



Primrose School
(A Unit of the Mother's Service Society)



Future Education Conference

January 28, 2018, Pondicherry, India

AGENDA LIST OF SPEAKERS PAPERS



MindMingle
inspiring schools to be innovative.



Future Education Conference

January 28, 2018 – 9:00 am to 5:30 pm
Anandha Inn, Puducherry

CONFERENCE AGENDA

8:30 – 9:15 **Conference Registration**

9:15 – 10:15 **Aims of Education**

Special Video Message from Students

Moderator/Speaker: Jareena Begum

Speakers:

- Garry Jacobs – New Paradigm in Education
- Ashok Natarajan – Aims of Education
- Vidya Rangan – Essence of Educational Inspiration

10:15– 11:00 **Person-centered education**

Moderator: S. Devakanni

Speakers:

- Shakeel Ahmad – The lost 'Why?' of our school system
- L. Kannan – Student-centered Learning
- Ritu Kohli – Preparing for Future Challenges of Life - Emotional and Social Skills
- Ranjani Ravi – International Trends

11:00 – 11:30 **Refreshment break**

11:30 – 12:15 **Employability & Entrepreneurship**

Moderator: K. N. Shoba

Speakers:

- G. Senthilkumar – Enhancing Employability
- S. S. Sreejith – What Employers Want
- S. Sairaman – Accelerated Technical Training
- Senthil Inbarajan – What Steve Jobs didn't learn at school
- Ramesh Kumar – Developing Entrepreneurs

12:15– 1:00 **Active Learning**

Moderator: R. Sujatha

Speakers:

- K. Srinivas – What Ought to be the Aim of Education?
- P.P. Mathur – Role and Responsibilities of Teachers
- M. Chandrasekaran – Earn while you Learn
- Latha Chandrasekaran – Memorization and Understanding

1:00 – 2:00 **Lunch**

2:00 – 3:00 Contextual Language Learning Strategies

Moderator: L. Kannan

Speakers:

- M. Gayatri – Early Childhood Learning
- Shweta Rangan – Holistic Contextual Learning
- S. Devakanni – Teaching Etymology
- Vasugi Balaji – Speed Reading and Composition
- Janani Ramanathan – Using Literature in Teaching

3:00 – 3:30 Innovations in Math & Science Education

Moderator: Vidya Rangan

Speakers:

- Vani Senthil – Basic Contextual Math
- Yogaraj – Math Science Education

3:30 – 4:00 Refreshment break

4:00 – 5:00 Value-Education and Higher Education

Moderator: Kanimozhi Arasi

Speakers:

- Arulmozhi Arasi – Success stories
- A. Vijayakumar – Character Education
- T. Sudha – Community development as a part of curriculum
- Gaurav Nigam – Early Childhood Education

5:00 – 5:30 Toward a New Educational Paradigm– open discussion & concluding remarks

Moderators:

- *Garry Jacobs*
- *Vidya Rangan*

Speaker: Naveen Sharma

Vote of Thanks: Sunita Prasad

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LIST OF SPEAKERS

1. Shakeel Ahmad, Co-founder, Mind Mingle, New Delhi
2. Arulmozhi Arasi, Programme Director, SpellBee International, Chennai
3. Ashok Natarajan, Secretary, The Mother's Service Society, Puducherry; Fellow, World Academy of Art & Science
4. Vasugi Balaji, Research Analyst, The Mother's Service Society, Puducherry
5. Jareena Begum, Principal, Primrose School, Puducherry
6. Latha Chandrasekaran, Senior Research Fellow, The Mother's Service Society, Puducherry
7. M. Chandrasekaran, Project Director, The Mother's Service Society, Puducherry
8. S. Devakanni, President, SpellBee International, Chennai
9. M. Gayatri, Vice Principal, Primrose School, Puducherry
10. Senthil Inbarajan, Software Professional, US
11. Garry Jacobs, CEO, World Academy of Art & Science; CEO, World University Consortium, USA; Vice-President, The Mother's Service Society
12. L. Kannan, Former Vice Chancellor, Thiruvalluvar University
13. Ritu Kohli, Principal, Eicher School, Faridabad, Haryana
14. Ramesh Kumar, Chief Executive, Chem Coats Ltd., Chennai
15. P.P. Mathur, Head of Department of Biochemistry and Molecular Biology, Puducherry University; Former Vice-Chancellor, Kalinga Institute of Industrial Technology, Bhubaneswar
16. Kanimozhi Arasi, Senior Content Analyst, SpellBee International, Chennai
17. Gaurav Nigam, Director, Modern International School, New Delhi
18. Sunita Prasad, Teacher, Primrose School, Puducherry
19. Janani Ramanathan, Associate Fellow, World University Consortium, Chennai
20. Shweta Rangan, Teacher, Primrose School, Puducherry
21. Vidya Rangan, Director, Primrose School, Puducherry
22. Ranjani Ravi, Associate Fellow, World Academy of Art & Science; Associate Editor, Cadmus Journal, Chennai
23. S. Sairaman, Project Director, Consortium for Indian Information Technology Education; Advisory Committee Member, LMS –NeGd, Digital India, Chennai
24. G. Senthilkumar, Chairman, Helikx Open School, Salem
25. Vani Senthil, Research Analyst, The Mother's Service Society, Puducherry
26. Naveen Sharma, Director, Mind Mingle, New Delhi
27. K. N. Shoba, Assistant Professor, Anna University, Chennai
28. S. S. Sreejith, CEO, Global Institute of Integral Management Studies, Kochi

29. K. Srinivas, Professor of Philosophy, Dean (i/c), College Development Council, Puducherry University
30. T. Sudha, Principal, TVS Academy, Tamil Nadu
31. R. Sujatha, Teacher, Primrose School, Puducherry
32. A. Vijayakumar, Founder-President, I.N.D.I.A. Trust, Chennai
33. Yogaraj, Director of LOCUS Institute for Math-Science Education, Puducherry

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Welcome Speech

Jareena Begum

Principal, Primrose School, Puducherry

Education means the first step for the child into the world outside his home. Ideally, children should be enthusiastic to come to school, a place where they find fun and joy of learning. They are entering a new world with abundant love and curiosity. But in our country, what we emphasize in the early years is the skill of reading, writing and simple arithmetic. In the class and for daily homework, repetitive writing is being assigned for 3 1/2 year olds. How will a child express her love, imagination and creativity in such a condition?

At Primrose, we have been experimenting different ways in which this ideal kind of education is made possible. Our founder, Sri Karmayogi's dream of providing the best possible education in the most joyful way, is what we have been tirelessly working for. Our policies are based on the teachings of Sri Aurobindo and the Divine Mother.

What Kind of Education does India Need?

Garry Jacobs,

*Chief Executive Officer, World Academy of Art & Science and World University Consortium (USA);
Vice President, Mother's Service Society, Pondicherry (India)*

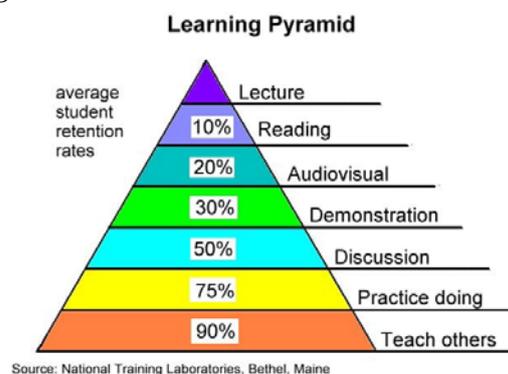
Education is humanity's most powerful instrument for human development and social progress. Imagine an educational system that fully prepares today's youth in India for high achievement in personal and professional life and to make a significant contribution to the emergence of India as a world leader in productivity, innovation, creativity, social welfare and well-being. What would the system look like? What would be its aims and objectives? What would be its content and method of instruction? How would it differ from the educational system prevalent in India today? These are questions that need to be addressed seriously for the Indian people to realize their full potential and for the Indian nation to attain a leadership position in global affairs.

Memorization of facts in order to pass examinations may have been adequate to perform specialized administrative duties for the British Raj in India prior to Independence, but it cannot prepare the youth or the nation for dynamic progress in the 21st century. The current system is based on the notion that knowledge is a commodity that can be transferred from teacher to student or a vaccine that can be injected into passive willing students by inoculation or indoctrination. Students learn faster and better when they are encouraged to understand rather than to memorize. Students from Finland rank at the very top of standardized international test score results through a person-centered, active and interactive, peer to peer, contextual hybrid learning system that focuses on the development of the student's capacity for comprehension rather than memorization and regards test score performance as unimportant. Many of Finland's classroom practices can be readily adapted and applied in India.

1. Active, Cooperative, Peer-to-Peer Learning

The traditional classroom model of education was developed 1000 years ago – long before the invention of the printing press, printed books, radio, motion pictures, TV and the Internet. It broadcasts information from one to many. The teacher is the source of knowledge and authority. Questioning by the students is difficult in larger classes and often frowned upon.

Research shows that the more active the learning process, the greater is knowledge retention. Students learn most when they have opportunities to openly question, think and discuss among themselves. Oral transmission of information from teacher to student is the least efficient and effective method of learning. According to the Learning Pyramid developed by the National Training Laboratories USA, average student retention rates from listening to lectures averages around 5% and retention from reading books is around 10%. Retention is far higher when audiovisual materials, demonstration, discussion and case studies are involved. By far the highest retention rates are achieved by teaching others.



In the mid-1990s the city of Napa, California asked a group of high tech companies for help to improve primary and secondary education. The companies pointed out that schools are training students to learn by themselves and compete with one another, whereas in companies they are expected to learn in groups and cooperate. Following this advice, Napa established the New Technology High School in which students in each classroom were divided into groups of four to teach and learn from one another with the teacher playing the role of a facilitator. The new approach proved so successful that it is now employed by more than 100 school districts around the USA.

The hybrid learning method is an excellent complement to this active network model. Students learn by themselves studying online courses at home and then come to the classroom to actively discuss and apply what they have learned with their peers. This makes available the world's most advanced presentation materials in multimedia format delivered by inspiring communicators in any language and in a format that can be reviewed and repeated as often as needed.

2. Early Childhood Learning

Early childhood is a critically important period in the life of children when they learn rapidly by observing, remembering, recalling, rehearsing and practicing countless things until they have mastered them without ever studying or being tested. Every young child has an insatiable curiosity to learn about people, objects, places and the environment in which they live. Learning is a spontaneous process driven by interest, curiosity and the joy of discovery which enhances understanding of the world and the student's sense of competence, self-worth and well-being.

Sixty years ago, the American educator Glenn Doman demonstrated that ordinary children learn everything taught in school effortlessly and better by methods that cater to their natural interest and curiosity. He found that children would rather learn than play or even eat. He showed that they can begin learning how to read multiple languages even before they can walk and that by the time they reach first standard they are able to read with comprehension hundreds of books on their own. Neuroscientific research confirms that this approach stimulates the development of the brain and can substantially increase the child's mental capacities. That's why every child learns his native language while many struggle to learn a second language later in life. Doman has taught millions of parents how to achieve these remarkable results using the simple device of flashcards. The key motivator is the parent's personal attention to the child. His first rule is to always stop teaching before the child loses interest in learning. The effectiveness of this approach has been demonstrated for the last 18 years at Primrose School in Pondicherry, at Doman's Institute for the Development of Human Potential in Philadelphia, and at countless other schools around the world.

3. Contextual, Creative, Person-centered Education

The world we live in is seamlessly interconnected and indivisible. Our education divides it into separate specialized subjects. It tends to focus on observable and measurable material facts rather than deeper invisible forces. It represents reality in the form of abstract concepts and models, often unconnected with the way things work in the real world. Chopping up reality into small pieces is like trying to envision the picture on a giant jigsaw puzzle by viewing each piece of the puzzle up close one at a time. We see the tree, but miss the forest. We understand the idea in isolation but miss the context. We learn the role of the seed in the growth of the tree but overlook the essential role of soil, sun, temperature, season and water in its growth. Efforts are now underway to reintegrate education so that each aspect of life can be studied and far better understood in its own context.

The most fundamental shift in education is from the subject to the student, from teaching information to developing the personality of the student. The world is changing so rapidly that much of what is taught in the classroom is obsolete before youth leave the school. The most important skill students need to acquire is how to learn on their own and keep improving their knowledge throughout their lives. More than 50% of companies surveyed recently reported that the most important thing they are looking for are people with the capacity for independent thinking, innovation and creativity. The prevailing system of rote memorization and standardized testing is based on the notion that there is a correct answer to every question and all the student has to do is remember it, even if he does not understand what or why it is correct. Independent thinking requires developing a very different set of capacities in the student – the capacity to freely question, doubt, come up with alternative answers and think out of the box.

Leading companies such as Google say they give far greater importance to the personality of job applicants than to their examination marks. They are looking for people with the social skills to

communicate with others, cooperate with colleagues and work together on team projects. Traditionally the character and personality of the child are developed at home during the early years of family life. Formal education emphasizes the development of advanced mental knowledge and skills beyond the capacity of most families to impart, especially during periods when levels of education are rapidly increasing and children receive more education than previous generations.

Formal education stops far short of imparting all that children need to learn in order to be successful in life. Life is a field of accomplishment in which knowledge and will, emotional energy and skill combine to achieve results that provide physical and economic security, sound health, harmonious social relationships, mental development, personal growth and spiritual progress. The capacities needed for accomplishment in life usually come through long experience.

Values lie at the heart of human personality. They represent the essence of the knowledge acquired by experience. Values are usually transmitted by the family and the culture, but they can to some extent be transmitted through education to support and accelerate the fullest development of the student's personality. Lecturing about values is the traditional form of character education, which has limited value. More effective is for students to study the role and value of values in history, biography, contemporary events and literature, where their power for accomplishment can be understood and mature into mental experience.

4. Paradigm Shift for Education

The changes advocated can be summarized as follows:

Existing Paradigm	New Paradigm
Subject-centered	Student-centered
Passive transmission	Active, interactive learning
Competitive individual learning	Collaborative group learning
Memorization & testing Standardized competencies	Understanding & independent thinking Customized, creative individuality
Abstract concepts	Experiential learning
Fragmented, compartmentalized subjects	Contextual multi-disciplinary knowledge
Information	Value-based life-centered knowledge
Transfer of mental knowledge	Development of the whole person

Education is a Civilising Experience

Ashok Natarajan,

*Secretary, The Mother's Service Society;
Fellow, World Academy of Art & Science*

Man's progress over time is considerable, but Sri Aurobindo thought that the Supermind could have been discovered even in the time of the Upanishads. **His own attainment of that height was in a few years, may be 2 or 3 years.** We may not experience the progress from the time of the primitive Men but the recent history of 100 or 200 years is known to us in a more vivid way. **What is the role of education in this period?** Does it keep up with time or is it anachronistic. Especially after WWII the progress is great but the field of education has not kept pace with the pace of human progress. Education **sticks to memorisation and**, that too, the rote memorization of earlier centuries before the advent of paper and printing. No doubt it has to be scrapped, but can it be done realistically as long as exams are there? Great pioneers of education have made themselves felt during the past 100 years – Montessori, Glen Doman, Dewey, Summerhill, Shantiniketan, Krishnamurthi, etc. – have made a dent in the decrepit system. All these names are revered but the world only pays lip service to these ideals. Tagore was a Nobel Prize winning poet. He established a university. Motilal Nehru and Jawaharlal Nehru had a difference of opinion about sending Indira to Shantiniketan. Ultimately she was educated in Poona, Shantiniketan and Cambridge. How then can we expect ordinary parents to send their children to Primrose?

Primrose was founded inspired by the work of Glenn Doman. He was a physical therapist in the army who during his service discovered the relation between brain injury and learning capacity. He started a School to educate brain injured and retarded children. It later blossomed into a full-fledged method for teaching normal children. He found children can find greater enjoyment in learning than even in playing or eating. One more great discovery of his was that mothers are the best teachers. In his School he dispensed with teaching alphabet, words, etc. and resorted to flash cards. Flashing cards with long sentences before children for one second each while simultaneously pronouncing the word, children learn the alphabet, the words, spellings and acquire capacity to read straightaway. He gave children total freedom and employed crawling copiously. At the age of 4 a child learning by his method can read any book. They are devoid of jealousy, comparison and competition. They love to come to School. His books have sold in the millions and 250 schools applying his methods sprung up all over the world. Still, it is unknown in its native Philadelphia. For over 50 years it was not recognised as a valid model.

Summerhill is an exceptional innovation in democratic education. Established in England in 1921, today the school has about 70 students. Over the decades of her existence, she has produced finished products of human accomplishments. The students acquire the capacity to accomplish in any walk of life they chose. Twenty years ago, the rule-bound British Government launched a vicious legal campaign challenging the school's approach. It is a credit to the emerging world of progressive education that the case ended in favour of the school. Society at large is far from rational. It is irrational with a vengeance. Society needs no reform; it deserves to be guillotined like the French aristocrats.

The Divine Mother started a school in Pondicherry in the 1940s. Education was not part of Her yoga. The influx of refugees from Sri Aurobindo's village in great number to the Ashram made Her start the school for the children. Those children were not expected to take to Yoga. They were to enter a life of their own choice. **She tried to run it on ideal grounds.** She concluded that a teacher should be a rishi. Over the years the students of the school spread all over the country and even abroad. A casual survey of them at the age of 35 revealed that all were of far above average of social success. A few did distinguish themselves. One attracted a half million disciples.

The West has a mentally developed culture. We are a vital society. But our basis is spirit. **The question is whether we can create a system of education that combines these two ideals.** The answer is yes.

The main obstacle is parents who expect their children to seek professional education. Selection for it is based on marks scored in the exams. **Exams are the prime culprit.** Are we to compromise even in the beginning? It complicates a complex situation. Let me try to present one for your esteemed consideration. **It is a system within the present structure but aimed at destroying it.**

The Indian Freedom Movement was headed by lawyers of Inner Temple, educated in the Britishers' best tradition. The Congress leaders used the Englishman's language against him. **He had introduced a semblance of democracy and it was effectively used against him.** It was English that helped the Freedom Fighters of various provinces to communicate with one another. He brought the British law to us. **He spoke of self-determination as a cardinal freedom.** He never declared that it was his right to rule over us forever. Even Churchill could not declare so. After prolonged procrastination **Power was transferred to the Indian Constituent Assembly by the House of Commons by an Act of Law.** It was a legal transfer. It is possible to devise a system based on Eastern Spiritual Values as well as Western Mental Values which will not be at loggerheads with the present examination system.

As freedom and flash cards have improved the atmosphere of the school, a **change in the attitude of the teachers can electrify the class as we already see in the 5th and 6th standards.** Our children say they could sit all day in such a class, giving up games. SpellBee can markedly improve the comprehension of words and their pronunciation. Yogiraj's company has come forward with improved techniques to score high marks in mathematics, even in the ISC system. We have started experimenting with his approach. Our goal is to integrate his special methods into our regular teaching. Of course, the bug bear of the exam system must be ultimately abolished. It rewards students for mindless memorization and fails to encourage understanding and thinking.

English is valued all over the world and in India it has achieved a preeminent status. It has displaced Tamil and other vernacular languages. Children are proud of their ignorance of their mother tongue. English is a foreign language. It can develop thought, but it cannot inspire. For effective education of both the mind and personality of the student, the mother tongue must acquire pre-eminence and become the medium for instruction. It is a fundamental error to ignore the mother tongue. USA, where the mother tongue is English, because it only emphasizes the superficial practical utility of the language, has not produced eminent thinkers or poets in the last four hundred years.

Monarchy was a great institution which served the world through aristocracy but over time it became rotten. **At one stroke the English King Charles I lost his head and monarchy was abolished.** Next was the turn of aristocracy, especially in France. They were insular and blind. The outraged public rose in revolt and guillotined 1800 of them, but never knew what to do. It led to a decade of terror until the appearance of Napoleon. Ironically he desired to become an Emperor. The liberty the French ushered in is still being established as political equality.

In 1848 Karl Marx conceived of communism. He called the world proletariat to unite and violently overthrow capitalism. His call alerted the world. All governments rose to the occasion and offered their largess to the workers. Their thunder was stolen by the innate aspiration of the masses to become capitalists. The call intended for industrial England and Germany was heard by rural Russia where oppression was most acute. **Abolition of violence** took the form of violence of the coterie of the party. In seven decades the Russians were disillusioned and reverted to Mafia, the chaos of unorganised awakened prosperity boon in Italy.

Man cannot be saved from the love of low consciousness which has occupied him. It is a process by which even the saint has come to dread Ananda! But Sri Aurobindo says Supermind could have descended even at the time of Upanishads. It was the Vedic Rishis who first saw in their vision **Supermind.** Sri Aurobindo has taken the phrase Supermind from the Vedas. Still it was not satisfactory for him. **He himself took to yoga in 1906 ostensibly for the attainment of Indian Freedom.** It was the Naga Sannyasis' cure of his brother Barin's fever by water charged by a mantra that gave Sri Aurobindo the clue to yoga. He tried his hand at all the Indian yogas. He could, I infer, do Hathayoga and Rajayoga in 3 days each. He could see that a Sannyasi sitting in tapas on the Himalayas unleashed

the French Revolution. Habits die hard. It is the dark imperative of creation. It is the descent of the luminous imperative of Supermind that alone can handle the original Inconscient.

Presently technology is moving fast and once again Man is enamoured of the Modern Maya of the computer technology. AI has captured Man's imagination. Recent past has seen his willing slavery to Money, his own creation. Money's rule was enforced by the rule of selfishness – capitalism organising itself in America. **Life permits the very opposite to excel any ideal, as the teetotaler was rivalled in health and longevity by one who would not touch anything but wine.** USA took the challenge of communism and socialism and said capitalism could successfully rival socialism. American President Franklin Roosevelt regarded the Sears Roebuck mail-order catalogue as a fitting answer to Stalin's Russian communism.

Education is an experience, not a structure. It is an enjoyable civilising experience. A child from Primrose said children love to come to School and **education at Primrose is an enjoyable mental experience.** Glenn Doman was our inspiration. A couple of highly educated parents in Bombay heard of Glenn Doman, studied his ways and courted the adventure of educating their three year old baby girl by his methods, rather than send the child to school. Many others followed their example. **They provided the child with home education, self-education, provided by both the parents with love and affection. It was a great adventure. Later they established a school in South India.**

An American lady responded to that adventure and Primrose was founded. She introduced the freedom of the American school, flash cards and never allowed kids to be punished or scolded. The children learned very quickly. Their parents loved a school that never punished the children. Beyond that, Primrose is an ordinary school. **It soon became evident that teachers who were educated in the old system were ill-suited to be teachers of Primrose.** The State Board, CBSE, ICSE/ISC were all viewed by parents as conduits to professional courses. They withdrew children in large numbers. In the higher classes only a few remained.

All experiments of self-education or free education have met with their death at the altar of the ubiquitous examinations. It was James Mill, a clerk in East India Company, who conceived of self-education for his son John Stuart Mill. The boy finished his education at 14. **The most educated university professor of Tamilnadu declared he wished he could have read as much as Stuart Mill by the age of 14.** Stuart Mill became a scholar and thinker in philosophy, economics. He was a leading free thinker of England in the late 19th century.

One complaint against home schooled children is that they miss acquiring social skills. In essence it is a false charge, but in practice it was partially true. The home-schooled aristocrats of the 19th century who became the rulers never suffered from that defect. Nor is the woman at home a victim to that charge nor are the children of affectionate families of high breeding. Only in uneducated, unaffectionate mercenary families is it true. **The future is for self-education.** An educationist recently said that by 2020 world-class education will be available free.

Our basic theme is learning goes with earning. The example of the 6 year old child who earned \$12 million last year on Youtube shows what is possible. Universities and schools are to be closed or they will die their normal death just as monarchy, orthodoxy and all anachronistic forms of life have died in the past.

A child is raised to become a complete Man or Woman by the family, the school and the society. The process is normally completed by the age of 35 or 45. The family is academically replaced by the school. **The structured school gives way to the unstructured society.** Dropouts and street children have the advantage of the widest education which life in the city can give from the very beginning. Very few can benefit, as it requires the **capacity for self-organization.** Schools of the new type can offer that self-organization so that children may become finished products long before they reach 35. All the progressive schools achieve it, especially the Ashram school. Earning from an early age vastly aids this process, as it gives the child social strength. At age 10 the child can be fashioned into a Man or Woman

by the affection of the family. **Affection is not mercenary. Freedom fortifies affection.** School reinforces the Man in the child by the absence of punishment and mean behaviour. Teachers go about asking that their birthdays be celebrated. It is a shame. No personality can be built in the child this way. Memorization saps energies. Thinking and understanding release the students' energies. Magnanimous behaviour of the teachers and principal helps.

The student entering life must be self-reliant, defying the low consciousness of modern life. That way he will be a crusader as Gandhiji was for freedom. **Now the crusade should be for Prosperity and inner psychological freedom.** The Prime Minister has launched a salutary campaign against corruption at all levels. Our students must be the brave soldiers of that Army.

Essence of Educational Inspiration

Vidya Rangan

Director, Primrose School, Puducherry

Education, in the largest sense, is an act or experience that has a formative effect on the mind, character or physical ability of an individual. In its technical sense, education is the process by which society deliberately transmits its accumulated knowledge, skills, and values from one generation to another.

Our present education system basically promotes a battle of unhealthy competition among our children. They have to read and mug-up entire text book without any understanding of it. The child does not have any analytical skills that a child must have.

Unfortunately, our education system is not helping to develop the persona of a child. Remember, it is personality that is more important than academic qualification.

Our children are not able to do critical analysis of anything, for example our history, culture and religion. They take the line of establishment or the views of predominant majority.

They are simply not able to look things from their own perspective. If you want the society to become a lot better than what we are now, then we must develop a culture of looking at things critically in order to arrive at a comprehensive understanding, where teachers should be able to cascade their knowledge and experience effectively to the children.

My article here is an attempt to throw some light upon certain fundamental aspects in student teacher relationship which would help enhance the overall child's learning capacity.

No child can be taught if there is punishment or even scolding.

It is important not to hit, abuse or physically punish the children. They generally are not able to make any connection between their behaviour and punishment. Instead they want to avoid the source of punishment. The fear for the punishment controls their behaviour. They don't correct their behaviour by understanding their mistakes. When they think that they are not being watched, the tendency to engage in the behaviour reasserts in them. Punished children do what was punished behind the teachers and parents. So instead of punitive approach if we shift to guidance approach, it will open the door for working together. It creates trust and invites cooperation. It offers children a chance to understand themselves and others. It gives us an opportunity to be seen as a safe and trusted source of meaningful guidance. The child must self-discipline himself out of interest for the subject and inspiration that he gets from the teacher. If interest is released in the children, they will like to learn as they like to eat and play.

The more the child's mind expands in magnanimity the better the child will follow.

If the teacher is magnanimous, the child will learn to be magnanimous. The child learns most of his lessons subliminally from the teacher. We must first understand our students from not only academic perspectives and cognitive developmental stages, but from emotional, psychological, cultural and socio economic perspectives, as well. How you teach is more important than what you teach. Children are watching our every move, every response. They are noticing every slightest change in the tone of our voice and our body language. They can see and feel whether we are in stress, over worked or overwhelmed, whether we are happy or sad. So the attitude of the teacher will directly affect the student. If we as educators are compassionate and understanding toward our students, we increase their potential to learn. This is what I call magnanimous teaching.

The child must be inspired to read the subject. The inspiration and interest must be evoked by the teacher.

If there is one thing we know about kids, it is that they have short attention spans and prefer to postpone things. It is one of the most difficult aspects of becoming a teacher learning how to motivate the students. Students who are not motivated would not learn effectively and cannot retain the information. Also they will not only participate but also become disruptive and get distracted to external forces. While motivating the children is a difficult task, the results would be a rewarding experience. Motivated students are most excited to learn and participate. Some children are self-motivated with a natural love for learning. But even with the students who do not have the natural drive, a great teacher can make learning fun and inspire them to reach their maximum potential.

The teacher's enormous interest in the subject should be communicated to the child, the child must be inspired by the teacher to acquire interest.

How can we do this? The teachers should inspire the children in the best possible ways. They must love their subjects and brilliant in communicating their learning with enthusiasm. The best teacher should be able to make the child feel confident. They should have the ability to make kids feel like they are individually important.

They must know how to encourage and connect with children regardless of their own levels of education. But it is seen that the process comes down to hard work rather than inspiration. Teaching is all about the relationship between teacher and pupil more than anything else. The best teachers are always wanting to do and find out more about their own subject, pushing out the boundaries of their learning and teaching. Teachers need to keep learning and growing. They are not to be characterised by their own academic performance but by their thirst for creativity and ability to pass on the benefits of education. The few inspiring ideas are-

- Energise classrooms with innovative strategies
- Include small play methods and games into the teaching
- To get to know the students closely
- Use examples and analogies by way of short stories
- Be a role model to them by yourself
- Make teaching interactive instead of one-way teaching

Once the interest is awakened learning is automatic, you cannot prevent the child from learning. Interest and inspiration are infectious and they easily spread. It is infectious from the teacher to a student. It is infectious to one student to the others.

The teacher must know the subject from the very first principle, meaning the teacher must know the subject as the text book writer knows. That subject matter is an essential component of teachers' knowledge. After all, if teaching entails helping others learn, then understanding what is to be taught is a central requirement. Curious students will come to class asking questions about the subject and the teacher may not know the answer. Being able to ask and answer question is an important part of teaching and learning. Teachers can encourage this spark of curiosity in children. Inspiration rises in children by allowing them to interact while teaching. For this, it is necessary that the teachers possess mastery in their subject of teaching.

The school can encourage teachers who are qualified and possess the talents, so that they can teach better. The attention of the child to the teacher is a function of teacher's devotion to the subject. The

mastery of the subject in a teacher creates a conducive atmosphere of learning in a child. Children will work harder for the teacher they respect.

The lower the class the higher should be the qualification of the teacher

Teaching Kindergarten is definitely not easy. In fact, it is an art. When we teach older grades, if a student was struggling, we could go back to the basics and build up from there. In kindergarten, we are in the basics and the children are in their most formative years of education. They will mentally respond only to the energy, inspiration, cheerfulness of the teacher and physically to toys, stories and games that may interest them. So, it is not easy to approach them and help them to extend their cooperation and willingness to learn.

Their social skills are only now developing and depending on personalities each day may be different from the next. So it is very challenging. There are schools where the 1st standard is taught by the Ph.D. of Cambridge.

Teachers of Kindergarten need enormous patience, understanding and various resourceful techniques to work with the kids which comes only by culture, education and experience in the field.

The education that the child gets is a gift of the expanding personality of the teacher.

A great teacher is sensitive to the children's needs. To excite and inspire a student requires excitement and a passion for the material itself. Enthusiasm is contagious. All it takes for a student to get excited about going to class is a teacher who is excited and whose positive energy fills the classroom. Creativity is a key to captivating a student. Showing a student something they haven't seen before, even showing them something familiar but in a new way is the surest way to leave an impression that lasts for years. A great teacher must be dedicated to their students, with an unwavering commitment to their education and wellbeing. One of the truest marks of a great teacher is the ability to bring out the best in students. A great teacher recognizes their students' potential to become great people, and they inspire them to be just that.

Almost anyone can become a teacher but it takes a special person to be a great teacher. To inspire the students, the teacher must rise above the crowd and make a lasting impression.

The discipline of the children depends upon the self-discipline of the teacher.

Teachers follow students through each pivotal stage of development. In fact, a teacher is a role model influencing every facet of the student's growth and developing their innate potentials, in addition to being a motivator, guide and friend. However, moral responsibility for her students' rests primarily on the shoulders of the teachers. Unless the teachers follow the disciplines themselves, teaching discipline to the students will not be effective.

Creating inspiration in students is to develop a constant passion in them for learning. If they do, they will never cease to grow.

The goal of the School is not even education, certainly not money. The greatest goal of the school is to enable the child to emerge as an individual. Education is the powerful means to achieve this goal.

Student – Centered Teaching and Learning: 21st Century and Beyond

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Abstract:

Students and teachers are the main players in higher education and in particular, in the teaching and learning process. The definition of learning is different now and novel approaches to learning and teaching are being evolved. The rapid changes of the 21st century witness a whole new approach to teaching and learning. The development of information technology and the accessibility of knowledge have opened up a lot of possibilities and are significantly changing the roles of faculty and students alike in the educational process. The introduction of e-learning results in increasing shift from the instructional and traditional approach towards the learning approach. Such exciting changes include digitizing the learning resources, gadget driven teaching/learning practices, open resources and online courses, and the moral growth of the students has to match the vast strides in these developments. Future education has to explore the dimensions of values, will power and cultural, ethical and spiritual potentialities of the teacher and learner.

Introduction:

India is a young country and half of its population which is below the age of 25 is exposed to the internet and mobile devices. By 2025, India will have 119 million 18 to 22 year olds, which means India will be the home to the largest student population in the world by then. Education is modernized today by knowledge revolution and a boom in information technology. Success in the fields of computers, robotics and artificial intelligence, once dreamt of in fiction has become real now by human-machine symbiosis. These changes will cause a radical transformation not only in our lives, but also in the nature of education. Higher education is faced with the challenge of preparing itself to fulfill its mission adequately in a world of transformation and to meet the needs and requirements of the 21st century society (UNESCO, 1998).

Students and teachers are the main players in higher education and, in particular, in the teaching and learning process. The primary mission of any educational institution should be student learning. We must not forget that the most important people are the learners and everyone else is there to help and support student learning. The definition of learning is changing fast and new approaches to learning and teaching are being evolved now.

Technology driven education

The rapid changes of the 21st century witness a whole new approach to teaching and learning. The development of information technology and the accessibility of knowledge have opened up a lot of possibilities and are significantly changing the roles of faculty and students alike in the educational process. By using information technology and to eliminate the constraints of time and space, higher education begins to innovate learning. The introduction of e-learning in the traditional education system has now become almost inevitable. Many colleges and universities are adopting e-learning and provide access to internet and multimedia resources. Interestingly, majority of the faculties are trained to use and apply e-learning. It results in increasing shift from the instructional and traditional approach towards the learning approach. There are many exciting changes accelerated by the adoption of technology in higher education (Nitin Putcha, 2012). It includes the following.

Digitisation of Books: Books have become clickable. Enriched with interactivity, videos and more - eBooks are no longer static texts and images but living gateways to a subject.

mLearning & Micro Learning: New technology is making learning mobile and consumable in a variety of formats. With new eLearning APIs such as Tin Can, learning can be delivered in micro-slices for quick and frequent consumption by learners.

Open Educational Resources: Open Educational Resource (OER) is content developed and offered freely for the purpose of teaching and learning. The digitised material allows for open development and reuse. OERs include education course content and materials, digitized textbooks, streaming videos, softwares and other materials, used to support and convey knowledge.

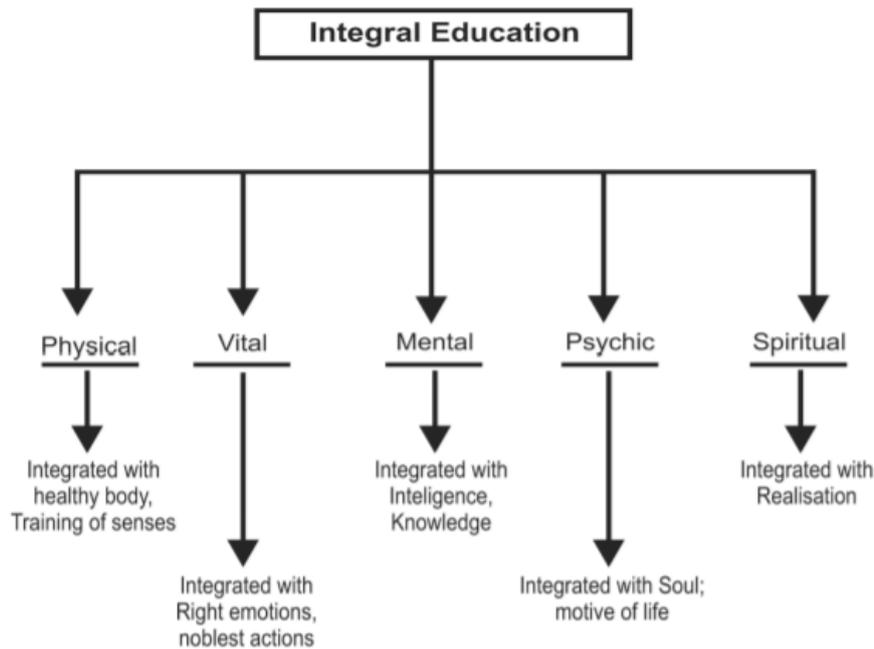
Social Learning: Peer-to-peer learning, which has been popularised by MOOCs (Massive Open Online Courses), is making way for Social Learning, where rich communities are formed around subjects and courses, with learners discussing and sharing from across the world and faculty members playing roles of facilitation and content curation.

Technology is no doubt disrupting traditional education, and academicians and school administrators need to realise that we have to adapt to the changes and adopt new practices and competencies to stay relevant in the years to come. Educational institutions in India are getting ready for a complete overhaul in the way they offer education to the burgeoning population of youth who want to gain the advantages that a high quality education offers. Further, we should understand that until the 21st century, the focus of education has been more on material improvements and economic benefits, rather than on the holistic growth of mind, body and spirit. The moral growth of man has not matched his vast strides in other fields. It is necessary that we ought to educate students to explore the dimensions of values, will power and cultural, ethical and spiritual potentialities. Indian philosophy of education is rooted in Indian culture. The basic characteristic of Indian culture is an integral approach to life. Such integral, value oriented philosophy of education has been advanced by Swami Vivekananda, Sri Aurobindo, Swami Dayananda, Gandhiji, Rabindranath Tagore, Sarvepalli Radha Krishnan, Pandit Jawarhar Lal Nehru and M.N. Roy (Ramadevi, 2013).

Spiritual and cultural values are essential for victory in life for any individual. When spirituality is embraced by our educational system, our students will not only make a living in this physical world, but also make living a success, and experience every moment of life as new, every day as a day of upliftment and blessing, and enjoy lasting peace. It is only through such an education, a person can have a sweet and balanced disposition towards life and face the trials of life with calmness.

Integral Education

According to Sri Aurobindo, for education to be complete, it must have five principal aspects relating to the five principal activities of the human being: the physical, the vital, the mental, the psychic and the spiritual. Usually, these phases of education succeed each other in a chronological order following the growth of the individual. This, however, does not mean that one should replace the other but that all must continue, completing each other, till the end of life. Five dimensions of integral education of Sri Aurobindo (1972) are depicted here.



Sri Aurobindo says that only through a spiritual evolution, a man can progress and acquire the correct knowledge. Education means to create the right culture and the corresponding changes within the individual. It is the open and kind approach to life and to others living around you which defines true spirituality. Sri Aurobindo establishes that such spirituality can bring about a revolutionary change within an individual. He also asserts that those who have acquired this level of spirituality can bring about a similar change in other individuals. A divine life upon earth, the ideal we have placed before us, can only come about by a spiritual change and a radical and fundamental change, an evolution or revolution of our nature (Sri Aurobindo, 1972).

Man making Education:

Swami Vivekananda says that what we need is man making education. He says what our country now wants are muscles of iron and nerves of steel, gigantic wills which nothing can resist, which can penetrate into the mysteries and secrets of the universe and will accomplish their purpose in any fashion, even if it means going down to the bottom of the ocean, meeting death face to face. It is man – making religion that we want. It is man making theories that we want. It is man making education all round that we want (Vivekananda, 1947).

Education to establish the bond of love:

Elaborating the aims of education, Rabindranath Tagore says that “the fundamental purpose of education is not merely to enrich ourselves through the fullness of knowledge, but also to establish the bond of love and friendship between man and man”. Thus, Tagore’s approach to education is humanistic and to ultimate reality is integral. He believes in an inner harmony among man and nature and god. They are, in fact, three aspects of the same reality. In man, again the physical, mental and the spiritual aspects are equally important and internally related. Therefore, like Sri Aurobindo, Rabindra Nath believes in a multi sided education.

From the foregoing discussion, it is discernable that the goal of our new educational system should be student centric and holistic so as to create entrepreneurs, innovators, artists, scientists, thinkers and writers among our students who can establish the foundation of a knowledge based economy rather than the low-quality service provider nation.

We have accumulated a huge mass of knowledge through 'Yugas' of scientific effort. Yet, all this knowledge has become a burden on our shoulders as it is not inspired by the spark of strength. I just like our ancient knowledge, the new knowledge acquired from the West is also something which, for us, is difficult to digest. We can, if we wish, blindly imitate England or Japan. But where will this blind imitation take us

- Sri Aurobindo

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The Finnish model of education

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In 1963, the Finnish Parliament decided that improving public education was its best strategy to improve the economy and the country as a whole. So from the topmost leadership in the country, everyone recognizes the value of education.

Happy, relaxed environment assists learning. Finland provides a nine-year free, compulsory education from the age of 7. So schooling begins relatively late. Teachers are asked not to rush with their lessons, but to have a happy relationship with the children. For the first six years of school, the same class teacher teaches all subjects. Sometimes, children have the same teacher for all six years. This gives the teacher the opportunity to understand every child, and cater to individual needs. Students address their teachers by their first name. They have lunch together. Teachers believe learning can happen not just in the classroom during lectures, but anywhere in any activity.

Finnish schools have a uniform standard. There is no special program for the fast learners, and no exclusive private schools. All children go to public schools, and follow the same national syllabus.

Teachers are well trained post graduates. All teachers have to study their final year of teacher training at one of the 8 government recommended universities, so all schools and all teachers receive the same, high quality training.

Teaching is one of the most respected, well paid professions in the country. The entrance exams for teacher education are difficult, and there is a lot of competition. Only top 10% of the nation's graduates can earn a master's degree in education. After being appointed, they are continuously given additional training. Teachers only spend 4 hours a day in the classroom, and take 2 hours a week for "professional development". High school teachers with 15 years of experience make 102% of what other college graduates make. In the US, this figure is 62%.

The elementary education departments in Finland only accept 10% of all applicants. A person not only has to be the best and the brightest to become a primary teacher, they also have to have passed a series of interviews and personality screenings to get in. So, it is not enough to be the smartest in the class, one also has to have the natural ability and drive to teach.

There is no state testing or inspection of schools and teachers. So their incentives for work come from inside. Their performance is not observed and graded. They are not required to prepare or submit detailed lesson plans. The notion that a teacher should provide evidence to prove what they have done is not present. Teachers enter the profession full of drive and enthusiasm. They are in the job for the right reasons. The country trusts them and keep that drive alive.

Freedom is a distinct characteristic of Finnish education. Schools and teachers have a lot of freedom. The syllabus is broad and loosely defined, and the teacher can use any textbook, teaching material, strategy and length of time to teach.

Teachers and students are not expected to be at school when they do not have a class. For example, if they don't have any afternoon classes, they (both teachers and students) can simply leave. Or if their first class starts at 11:00, they don't have to be at school until that time.

Finnish kids statistically spend a lot less time in school than kids in other countries. They have a 75-minute recess daily. In Finnish schools, there is less homework than in other countries. It has the lightest homework load of any industrialized nation. There is a 10-15 minute break between two classes. On an

average they have under half an hour of homework a night. Finnish students typically do not have outside tutors or lessons.

There is no testing or grading. Neither the students nor the teachers are required to prove anything to anyone. “We prepare children to learn how to learn, not how to take a test,” said Pasi Sahlberg, former teacher currently in Finland’s Ministry of Education and Culture.

There are no mandated standardized tests in Finland, apart from one exam at the end of students’ senior year in high school. There are no rankings, no comparisons or competition between students, schools or regions.

Without tests looming ahead constantly, students as well as teachers feel free. Teachers do not have their pay or promotion tied to students’ scores. This lets them be more creative, explore new methods, even take some risks that might turn out to be successful. Students can also have more fun learning.

Pupils will themselves decide which level of achievement they want to aim for, and they will be set assignments enabling them to achieve such grades. They set personal goals for themselves in the beginning of the school year, or even as often as every week. Teachers will talk to pupils about the goals they want to set themselves. When students are actively involved in such discussions their motivation will grow. From a very early age, they learn to take responsibility for their learning—and hopefully learn out of inner motivation, not for parents or exams. Hence, there is no pressure. Also, cheating in exams is not as common as in some other countries.

Evaluation does not happen in the form of one final exam, but the pupils themselves participate in it. Assessments are primarily used to pinpoint areas where students lack understanding, not to differentiate performance between students. Teacher based assessments are used by schools to monitor progress and these are not graded, scored or compared; but instead are descriptive and utilised in a formative manner to inform feedback and assessment for learning.

Students get individualised feedback to help them close their gaps in understanding. Assessment, therefore, is a support platform for teachers to give personalised, early intervention to aid the students’ learning. It is also for students themselves to have a stake in their education—from as young as seven years old. Assessment is ongoing, encouraging and guiding.

The differences between weakest and strongest students, and between schools are the smallest in the world. There is no marketplace competition in public schools. Timo Heikkinen, a Helsinki principal with 24 years of teaching experience says, “If you only measure the statistics, you miss the human aspect.”

All round support for learning is provided by all. Every member in the government Education department must have been a trained teacher. The school network is wide-spread, so every child has a school as close to home as possible. In rural areas where this is not possible, free transport is provided to students.

Finland provides three years of maternity leave and subsidized day care to parents. The state pays the family 150 Euro per month for every child until he or she turns 17. Schools provide food, medical care, counselling and taxi service if needed. Student health care is free. Schools serve free, nutritious meals for all.

The school day is over between 12 noon and 2 pm, depending on the day and group. Most children come from families where both parents work fulltime, this is customary in Finland. Consequently, some city authorities have built playgrounds near schools, which is access safe from motor traffic. Playground attendants take care of the children while they are there.

Everyone pays their taxes in Finland, this takes care of funding resources for education.

All activities are educational. Unlike in other countries, Finland does not feel that there are important subjects and less important subjects. All subjects play an equally important role. The goal is to give youngsters a broadly-based education. School are where students are taught much more than academic lessons. They are taught community skills, a good self-image, a strong sensitivity to other people's feelings, the meaning of life. 43 percent of Finnish high-school students go to vocational schools and polytechnics. Vocational training is not less prestigious compared to academic universities.

Activities during school hours include daily sports, handcrafts, cooking, creative pursuits, and sports. These help young people benefit more from the skills they are learning in school. Schools try to teach the meaning of life, community skills, a good self-image, a strong sensitivity to other people's feelings and understanding that it matters to take care of others.

Learning by carrying out "chores" is a key element in the school curriculum. Pupils participate in common chores from the first year onwards. Taking turns in groups, they see to the school's houseplants, library, wastepaper collection, recycling, compost, yard and aquarium. Non-teaching staff guide the kids in these chores: cleaners, kitchen workers, the caretaker, the school secretary and attendants. Everyone shares responsibility for educating the children and unnecessary hierarchy is avoided among the staff.

The school is also open to the local community. Parents are always welcome in the classrooms and their expertise is utilised in the workshops and evening school sessions.

The method produces great results! The Education Index, published with the UN's Human Development Index in 2008 lists Finland as 0.993, amongst the highest in the world, tied for first with Denmark, Australia and New Zealand. Without many school or national level tests, without any emphasis on grades, Finland has consistently ranked high in the PISA study, which compares national educational systems internationally.

Experimentation is ongoing in the country. A lot of emphasis is given to child development and pedagogic research. The research results of developmental psychology and learning psychology are greatly applied in teaching, and a lot of importance is given to what learning actually means.

Teachers become enablers, helping each child find their own way to learn. Teachers will no longer be information providers, and pupils will no longer be passive listeners. Schools are communities where everyone learns from each other—including adults learning from children. Children are encouraged to think, to understand and to look for information themselves. They are even encouraged to find questions to which even their teachers might not have answers to. In this case, the answers are sought out together.

Schoolchildren are not divided into conventional groups of learners, but choose their own study groups according to their interests. Learning groups are formed so as to ensure the goals set in the curriculum can be reached. Schools monitor this forming of groups, according to what and how each child learns.

Mixed-age learning groups are common, where two grades are taught together. This encourages peer-tutoring, one of the best practises in education, because we learn more when we teach another.

Commencing in the 2016-2017 academic year, Finland is implementing educational reform that will mandate that phenomenon-based learning be introduced alongside traditional subject-based instruction. Students will also embark on at least one "phenomenon-based" inter-disciplinary module per year. These modules require them to learn and apply a variety of skills and competencies within a single lesson unit instead of studying subjects such as mathematics and geography as separate disciplines. An example of such an inter-disciplinary module could be one where teachers guide students to work in groups to research the effects of climate change. Students may then create a global awareness campaign on YouTube to persuade their peers from Finland and other countries to conserve the environment. Phenomenon-based learning is also about getting students to take charge of their own learning. Instead

of imbibing content knowledge from their teachers, students are trained to be intellectually curious to create their own understanding of a topic.

When critics pointed out that such drastic changes to a successful system may see a fall in the country's scores in international tests, the Education Department typically says that they are not worried about the test scores!

It may not be possible to apply some of the methods used in Finland in India. Some circumstances may be far different here than they are there. But anyone here, member of the school management board, principal, teacher, or parent can try reducing the emphasis of writing exams and getting good grades, and see the difference.

What Steve Jobs didn't learn at school

Senthil Inbarajan

Software Professional, US

Recently when I was browsing the website of Amazon in my iPhone, I came across an ad for a book written by Mark McCormack. The title of the book was 'What They Don't Teach You at Harvard Business School'. It topped the New York Times bestseller list for 21 consecutive weeks!

What makes people buy such books? Obviously millions believe there are many important things one must know to be successful in life and unfortunately even reputed institutions do not teach them.

I asked myself: Our education starts at a very young age, years before we decide whether to go to a business school, or law school or medical school. Do our primary schools and high schools teach us what we need in life? Will it not be a best seller if someone writes a book on 'What they don't teach you at School?'

I looked at my iPhone again and wondered what did Steve Jobs, the creator of iPhone, learn at school? If Steve Jobs had learnt things that made him very successful in his life in his school, then we must be living in this world with hundreds of Steve Jobs that studied in the same school. That is not true. There must be a few lessons that Steve Jobs did not learn at school. What are those lessons?

I believe three things made Steve Jobs successful and made him one of the richest men in the world. These three things that are not normally taught in schools. They are:

1. Understanding what the society really needs
2. Bringing out the hidden talents in others
3. Training the mind always to be creative

These are a few of the fundamental qualities of an entrepreneur.

Though Steve Jobs was not a technical person, he invented many products. His genius was in understanding what the society needs, what the market wants. How did he do that? He identified himself with the society and understood its needs. The needs of the society were his needs too. He wanted a phone that could do many things and a computer that was easy to operate. The society too wanted such products. From an early age, he understood that every unsolved problem in the society was actually untapped business opportunity. Entrepreneurs know every problem is an exciting opportunity. Many business people do what they want to do or what they know to do irrespective of what others want or know. They think from their own point of view and try to make the market accept it. They do not think from others' point of view. Steve Jobs thought from society's point of view. Because of that wonderful attitude, the society responded magnificently. Did he sell his products? No, the society bought his devices wholeheartedly!

An entrepreneur may understand the needs of the society. If he is not a technical person, what can he do about it? In a TV show, a speaker said that though Dhirubhai Ambani had little formal education, it was sheer luck that he could run successfully a company worth billions. A wise man from the audience shouted that it was not luck, it was Ambani's ability to identify, recruit and manage thousands of talented finance professionals and technical persons who in turn managed the company. This is the business secret of any successful entrepreneur. Steve Jobs did exactly the same. Even though he was not a technical person, he hired people with great potential and squeezed the best out of them. He forced them to come out of their comfort zone. He encouraged them to bring out the dormant talent and hidden potential. If Jobs found someone with a skill that he did not have, he would immediately hire that person. If you are not an entrepreneur, you will view the other person as an opponent or an enemy. But entrepreneurs like Jobs will look at the opposites, the contraries as complementarities. Gandhiji knew

who he was and what his strength was. He created many second line leaders without the fear of getting replaced by them one day. How many politicians and leaders do create second line leaders today?

The third remarkable lesson that Steve Jobs learnt was to be creative at every moment. He learnt not to repeat what everybody else is doing. In other words, he trained himself to think freshly. He said that he learnt this lesson when he travelled to India and wandered around the Himalayas for six months. Indian culture knows that when mind works logically, it is less creative. The logical mind can be used to prove something right or wrong. It is useful in physical sciences to prove something. But it does not create anything. Great scientific discoveries emerge when mind thinks out of box, out of a rigid closed conceptual system.

I believe it is possible to teach these three values, these three principles of entrepreneurship even at school level.

Our school students can be taught to think in terms of what the society, the nation, the world REALLY needs or wants. They can be taught to help other students and bring out the hidden talent and potentials through cooperation instead of competition. They can be trained to solve problems innovatively or approach problems creatively instead of becoming a warehouse of memorized stock answers.

If we teach at least these three things at schools, we will create millions of successful entrepreneurs who can make India in a few decades the dream destination of Americans and Europeans.

Developing Entrepreneurs

Ramesh Kumar

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I am not going to touch upon the problems of today's education system as every facet of it is known to all here.

As an entrepreneur with the fire of ambition to grow, my concern is on employability of our youth that is going to come out of educational institutions in future. I use this term as it is familiar in the job scenario but I am concerned about the career of youth.

Right from career counselling to campus interview I see a prevailing attitude that high scores are an indication of a good candidate. But in reality, the education system that promotes the person who memorizes best in exams with outdated syllabus on systems, methods, technologies only prepares a person for "what he knows" and not for "what he can do". Even the objective methods only increase the probability of memorisation of the solution without any scope to be objective.

The complacency of the education system should give way to the evolution of the individual in a holistic way with knowledge and values.

Education should be based on understanding the essence on one's own experience. For example, if one experiences and understands a drum he can understand at least sixteen basic formula for shapes and yields that is applicable in different fields. In chemistry molecules are taught and then reaction explained. But when reaction is understood any number of combinations can be made for innovation, invention and creativity.

Latest example is Fibonacci numbers. It is a one-line utterance during Maths classes on probability theorems. Some student understood the essence of it and extended this is to Botany and the result is better crop growth and yield rate. Now it is being researched for deciding the better angle for key hole surgery and virtual operations. Can any body think of Maths formula applicable to the human body? That is power of understanding by heart.

In my own case when an international company had an R&D with a budget of 60 lacs for an upgrade in conductive materials, as an individual and with many limitations I found a solution by spending only 2.00 lacs. Because the entire R&D team understood the molecules or resins where as I understood chemistry.

I am a self-made person. I got the freedom to learn only at the age of forty. In these last ten years I am known as a specialist in static control products and protective coatings dealing with high profile clients handling all electronic, chemical and civil engineering concerns. This in spite of not having any formal education in any subject.

So, I think the system should feed the curiosity and help the freedom of the student. It should encourage his/her own way of learning. Teachers shall give only the information and facts over which students can research, think and reflect what they learned. Evaluation should be only to help the betterment of skills, capacity and knowledge.

As an entrepreneur I need, in fact all entrepreneurs need - not employees for doing the job. We need entrepreneurs who can travel, grow and earn with us. Education should be based on consensus and freedom of the learner to induce his aspiration to take any job not as a way to earn, not as a career but as a vocation.

For that I think we need just a small change. The present method consists of system, development, growth and intellect. From this we need to change to curiosity, aspiration, perception and cognition.

Taking a cue from Steve Jobs' success line "follow your heart" I think future education should "follow the heart of the learner".

What Ought to be the Aim of Education?

K. Srinivas

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Outside Plato's Academy there was a board stating that "Let no one ignorant of geometry enter my doors".

Similarly, in Durban Institute of Technology, South Africa, the importance of education for nation building is thus summarized: "Destroying any nation does not require the use of atom bombs, or the use of long range missiles. It only requires lowering the quality of education and allowing cheating in the examinations by the students".

Patients die at the hands of such doctors. Buildings collapse at the hands of such engineers. Money is lost in the hands of such economists and accountants. Humanity dies at the hands of such religious scholars. Justice is lost at the hands of such judges. The collapse of education is the collapse of the nation.

Then what ought to be the aim of education? It must promote quality, competence and values. These three become the integral part of education. There is no point in pursuing education without these ideals. I would say all the three have equal share in building up any healthy and wealthy nation. The aim of education ought to be the in the direction of the furtherance of the human race and above three must be its objectives.

Mere literacy for the sake of literacy does not lead us anywhere.

Quality presupposes the revamping of curriculum to keep both teachers and students abreast of what is happening in any field of inquiry

Competence is to promote healthy competition among the peers to sustain the quality through innovation and efficiency

Values inculcate sense of humanity by sharing the know-how for the benefit of human race.

Earn While You Learn

Chandrasekaran

Project Director, The Mother's Service Society

Active learning is a form of learning in which teaching attempts to involve students in the learning process more directly than in other methods. It requires students to do meaningful activities and think about what they are doing.

Earn while you learn is an active learning method. It is not a novel concept. This idea has been in existence for decades in different forms.

When you join courses like Chartered Accountancy, you become an articled clerk and would receive monthly stipend or allowance to cover expenses. This stipend is a form of low salary linked to the training.

Ten years ago, a big software company launched "earn while you learn" program targeted at undergraduates. After four years, the students would receive masters in software engineering, and simultaneously would receive a stipend and hands-on experience in the tools of the company.

Seven years ago, a state government announced the "earn while you learn" scheme for college students in that state. Selected students were paid Rs.2400 per month. They had to work as assistants in various government facilities after college hours. The aim was to reduce the dropout rate in colleges.

Such programs are not designed to make you an entrepreneur. They do not teach you anything about real-world entrepreneurship.

All these programs are for graduates and adults. When you become an adult, the personality, attitudes, and values are already formed and fixed. In most cases, it is extremely difficult to change them.

But children are different. We at MSS, want the school kids to earn while they learn real-world entrepreneurship. We believe we can teach entrepreneurship to children.

We, the parents and teachers, have to examine our attitudes towards earn while you learn programs. Indian parents are too protective of their children. Sending them to school is more of a necessary social convention than for the development of their individuality. To allow children to work is a blow to our prestige. How comfortable would we be, if our children work as waiters in restaurants? Students have little time to participate in innovative programs as their calendar is already overflowing with homework, assignments, projects, and exams.

Does it sound practical to ask kids to make money?

A few years ago, I met a student studying in the ninth standard. "How are you doing in classes?" I asked him.

"I am always happy because I play all day! I go to classes only when I want to" he replied. I was perplexed and asked him "How do you manage your parents and teachers?" The boy said "Sir, I am an idiot. They say my brain has not developed. Nothing can go into my head. So, they have written me off."

I asked him, "If you get good marks in the next test, will they believe you are intelligent?" The boy replied, "Yes, certainly. But that is not going to happen. I have never scored more than 5 marks in any subject."

I spent a few hours with him and taught him a few creative shortcut methods that were full of life and fun. In the next test, he scored 70 in Science. The principal thought the boy had cheated. So, he made the boy write the test again with a different set of questions. This time, the boy scored 75!

My anecdote is not about scoring marks using some secret magical methods.

I met the boy again after a month. "How are you doing?" I asked him.

He said, "I am teaching my classmates the shortcut methods for fifty rupees each. I have made 500 rupees so far."

Who is intelligent? This so-called idiot or the other students?

An entrepreneur has at least three qualities: he understands the needs of the society, he accepts talents in others, and he is creative.

Don't you think this boy in my story has all the three qualities? Is he not a born entrepreneur? I believe what he knew through intuition can be consciously taught to all children in schools.

The Internet offers tens of thousands of opportunities for students to earn while they learn the process of Entrepreneurship. A Facebook-savvy high school student designs Facebook backgrounds and earns in thousands. A tenth standard student sells Excel templates and makes money. A Plus Two student writes reviews about mobiles and receives sales commission from Amazon.

Educators and employers are interested in making students employable. Dictionary defines Employability as a set of attributes that makes individuals gain employment and be successful in it. Entrepreneurship is a set of attributes that makes individuals become successful employers and create jobs for others. In that sense, I value Entrepreneurship more than Employability.

An IAS officer is fit to run any department. Why? He receives training in the principles of administration. Getting trained in one particular department is a limitation and it is not imposed on an IAS trainee.

When we teach kids the principles of Entrepreneurship, we make them fit to own any business in the distant future and run it profitably.

Do we ever see the potentials in our children? What we observe superficially at the surface level of our children is tangible. We are contented with those tangible actualities in our children. We do not see the potentials. We do not value a possibility because it is not tangible.

We mistake fluency in English for native intelligence and top marks in test for achievement in education. It never occurs to us that there is a possibility that our children can become more intelligent or even a genius. Such aspirations are not in our present scheme of things in life.

Entrepreneurship is the lowest possibility among the highest potentials. Every child has that potential.

It is our duty to help the children manifest that potential in life. We must help the seeds bring out the trees hidden in them. Systematic training, active transdisciplinary learning, building attitudes, developing skills, imparting values and giving life knowledge will make any student become an entrepreneur.

Memory and Understanding

Latha Chandrasekaran

Senior Research Fellow, The Mother's Service Society

A student asked Einstein, "What is the speed of sound?" Einstein replied, "I don't know." The student was shocked. Then Einstein explained, "I don't carry such information in my mind. I never memorize what I can look up in books."

We are luckier than Einstein. We have the Internet. We don't need even books. Ask Google search engine a question. Google magically fetches the results you need in a few milliseconds. You are happy.

But there are situations where you have to act without looking up books or videos. If an Internet-savvy surgeon is looking up a video on YouTube and carries out the surgical procedure step by step on a patient in an operation theatre, how comfortable will you be?

Life without memories is impossible. If we banish memory from life, we would have no history, no law, no relationship, no identity, no society, no order and no education.

Every area of life demands its share of memory from us. Education is no exception.

Memory is crucial for us. It is even more crucial in school years.

I believe Einstein asked us not to memorize those facts that did not contribute to the process of building our skills or capacity. He said, "The value of the education is not the learning of many facts but the training of the mind to think."

What is thinking? Thinking is a mental process of relating two or more objects, events or people. This principle of association can be extended to memory too. All memory aids work on this principle.

Throughout the day teachers present new information to children. Kids are given little opportunity to consolidate this information before other new information is presented to them. They are not taught how to consolidate information through memory devices. If they perform poorly in a test because they are not able to recall from long-term memory, we assume that learning has not taken place.

There is a relationship between understanding and remembering. If we understand something, we are usually able to remember it better. Understanding enables us to know where to store the information in long-term memory, and effective storage leads to effective retrieval.

If we are able to retrieve previously learned information from long-term memory when we are presented with new information, we can make associations between the two and thus understand the new information better.

Today several speakers shared their brilliant thoughts with us. We understood all of them. How many of us can remember everything that was said here tomorrow or next week?

Many students don't know the difference between understanding and remembering. They believe that if they understand something, they will always remember it. Therefore, they don't study much. If they don't transfer what is stored in short-term memory at the time of learning to long-term memory, very soon they will lose it. Spaced repetition, mnemonics, and active learning tools help the students build a strong long-term memory.

Memory has an important role to play in education. Memory skill is not something that people are born with. It improves the more it is used systematically and becomes stronger like any other muscle.

Because a strong memory helps a student score high marks, traditional educators give more importance to memory than it deserves and make it the absolute basis of learning. On the other hand, new age educators refuse to give importance to memory that it deserves. Common sense suggests that these two opposites must be reconciled.

Is memorization more important than understanding? Here I am referring to rote memorization.

Because memorization tries to learn concepts word for word, the student will find it difficult to explain the ideas to others. As understanding converts concepts into own knowledge, the student will be able to explain the ideas to anyone in his own words.

Memorization makes it difficult to see how ideas apply in real-life situations. The relevance of ideas outside the classroom is not sought. Understanding helps apply the ideas to real life situations as it seeks connections between knowledge from the classroom and the outside world.

Memorization does not see differences, similarities, and implications of ideas. So it interprets ideas literally. Understanding can identify differences, similarities between ideas and implications of these ideas. It helps you realize there can be figurative as well as literal interpretations of ideas.

Memorization strives for rote learning. It gets into trouble when even one component is changed. Understanding can solve problems even when several components are changed.

Memorization believes there is only one right answer to every question. Understanding accepts that there may be more than one right answer to a question depending on circumstances.

So, what is the conclusion? To memorize or not to memorize?

We must teach students how to identify important information, understand it and then store it in long-term memory. That must be one of the methods of learning.

Memorization without understanding or rote memorization must be discouraged. It will defeat the aims of education.

Early Childhood Learning - Glenn Doman Method

M. Gayathri

Vice Principal, Primrose School, Puducherry

Every child, at the moment of birth, has a greater potential for intelligence than Leonardo da Vinci. According to Mr. Glenn Doman, every child is a genius. Stimulation is the key to unlocking a child's potential. Teaching should commence at birth. Younger the child, easier the learning process. Children naturally love to learn; parents are their child's best teacher. Teaching and learning should be joyous and they learning should never involve testing. Glenn **Doman** is the originator of this method of teaching children at a very early age. He has many enthusiastic followers, around the world, and it is this method that we follow at Primrose. Our Vice President, **Mr. Garry Jacobs**, way back in the 90s, met Doman and introduced this special method of teaching here at Primrose. Primrose was the only school back then, to introduce such an innovative method.

Let me detail you a bit about Doman and his philosophy about teaching methods. Doman earned his degree in Physical Therapy from the University of Pennsylvania in 1940, after which he started pioneering in the field of child brain development. In 1955, he founded the Institutes for the Achievement of Human Potential in Philadelphia, Pennsylvania. He studied, worked and lived with children from more than hundred nations ranging from the most civilized to the most primitive. With rigorous research, he has demonstrated for half a century that very young children are far more capable of learning than we ever imagined. The younger the brain, the more malleable it is. The young children are like sponges. A baby's brain builds itself by forming connections in response to the stimulation it receives. The foetus begins responding to sounds during month FIVE in the womb, when the sense of hearing becomes fully developed. This means that learning begins before birth.

Doman believed that teaching should never be forced and regular practice is very important. The child should be given lessons only when he is receptive and end them before he loses interest. Now, let me detail you a bit about this method that we have been devising at Primrose for more than 18 years. Our students really enjoy their days at Primrose, thanks to this wonderful method, which ensures 'learning is joyful'. So here at our school, as the students enter the Pre-Kindergarten, they get introduced to 'creeping and crawling' which helps co-ordination, balance, respiration, brain development, convergence of vision and language. It is based on the point that the more the child moves, the more his brain will expand. It is very important for a child to go through creeping crawling at this age, for if he skips it, he may develop problems with speech, reading and writing later on.

They also get introduced to the flash card method, where the teacher flashes hand-made cards, which come in different colors. The cards are flashed at a speed of less than a second. The speed plays a significant role here as the task would easily be apprehended by the right hemisphere of the brain which is quite effortless. Different topics are chosen, like fruits, vegetables, flowers etc., and are flashed to the child, where the teacher doesn't really repeat. The teacher also explains every other information about the subject that is being flashed and gives the correct pronunciation of every word that is flashed. Later, once the child gets familiar with the cards, they are shuffled and are flashed again for about three to four times. This goes on for about a week with a set of 25 cards. As a second step, the child gets introduced to the hand-made books, which contain sentences, a word or two in each page. Here too, the teacher explains everything about the sentence in great detail and then flashes it to the child. These books are also shuffled and flashed again. Like we do for the words, the same method is used for teaching numbers too. The numbers are also written on cards and are shuffled and flashed in the same way. When it comes to counting, it is taught using pebbles, blocks and beads. Throughout the kindergarten period, the child goes through different levels with words, numbers, sentences, general knowledge, art and craft and even Thirukkural.

Let's us have a look at what a child gets to learn by the end of the kindergarten session. In **Pre KG**, the child completes the course with 200 picture cards, 15 hand-made books, Numbers up to 25, 30 Thirukkural verses, India's states and capitals. By the end of the **LKG** session, the child gets to learn another 300 picture cards, 20 hand-made books, Numbers up to 100 and starts with addition of single digits, 9 story books, 10 CIEFL books, 80 Thirukkural verses, 100 'fun and frolic' rhymes, 3 art and craft books which has drawing and colouring and colouring on craft, play-way method which deals with geometrical, knobbed cylinder and knob-less cylinder equipments which would help them with eye-hand coordination and writing, 100 Countries and capitals, even activities useful for their day-to-day life. And in **UKG**, the child gets to complete another 200 picture cards, 9 Central Institute for English and Foreign Language book (CIEFL) with questions, 10 Cambridge books, 17 sets of Vocabulary cards relating to festivals, occupation, flowers, types of soils etc., 16 Child Craft books which deals with history, science, rhymes, Numbers up to 1000, 50 hand-made cards, 100 Thirukkural verses, 10 story books based on shapes, colours, patterns etc. and all the countries and capitals in the world. They also learn to identify the flags of the different countries in the world.

It must be specially noted that alphabets are not taught all these three years and teachers resort to different methods of teaching to instill interest and creativity in the child during the teaching-learning process. The teachers don't restrict themselves from giving extra information about all the topics that are being taught. They try to bring them to listen to them without forcing them to get into the learning frame of mind. In short, this method of teaching enables the child to amass a lot of information about the things around him. It also makes them ready to enter Class I, where the child would find reading and writing coming to him with such ease. At Primrose, we make it a point to remind ourselves that knowledge is the most precious gift we can give the child and we must give it as generously as possible.

Holistic education – An approach

Shweta Rangan

The whole is greater than the sum of its parts - Aristotle.

The idea of holistic education should be to arrive at this greater system by exploring and understanding the relationship between its parts. Holism in general is the idea that all the properties of a given system in any field of study cannot be determined or explained by the sum of its component parts. Instead, the system as a whole determines how the parts behave. For e.g. To become an engineer, a student should first understand engineering as a whole system and then explore its depths. When you give a child, a car, it first observes the car as a whole. It then observes all the car's parts individually. It moves the whole system and sees how all component of the car move together, simultaneously, functioning separately. It then understands the relation between the car, its movement and the surroundings. It understands value, space and time. Now the child has a higher knowledge about the car than the car itself. A holistic way of education tries to encompass and integrate multiple layers of knowledge and experience from a wide variety of systems.

As an attempt towards forming concepts to develop such an integral form of education, a video¹ is being presented as a milestone. Though the video talks about a child playing with a kite, we have attempted to develop each word into a new concept thereby providing the child a holistic view of learning. In this video we have tried to harmonize theoretical and practical ways of learning. We are also in the process of researching ways and means by which such videos can be further developed to capture the interest of the learners and intrigue young minds. All the videos are available in YouTube² and Facebook³.

¹ <https://www.youtube.com/watch?v=Px6ly8e90nA>

² <https://www.youtube.com/channel/UCXPGwBJYqMd0S3Yv7sPRYgw>

³ <https://www.facebook.com/Kids-Education-1931078280492505/>

Etymology

S. Devakanni

President, SpellBee International

The study of origin and evolution of Individual Words in a language.

It deals with tracing the history of that language, it's words, its development since its earliest recorded occurrence where it is found, by also tracing its for-mation from one form of the language to another, analysing its parts (mor-phemes-smallest unit of the word and phonemes-smallest sound unit of a word), by identifying its cognates (similar/equal words) in its ancestral form or in other languages.

It is also about Phonology, the sounds that dictate how a word should be pronounced and Morphology the root words, prefixes, suffixes and other affixes that structure a word.

English is a product of vast influences from different languages.

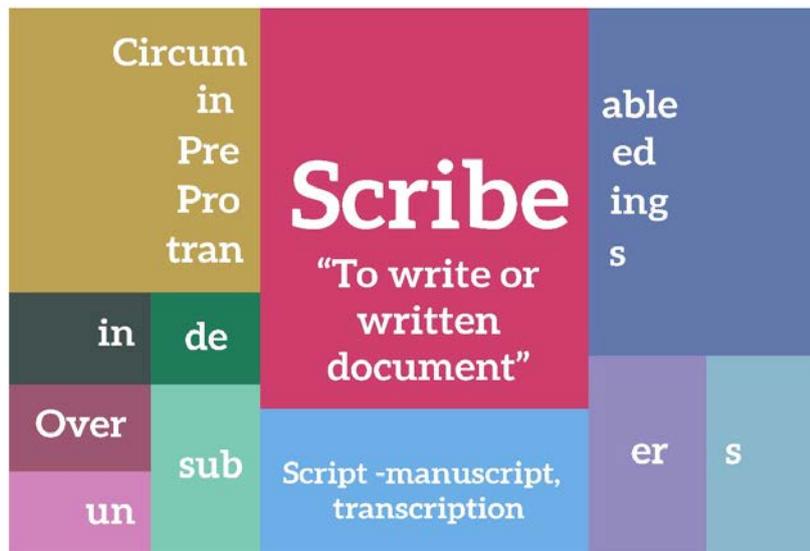
Around 29% of root words comes from Latin; and from European languages as 29% from French; 26% from 4 different Germanic languages (Old Anglo-frisian dialects, Old Norse, German, Dutch); 6% Greek; 6% of other languages (Indian languages, Yiddish, Jewish, Arabic, etc.); 4% of proper names (around 10 words are added per day of different languages) which gives us an overview there is an idea of how the pronunciation and spelling will differ tremendously.

Learning word morphology will help one to analyse the parts of the words and to form new words. It deals with connecting the smallest meaningful word units (morphemes) and sound units (phonemes) - how they combine and how they evolve and render themselves for current usage in their form, spelling, pronunciation, meaning, etc.

Word Morphology

Prefixes	Base words	Suffixes
RE	HEAT	ED
IM	PORT	ED
RE	DO	ING
IN	DEPEND	ENT
MIS	UNDER	STAND
DIS	AGREE	MENT

Even though it is a vast subject, SpellBee International helps in understanding and mastering it.



Derivational Morphemes

Derivational Morphemes is the formation of new words by adding prefixes and/or suffixes to the existing word.

The words have the same root but different stems.

E.G. NATURE, NATUR-AL, NATUR-AL-LY, UN-NATUR-AL, UN-NATUR-AL-LY,
NATUR-AL-ISE, NATUR-AL-IS-ATION, NATUR-AL-IST

Inflectional Morphemes

Inflection is the formation of new words by adding suffixes to the existing word.

Inflects are a set of related words consisting of the same stem.

(There is no change in the part of speech or basic meaning.)

E.G. BRIGHTEN, BRIGHTEN-S, BRIGHTEN-ED, BRIGHTEN-ING,
TALL, TALL-ER, TALL-EST, CAT, CAT-S, CAT'S, CATS'

Word Analysis

What are words made of? You say letters? Good!

Now, have you ever thought why exactly THOSE letters?

In English, words are many; but root words are few! When you learn a root word, you will learn so many words built with it! Isn't mastering the root words the quickest way to expand your vocabulary?

The root word GRAPH comes from the Greek word GRAPHEIN which means WRITE.

There are so many words from this root: biography, calligraphy, geography, auto-graph, paragraph, graphite... So remember: GRAPH is all about writing. When you see this word root, look for a connection between the word and something written.

When you know the meaning of the root word, you can also guess the meanings of words that use the same root, even if you are looking at the word for the first time!

The root word PHIL is also from the ancient Greek that means TO LOVE.

Some common words that contain this root are: bibliophile (lover of books), philosophy (love of knowledge and wisdom), technophile (lover of technology) and anglophile (lover of all things English!).

Ancient Greek words ‘hippos’ means horse and ‘potamus’ means river. **Hippopotamus** literally means river horse!

Arguably, the word **anaconda** is of Tamil origin! Based upon the phrase ‘anai-konda’ meaning, “having killed an elephant”

Hazard is from Arabic. ‘al zahr’, which means the dice. The term took the meaning of danger because, since ages, games using dice were associated with the risky business of gambling

Etymology of English language helps in better pronunciation of words equally as English is not a Phonemic Language; it means that the writing symbols are not matching the pronunciation of the words in the language. In fact, there are 26 letters. These letters encode around 44 sounds.

The spellings of all words were organised by Samuel Johnson in 1755 in his dictionary, as a demand for documentation and for facilitating book printing companies (these companies became the authorities of the written form of English at the beginning).

This explains the difficulties in spelling system like the number of silent letters as an auxiliary or dummy silent letter, the alternative spelling pattern representing the same sounds, the divergence in a few plural nouns and irregular verbs because of the influence of other languages, the arrangement and order of spelling like in homographs and homophones, the vast self-defined names with imported pronunciation, the imported derivational forms of many words which depends on how it is available in the original influencing language (root) and so on.

With such historical background and features of the language it is still possible and important to introduce the seemingly complex subject ETYMOLOGY in the curriculum even for beginners in the most simplified forms along with activity-based lesson plans.

SpellBee international, in the last 8 years, has introduced Etymology (root words and phonetics) to 300000 students through 1500 schools across India in 22 states from grade 1 to grade 9. 60% of the 300000 students belonged to 1st-4th grade.

Their performance exceeded expectations, when in fact the competition was far more tough for Grade 1 and Grade 2 (because hundreds of students get 100/100 even in the second tie round).

Educators can draw confidence to introduce etymology at (especially at) early stage without hesitation and doubts on students’ ability to understand and practise.

This paper is presented to you by SpellBee International after assessing more than 100,000 exam papers, year after year, at different levels and training students and faculty of 300 institutions in person.

This can be implemented in your School!

For queries, assistance and direction please mail us at sdevakanni@gmail.com. Also please feel free to use our website www.spellbeeinternational.com for knowledge re-sources and periodical updates in language teaching and learning.

Composition Writing: A Skill that can be Taught to Young Learners

Vasugi Balaji

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Composition is an act of writing which brings out the inner ability and creativity of the writer. Composition in general means any form of writing like essay, poetry, paragraph, journal, diary, summary, dialogue writing etc. Even writing an answer to a question or even framing a question is also an act of composition. It is necessary that young learners of English be taught the sentence structures to write a composition.

A writing in general requires i) a thought content ii) mental organization of thoughts iii) the act of writing iv) evaluation of the writing. The act of writing is a skill that could be developed and mastered from a very young age. The skill could be developed by teaching how to write and giving ample opportunities to practice.

Many schools teach composition from the point of view of examination. A basic structure or a standard template for writing a composition is given to students if it is an essay, letter or any form of composition writing. Though they are giving the structure of writing and the teacher holds a brain storming session before the students start writing, most of the students find it difficult to compose their thoughts as they are not much sure about the construction of the sentences. The children are taught spelling, vocabulary and grammar as separate entities and asked to compose using them to form sentences. The lack of composing good sentences would become a hurdle to students when the thought has to be put in the form of writing and would be a barrier to the expression of creativity of the child. This also leads to simply memorizing and regurgitating information.

It is necessary to teach how to compose sentences from a very young age. From the primary sections, when the kids have a general understanding of the types of words—nouns, verbs, adjectives, adverbs, pronouns, prepositions, conjunctions—that are used to compose a sentence. With this basic understanding the kids could be taught to compose a simple sentence with a noun and a verb which could be extended as an addition of an adjective, an adverb or even both. They can also be taught how the noun/verb can be replaced by another noun/verb, how a noun can be replaced by a pronoun, how the verb form changes with a plural noun, etc.

By upper primary levels, the children are exposed to a lot of reading material through various subjects and have a better vocabulary. They can be taught how to write the various types of sentences—simple, compound, complex and compound-complex sentences and how they can be combined. Later on, the children can be asked to read a story and summarize or rewrite it in their own words when they have a strong foundation in sentence structures. Teaching of sentence structures enables the children to avoid errors while writing.

The method explained above is an extension of a method devised by the founder of The Mother's Service Society. It was tested and proven by him more than 40 years ago when he was a teacher in a government school in Cuddalore, teaching students of Tamil Medium who were not able to write a sentence on their own. A particular student who was to appear for his final S.S.L.C exam was able to write on his own with a training for about a month on the basic sentence structures and summarizing/rewriting his lessons in his own words. This enabled him to get first mark in his class in English when he was not even able to pass in English before. He was a student who found memorizing very difficult. We have plans of implementing this method with the students of Primrose.

Being a voracious reader does not make a person a good writer. It is necessary to have a good foundation for writing in any language. A good composition is one that has rich content and not the one with flowery language. Knowledge in basic sentence structure will give an expression for the free flow of thought for the young learners.

Speed Reading for Kids

Vasugi Balaji

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Speed reading is a technique used to improve one's ability to read quickly. Speed reading is a science that was developed in the west and used by professionals to learn how to read faster. They show that through constant practice we can raise the rate of reading speed to double or triple and at most to 10 times faster.

But these methods are not commonly used because by the time. As we become an adult the physical habits of how we read is so ingrained that it takes a lot of retraining and deconditioning to break those monotonous habits even in reading.

We believe that the skills for speed reading can be learnt at a very early and formative age when the children are just beginning to read. And it will become as natural as learning a first language. In speed reading we teach the child to view a wider peripheral area so that the kids read not as individual words but as chunk of words and then visualize a whole page in a book. It needs a daily practice of 15 minutes.

Average readers read at a speed of around 250 words per minute in a non-technical material with a typical comprehension of 60%. The top readers reach above 1,000 wpm (words per minute) with nearly 85% comprehension.

A 200-page book usually has around 50,000 words. If we can read 200 wpm, it will take about $50,000 / 200 / 60 = 4.17$ hours to read it. If we can read 500 wpm, it will take only 1.67 hours to read. If a child can read 800 wpm, it will take only 1.00 hour to read a book. This would enable a child to read even two/three books a day.

Elon Musk is a famously voracious reader. He could read two books in one day. Though Musk has degrees in Physics and Economics, he is self-taught in aerospace and automotive engineering, the two primary concerns of his companies, SpaceX and Tesla.

Using Literature in Education

Janani Ramanathan

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We have always told stories to children of all ages. We tell them these to bond with them, entertain them, get them to eat, or go to sleep. We have also known that stories teach. They teach morals, ethics, life values, religious principles, even management lessons. This is part of the value of Aesop's fables, Panchatantra stories, Jataka tales, and the epics, folklore and fairy tales of all regions. In organized education, many teachers have used stories, biographies, case studies, movies and popular television serials to illustrate a point in their lesson. This makes the lesson that would otherwise remain a unidimensional picture come alive. Students sit up and listen with greater interest. They understand better when they see the parallel in the story. An analogy helps them retain what they have been taught well after the exam is written, the grades are received and they move on to the next year.

Progressive schools and teachers encourage some use of fiction to teach certain topics and subjects, but the value of literature is still largely not recognized by most. A story is not just a product of a creative writer's imagination or a tool for entertainment. It reflects life. It describes a place and a period, the political atmosphere, economic situation, social attitudes, scientific developments, and the values and aspirations of people and society. Thus, a story that captures the essence of history, geography, politics, economics, psychology and in some cases, science is a vast educational resource that is waiting to be tapped into. It provides more insight into all these subjects because it gives the subjective psychological and social consciousness of the characters with far greater depth and realism than a textbook on the subject can. We do not really know something fully until we have experienced it. Mental understanding gives us the information, not the sensation, emotion and tangible concreteness of experience. It is the difference between reading about a person or place or event and actually experiencing it. Literature reduces this difference by providing the added dimension of experiential life-centered knowledge to abstract intellectual knowledge.

An adventure story like *Around the World in 80 Days* can supplement the teaching of geography in an entertaining way. *David Copperfield* portrays the human side of the Industrial Revolution. *Les Misérables* and *The Idiot* are, apart from many other things, also treatises in human psychology. *The Tale of Two Cities* and *Gone with the Wind* look at political and historical events from multiple angles. The political machinations described in *The Three Musketeers* give a historical perspective of military governance and international relations. *Pride and Prejudice*, a romance, can teach the secrets of great accomplishment as well the theory of social evolution. And it is not that one story can be used to illustrate only one dimension of life. Even a single story or event contains all of life in it and only when we bring out the full reality of life in a story does it truly convey its experiential knowledge. *Around the World in 80 Days* can teach geography. It can as well teach the history of travel, colonization, international law, and cultural and religious differences in different parts of the world. It can also be used to illustrate the high principles and positive values in one, in this case Phileas Fogg—punctuality, calmness, courage, generosity, perfection—that help him accomplish in his adventure and in life.

When a teacher integrates a story into her lessons, in one or more subjects, the branches of knowledge that are separated into silos in our current method of education get linked together. In showing parallels between lessons and a life situation even if it is in a piece of fiction, the teacher is able to get the learner to relate to the learning. Thus, the use of literature in education bridges two gaps. The horizontal separation between the different aspects of reality is eliminated by showing the interlinks across various subjects. When a story is used to show the life relevance of what is being learnt, when textbook learning is posited in a real life situation, knowledge does not remain abstract anymore and the vertical disconnect between the student and the lesson is removed. Education becomes transdisciplinary, erasing artificial boundaries and enabling students to see comprehensively, as they would need to later in work and in life.

Every story is a lesson in accomplishment. When the protagonists succeed, it is a positive lesson. Every failure in the story is an equally powerful lesson on what not to do. Great authors have captured the essence of accomplishment in their narratives. Every story can be a rich case study that teaches the values that help in accomplishment, and the internal and external elements that hinder us from making progress. Literature can uplift our education if, apart from supplementing and integrating academic knowledge, we use it to teach every child the laws of life and accomplishment and the way life responds to our every thought, impulse and act.

Beauty of Mathematics and Overcoming the Agony of Math Education

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The wonders in nature are described and illustrated in poetry, music and various art forms like paintings, photography and dance. Beauty in nature manifests as symmetry, rhythm and balance. These are the basic attributes of mathematics. Leonardo Da Vinci understood that nature writes her laws in mathematical language. He realized that Maths was the key to turning observations into theories. He revealed the beauty of nature in his art, architecture and scientific inventions. He said “There is no certainty in sciences where Mathematics cannot be applied”. Maths is the architecture of the whole universe. It is the language of nature and has the vocabulary to make sense of the world around us. Our inability to perceive nature and communicate in terms of Maths only signifies the flaw in our education.

Hemachandra, an Indian linguist discovered a mathematical sequence in Sanskrit poems observing the rhythm of the syllables. He formulated the sequence and gave a simple proof by relating the sequence to the long and short beats of tabla (percussion instrument). The same mathematical sequence was discovered by Fibonacci, when he wondered about the growth of population of rabbits. This sequence appears everywhere in nature, in the arrangement of leaves, petals, shells and more. Curiosity and imagination stimulate mathematical thinking. We must provide a nurturing environment for kids to follow their natural curiosity. Curiosity is expressed in the form of asking questions. There is no such thing as wrong questions. No matter how silly or unrelated they may seem, questions can lead an open mind to new discoveries.

When kids gain an awareness of the world, they learn to think mathematically about the world around them. Maths should be taught as a natural, intuitive language that helps kids to express and communicate their thought process. But Maths is taught as a foreign language, where we memorize the sounds and do not understand the language. We do not understand the context of the mathematical symbols, their application and counterpart in the real world.

A class of 30 students were posed a challenge – everyone must shake hands with every other classmate and find the total number of handshakes, without repetition. The kids tried to act out the problem, drew diagrams and figured that it is much easier to solve the problem in a small group, consisting of 3 kids. As they increased the number of kids in the group, they noted down the number of kids and handshakes. With enough samples, they looked for a pattern and generalized the answer for 30 students. This experiential understanding and reasoning, would have been lost if the kids were taught the formula for combinatorics initially. The formula $n(n-1)/2$ and replacing n by 30, can give the answer in a minute, but it gives no knowledge to the student who will forget this formula as quickly as he memorized.

The capacity to understand and perceive numbers at the level of sensations is termed as ‘Number Sense’. Number is an abstract idea. Number sense is a fundamental way to relate numbers concretely and visually, so it becomes real to the student. Visual learning is a key to gain intuitive understanding of numbers. Visual representations are not only engaging, but they transform abstract mathematical concepts into physical tangible objects. Professors at Stanford Graduate school of Education, US have found that visual learning has led to 50% average improvement in test scores, and boosted students’ engagement, persistence and mindset.⁴ Some of the world’s top mathematicians engage almost entirely with visual Maths.

Singapore has consistently scored on top in the Programme for International Student Assessment (PISA), a worldwide study of school students’ scholastic performance on mathematics, science, and

⁴ <https://www.youcubed.org/evidence/visual-math-improves-performance/>

reading.⁵ Singapore Maths program uses visual learning and succeeds in mastery of mathematical skills. Problems are taught with physical objects in a concrete way and then kids are asked to represent the idea as a diagram. Only in the last step, the problem is taught using numbers and symbols. These strategies have helped the kids to learn faster and effectively apply them. There are better ways to retain the knowledge, apart from repetitions of facts till the kids lose interest.

For instance, when multiplication is taught in traditional methods, kids are forced to rote memorize the multiplication tables, repeat it endless times and given timed tests to evaluate if they have understood the concept. Memorizing the symbols and numbers first and then asking them to apply the same idea in real life makes no sense to the child, as they appear to be in two different worlds. In Singapore Maths Program, kids learn using concrete materials like blocks or beads. They may count several 11 blocks and see a recurring pattern in it. Then they draw diagrams or given visuals to represent the idea that was learnt. Finally, the teacher uses symbols and numbers to show them how to write the idea in mathematical language.

Step 1:



Step 2:



Step 3: **11 x 2 = 22**

In India, visual learning is emphasized in lower grades in primary school, but given up after the early stages of education, assuming that it is not needed for high school students to learn abstract math. Estimation, pattern and spatial recognition can be taught only using images and physical objects. We readily accept that comparing size or estimating distance between objects need visual learning to get the 'sense of scale'. Similarly, we must teach 'number sense' using visual aids and manipulatives, so kids can understand Maths and have the capacity to communicate their ideas. Seeing numbers in different ways is the key to develop number sense and to build fluency of Maths language.

Using this method, children learn Maths facts and its context. They can intuitively apply the abstract Maths concepts in their everyday life, and their education stays relevant to their world. This motivates them to pay attention to what is taught and think about the ideas, even after their class is over.

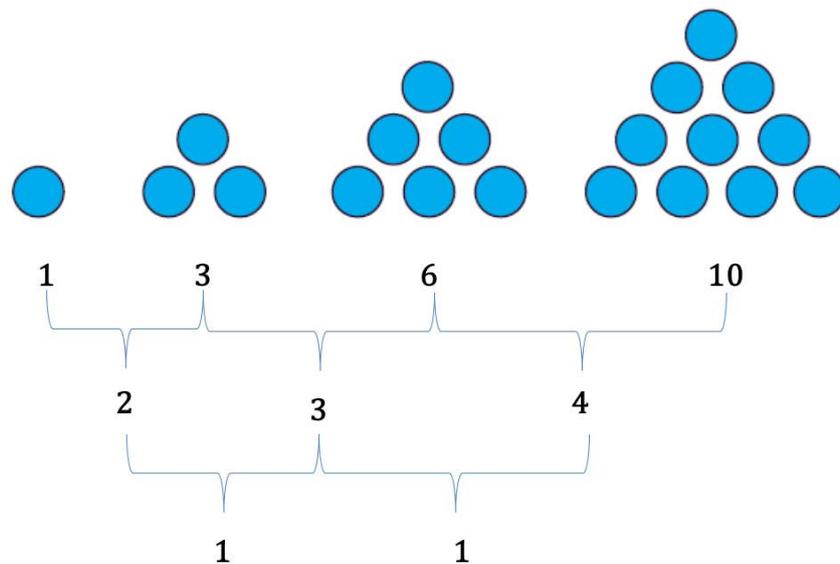
The tools for teaching this approach are the very same tools that are discarded after primary school - Puzzles, blocks, Lego, dice, Rubik's cube and activities like paper folding, tracing points, magic tricks and toothpick modeling. Manjul Bhargava won his fields medal, that is considered as Mathematics' equivalent of the Nobel Prize by using the simplest Rubik's cube. He also offers a seminar on "The Mathematics of Magic Tricks" in Princeton University, and is celebrated as an extraordinary professor

⁵ <http://www.oecd.org/education/singapore-tops-latest-oecd-pisa-global-education-survey.htm>

by his students. This validates the point that games and puzzles are mathematical tools that cannot be ignored as childish ways to learn middle and high school Maths.

Visual learning and the freedom to explore will allow kids to understand mathematical concepts that are reserved for college and researchers. Non-Euclidean geometry is a child's play if he is allowed to draw shapes on paper and a ball, and compare the results. They may formulate their own fractals and compute irregular shapes by conducting experiments and generalization. We must remove the stigma on visual learning methods and build the classroom environment that encourages all students to participate and feel validated for their thinking. There is more than one answer to a question and there are different ways to arrive at an answer. We must celebrate success and also appreciate the mistakes in the classroom, as mistakes are an integral part of learning. Teachers can make the thinking process conscious but help the students identify the different types of mistakes. Some mistakes are made during Eureka moments, when a new idea pops up and it is expressed without thinking through various facts. Mistakes are bound to happen when a child tries to apply a known concept to a new setting. These are bold mistakes that have to be encouraged, and rewarded for taking the adventure into the unknown. Kids must be able to distinguish such bold mistakes from sloppy mistakes that should be avoided.

Calculus is taught as “the branch of Maths that deals with limits and the differentiation and integration of functions of one or more variables”. If taught through visual learning methods, children can see the patterns and the way the patterns change in succession. This rate of change is the fundamental idea of calculus. Algebra formulates equations by finding patterns in numbers and calculus finds patterns in algebra.



Only few may be interested in getting into the details of calculus, but everyone should be able to admire Maths and expand our mind in the process. We might not be interested in the acceleration of the rocket launched into space, but we are very much eager to know the rate of increase of our salary over time.

In traditional method, teaching Maths is to pose a question to kids and tell them the steps to find the answers. The focus is on memorizing the procedure to find the answer. Taught by this method, a child can apply the formula and solve the quadratic equation. But if a child is given the freedom to explore and guided to find patterns in them, he will find the infinite pattern that is hidden in the quadratic equation.

For example, to solve the equation, $x^2=2$ the child is taught to plug in the values to the quadratic formula and solve for x.

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

But if he is let to explore, he might discover the infinite-continued-fraction hidden in the equation.

$$x = 1 + \frac{1}{2 + \frac{1}{2 + \frac{1}{2 + \frac{1}{2 + \frac{1}{2 + \dots}}}}}$$

A high philosophical truth, “Infinity is contained in the finite” can be realized by a child when he learns to think in the mathematical language. Learning without context makes Maths a difficult and boring subject. When students gain fluency of Maths concepts and mastery over the skills in an intuitive way, they can express their knowledge in any field of study.

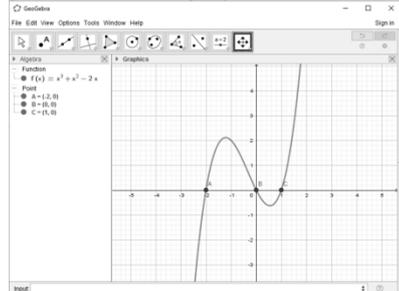
Effective teaching practice in Mathematics Education: Understanding equations through graphs

Yogaraj

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In mathematics, the phobia that bothers most of us tends to be part of a bigger problem. Many, perhaps most of the students and teachers have a wrong notion that mathematics is the subject with a lot of formulae and definitions which need to be learnt by-heart. They strongly believe by doing lot of maths they can acquire the skill to think mathematically. But the sad truth is, the most significant processes like generalization and reasoning are not happening in math learning. According to National curriculum framework – 2005, “developing children’s abilities for mathematisation is the main goal of mathematics education”.

In high school mathematics, doing mathematics has become more procedural. But it is important to know how to mathematise than to know lot of mathematics. In case of algebra, the students are asked to solve, factorise and simplify the given equations. In our experience, one of the main challenges for both teachers and students that we observe is in understanding an equation, its structure and properties. The abstractness of dealing with equations needs to be cleared. The basic premise is that challenge to teach is nothing but solving learning challenges. While mathematising a child’s thought process, it is important to forge his/her approach towards mathematical concepts. To understand the beauty behind the equations, the tool which we use in the class is ‘Graphs’. Every equation in mathematic corresponds to a graph. For example, we teach how to find the zeros of a polynomial equation algebraically, but by drawing the graph of a quadratic equation we can see the zeros as the points at which the curve meets the x-axis.

Factorize $p(x) = x^3+x^2-2x$	
Algebraically	Graphically
$p(x) = x^3+x^2-2x$ $p(x) = x^3+2x^2- x^2-2x$ $p(x) = x^2(x+2) -x(x+2)$ $p(x) = (x+2)(x^2-x)$ $p(x) = (x+2)(x-1)x$	

Using graphing calculators like Desmos and Geogebra, we have implemented this approach at Locus and have experienced that the learning outcome is increasing the interest towards conceptual learning of mathematics among our students. By drawing the graph of the equations, wherever possible, students get a hands on knowledge about what he/she is doing.

Future Roadmap: Through our social enterprise called “Mathematica” we have started inculcating this philosophy through in service teacher training programs at different levels. Now we have come up with pre-service programs for those undergoing teaching education in B.Ed. colleges aspiring to become teachers in the near future. So we have moved from training the older generation to catching them young to create an effective impact on their teaching approach.