

A Paradigm Shift in Digital India for Sustainable Education System Part 2 – (21st Century Curriculum, Learning Oriented System)

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Designing 21st-Century Curriculum

Strong education systems are guided by a strong curriculum, which describes the crucial competences that students need to develop and sustain. Because the world has undergone such vast social, ecological, economic and political changes and faces such major threats, the curriculum of the 21st century will need to be different from the curriculum of the previous century [4].

Every era needs its own education. To fully live their present and future lives and to secure the future of our planet, students of the 21st century will need to learn to:

- Make knowledge work: Rather than merely accumulating facts and figures in their heads and memorizing specialist, decontextualized knowledge, and young people need to learn how to use knowledge in flexible ways to solve complex problems in a wide range of situations and contexts. They will need to be able to “re-contextualize” the abstract knowledge they have acquired to cope with authentic, real-life challenges. Therefore, if the education of the 20th century was knowledge based, sustainable education for the 21st century will need to be solution oriented.
- Make communication and information work: Rather than absorbing information provided by a teacher or a handbook, young people need to learn how to find, critically evaluate, organize and use information for a wide variety of purposes. In addition, young people need to learn how to communicate in clear and coherent ways, to report and summarize findings (both orally and written), to share thoughts, to deliberate and join discussions in a civilized and rational way and to

engage in open-minded and constructive dialogue. Therefore, if the education of the 20th century was transmission based, sustainable education for the 21st century needs to be communication oriented.

- Make their creative powers work: Rather than solving problems in one particular, predetermined and uniform way, young people will need to learn how to devise different solutions and adequately apply the most appropriate ones to the case at hand. Crucially, the next generation of adults will need to be able to come up with innovative solutions for the social, ecological, economic and political problems the current generation of adults fails to solve. From an early age on, creative, “out-of-the-box” thinking should be stimulated throughout the curriculum. Therefore, if the education of the 20th century was highly reproduction based, sustainable education for the 21st century will need to be innovation oriented.
- Make social relations work: Rather than merely striving for personal success (at the cost of others), young people need to be able to work and learn together with others, respect other viewpoints and cultures, work out compromises and solve social conflict in rational, nonviolent and civilized ways. In view of the fact that intolerance underlies much current warfare and social injustice, young people should develop their own identity while fully respecting other people’s identities and choices. Therefore, if the education of the 20th century strongly emphasized individual merit, sustainable education for the 21st century will need to take a social turn.
- Make technology work: In addition to using technology for personal, informal purposes, young people will need to

develop high levels of functional literacy to critically cope with the overload of information that modern technology produces. They will need to learn how to put technology to adequate use to make their own and other people's lives richer, safer, easier, more peaceful and more worthwhile and, at the same time, secure the future of the planet on which we live. Therefore, if the education of the 20th century was low-tech, sustainable education for the 21st century will need to be multimodal and high-tech.

- **Make change work:** Rather than being afraid of change, young people will need to learn how to cope with sudden challenges and unexpected events in a flexible, creative, rational and well-considered way. Young people will need to develop the flexibility to adapt their behavior and decisions to new input and rapidly-changing contexts. Therefore, if the education of the 20th century was largely based on the transmission of established bodies of knowledge, sustainable education for the 21st century will need to strike a balance between the legacy of the past, the pace of change in the present and the needs of the future.
- **Make their own learning work:** In addition to learning how to meet immediate needs, young people will need to develop a wide range of learning strategies, attitudes and skills to sustain their own learning and development in the future; they will need to develop a high degree of confidence in their learning skills and the willingness and skills to aid others in furthering their development. Therefore, if the education of the 20th century was strongly focused on immediate performance targets, sustainable education for the 21st century will need to foster lifelong learning skills.
- **Make their own lives work:** Rather than merely dictating which path students should blindly follow, educators should foster students' ability to think independently and make their own decisions in a rational way. Rather than dictating what students should think,

education should teach students how to think for themselves. Furthermore, education should enable students to explore who they are, to discover what their true talents and ambitions are, which of their limitations they can overcome (and how to do so) and which educational path is best suited to make the most of their learning.

- **Make life on the planet work:** If education should foster people's capability to take charge of their own lives and their own development, they should learn to do so without damaging others and their environment. Even more, they should learn how they can make a positive contribution to preserving the social and ecological diversity on this planet, enhancing equity among people of different ethnic, cultural and religious origins and solving the major problems this planet currently faces (amongst which are poverty, child abuse, global warming, species extinction, warfare and the depletion of the Earth's natural sources). This aim resonates strongly with the original meaning of the term "sustainable education" as coined by Sterling [4] and advocated within the field of education for sustainable development.

Understanding Learning

To make education systems work optimally towards the above-mentioned learning goals and to do so for every single student in the system, we need to understand how learning works. We need to fully grasp what it is that turns students' energy into the development we envisage. Although much remains to be uncovered, there is much about learning processes that we have discovered over the past few decades [4].

For one, learning is about connecting. To learn, people need to be able to connect the new with what is already known. To a great extent, prior knowledge determines what can be learnt; the learning outcome of human activity heavily depends on the extent to which new information can be connected with what has already been

acquired. Research into learning has tended to highlight the cognitive side of this basic insight. However, especially in compulsory education systems enlisting children and adolescents, the cognitive aspects of learning (and connecting) cannot be separated from other dimensions of learning. For young learners of flesh and blood, the cognitive aspects of learning are inextricably entwined with social, emotional and physical aspects [4]. Connections, then, may be hypothesized to be richer for learning and thus give rise to more sustainable energy-learning cycles, if they positively engage the learner's whole being. Therefore, in this line of reasoning, learning is facilitated if learners also connect socio-emotionally to what they aim to learn or need to learn and if learners socio-emotionally connect to the activity they are participating in and might learn from. In addition, learning will be enhanced if learners are able or willing to connect to the person(s) with whom they are interacting and/or from whom they are learning [4]. In other words, the combination of socio-emotional, physical and cognitive engagement can top-up the energy unleashed for learning, and the learning experience, in turn, may feed the learner's socio-emotional, physical and cognitive well-being.

Secondly, learning is an active verb. Connecting (and thus learning) cannot be done for the learner; it is something the learner needs to do. For much of what people need to learn, especially for the development of complex competences, people need to engage in situated practice and to do so repeatedly. However, merely repeating a particular activity does not automatically result in deep-level learning. Much learning requires some degree of reflection on what we are doing. If we understand what we are doing (especially when we are doing, or supposed to be doing, new and complex things), our capacity to handle the new, modify and apply it in a wide range of situations and contexts may be largely enhanced. In this

way, learners' natural powers to learn will turn into expert power.

The above implies that much learning requires effort and that learning also has a motivational aspect. If learners assign personal meaning to what is to be learnt or done, if they believe the new will make a positive difference in their lives, if they expect the learning or participating will matter in any way, if they can make educational aims their aims, they might be inclined to invest more energy in the activity. Ultimately, much of what does engage people in activities that might lead to learning boils down to some prospect of personal or social reward.

In a nutshell, learning is about connecting, investing, and expecting. The three reinforce each other. If people can connect the new they encounter in the now to something they knew, did or felt in the past with a view to feeling or doing better in the future, then they are bound to invest energy in the ongoing activity, and the energy-learning wheel will start turning. This does not imply that learners need to be consciously aware of each of these conditions. There is quite a lot of investing, connecting and expecting that goes on at an unconscious level. Additionally, as mentioned above, if people are cognitively, socio-emotionally and physically engaged in connecting, investing and expecting, then the learning that comes out of it, and the new energy that the learning experience produces, may be largely enhanced. Conversely, the socially-disadvantaged child who cannot connect her prior knowledge and skills that she developed at home to the abstract subject-matter of the school curriculum, who feels that the teacher holds low expectations of her school achievement and who expects to do badly on the following tests, may find it increasingly hard to invest further mental and physical energy into studying and working hard at school. For this student, the energy-learning cycle may grind to a halt: the energy for learning this student has left may fail to be renewed.

Designing Learning-Oriented Education

Education systems work well if they work well for every single student in the system. That is, if they manage to keep the self-perpetuating energy-learning cycle of every single child going and if they make sure that every single child develops the crucial competences in the curriculum and realizes her full learning potential. However, how do successful education systems accomplish this? What do education systems that foster both equity and excellence actually do [4]?

- They challenge and trust learners: Teachers in successful education systems hold high expectations of every single student in the system and expose their students to challenging, meaningful content. They are not discouraged by the temporary flaws, errors or mistakes that inherently belong to any process of learning (and which, if put to proper use, may actually be exploited to promote learning). Challenge is key to high-quality education, because, in essence, it is about inviting learners to stretch their muscles and continuously acquire new skills, knowledge and attitudes. Reviewing the research on what distinguishes expert teachers (whose students show higher-than-average learning gains year after year) and experienced teachers, Hattie [4] concludes that “expert teachers do differ from experienced teachers, particularly in the degree of challenge that they present to students, and, most critically, in the depth to which students learn to process information.”
- They activate and motivate learners: teachers cannot do the learning for their learners. Research into learning processes amply shows that to develop expertise (in whichever field), learners need to engage in much deliberate practice, during which they can learn by doing and by reflecting on what they are doing in an effort to improve their practice [4]. Rephrasing this insight in terms of sustainable education, this means that learners need to invest energy in their own learning process. As

research into learning motivation indicates, energy for learning is boosted and activated if learners are exposed to tasks they consider valuable, challenging and doable and if they know that support (by a more competent partner) is provided should obstacles arise [4]. In addition, learners’ energy for engaging in learning activities might further be boosted to the extent that teachers tailor content and support to their students’ learning needs and allow their students to have a say in what learning content and learning activities are truly worthwhile.

- They contextualize learning: Activating students’ energy for learning does not suffice. As mentioned in the Introduction, one of the key principles of sustainable education is that the energy that learners invest in learning activities should turn into successful learning experiences, so that their energy for learning gets renewed, and a virtuous cycle ensues. One of the key features of successful learning experiences is that new content can be linked by learners to their prior knowledge [4]. Therefore, in successful education systems, the substantial body of decontextualized knowledge students need to acquire is linked by teachers to numerous concrete, contextualized cases and examples and connected to students’ prior experience; in a similar vein, students are invited to apply this knowledge to new cases in (semi-) authentic contexts and situations. Reviewing research on the impact of education on learning, three out of the five recommendations that Pashler et al. [4] make to teachers focus on using multiple ways of presenting challenging input (verbal, visual, digital, etc.) and designing multiple ways in which the student processes the input (problem-solving tasks, worked examples, hands-on exploration, etc.). Both inside and outside school, learners should be offered rich opportunities to re-contextualize their new knowledge to fully understand it, to make it come alive, to put it to societal use and to use it to enrich their own and other

people's lives. Therefore, in sustainable education, bridges between the school and the outside world are constructed and maintained: opportunities for workplace learning, community learning and learning from the multimodal experiences that modern technology offers are fully exploited to allow the learners to establish rich connections between the abstract and the concrete, between academic knowledge and real life and between new knowledge and learners' prior knowledge.

- They socialize learning: In successful education systems, learners get ample opportunity to collaborate on tasks and learn together. The empirical evidence on the positive impact of cooperative learning on students' development is robust [4]. In the process of collaborating, learners can support each other's learning and understanding of new content and, at the same time, learn how to work together, develop social skills and learn how to solve problems and settle disputes in a constructive way. In sustainable education systems, learning to work, learn and live together are fostered in an integrated way and become part of the school's daily life and assessment culture. School populations become learning communities where pupils develop and sustain rich and constructive relationships with more peers than just the pupils in their own class. In sum, for sustainable education, cooperative learning is of crucial importance, both in terms of enhancing successful learning experiences and in terms of fostering one of the key competences that students need to develop to fully live their present and future lives and to secure life on this planet.
- They differentiate: Today, many education systems require all students to acquire all subjects at the pace of their birthdays. However, the energy-learning cycle of every student has a distinctly personal touch. People differ in what exactly arouses their energy flow, in the prior knowledge they have built up, the interests they have, the way they learn and the pace

at which they acquire different skills. As the research on evidence-based education amply indicates [4], successful education systems are characterized by a high degree of flexibility in the teaching methodologies, support systems and grouping formats they offer: students who are temporarily lagging behind are offered more intensive, or adaptive, support; students who are extremely fast are offered further challenges.

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