and practices of creating an enlightened mind, we in India have a unique advantage in proposing general solutions to this problem; which is the centre of attention of education planners throughout the world today.

Core Research Objective

To understand the nature of rich learning environments across the entire learning spectrum; and help create them for different learning contexts.

Value of Work

Developing a national capability to lead in the knowledge economy to ensure prosperity for themselves is the most urgent problem for nations and societies worldwide at the present time of transition from material era to knowledge and creative era. Thus, the solutions as the outcome of the results of this research will be applicable and be of interest universally, and will be of great value not just to those entrusted with human resource development at policy level; but to all current educational institutions, schools and universities, who will be able to achieve the transformation making use of the current physical infrastructure already created. As the results would constitute a way of organizing learning

which will be applicable to all learning contexts, the results will be applicable to all curricula and examination boards.

In the process of comprehensively defining components and processes of rich learning environments, one of the objectives should be to ensure the scalability and replicability of the solutions, so that they may be adopted for mainstream national education programme, and be implementable in current state-run educational infrastructure.

Explaining the Research Rationale


The relevance and the rationale for conducting the proposed research are explained with the help of the two tables below.

The first table shows the varying amount of emphasis in learning different abilities: from learning which involves almost entirely training of the body and bodily reflexes through physical body exercises which develop specific capabilities. For example a juggler has to primarily train the body to be able to develop the special skills which a juggler needs to possess. The learning environment which develops bodily skills will largely consist of practice sessions, physical conditioning, and the necessary muscle and suppleness building along with stamina. There would also be required a mechanism for providing feedback and tips for improving performance, and specific exercises to eliminate the flaws in technique and to fine tune the skills.

On the other hand, the learning environment for those inclined towards becoming philosophers will largely need to support and provide the spaces for discussing and reflecting; where matters of philosophic enquiry can be reflected upon and debated, as one develops a position, world view and point of view. Zen monasteries are good examples of such environments where one lives a simple life free of all distractions and cultivates a reflective attitude.

Present institutionalized teaching set-ups usually tend to have the same structure and approach for all learning; and also a single outcome objective. For example, engineering colleges would only teach engineering in a chosen branch specialization; and neglect development of other potentials and inclinations of the learner. However, most human beings have multi-dimensional and multi-disciplinary inclinations, and to bring out the full flowering of the individuals, which will allow them to develop all their latent potentialities: for examples to be a juggler, doctor and poet at the same time and to excel in all three; will need a radical restructuring and reorganizations of the learning environments.

Learning Matrix 1: Body - Mind Gradient

Body 		Mind		
Sportsmen	Performers	Engineers	Mathematicians	Philosophers
Jugglers	Actors	Doctors	Theoretical Physicists	Thinkers
Gymnasts	Dancers	Industrialists	Economists	Monks
Trapeze Artists	Musicians	Technopreneurs	Planners	Poets
Climbers	Singers	Artists	Social Scientists	Writers
Divers	Calligraphers	Craftsmen	Politicians	
Contortionists	Magicians	Designers		

The second table shows the matrix of occupations from service occupations to knowledge occupations. On the one end are unskilled service activities such as loading or cleaning, where only the physical capability is being used to provide a service. This is the lowest value occupation for a person – where one carries out an activity as ordered or directed, and no intellectual involvement in carrying out the activity. As the nature of skills required to perform a service become more, the value of the service provider increases, for example the value of a mason is more than that of a brick loader; and that of an architect more than that of a mason. The value of the skills of a heart surgeon are hugely more compared to that of plumber, because of the complexity and the demanding nature of acquiring the skills of a heart surgeon. The main purpose of the current education system is to provide this skill training at various levels in an individual’s development, whose primary aim is to work as a service provider.

The value of knowledge providers is always more than that of service providers in any domain. In knowledge societies, the most valuable are the enlightened people, the innovators and creators which represent the evolutionary spirit of humanity. They become the leaders and are the most important assets of a nation, and also the most valuable wealth creators.

Increasing the proportion of the creative people in a nation, has thus become a major priority in the Knowledge Economy, as it is recognized that the higher the proportion of creative people in a population, the more rich that population will be by its intrinsic higher capability to solve problems through creativity and originality. The models of future learning environments world-wide are now being developed with the objective of increasing the ‘creativity’ of a nation as the objective with the highest priority. Education systems in many developed countries have already shifted to this re-prioritizing of the objectives of their education systems; where ‘nurturing creativity’ function takes priority over ‘skill imparting’ to provide a service. Such a shift has already become mainstream in schools in Japan, South Korea, Taiwan and China; who have modified their learning programmes by adopting systems which promote nurturing of individual creativity.

Learning Matrix 2: Service Occupation – Knowledge Occupation Gradient

Service Activities			Knowledge Activities	
<i>Unskilled</i>	<i>Semi-skilled</i>	<i>Skilled</i>	<i>Professionals</i>	<i>Enlightened People</i>
Loaders	Workers	Technicians	Managers	Seers
Lifters	Assistants	Equipment Operators	Finance	Innovators
Cleaners	Support Staff	Nurses	Designers	Creators
		Pilots/Drivers	Engineers	
			Doctors	

However, as mentioned earlier, the science of creating learning environments for different learning needs is still under-developed; and the proposed research project should aim to provide blue prints and manuals which will provide detailed instructions for these; for different learning levels and learning contexts.

Finding General Solutions

Understanding what would be the best learning environment for a specific occupation, covering the entire spectrum of learning objectives, should be the primary objective of research. The insights will be gained through visits to proven learning environments; discussions with experts and those with insights in nurturing specific disciplines; field trials to validate specific research hypotheses and combining the insights to compile them as a set of recommendations which can be applied across various learning contexts at various levels. It is envisaged that general solutions will result for various main categories, which could then be easily applied to economic, cultural or linguistic variations in the main category through appropriate customisation tools provided in the recommendations.

Outcomes

The following can be expected to be the main outcomes of the research activity:

1. Detailed manuals for creating rich learning environments for various learning contexts, which will ensure both excellence in learning and creativity presented with full implementation and execution details. The manuals will provide detailed instructions on how to create rich learning environments for learning various things, such as music or maths or computer science or cookery; including planning the learning paths and methodology for creating a culture of creativity, which is quite different from the methods of institutionalized teaching where the primary goal is transfer of knowledge. It is expected that this transformation of current campuses will be the key to keep the advantages of learning in a physical campus for the learners with different learning aspirations.
2. Development of a wide variety of new enabling products and technologies which will be required for creating rich learning environments.
3. Establishing a constantly growing reservoir of wisdom on meeting the learning needs of knowledge economy.

Reference:

Innovating to Learn, Learning to Innovate, Centre for Educational Research and Innovation, OECD (Organisation for Economic Co-operation and Development), Paris, 2008