

THE SCIENCE OF LEARNING: NEED THE BEST PRACTICES IN SRI LANKAN EDUCATION SYSTEM.

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ABSTRACT

All children are capable of learning, although there are individual differences among children, they have the potential to express their abilities in appropriate fields according to their ability and capacity. An understanding science of learning and discipline is essential in performing these tasks. Quality of learning is more important than quantity of learning. All teachers should be concerning with accepting and understanding the science behind learning and teaching to raise the quality of teaching and learning. There are significant differences between national and modern concept of learning and teaching. Western concept and processes related to learning and teaching emphasize psychology, which means that the learning and teaching process is approached from a scientific perspectives Traditional thoughts on education highlights the “Teaching is an Art” Teachers need to have a good understanding of the educational psychology and science of learning behind learning and teaching to maximize learning effectively. In particular, teachers need to integrate Abraham Maslow's hierarchy of needs heir importance in to this process. According to our observations, a significant number of teachers fail to apply those methods in the classroom practices Students are seen with various apprehensions (Kayalazhi) regarding school rules and teaching activities of teachers. These fears about learning are important factors affecting the effectiveness of learning. Unfavorable teaching practices, corporal punishment unfriendly interactions loud conversations create classroom and school-related fears in students. Physically painful corporal punishments negatively affect children's affect physically and mentally functioning and psychology Teachers should learn well the psychology of learning proposed by psychologists and use them effectively in learning and teaching activities. In this background this study is comparing the nature and practices of Sri Lankan Education in System.

Keywords: Science of learnig, Education, System, Sri Lanka, practices.

BANKING SYSTEM IN LEARNING

The banking concept in education proposed by educationist poullo friary said leering is not merely memorizing information. Banking concept mean teachers deposit knowledge in the classroom and students are expected to reproduced those knowledge ad information in examination. Students learn to read books but do not use the knowledge they acquire for social development. Instead this concept poullo freire express the view that to provide the skills to solve the problems that arise in day to day life. But unfortunately our education system pays more on cognitive domain Curriculum, teaching and assessment activities are mostly knowledge-centered. Paulo freire indeed, learning should be mostly concrete on delivering experience. For example, learning driving y reading a book cannot give enough experience for driving

Learning occurs when a relatively permanent change in a person's behavior, cognition, brain activity, skills, or knowledge results from experiences. Advances in neuroscience over the past two decades have revolutionized the way we think about the connection between learning, emotion, and the brain. Learning is shaped by our experiences. Experiences are caused by external stimuli that are perceived by our senses and conveyed to our brain for processing. However, the journey of our experience is not as simple as it seems.

Assessing learning progress rather than assessing the end result can encourage students to move away from memorization to meaningful learning that goes beyond exams. Meaningful learning can be promoted through systematic and appropriate planned learning designs that encourage students to take experimental and exploratory approaches and take risks and make mistakes without harming their grades. Also, assessments throughout the learning process and not just at the end use multiple sampling points and low-risk tasks

Human development is based on nature (genetics), nurture social and their interactions (epigenetics). These factors play an essential role in learning processes and the reorganization of neuronal networks to create neuronal representations of new knowledge. Learning and training new knowledge or skills evoke specific and repeated activity patterns, and in the process of Hebbian neuroplasticity, neural pathways are reinforced by the strengthening of specific synapses, while less functional ones are eliminated (Kass & Jain, 2000; Mundkur, 2005).

Psychologist Vygotsky introduced the zone of proximal development (ZPD) in education. According to the ZPD, learning and development depend on an optimal balance between support and challenge which should be tuned and tailored for each learner based on their specific developmental stage. The ZPD model was revolutionary, as it emphasized the importance of the educational environment (nurture) in unlocking the internal potential (nature)

of students, and it placed the learning process as the central educational goal. Some decades later, the biology of learning revealed a beautiful alignment with Vygotsky's theory—with evidence showing that brain neuroplasticity is highly affected by environmental conditions and the balance between demands (challenge) and available resources (support). The impact of stressors on learning can be constructive or destructive depending on the intensity, duration, and accumulation of the stressors and the coping mechanisms and support that one has.

LEARNING MOTIVATION AND REWARD

Learning and adaptation are essential for surviving and thriving in dynamic environments. The brain evolved to make sense of information from our external and internal environments and to produce adaptive behaviors that promote survival. The brain is, therefore, a learning machine by nature, and learning does not require external initiation. However, learning is highly experience-dependent and can be directed and enhanced through education. The brain reward system evolved to reinforce effortful behaviors that are essential for survival (e.g., foraging, reproduction, and caregiving). Such behaviors activate the dopaminergic system associated with reward and motivation. The hormone/neurotransmitter dopamine is a central player in reward-motivated behavior and learning through the modulation of striatal and prefrontal junction's. The human brain reward system balances between (limbic) impulsive desire and (cortical) goal-directed wanting to guide flexible decision-making and adaptive motivational behaviors.

HIPPOCAMPUS AND LEARNING

The hippocampus is a small, curved formation located deep in the temporal lobe of the brain. As part of the limbic system, the hippocampus has three primary functions: forming new memories, learning, and emotions. It is susceptible to damage from injury, stress, and disease, including psychiatric and neurological conditions such as Alzheimer's, schizophrenia, and depression. The hippocampus plays a critical role in the formation, organization, and storage of new memories and in connecting certain sensations and emotions to these memories. It also plays an important part in the recall of emotional memories. Have you ever noticed how a particular scent might trigger a strong memory? It is the hippocampus that plays a role in this connection.

The main functions of the hippocampus involve human learning and memory. It is a part of the brain found in the inner folds of the temporal lobe. Knowing about the hippocampus has helped researchers understand how memory works. In people with severe depression, the hippocampus has less volume. Scientists are unsure whether the small size results from depression or if it is a contributing factor. Evidence suggests that stress may cause Trusted Source a negative impact

on the hippocampus. Some of the signs of damage or injury to the hippocampus include: Changes in cognitive functioning, Mood dysfunction, Problems storing memories, Difficulty recalling long-term memories, Spatial disorientation and getting lost in familiar places, Losing or misplacing items often, Problems following directions, Problems with decision-making, Difficulty carrying on conversations

WAYS TO BRING BRAIN SCIENCE INTO THE CLASSROOM

As early as infancy, the human brain is developing its response to stress and risk, known as “fight or flight”. When a brain learns early that in times of stress (hunger, tired, cold) the bodily needs will quickly be met, the amygdala develops a healthy response to stress that allows it to endure that stress, anticipating a positive response. When a brain is not developed to anticipate a positive response (for example, in response to hunger the caregiver yells or worse without providing food), the amygdala develops a defense mechanism that lacks trust in a risky situation.

As an educator, we are hopefully quickly mirroring this in your classroom, recognizing that if the second developmental path occurs, student brains may not be able to persevere through the rigorous tasks you pose to your students that require academic risk taking and discomfort.

What is learning? How does it work? On this course you try and answer these questions, exploring how you can use the science of learning to inform your teaching and support your students’ learning. Drawing upon educational neuroscience and psychology (and combating neuroscience myths), you will learn how to interpret research to be better informed about how your students learn. Throughout the course, you will reflect on your own practice as a teacher, learning how to justify and improve your approach.

The Science of Learning studies how people learn and retain information. Applying this science in the classroom helps students acquire 21st century skills and competencies that they can recall and use in the future, whether in class as a foundation for new concepts, in assessments to demonstrate learning, or in careers to excel professionally.

Ultimately, teaching intends to ensure students are ready for their future endeavors, and their stored memory of learned information will be essential in doing so. Moreover, optimizing memory is key to unlocking a student’s learning potential. And the Science of Learning uses memory science to develop researched best practices for quality curriculum, assessments, and lesson plans that enhance student learning.

The Science of Learning does not encompass everything that new teachers should know or be able to do, but we believe it is part of an important and evidence-based core of what educators

should know about learning. Because our scientific understanding is ever evolving, we expect to periodically revise The Science of Learning to reflect new insights into cognition and learning. We hope that teachers, teacher-educators, and others will conduct additional research and gather evidence related to the translation of these scientific principles to practice.

WHAT DOES THE SCIENCE OF LEARNING MEAN FOR TEACHING?

The Science of Learning appeals to the neurological process of learners through hands-on, multi-modal, and personalized content with application exercises, assessment, and scaffold instruction to practice recall. This targets the prefrontal, sensory, and limbic systems in the brain as maximum learning occurs when these three areas of the brain are activated. The prefrontal cortex oversees the memorization of information (encoding) and the retrieval of memories (recall); the sensory system processes information (encoding) and passes it to other systems; and the limbic system manages memories (storage).

So we as teachers should not just be experts in what to teach our children. Therefore, to make it a lasting learning and a useful education for life, they should understand the science of learning and become experts in it become a caterer of students' psychological needs. Instead of resorting to corporal punishment, we must seek to find wiser ways to promote learning and discipline. Internal health should be taken care of from early childhood. Better mental balance is essential for behavior modification.

NATURE AND EXISTING PRACTICES IN SRI LANKAN EDUCATION SYSTEM

Quality inputs in teaching and learning In addition to providing education free of tuition costs in all government schools from grade 1-13, the government provides all children from grade 1-11 free schools and a set of free textbooks each year. Discussions and questioning emerged as two of the more successful areas of teacher performance which may have facilitated student teacher interactions as well as student –student interactions. However, the overall conclusion of the study with regard to student participation was that the opportunities for student participation through peer interaction and interactions with the teacher were less than desirable in all classes. also found that various teaching-learning factors such as ‘uninteresting/poor teaching’, ‘apathy of teachers’, ‘harsh punishments such as ‘ making children kneel in the hot sun’ and ‘teachers not allowing children to play’ had led to increase non-attendance of children in school. The study on out of school children also revealed that the reasons given by care givers (25.4%) and children who had dropped out (22.3%) were related to ‘lessons are boring’, ‘no interesting activities’ and ‘limited use of audio-visual teaching’. The report further mentioned that the

reactions of the children reassured that the teaching learning process prevalent in the classroom was a one way passive process. Some children who were weak in studies had dropped out or were at risk of dropping out due to negative experiences such as punishments, ridicule and discrimination and lack of attention from teachers. The negative attitudes of teachers were attributed to the social distance between the teachers and families and their lack of empathy and understanding of their living conditions. On the other hand developing social skills related to leadership, team work and building mutual trust among diverse ethnic, cultural and religious groups are the main areas in the social environment that need concern and attention. The examination oriented student behavior has hindered the expected goal of education i.e. total development of the child and has created too much of an academic bias (World Bank, 2007) and increased an undesirable competition and coaching for examinations among students especially at the secondary education level. Also students are entitled to subsidized transport in public buses and trains. Further, primary school children in poor and disadvantaged areas receive free meals. In the same report, the difficulty in enhancing the allocation of resources to high level quality inputs, such as IT centers, science laboratories, libraries, workshops, activity rooms, multi-purpose rooms, computers, books, journals, audio-visual aids, educational software, equipment and tools in schools and universities; and 23 improving the supply of basic facilities, such as water supply, sanitation and electricity, in rural and estate schools was emphasized (World Bank, 2004). Lekamge and others (2008) reported that the percentage of learning outcomes and the activities focusing on Higher Order Cognitive skills was somewhat low in Science, Mathematics and Mother Tongue in instructional materials of Grade 9 and the emphasis of teaching was mainly on concept analysis. In another study, it was revealed that the Science curriculum is overloaded and cannot be covered during a school year (McCaul, 2007, Dissanayake and Sonnadara, 2011, NEREC study 2002) also found that material introduced under new Educational reforms were too teacher centered thereby stifling the creativity and initiative of teachers and students. The study conducted by Gunawardena, Wijetunge and Perera (2003) had revealed that New subjects in the curriculum i.e. Environmental Studies, lack clear objectives are not integrated into science and social studies with no competent teachers to teach. With regard to Science and Technology, the limitations identified were that the two subjects have been hastily and artificially integrated and teachers were not clear why or how technology was included. Practical and technical skills in the curriculum have been seen as a positive change. There was no integration within the subject or with other subjects. Classrooms were found to be conducive to activity based learning (NEC, 2003: 37). The study found that the expected transformation in the learning-teaching process had not taken place in many schools.

Many classroom activities were seen to be desk, blackboard, book and teacher centered with few opportunities for creative activities and flexibility in movement. Teachers have not fully understood the competencies and competency levels and Teacher Instructional Manuals do not provide adequate guidance on the evaluation of competencies. Utilization of these inputs. The thousand school project also has a strong emphasis on developing teaching –learning facilities including IT facilities of the selected schools. Therefore, the recent developments in the decentralization of responsibilities and funds to schools for the quality inputs might change existing situation in those schools. Teachers’ qualifications According to the statistics of the Ministry of Education (2012) there are 223,333 teachers in the school system to be engaged in the teaching –learning process the majority (57.4%) of teachers are trained in different subject areas such as Primary, Science, Mathematics, English, Agriculture, PT etc. However, there are no minimum qualifications for teaching appointments and subsequently there have been deviations from policy of recruiting teachers with GCE/AL attainment and professional qualifications. The expectation on making teaching an all graduate profession is far from realization.

Rural schools in difficult areas find it extremely difficult to teachers for main subjects. The ministry of Education and Provincial Councils have introduced certain mechanisms such as giving faster promotions to teachers serving in disadvantaged schools, providing accommodation for those teachers and selecting candidates for trainee positions from the districts which experience teacher shortages.

According to a World Bank report (2011) there has not been a focused programmer to improve quality education at the secondary school level and certain weaknesses had hampered the promotion of learning. The report emphasized the need for rationalizing construction activities in the school system, devoting greater resources to expanding and increasing urban schools, enhancing the allocation of resources to high level quality inputs, such as IT centers, science laboratories, libraries, workshops, activity rooms, multi-purpose rooms, computers, books, journals, audio-visual aids, educational software, equipment and tools in schools and universities, improving the supply of basic facilities, such as water supply, sanitation and electricity, in rural and estate schools. The survey also confirmed that many rural schools operate without separate classrooms, libraries, play grounds, laboratories, music room, IT room and other facilities whereas the popular schools have all the facilities they need in several numbers.

Classrooms in Sri Lankan schools are overcrowded and congested, thereby stymieing activity-based learning. Some schools are reported to have more than 50 students even in primary

grades. The study conducted by Gunawardena, Wijetunge and Perera to evaluate the effectiveness of the implementation of Educational Reforms (2003) revealed that teachers were of the view that they were not provided with the recommended classroom facilities and student numbers which may have led to difficulties in arranging classrooms to suit the teaching and learning process. Space in the classroom is inadequate. It is not possible for the teacher to go near the students and for the students to come to the front of the classroom. Desks and chairs are kept close together. No space for group activities. Number of students is large.

Unavailability of basic facilities in schools is a critical issue. It was surprising to find that adequate water and sanitation facilities and good hygiene practices are lacking in almost 50% of schools (World Bank, 2011) in the country. According to the School Census data, about 49% of schools did not have adequate toilet facilities and 18% were without adequate water supply (World Bank, 2011) which may have affected directly the rights to hygiene of the students in these schools. MoE, (2011) also confirmed that the facilities are in a serious deficit in 18.3% schools while in 30.4% schools sanitary facilities are not adequate. There are huge gaps in the implementation of principles of equity and equality in educational opportunities especially in geographically disadvantaged areas. Further, there are concerns that the quality of education is poor in very small schools which located in rural areas.

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