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Self-learning: More Agency to Learners

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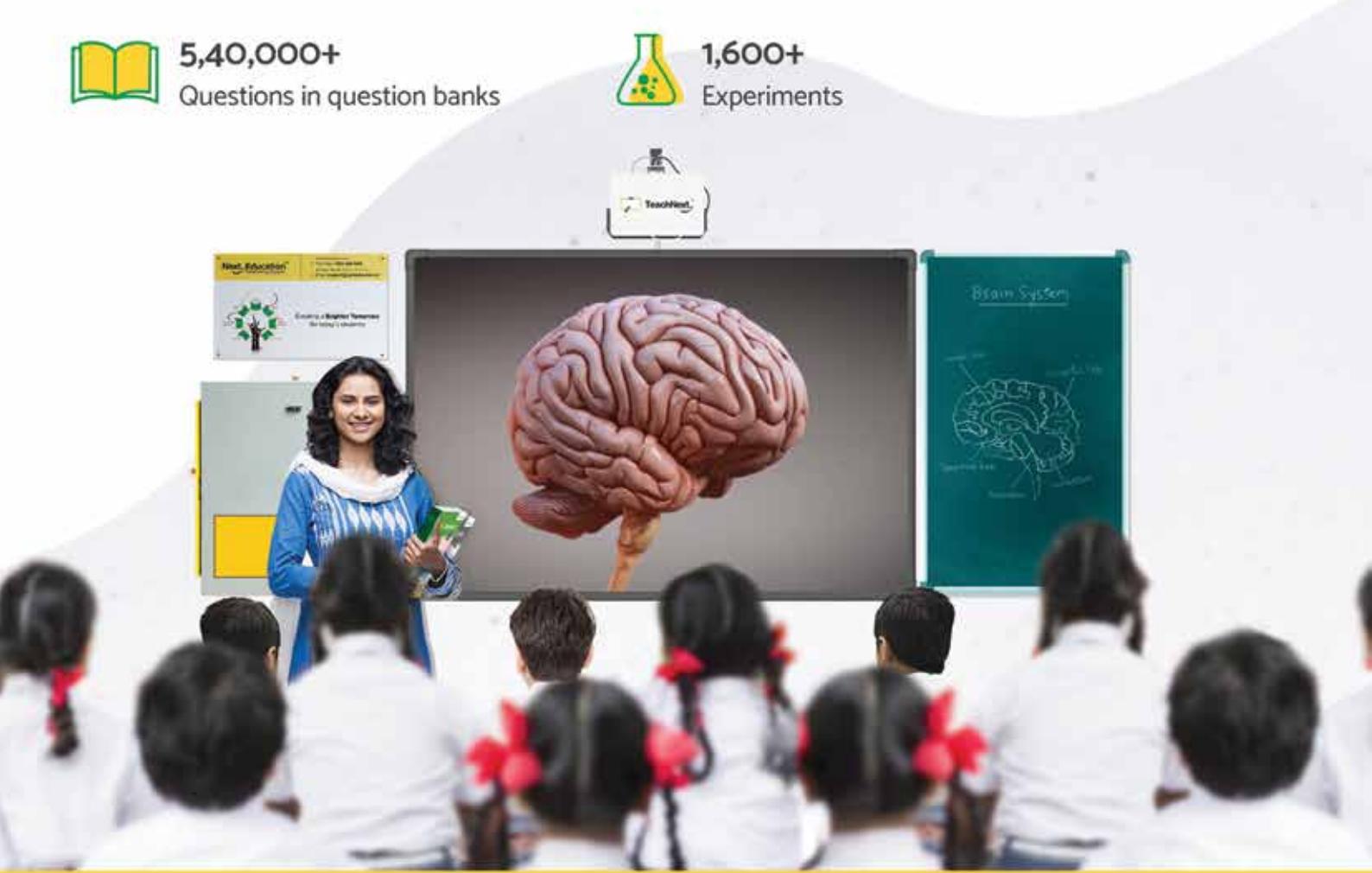
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EDITORIAL

The Brave New World Needs Self-directed Learners



SAMEER BORA

Sameer has over 18 years of experience spanning education, software technology, marketing and advertising. He specialises in K-12 education and product management, and is interested in the emerging trends of the education technology industry. He is currently the EVP of R&D at Next Education. He can be contacted at editor@nextworldmag.com



A brave new world is beckoning present generation learners. In this equal-opportunity world, anyone can aspire to reach for the moon. Needless to say, the moon is certainly not the limit to one's ambitions either. The rulebook is changing too; branding students using the age-old method as good, bad and average is no longer the norm today.

It is heartening to see that the world is remodeling itself to accommodate different voices and aspirations. However, thriving in this ever-changing, fast-paced world is not an easy task. Today, information on virtually everything is available at the touch of a button. However, the ability to use the information in the right way is of critical importance and only a well-rounded education can ensure this.

The primary aim of education is to prepare students to face the challenges of the future, and to achieve this, the education system should keep pace with the times. It is pertinent to note that major changes have been taking place in the K-12 sector in the last decade. Contrary to popular belief, it is not technology that has driven this transformation. Rather, it is the shift in teaching-learning approaches— inclusion of innovative and latest pedagogies—that has proved to be the game changer. For instance, digital classrooms would not have made their way into schools, had the key stakeholders, teachers and students, not accepted it.

In the last decade and a half, the entire teaching-learning process has undergone a sea-change, and is viewed from totally new perspectives which offer both student-centric as well as person-centric learnings.

Self-learning is one such approach that has gained momentum recently. As the name suggests, it is a way in which students learn without direct intervention of teachers. As students get to understand the process of acquiring knowledge, they develop a love for lifelong learning that goes beyond textbooks and classrooms. Even though self-learning is not a totally new learning approach, it has received a boost today owing to the pervasiveness of technology—the emergence of edutech platforms that cater to the learning needs of K-12 students and the penetration of internet connectivity and technological devices, such as smartphones and laptops, into almost all Indian households. Thus, it is clear that technology, innovation and research on new pedagogies have to work hand in hand to bring forth a change.

The first edition of NextWorld explores the various definitions of self-learning and the important role that a teacher plays in the process. It also busts some of the myths associated with self-learning in an attempt to establish self-learning as a crucial way of thriving in this world. We have also included a brief article on online teacher training programmes to address the learning needs of teachers and emphasise the need for constant upskilling.

More than being a commentary on the current education scenario, the magazine is an attempt at initiating a dialogue among all the stakeholders of the K-12 sector. The magazine has contributions primarily from teachers, subject matter experts and product managers. We welcome contributions from experts in varied fields to make the dialogue diverse and rich.

A Next Education Initiative



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Mundane routines can bring in boredom and kill excitement in the learning process.

Pre-primary Subject Matter Expert Rama Mavuri writes about making every day special for preschool kids to help them look forward to learning.

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Self-learning: More Agency to Learners

The benefits of self-learning go beyond acquiring knowledge. Self-learning helps learners become independent and develop critical-thinking skills.

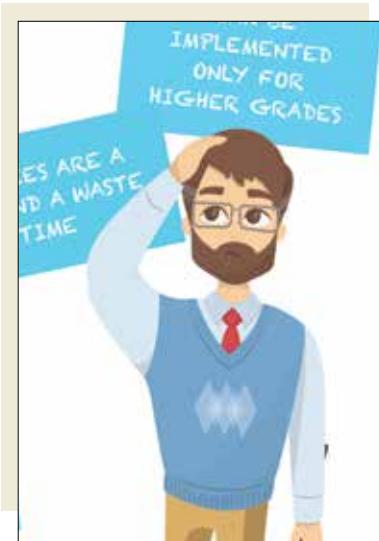
The article looks at the different definitions of self-learning and discusses the role of a teacher in the process.



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Challenging the Common Misconceptions around Self-learning

Self-learning is one of the prevailing trends in today's education, but parents and educators are concerned about certain aspects of self-learning, giving way to certain myths.



This article aims to shed light on those aspects and challenge the misconceptions arising from them.

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Teachers need to upgrade their skills in order to deliver instructions as per the changing requirements of the 21st-century learners. What better way than an open online course?



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Coding is one of the most essential skills required in 21st-century learners, for it is the language of the future.

Niveditha Murthy speaks to Anand Ramaswami, VP Academics at Next Education, on the importance of coding for kids



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Preschool- Making Everyday Moments Special

A DAY AT A PRESCHOOL IS A SPECIAL INTERPLAY BETWEEN A TEACHER AND A CHILD. THIS INTERPLAY MAKES A DAY QUITE MEANINGFUL FOR EACH CHILD AT A PRESCHOOL, AND A PRESCHOOL TEACHER IS THE DRIVING FORCE BEHIND IT.

RAMA DEVI MAVURI

We always look forward to special moments in life. For example, birthdays and celebrations, the day we will get married, the day when a child will be born, the moments that will be rewarded, etc.

These moments always remain special to us. But, there are other moments which are not that special. They just pass by in a very routine manner.

Don't we all wish that every day in our lives be special or at least a few moments be special each day? I know, it's a big 'yes'. It's the same with kids. In fact, they wish for more. I often see that many children don't want to go to school. They repeatedly grumble saying that they are bored in school.

Early childhood classrooms are filled with routine moments, such as, get-

ting into the classroom in the morning, repeating the lessons, scribbling and writing, participating in some activities, and finally, leaving for home at the end of the day. These ordinary moments make the children sense the world. The rituals and the routine have a lasting impression on them. As these moments stay for a lifetime, it is important for teachers to think how to transform this everyday routine into some extraordinary moments.

Usually, in a preschool environment, the welcome and the goodbye time are crucial moments which help a teacher get connected with the children in a better way. We can call these as 'connecting moments'. Capturing these moments to the optimum, helps a teacher capture the attention of the children, which in turn helps them in learning better in the classroom.

"The child has a different relation to his environment from ours... the child absorbs it. The things he sees are not just remembered; they form part of his soul. He incarnates in himself all in the world about him that his eyes see and his ears hear."

-MARIA MONTESSORI

LET US LOOK AT A FEW IDEAS.

Surprise Welcome:

Children are always eager for something new. They look forward to surprises. So, place a table at the entrance of the classroom. Arrange a few objects on the table in an interesting way to arouse curiosity in children. Ensure that the things are such which children can manipulate. For example, finger puppets, hand puppets, door knobs, calling bell, tic-tac toys and so on. You can also arrange a water tub with fish and make children drop some



RAMA DEVI MAVURI

Subject Lead, NextPre-primary, Next Education

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food for them. Welcome the children and encourage them to see, touch and feel the things. Use some colourful papers, trays and other decor and arrange the table in an interesting way.

The objective of this 'Surprise Welcome' is to spark their curiosity and help them start their day in a special and interesting manner.

In-Out Stations:

Once children complete their day they should go home happy. At the same time, they should be eager to come back the next day. Hence goodbye moments too should make an impression on the child.

Design cards representing one picture for each child. Write the names of the children beside the pictures. For

Welcome the children and encourage them to see, touch and feel the things.



Encourage the child to greet everyone once they place the card in 'In station' and say bye to everyone when they place the card in 'Out Station'.

example - Rose for child A; Puppy for child B and so on. Explain to each child that the picture represents him/her. Punch holes to the cards and tie a small rope so as to hang it in the designated place. In the classroom, designate two places to hang the cards at a height where the children can reach.

Name the places 'In Station' and 'Out Station' respectively. Hang all the cards on the 'Out Station' hanger. As soon as the child comes in, welcome and direct him/her to the 'Out Station' hanger. Ask the child to identify his/her card, pick it and hang it to the 'In Station' hanger. At the end of the day,

when the child is about to leave, ask the child to place it back at the 'Out Station' hanger.

Encourage the child to greet everyone once they place the card in 'In station' and say bye to everyone when they place the card in 'Out Station'. This acts as a motivating factor for the child and makes them look forward to the next day. This arrangement can be made in many more creative ways according to the convenience of teachers, space and resources.

Making these two connecting moments special, makes the day extraordinary for children.



Feature Story

Self-learning: More Agency to Learners

IN MANY WAYS, SELF-LEARNING SEEMS TO BE THE MOST ORGANIC AND OBVIOUS WAY OF LEARNING. HOW ELSE DO INDIVIDUALS LEARN IF THERE IS NO SELF-INITIATIVE, SELF-DISCOVERY AND SELF-EVALUATION?

RITUPARNA SUR

Education has an ennobling and lofty purpose to serve in shaping human minds. Thus, it is not just about completion of a certain number of years in a formal or informal schooling to acquire a degree good enough to get a job. Rather, the true purpose of education is to acquaint students with their passions and aspirations; help them hone their strengths and overcome their shortcomings; and also to engage their sense of purpose in citizenship so that they can make the world a better place to live in, with their contributions.

Unfortunately, the way education is being imparted in most Indian schools, it fails to fulfil its true purpose. However, with the advent of technology in the K-12 sector, there is a glimmer of hope on multiple fronts. With the proliferation of electronic gadgets such as smartphones, tablets, computers and proper internet connectivity, e-learning content and strategies have started making their place in the teaching-learning gamut; personalisation of learning has almost become a buzzword, and self-learning has become a possibility.



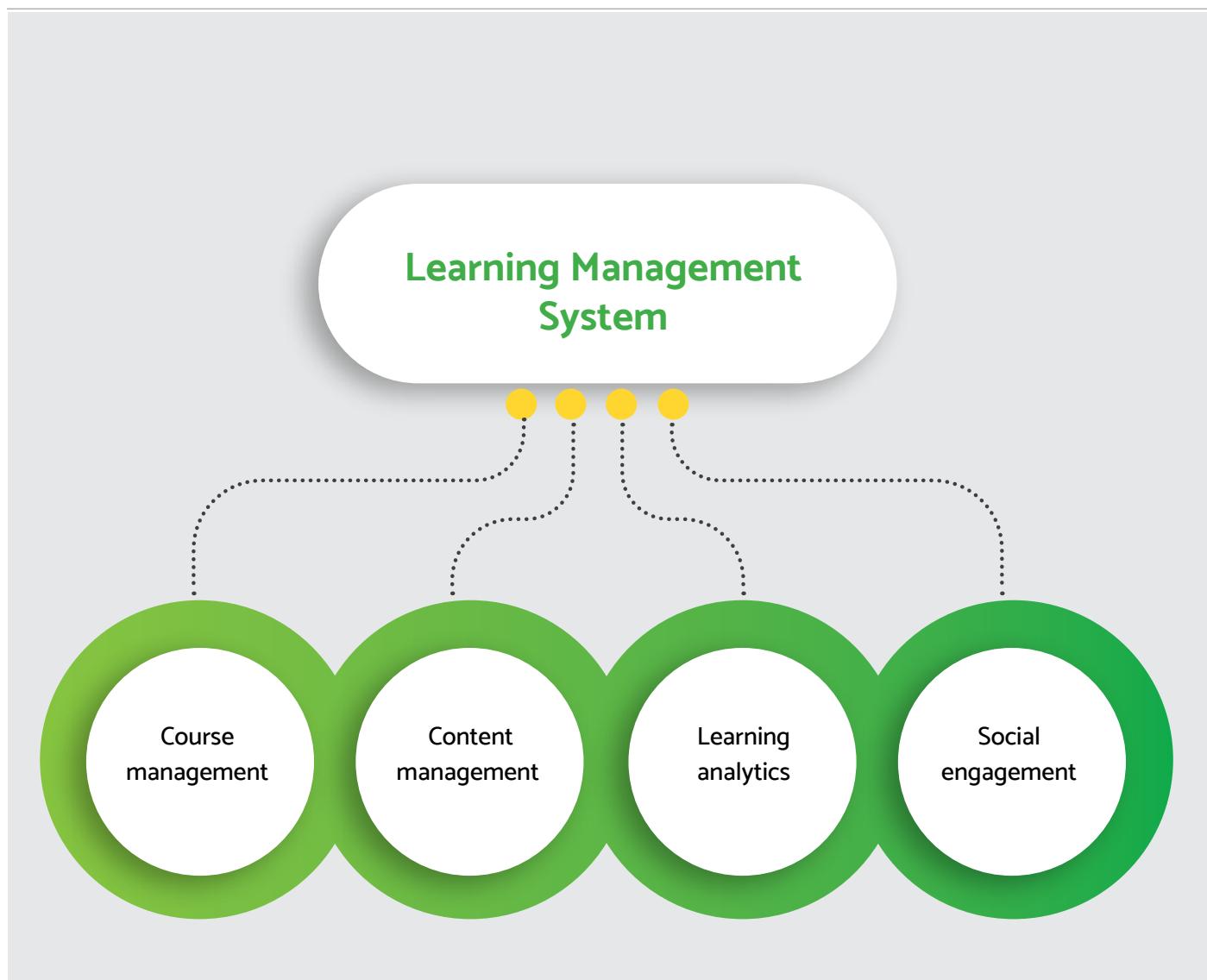
In many ways, self-learning seems to be the most organic and obvious way of learning; how else do individuals learn if there is no self-initiative, self-discovery and self-evaluation?

Let's look at a more detailed definition of self-learning.

Self-learning could also be referred to as a way of learning to attain knowledge

SELF-LEARNING

Self-learning or self-directed learning, as we call it, has different definitions and is used variously in an educational environment. It is often referred to as an educational goal on one hand and as a teaching methodology on the other. It could also be referred to as a way of learning to attain knowledge.



Self-learning is a rewarding experience for students

Teacher-assisted self-learning

Teacher assigns tasks to students which the latter complete on their own. The teacher defines the content, defines the various tools that a student can resort to at the various stages of learning, and also keeps a tab on the learning progress. However, the student brings in personal relevance to the learning goals and devises strategies to attain them.

Self-learning of this kind facilitates blended learning and flipped learning.

In a flipped classroom, the teacher shares the content material beforehand and students go through the same before attending the lecture, thus having a basic understanding of the topic already. The classroom facilitates discussion on and elaboration of the topic.

Next Education has designed its own Learning Management System with integrated content called NextLearningPlatform, which facilitates teacher-assisted self-learning. Self-learning without teacher guidance can become too overwhelming for a beginner. This

is a good solution to train students to exercise control over their learning process.

Teacher-independent self-learning

This could be described as a goal-oriented dynamic process by which students construct their knowledge based on reflection and motivation, independent of direct intervention of the teacher.

Students retain full control over their learning, they are aware of the timelines, they select their own goals and

have the autonomy to choose from a variety of resources and tools. Whenever the need arises, they collaborate with their peers or reach out to facilitators and subject matter experts. Many self-learning platforms, including Next Education's LearnNext, are examples of this kind of a self-learning solution.

Students are able to keep themselves motivated in this kind of learning as they have the agency to regulate challenges. Failure is not seen as a shameful experience but a means to push oneself harder to attain success.

This is a rewarding experience for students. They take pride in the success that they have achieved, as it is a reflection of the strategies they have adopted and the efforts they have undertaken.

SELF-LEARNING - A NECESSITY

As already mentioned, the true purpose of education is to help students become independent individuals who are able to contribute towards the betterment of the society. Thus, it is imperative that students today develop 21st-century skills such as critical thinking, collaboration, creativity and communication. Self-learning helps instill 21st-century skills in students and prepares them for the challenges of the future.

It helps students with the following:

Investment and motivation to gain knowledge

Self-learning programmes emphasise the process of learning as the focus is on 'how to learn' and not 'what to learn'. This helps students become lifelong learners, invested in seeking knowledge and solutions to problem



RITUPARNA SUR
Senior Sub-editor

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in all aspects of life, be it professional or personal. Also, as students take the path of discovering new information, indulge in critical thinking and design their own learning path, they take full ownership of their learning.

Personalisation of learning

No two individuals learn the same way. However, the education system in India has not been able to move away from the one-size-fits-all approach. Personalised learning gives students the opportunity to learn at their own pace and space. The important tenets of personalised learning include pursuing aspirations, investigating problems and designing solutions to solve those, thereby pro-

ducing measurable learning outcomes. Self-learning programmes are personalised in their approach and help students work within this framework.

In-depth learning

More often than not, human beings forget the information they consume if they do not revisit it at regular intervals. This is why learners are required to practise every topic after they learn it to ensure that they retain the information completely. Practice forms an integral part of any self-learning programme. In fact, many of the self-learning portals have gamified the learning experience where practice tests and assessments are presented

Self-learning programmes emphasise the process of learning as the focus is on 'how to learn' and not 'what to learn'. This helps students become lifelong learners, invested in seeking knowledge and solutions to problems in all aspects of life

Self-learning, puts students at the centre of their learning experience, empowering them with experiences, insights and strategies to learn in the modern era.



to students in the form of quizzes or games to keep them engaged and motivated.

Miscellaneous

Besides developing critical-thinking skills, self-learning can also help learners gain knowledge about themselves, become aware of their interests, learn to judge the credibility of content available on the Internet, be more open to new perspectives, and learn

to divulge information, feelings and experiences together. Self-learning, be it independent of or dependent on the teacher, aims to bring forth a vast change in the attitudes of students towards their learning and life. Besides being motivated to reach their goals, they are also independent in their actions. The role of a teacher is changed to that of a facilitator who helps students whenever the latter needs guidance.

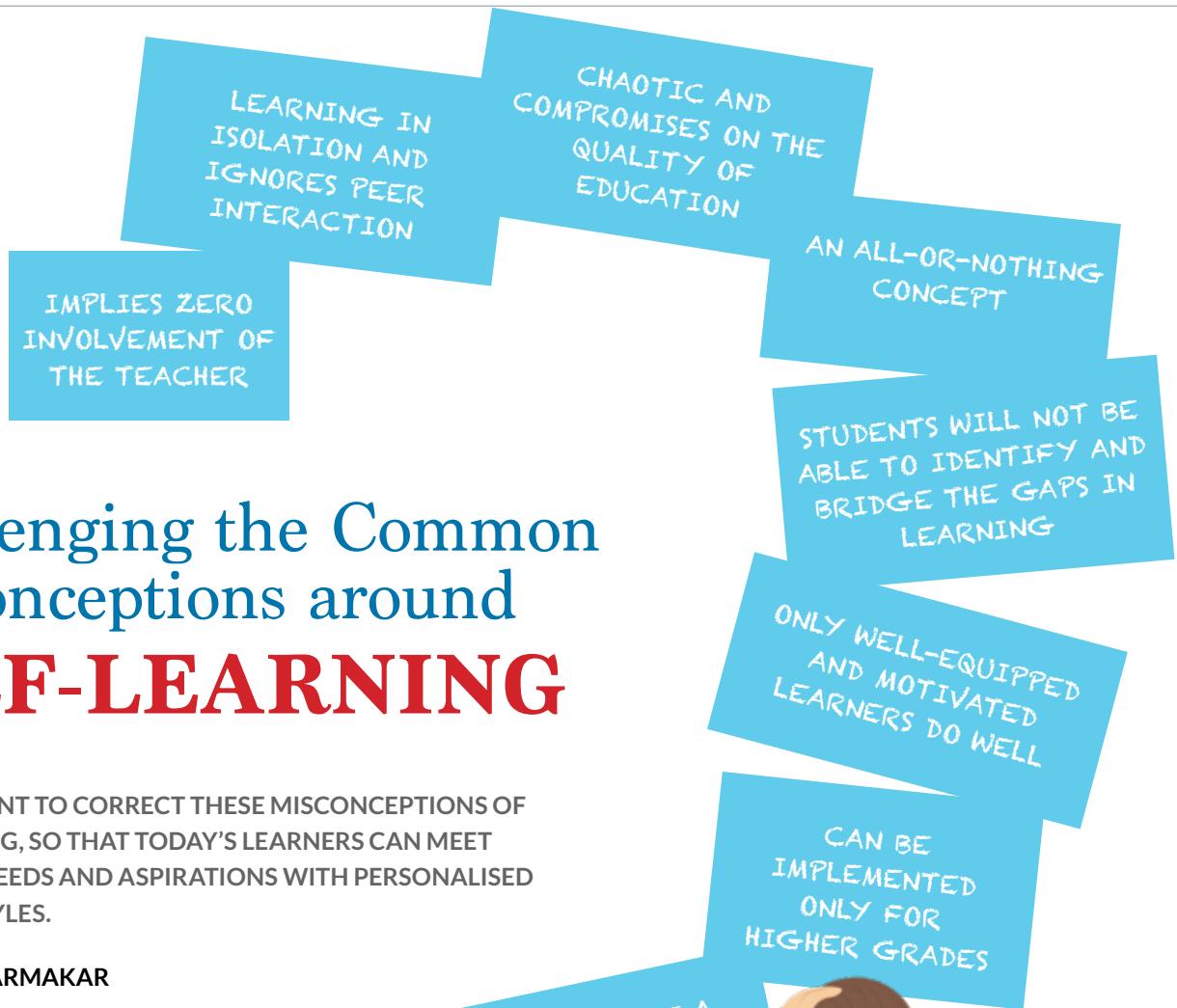
EVER-EVOLVING ROLE OF A TEACHER

It is often erroneously assumed that teachers do not have an important role to play in the self-learning process. In self-learning programmes, teachers are not the arbiters of truth, information and knowledge; they are like a coach whose team's success depends on his/her administrative and networking abilities. They have the crucial responsibility of helping learners with the following:

- a. Help students set their learning goals as per their individual interests and capabilities
- b. Set methods to measure learning outcomes effectively and communicate the same to the students
- c. Organise online discussion forums, inviting interested participants, moderating the groups and summarising the conclusions
- d. Motivate students to collaborate and communicate with each other to diversify their knowledge creation process
- e. Supervise the learning progress

Research has proven that motivation is directly related to whether or not students have opportunities to make important academic choices. Having choices allows students to feel that they have ownership, and this, in turn, helps them develop a sense of responsibility towards their own learning.

Self-learning, as a way of learning or as an academic goal, puts students at the centre of their learning experience, empowering them with experiences, insights and strategies to learn in the modern era.



Challenging the Common Misconceptions around SELF-LEARNING

IT IS IMPORTANT TO CORRECT THESE MISCONCEPTIONS OF SELF-LEARNING, SO THAT TODAY'S LEARNERS CAN MEET THEIR OWN NEEDS AND ASPIRATIONS WITH PERSONALISED LEARNING STYLES.

PRITIKANA KARMAKAR

The increasingly globalised labour market demands modern learners to be actively involved in the learning process by developing their own ability to learn. It allows them to identify, plan and implement their activities according to their own learning objectives. According to Maryellen Weimer in Learner-Centred Teaching: Five Key Changes to Practice, such a learning approach brings five key changes in the teaching-learning process—shift of classroom power from teacher to student, active construction of knowledge as opposed to target-oriented learning, transformation of the role of the teacher from the director of the learning process to that of a facilitator, shift of the responsibility of learning from the teacher to the learner and promotion of learning through effective and continuous assessment.

Self-directed learning aims at making a learner self-reliant and capable of using resources that are available to him/her, be it online materials or skills such as communication and collaboration. Therefore, self-learning is one of the most interactive approaches to education.

While learning approaches are gradually accommodating self-learning methods, there are some prevalent controversies over the meaning of self-learning— whether it can be implemented in formal education; to what extent learning should be self-directed; whether learning happens in a holistic, organised manner or in isolation and chaos; and whether teachers have a role to play in the process. This has led to the rise of a number of myths about self-learning, which cause parents and curriculum coordinators to shy away from implementing such learning methods. It is important to correct these misconceptions so that today's learners can meet their own needs and aspirations with personalised learning styles. Some common misconceptions regarding self-learning are:

SELF-LEARNING IS AN ALL-OR-NOTHING CONCEPT

Myth:

Self-direction is often considered to be an all-or-nothing concept, where learning is either completely directed by the student or not at all. In this case of extremes, learning is incompatible with the formal environment of education.

Reality:

According to R. G. Brockett and R. Hiemstra in *Self Direction in Adult Learning: Perspectives on Theory, Research and Practice*, self-learning is better considered as a continuum of varying levels of self-directedness in different learners, which makes it suitable for both formal and informal settings.

SELF-LEARNING IS LEARNING IN ISOLATION AND IGNORES PEER INTERACTION

Myth:

Self-learning is considered as an isolating experience— an every-learner-an-island scenario— when it is actually far from it.

Reality:

There is no doubt that the learner tries to find out things, but not without help, be it from social media, mentors, experts on academic communities or fellow learners. In self-learning techniques, such as flipped classroom, there are peer discussions and peer reviews of assignments, which gives a learner different perspectives on learning. Students also form study groups outside classrooms, and even

online, to enhance communication and collaboration.

Self-directed learning aims at making a learner self-reliant and capable of using resources that are available to him/her, be it online materials or skills such as communication and collaboration. Therefore, self-learning is one of the most interactive approaches to education.

SELF-DIRECTED LEARNING CAN BE IMPLEMENTED ONLY FOR HIGHER GRADES

Myth:

Learners in their late-teens or adults are usually considered to be mature and therefore, capable of directing their learning through personalised objectives, styles and activities.

Reality:

Studies on adult self-learning have shown that most adults are prone to being comfortable in 'other-directed' learning projects and often needing explicit directions on assignments and study methods. Hence, self-study has nothing to do with maturity and age.

According to Philip C. Candy in his

book, *Self-Direction for Lifelong Learning*, the myth that "children must be taught whereas adults can learn for themselves", should be challenged, and self-learning approaches should be implemented in lower grades as well with, perhaps, a little more help from instructors and a better curriculum structure.

SELF-LEARNING IS CHAOTIC AND COMPROMISES ON THE QUALITY OF EDUCATION

Myth:

Self-directed learning causes most people to envision a chaotic situation— children studying whatever they want, while teachers are focused to provide for the whims of every young learner.

Reality:

Self-learning does not always let learners dictate what they want to learn, rather it facilitates the learning of the concepts in a way directed by themselves.

Most children prefer story-based, enquiry-based and activity-based learning because it helps them relate the concepts they study to the world around them— as available in game-based lessons, where there are multiple levels of learning in a structured manner, ensuring organised learning.

These also improve strategic thinking, problem-solving and creative skills in relatable, integrated platforms, which make learning more interesting than in independent subject approach. It has been proven that these approaches enhance learning and not the other way round.

SELF-LEARNING IMPLIES ZERO INVOLVEMENT OF THE TEACHER

Myth:

Perhaps the most common myth around self-learning is that learning happens without teacher's help.

Reality:

Self-learning does not mean that the student learns independent of the teacher. It merely implies that there is no ordered teaching with the teacher as the centre of classroom activities, but only a gentle guidance by them in the proper direction of learning, so that students can develop their own style of learning.

For example, teachers can provide reading material on a lesson beforehand and initiate a discussion based on students' understanding of the given material. They can also guide students in the right direction of enquiry while teaching a concept and arrange appropriate activities so that students can form their own conclu-

sions regarding a concept, thus, implementing the flipped classroom model and a blended learning approach. The younger the students, the more support they need from teachers to enhance their self-learning abilities.

IN SELF-LEARNING, ACHIEVEMENT IS MEASURED BY END-PRODUCTS

Myth:

Some parents equate self-learning to traditional learning in its target achievement and believe that learning is measured in terms of assessment and evaluation after each activity.

Reality:

Self-learning is not a target-driven process, rather it develops skills and experience in multiple fields, such as problem-solving skills, resourcefulness, interpersonal and psychosocial skills. These have a huge impact throughout students' lives.

Tricia Whenham, academic enthusiast and communications specialist at Nureva Inc., Calgary, Canada, advocates self-learning approach for children, because she believes that "learning comes from the process, not the product", that the ups and downs in the learning process can best evaluate how much students are actually learning.

STUDENTS WILL NOT BE ABLE TO IDENTIFY AND BRIDGE THE GAPS IN LEARNING

Myth:

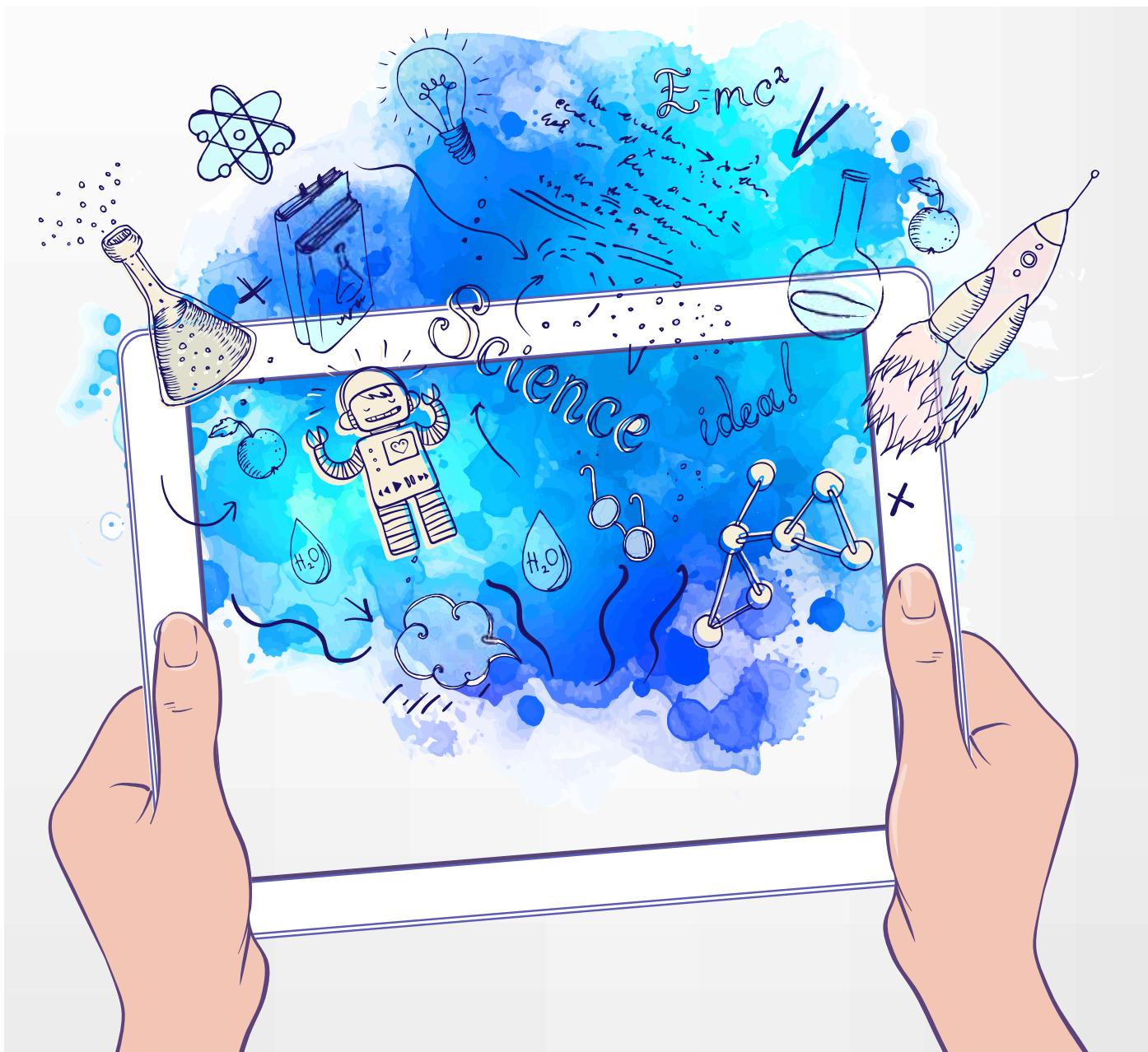
This is a common doubt regarding the ability of the students in self-learning activities. Since students are not expert academicians, they are not considered capable of analysing or evaluating their achievements.



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Sub-editor

Prithikana Karmakar has completed her Masters in English from University of Hyderabad. Currently, she is a part of the Next World editorial team. She has teaching experience in an NGO, and is an aspiring teacher and a budding academician. English Language Teaching (ELT) is the area of her research interest.



Next Education offers an integrated curriculum that makes room for cost-effective, activity-based learning within a standard timeframe via ScienceLab manipulatives and audio-visual modules in LearnNext and device-independent TeachNext@Home solutions.

Parents and educators need to be aware of these myths and how to counter such preconceived notions with correct solutions, so as to foster self-development and future skills in the citizens of tomorrow.

Parents fear that this might lead to gaps in their education, which they might not be aware of.

Reality:

This problem has solutions. Firstly, instructors are present to supervise learning sessions; they take notice of the gaps. Secondly, most self-learning modules have some form of self-assessment technique that allows children to understand their shortcomings. Lastly, children will learn to overcome gaps when they discover a need for it in the process of self-learning.

ONLY WELL-EQUIPPED AND MOTIVATED LEARNERS DO WELL VIA SELF-LEARNING

Myth:

It is also considered that disadvantaged and under-motivated students do not do well in self-learning techniques.

Reality:

This is a misjudgement when it comes to self-learning, because self-learning does not happen in a day. It is a process of enabling students to rely upon their own skills to learn. It takes some time for them to be confident enough to learn on their own terms. Undermotivated students eventually find their motivation when their inter-

ests are given a chance in the learning sphere. As for underprivileged students, they are usually the ones to apply self-learning by being resourceful to make up for the dearth of proper resources.

SELF-DIRECTED LEARNING ACTIVITIES ARE A LUXURY AND A WASTE OF TIME

Myth:

People trained in the traditional methods of learning tend to view self-learning as a comparatively frivolous way to learn. Most parents want their children to meet the traditional curriculum demands and self-learning techniques may seem more time-consuming to them. Moreover, activities related to the deeper understanding of topics are not always found to be cost-effective.

Reality:

There are solutions to this as well. Online resources such as Massive Open Online Courses (MOOCs) are available to everybody free of cost. Non-profit educational organisations such as Khan Academy and Room to Read also provide free online resources for school students who do not have access to top-quality schools. Next Education offers an integrated curriculum that makes

room for cost-effective, activity-based learning within a standard timeframe via ScienceLab manipulatives and audio-visual modules in LearnNext and device-independent TeachNext@ Home solutions. These help today's students to learn actively by themselves irrespective of time, place and financial restrictions.

SELF-DIRECTED LEARNING MAKES STUDENTS SELFISH

Myth:

The word "self" in self-directed learning misdirects people into believing that it caters only to the student as an individual.

Reality:

While self-learning does indeed develop individualistic skills, it does not mean that the learning is aimed to enhance the self only. Self-learning happens when the learner is in close contact with the environment, the society and the world they live in. All self-learning objectives are ultimately for the development of the society. It is about learning how to meet goals, find the proper resources to reach an aim and be personally responsible of one's position in the society. It is not about being selfish, rather it is about helping people be aware of their role as an individual in the society.

It is necessary to eradicate these myths about self-learning, so that students can have access to an all-round development via education. Parents and educators need to be aware of these myths and how to counter such preconceived notions with correct solutions, so as to foster self-development and future skills in the citizens of tomorrow.

Training Teachers through MOOCs

A MOOC IS A FREE ONLINE COURSE OFFERED FOR AN UNLIMITED NUMBER OF PEOPLE

DR SRIDHAR IYER

Massive open online courses (MOOCs) can address the gap in pedagogic practices. These courses supplement traditional teacher-training courses and equip teachers with the technological edge needed to deal better with the learning requirements of 21st century students.

Lack of adequate focus on student-centric teaching practices in teacher-training programs is often regarded as the prime reason for the poor quality of education in India. Teachers are expected to teach students of the present generation, who are well versed in technology from a very early age, with very little or absolutely no training in technology. Massive open online courses (MOOCs) can address this gap in pedagogic practices. These courses supplement traditional teacher-training courses and equip teachers with the necessary technological edge that help them deal better with the learning requirements of students of the 21st century.

WHAT IS MOOC?

As the name suggests, a MOOC is a free online course offered for an unlimited number of people. In addition to traditional course materials, such as filmed lectures, readings and problem sets, MOOCs also provide interactive user forums to support interactions among students, professors and teaching assistants.

MOOCS FOR SCHOOL TEACHERS

The Faculty of Educational Technology at IIT Bombay has designed two MOOCs, Pedagogy for Effective Use of Information and Communication Technology (ICT) for school teachers and Pedagogy for Effective Teaching–learning of Computer Science (CS) in Schools. The courses are available at the IITBombayX MOOC platform. Next Education

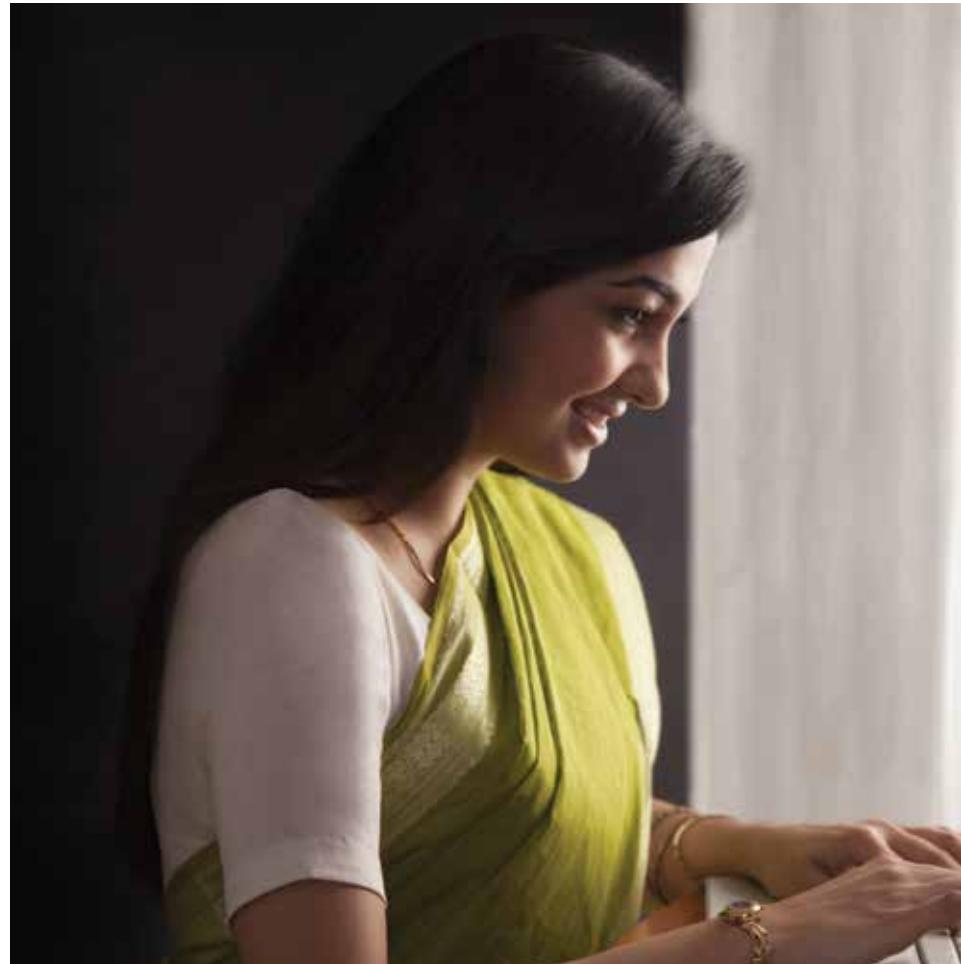


has sponsored the design of these courses. These MOOCs , have been designed as learner-centric courses, and the course material contains:

- i. short instructional clips interleaved with activity questions.
- ii. an array of resources that demonstrate how to apply the concepts taught in real classrooms.
- iii. learning activities that provide formative feedback to the learner.
- iv. forums for learners to interact and share their experience.
- v. quizzes to assess their learning.

Each course spans for a period of four weeks. They will benefit in-service school teachers to gain knowledge on effective integration of ICT tools in their teaching practices. These courses will also benefit students pursuing higher education who aspire to become teachers. B.Ed. students can also join these capacity building courses.

MOOCs equip teachers with the required expertise on these teaching strategies which help them engage students effectively and achieve the stated learning objectives



PROF SAHANA MURTHY
Associate Professor, IIT Bombay

Prof Murthy got her Post Doctorate degree from Rutgers University, USA and her second Post Doctorate from MIT, USA. Her current research interests include development of scientific abilities through technology-enhanced learning and inquiry-based environments for STEM education.



SRIDHAR IYER
Professor, IIT Bombay

Prof Sridhar Iyer's current research interests are in the field of Educational Technology, which includes technology-enhanced learning environments for thinking skills, pedagogies for effective use of educational technologies, development of ICT tools for educational applications, and Computer Science education research. Prior to Educational Technology, he has worked on wireless networking protocols and mobile applications. Sridhar Iyer received his B.Tech., M.Tech. and PhD from the Dept. of Computer Science & Engg. at IIT Bombay.

MOOCs have the potential to revolutionise the teacher-training programs in India. This is an opportunity for aspiring and present teachers to enhance their skills.

WHY ARE MOOCS IMPORTANT?

There are research-based evidences which show that lectures or demonstrations that uses Information and Communication Technology (ICT) tools are not effective enough for learning, especially if the teacher's objective is to build higher-order thinking skills in students. Instead, students learn effectively only when they perform carefully-designed group activities in class using technol-

ogy, get immediate feedback on their work and when the assessment is well aligned to the stated learning objectives. MOOCs equip teachers with the required expertise on these teaching strategies, which, in turn, help them engage students effectively and achieve the stated learning objectives.

GOALS OF THE COURSES

The course on the use of ICT would help teachers to adopt student-centric approaches while using ICT tools in their teaching practices and also, help them align assessments and activities better with the learning objectives using such tools. It would also help them to identify various ICT tools that they can integrate in their teaching practices. The course on teaching-learning Computer Science would help teachers to facilitate the learning of computational thinking and help them adopt relevant teaching-learning practices to achieve this goal. These courses would also develop a collaborative community of teachers for sharing their experiences and best practices.

MOOCs have the potential to revolutionise the teacher-training programs in India. Given the dearth of student-centric teacher-training courses on the usage of ICT in teaching practices, this is an opportunity for aspiring and present teachers to enhance their pedagogic skills .

GARGI BANERJEE

Research Scholar, Educational Technology, IIT Bombay

Gargi Banerjee is presently pursuing her research on "Framework to enable instructors to create constructively aligned, custom learning designs with visualisations". Her current interests lie in developing instructors' design thinking for effective integration of ICT in teaching and instructional strategies for effective use of visualisation.



JAYAKRISHNAN M

Research scholar, Educational Technology, IIT Bombay

Jayakrishnan M has a keen interest in the use of information and communication technologies for the development of education. Within this research space, his work focuses on improving in-service teacher training programs in the higher education sector of India.



By the Textbook

TWENTY-FIRST-CENTURY EDUCATION IS ALL ABOUT CREATING THE RIGHT BALANCE OF TECHNOLOGICAL AND NON-TECHNOLOGICAL RESOURCES FOR THE BENEFIT OF STUDENTS. THE RIGHT EDUCATION IS A COMBINATION OF DIGITAL RESOURCES AND ANALOGUE TOOLS.

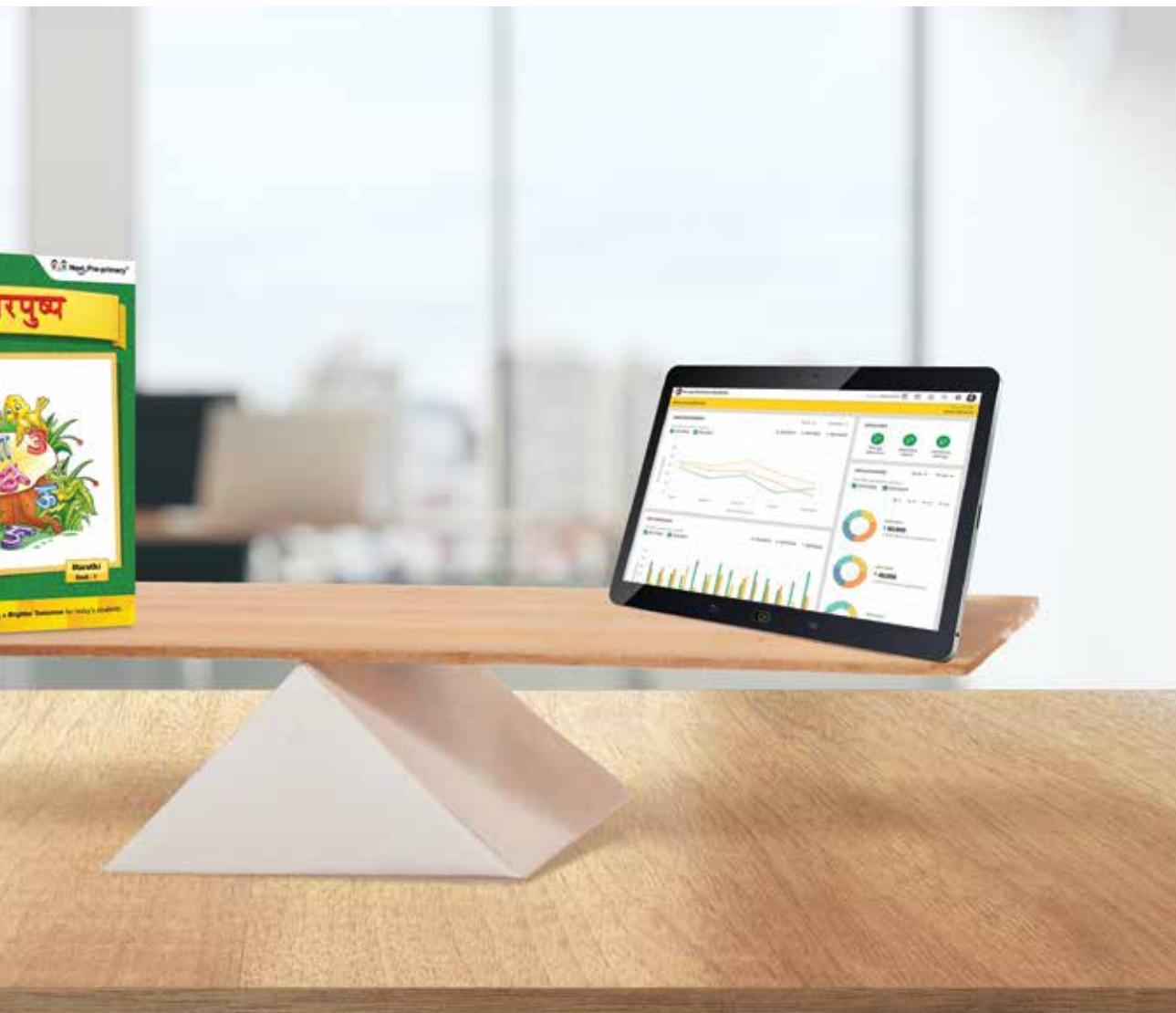


VISHNU VARDHAN

Advancements and Approaches in the Development of Textbooks:

In this day and age when we can hail a cab, order food, watch movies and read books, all on our mobile phones, we can safely assume that we have finally reached the peak of 21st-century civilisation. This is an interesting epoch in the field of education too – a juncture at which we need to contemplate the future of the humble textbook, the one we grew up with, and which has steadfastly served education in the last few centuries. Will it survive and thrive in the future?

Like everything else around us, the textbook is changing too. It is also a fact that online journals and digital learning resources have had quite an impact on the production, distribution, sales and utility of paper textbook, but they still continue to be popular due to their seamlessness, availability and portability. It may be surprising to know that, even in 2018, with all the technological advancements that we have made in the world so far, there is still a large part of the global population that does not have access to any kind of digital tools or online information. As the global citizens of the 21st century, we may be tempted to rely too much on technology, and rightly so, as it can afford us many conveniences and comforts, but at the same time, we need to use a rational approach to integrating technology into our lives. A balanced perspective on technology is also a need of the hour in edu-



cation. Twenty-first-century education is all about creating the right balance of technological and non-technological resources for the benefit of students. The right education is a combination of digital resources and analogue tools. Thankfully, governmental agencies, educational organisations and NGOs are all working together to reinforce the use of the textbook both inside and outside the classroom.

Role of Textbooks:

In the scenario of modern education, textbooks play a vital role in the teaching–learning process. It is unlikely for any other teaching aid or tool to replace it. Even in this day and age of advanced technology, textbooks remain one of the most basic and foundational steps towards education. A young student's first exposure to education begins with

textbooks. They are personal, handy and students do not require preparations for their utility. Children also develop the habit of opening the textbook and reading up on their own. Textbooks are still the inevitable and important part of the curriculum. Aspects of a good textbook include interactivity, ability to inspire interest in students and capacity to engage and immerse them in the learning process. In other words, good textbooks are the right tools to communicate, indulge and interact with students.

ADVANCEMENTS IN TEXTBOOK DEVELOPMENT AND PRODUCTION

Look and Feel:

Today, graphic designing for books has become a specialised

Over the years, textbooks have been developed to support highly effective pedagogic practices and their features have been subjected to extremely careful development and refinement. However, it needs to be understood that paper textbooks and digital textbooks do not discount each other. An effective teaching-learning process is a result of a balance of the two.

activity. It is continuously evolving to adapt to the changing needs of the education sector. In the last two decades, the rise of graphic design, typography, photography, availability of quality paper and printing techniques have thoroughly changed how textbooks look and feel. A great textbook is a fine combination of clean typography, photographs and illustrations that appeal visually as well as communicate the themes and concepts; good printing as well as production techniques.

Research in Education:

There has been a lot of research in the education sector in the last two decades. New scientific insights into how children learn are influencing the curriculum which is being designed keeping in mind their learning needs in the 21st century. In India, autonomous bodies like NCERT undertake a majority of studies and research to understand students and their academic requirements to better provide lessons that will help them grow up as well-rounded individuals. Learners are changing, so should the textbook.

Advancements in Printing:

Printing has come a long way, from the Gutenberg machine to the modern laser printer. With faster turnaround times, better quality and lower costs, offset and digital printing has thoroughly revolutionised the textbook industry, with the provision of mass production in the smallest time frame.

Paper Quality:

Choice of the paper for a textbook is the most important factor that signifies its overall quality. Luckily, there have been tremendous advances in the manufacture of paper in the last few decades. Printers, these days, are using lightweight paper to reduce the weight of the textbooks. They are also being separated into thin volumes for portability and printed in separate modules for the convenience of students.

Textbooks and the Digital Age:

Some of us may wonder why we are talking about textbooks when the future is going to be all digital? The slow transition of academic materials into digital platforms is quite a signif-

icant one, but it needs to be remembered that textbooks have played a crucial role in improving educational outcomes. Over the years, textbooks have been developed to support highly effective pedagogic practices and their features have been subjected to extremely careful development and refinement. However, it needs to be understood that paper textbooks and digital textbooks do not discount each other. An effective teaching-learning process is a result of a balance of the two.

New-age Digital Resources:

Using electronic learning resources to enhance interactive and self-directed learning has become a global trend in education. The interactive and diversified sets of e-textbooks can be developed on parity with printed textbooks. Schools may opt for e-textbooks as per their students' learning needs and capacity, as well as the school infrastructure and technical support. Digital books enable students to study from any place, at any time by using a computer, a tablet or a mobile phone. Not only this, the learning process is far more engaging and immersive. Students can now watch videos, make notes while reading, take part in activities and work on assignments. Report of their activities can be generated and sent to their parents. The advances in technology are also enhancing the utility of many digital learning resources.

NEXTBOOKS

As the textbook is the most basic and elemental part of education, Next Education recognises its importance, function and scope. In their effort to reinforce quality education, they developed a series of textbooks called

NextBooks. The books have been effective because of their appealing look and feel, and carefully crafted content and teaching approaches. These factors come together to engage the learners and make them eager to explore more. While our core instructional books keep the learners engaged in the classroom, the learners' companion provides ample practice and gauges comprehension and the digital version of the books extend learning beyond the classroom at any time.

Characteristics of NextBooks:

NextBooks are manufactured on 80 GSM quality paper. They feature a refined style of artwork and thoroughly researched content, which make the subjects both interesting and engaging. Additionally, elemental chlorine-free paper is used to make the books safe for students.



VISHNU VARDHAN

Senior Sub-editor

Vishnu Vardhan has completed his Masters in Advertising and has more than 12 years experience in the advertising industry. Coming from literature background, his primary talent lies in writing engaging articles. Technology, science, cinema and literature are his favorite subjects.

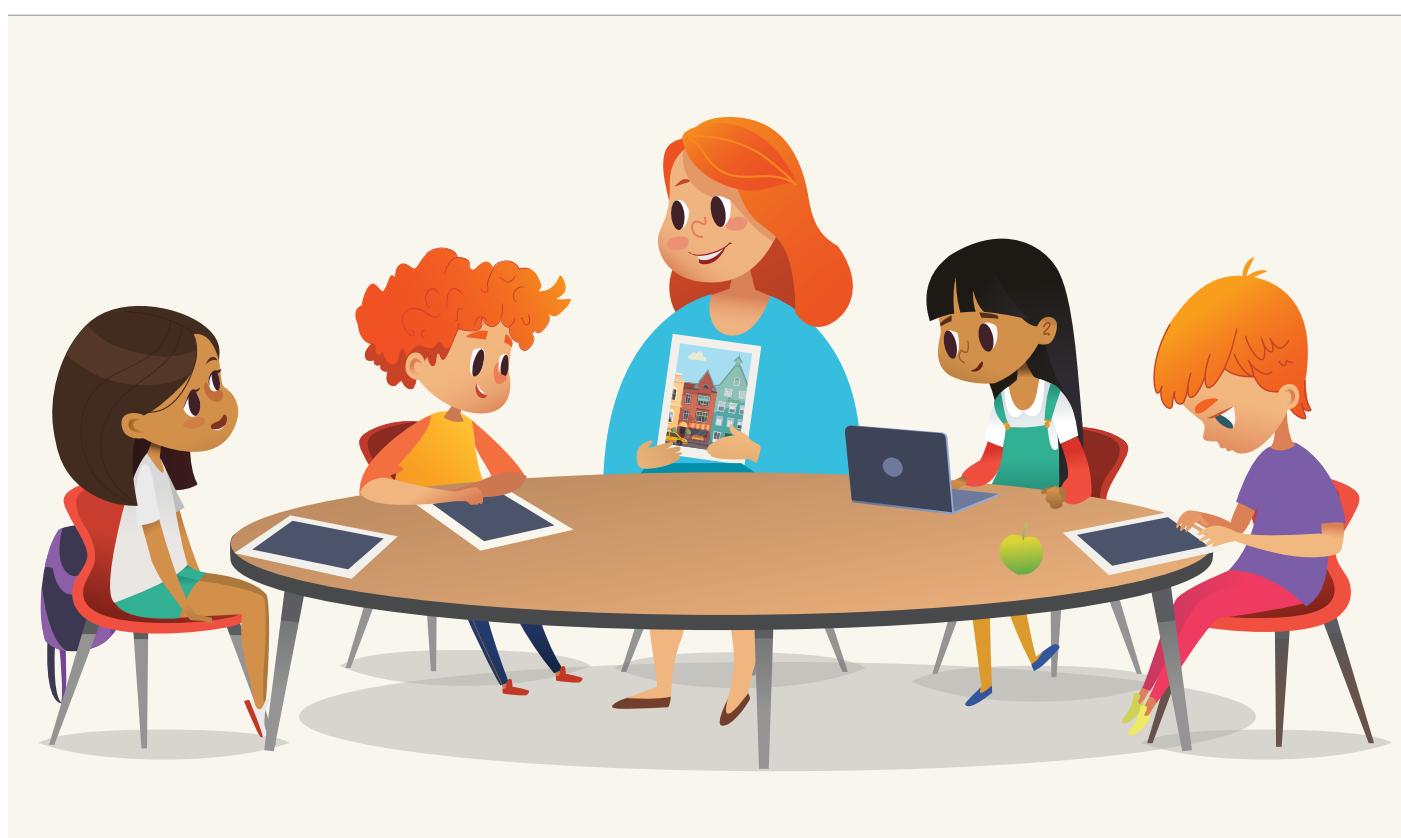
Curriculum Design & Pedagogy:

NextBooks series is carefully constructed using relevant pedagogies and modern curriculum design for the most effective teaching-learning process. The lessons are thematically grouped for effective learning and retention of information. The lesson design, too, has been executed to develop multiple intelligences, higher order thinking skills (HOTS) and instill life skills in students.

Content Structure:

NextBooks series comprise core instructional books which are divided into three parts, A, B and C or A and B, depending on the curriculum, to reduce physical burden on students. The books have ample practice exercises compliant with Bloom's taxonomy which assesses the child's comprehension through new exercises and fun activities that remove repetitiveness from homework. The content of the





books is thematically integrated and observes a logical flow. The learners are gradually introduced to the lesson followed by exercises to test their knowledge and finally revision to strengthen the concepts learnt.

Integration of QR Codes:

QR codes which can be scanned by mobile phones and tablets open the doors to digital learning. The codes are strategically placed within the physical books. On scanning them, students can watch videos on their smartphones and tablets to gain more clarity on concepts.

Interactive Digital Books:

The responsive user interface of the digital book enables students to study from any place, at any time using a computer, a mobile phone or a tablet. Apart from these conveniences, the learning experience is far more engaging, given the interactive nature of the digital books. Learners can now watch videos, annotate while reading,

NextBooks series is carefully constructed using relevant pedagogies and modern curriculum design for the most effective teaching-learning process.

partake in activities and work on assignments based on which reports can be generated and sent to parents.

On the whole, NextBooks offer a lot of exercises for activity-based learning. Features of the books such as Get Set/Jump Start, Exercises, Questions, Activities, Revision, etc. not only help measure the learning outcomes, but also help to predict them.

Conclusion:

With the advancing technology, it's hard to predict what will happen to the ubiquitous textbook, but it is also

true that the education sector today is rife with exciting happenings with regards to the development of new learning tools and resources which are increasingly becoming more dynamic than ever. Even in the middle of all these developments, the market for textbooks is still very much in existence, with the format remaining relevant at the current moment. It is easy to get blindsided by the overwhelming influence of technology in our lives and we may even wonder, which direction is the education sector heading and arrive at the contemplation – Do we still need the textbook? The answer is a resounding yes!



CREATE A WORLD-CLASS SCHOOL

Join hands with NextSchool today and nurture the seeds of your dream to prospering realities!

- ✓ Academic solutions and operations support
- ✓ School management support
- ✓ Student enrolment
- ✓ Enhanced brand identity

The NextSchool Academic Partnership Programme helps new & existing schools achieve global standards to run and manage their academic and administrative operations.



Digital Education and Its Benefits

WITH THE ADVANCEMENT OF TECHNOLOGY, THE USE OF COMPUTERS IN EDUCATION HAS BECOME IMPERATIVE. COMPUTERS NOT ONLY HELP STUDENTS ACQUIRE KNOWLEDGE VIA KINAESTHETIC LEARNING BUT ALSO DEVELOP THEIR CREATIVE THINKING SKILLS

DR RUCHIRA S. SOLANKI

BENEFITS OF TECH-MEDIATED EDUCATION

Technology-based education has a multi-disciplinary approach and facilitates understanding of concepts via activity-based and hands-on learning, thereby stimulating creativity in young students. Students actively explore real-world problems and acquire a deeper knowledge of fundamental topics in different perspectives. Technology-based education focuses on the application of CS-STEM concepts and themes by allowing students to analyse, strategise, experiment and apply their ideas in real-life situations. Students engage in enterprising activities, and through these experiences, become the protagonists of their own learning. According to Mr Abhimanyu, our trained expert on the subject, IT fluency will be the most essential skill in future. Our Robotics Lab has all the required equipment, such as modular robotics platform and visual programming language which enhances problem-solving skills in our students. With the help of such education solutions, students are updated with the recent scientific and technological innovations, thus providing them opportunities for self and social development.





These competitions aim to advance state-of-the-art robots and inculcate 21st-century skills, such as critical thinking, problem-solving, logical reasoning, communication and collaboration in students.

With the aim to enhance learning through practical knowledge and real-life application, Tagore Public School, Shastri Nagar, Jaipur has introduced ROBOTICS and S.T.E.M. Education in grades V to X. LEGO-based dynamic activities in robotics and technology labs based on CBSE curriculum are incorporated in the school time table. Besides performing these activities, students also get a chance to compete in Robocup, BuildAThon and World Robotics Olympiad. These competitions aim to advance state-of-the-art robots and inculcate 21st-century skills, such as critical thinking, problem-solving, logical reasoning, communication and collaboration in students.

SMART CLASSROOMS ENGAGE STUDENTS

The traditional chalk-and-talk method of teaching is passé. Smart classrooms, as adopted by Tagore Public School in collaboration with TeachNext, engage students by making the learning process enjoyable through animated, interactive audiovisuals. They also facilitate better understanding and retention of concepts.



The school follows the concept of 5 E's – Engage, Explore, Explain, Elaborate and Evaluate

TeachNext provides digital content aligned with the CBSE syllabus. The interactive animations and real-life videos clarify concepts which are difficult to understand through textbook learning, besides making learning interesting and appealing to students. With the installation of TeachNext digital solution in the classroom,

the teaching-learning process has become easier and learning objectives are fulfilled. Next Education has thus transformed the classroom environment, enabling students to visualise, experiment and globalise their learning.

With the sole intention of imparting

services to the society, the hope of structuring a better tomorrow and a dream of providing a broad and stimulating educational experience of the highest quality to the future generations, Tagore Public School has adopted and implemented modern methodologies to make the teaching-learning process effective. Students thrive under the guidance of experienced and knowledgeable faculty and administration. The school follows the concept of 5 E's – Engage, Explore, Explain, Elaborate and Evaluate. The pre-primary curriculum is disseminated by adopting effective learning approaches, such as audiovisual integration, multiple learning opportunities, age-appropriate progression and integrated approach. Grades V to VIII are taught following various approaches such as interdisciplinary approach, multiple intelligences, enquiry-based learning approach and activity-based learning. Problems to develop critical thinking abilities are provided for content discussion.

The secondary and senior secondary grades are instructed following an age-appropriate approach for smooth progression and self learning.

DR RUCHIRA S. SOLANKI
CEO of Tagore Group of Institutions

She is currently the CEO of Tagore Public School, Shastri Nagar, and Consultant Gynaecologist & Obstetrician, and member of Board of Directors at Tagore Hospital and Research Institute, Jaipur, Rajasthan. She has 25 years of experience in the medical field, as well as administrative experience in the field of education.





Promotion and Impact of Digital Education in Schools

Computer education is one of the most important subjects in schools. It is essential for students to be tech-savvy, and not just IT literate, to explore the benefits of various existing applications

MRS. MANJEET MADRA

Computer education plays an important role in making students career-ready. Information and communication technology (ICT) enables students to develop higher-order thinking skills (analytical and evaluative skills) and helps them become IT fluent. The basics of ICT are taught in schools around the globe. New technologies are being developed everyday to facilitate better learning.

Computer education is one of the most important subjects in schools. It is essential for students to be tech-savvy, and not just IT literate, to explore the benefits of various existing applications such as MS Office, and Python enabling them to create the technologies of tomorrow. The goal of digital education is to help students become creative, confident and think critically.

Computer education as well as sponsored teachers' training is being widely promoted in schools by many edutech



companies and the government. IT development sectors have introduced teacher and student-friendly technology. The user-friendly intuitive technology design has resulted in the adoption of digital education by teachers in the recent years, and exhaustive teacher-training programmes have

growing number of classroom success stories boosting their confidence.

Not only students and a few tech-savvy teachers, but IT developers have also contributed to the integration of computers into classrooms. Some offer educational discounts and EMI

ware and innovative applications of digital equipment. In-service training of teachers and special workshops sponsored by these companies have also been significant in creating a more upbeat attitude towards classroom computing in the recent years. The impressive assimilation of the technology in classrooms is evident.

Students are the future leaders of a nation—future doctors, engineers, entrepreneurs—who would make use of technology to create a better society in the future. For the development of education, ICT should be a part of school curriculums, as it is increasingly becoming the most important educational tool for both teachers and learners.

made them adept. At the same time, innovative learning aids have gained a wider appeal among learners. Institutions are not reluctant anymore to make a financial commitment to ICT implementation. Teachers are now less anxious about computers with a

options to purchase the products. Others provide grants for the effective use of digital tools. In addition to easing the financial burden, hardware manufacturers promote the quality, efficiency and productivity of the edutech industry through quality soft-

The quality of education has improved significantly due to computer education. It not only helps students enhance their creativity and imagination but also helps them understand the current technological tools.

Students are the future leaders of a nation— future doctors, engineers, entrepreneurs— who would make use of technology to create a better society. For the development of education, ICT should be a part of school curriculums, as it is increasingly becoming the most important educational tool for both teachers and learners.

Nowadays, every school has computers. The standard of a school is determined by the level of technology integration in the infrastructure and curriculum. But the more important



MANJEET MADRA

Principal of Doon International School, Mohali

Manjeet Madra, Principal of Doon International School, Mohali, is a highly experienced teacher and administrator of the school for the last 14 years. She has a passion for teaching and loves to explore upcoming trends in the educational field.

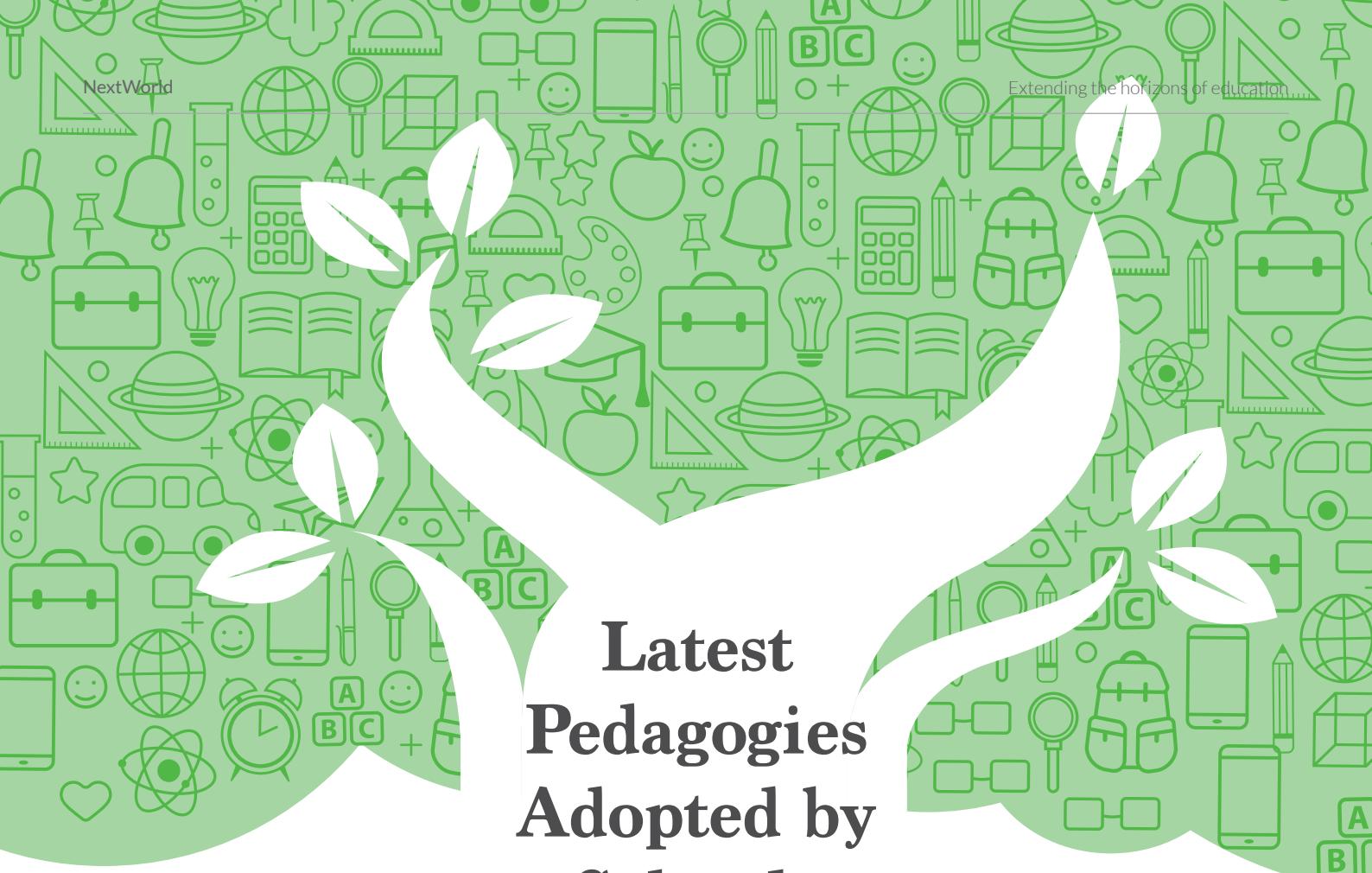
It won't be an exaggeration to say that with the help of computer education in schools, the students of today are in a more advantageous position compared to those from even the last decade.

criteria of judgement should be the technological proficiency of a school.

A computer can be an incredibly effective tool for teaching and learning, as it provides engaging activities for students as well as allows the creation of more individual lessons for teachers. The usage of computers by students has drastically increased over the last few decades. Students of all ages use computers for various reasons such as research, producing media and multimedia projects and presentations. ICT plays a vital role in the field of education— in the dissemination and absorption of vast amounts of information that is circulated around the globe. Technology-integrated education enables the development of 21st century skills— critical thinking, communication, collaboration, creativity and career-readiness, which pave the way for 21st century

careers. Computer education benefits students by providing quick access to information and skill sets that might take much longer to acquire using traditional methods.

It won't be an exaggeration to say that with the help of computer education in schools, the students of today are in a more advantageous position than those from the last decade. The unceasing quest for knowledge is aided by the advent of computer education and will contribute to the evolution of the teaching-learning process.



Latest Pedagogies Adopted by Schools to Improve Learning Outcomes

Since the beginning of time, man has been in the quest for learning. His evolution is marked by what he learned and used. In the Stone Age, he learned to use rocks and stones; the Iron Age brought about an understanding of metals, and the Bronze Age was defined by the learning and understanding of alloys.

There has been a constant interaction and interchange of knowledge in various ways since time immemorial. This exchange of knowledge has been dependent on the instructor, the learner and the learning outcomes.

The strategies and techniques of how content should be disseminated, changes with time and circumstances. Pedagogy, therefore, can be defined as the way knowledge is disseminated to others.

Over the years, great strides have been made in the development of new pedagogies. The requirements of education have also changed with the

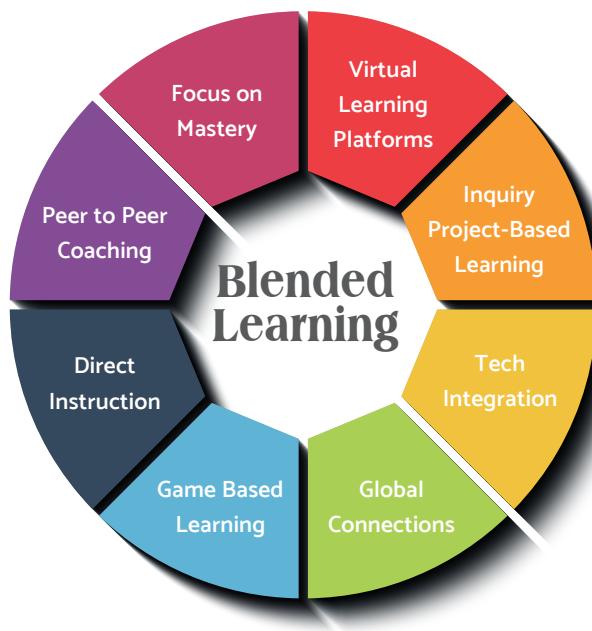
BLENDED LEARNING, FLIPPED CLASSROOMS AND REFLECTIVE LEARNING. THERE IS A HUGE ARRAY OF TECHNIQUES THAT CAN BE UTILISED TO ENHANCE LEARNING OUTCOMES.

transformation in the roles of the learner and the teacher.

In a traditional setting, the teacher plays a central role in planning content, designing methods of dissemination of content, assessment and remedial measures, whereas the learner is passive. However, the past few years have witnessed a reversal in these roles. Today's students are active learners rather than mere spectators, while teachers are facilitators. The coming years will observe further developments in the process of self-learning.

From the traditional, teacher-centred chalk-and-talk methods to the modern learner-centred methods, such as blended learning, flipped classrooms and reflective learning, there is a huge array of techniques that can be utilised to enhance learning outcomes.

In blended learning, students learn via both traditional



In blended learning, students learn via both traditional and digital classroom activities. This is essentially a method of self-learning, which inculcates a sense of responsibility and control in the students' mind regarding their education.

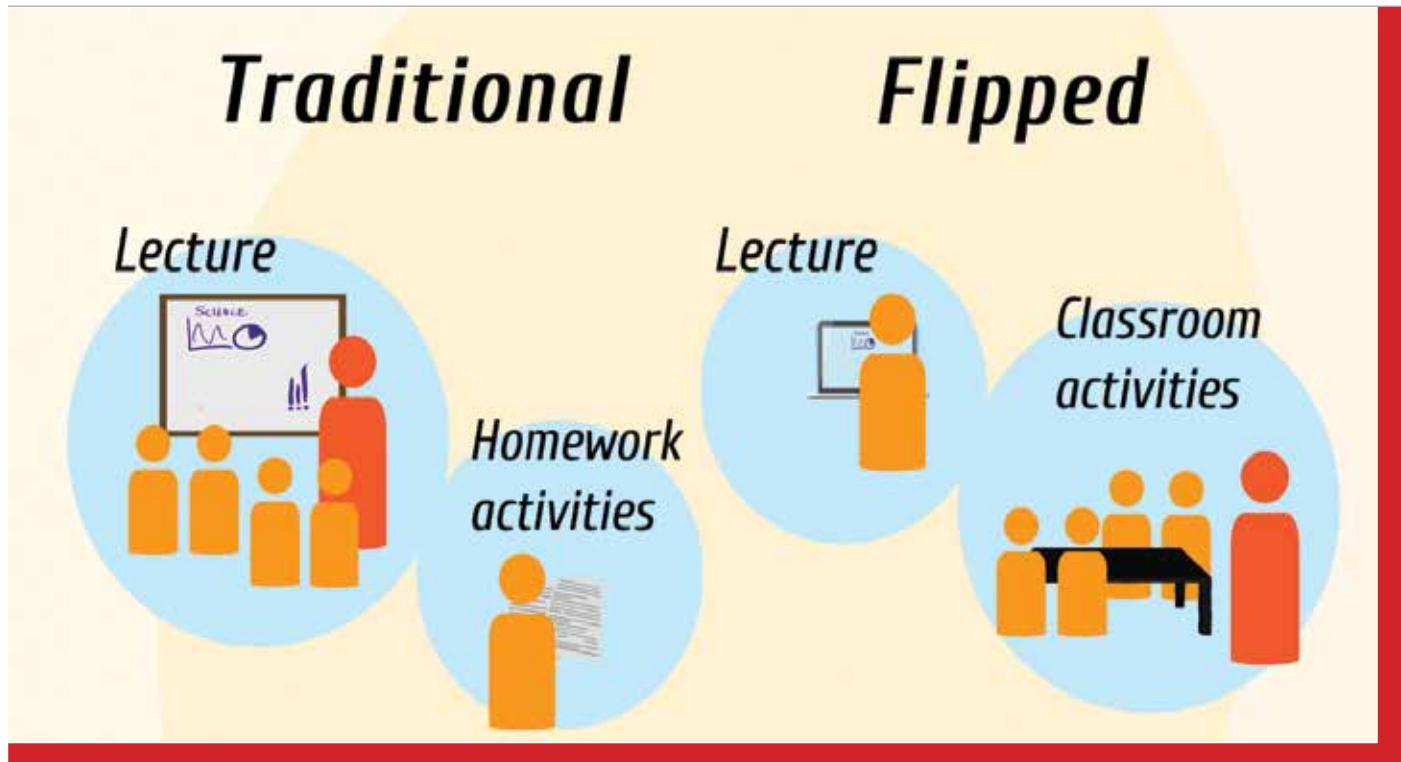
and digital classroom activities. This is essentially a method of self-learning, which inculcates a sense of responsibility and control in the students' mind regarding their education. It also puts the learners at ease by giving them the freedom to learn at their own pace.

Experiential learning is the key to student-centred learning for a sustainable future. It is the process of learning through experience, that is, learning through reflection. Students learn the practical applications of what they learn in the classroom through workshops, cultural ex-

change programmes and field visits. It engages students in critical thinking, problem-solving and decision-making in contexts that are personally relevant to them.

Problem-based learning is another student-centred pedagogy in which





students learn by solving open-ended problems in groups. Students get to learn collaborative thinking strategies and implement domain knowledge in a meaningful way. Today, the learning outcome is not just gaining theoretical knowledge, but also the ability to use the acquired knowledge and skills in real-life situations.

A flipped classroom is another instructional strategy that reverses the traditional learning environment by delivering instructional content before the introduction of a concept. The classroom time is managed with the teach-

More than technological expertise, our students, as the future workforce of our nation, need adeptness in communication skills and collaborative efforts to collect, decipher and assimilate information.

er facilitating a deeper understanding of the concepts via discussions and activities. It promotes self-learning and active learning through online resources, and enhances the cognitive skills of the learner. Digital education promotes the flipped classroom model by providing content that aids the basic understanding of concepts that can

be applied in the class, thus ensuring time management, especially in higher grades.

These advanced pedagogies help educators instill the skills and competencies that students require to meet the challenges of the 21st century.

More than technological expertise, our students, as the future workforce of our nation, need adeptness in communication skills and collaborative efforts to collect, decipher and assimilate information. They need the capabilities of critical thinking and creativity to be resourceful and solve any problems that might come their way. These latest pedagogies will ensure that our students are skilled enough to anticipate, decipher and evaluate the challenges of tomorrow.

ROSHNI RACHEL GEORGE
Principal of Dr. Mar Theophilus School, Dhanori

Roshni Rachel George, Principal of Dr. Mar Theophilus School, Dhanori, has 31 years of experience in the field of education. She has received several awards, distinctions and accolades such as National Ideal Principal Award from Student Development Society in 2017 and a certificate of appreciation from Malankara Orthodox Church Council of Bombay (MOCCB) education board in 2018





DR MADHUBALA PRAKASH GAIROLA

The goal of education is not to solve the problems of the past but to tackle the challenges that the future may hold. For this, we need to bring about a radical transformation in the curriculum and the pedagogy.

In order to deal with the challenges of the 21st century, we need creative and critical thinkers who can adapt to an increasing pace of change. The mainstream education system in India, therefore, needs to make changes in the curriculum, pedagogy and monitoring of education for nurturing such thinkers. We need to focus on creativity, collaboration, critical thinking and communication to achieve a quality output. Thus, we need to train learners in such a manner that they are able to interpret the new challenges and apply their knowledge to solve real-life problems.

Therefore, the onus eventually lies on schools to develop the 21st century learners who will not only become better job seekers but also job makers.

Preparing Students for the 21st Century Challenges

BY FOCUSING ON COMMUNICATION, COLLABORATION, CREATIVITY AND CRITICAL THINKING, WE WILL BE ABLE TO BRING ABOUT A GREAT DEAL OF CHANGE IN THE INDIAN EDUCATION SYSTEM.

The 2005 National Curriculum Framework (NCF) guidelines given by the National Council of Educational Research and Training (NCERT) have tried to implement a child-centred approach in all subjects. The evaluation pattern has been designed to enhance every aspect of the students' personality.

PEDAGOGIES TO INculcate 21ST CENTURY SKILLS

I believe, that by focussing on communication, collaboration, creativity and critical thinking, we will be able to bring about a great deal of change in the Indian education system. Developing creativity and critical thinking skills of a higher order at an early age could be effective ways of mitigating the learning gaps. In the past decade, creativity and critical thinking skills have been integrated into the kindergarten and the primary school curriculum. Even a country like Finland, which is known to have followed traditional education benchmarks, is reinventing itself by integrating 21st century skills across existing subjects and making



learning a collaborative process.

In innovative/modern classrooms, learning is an enquiry-based and project-based phenomena and teachers play the role of facilitators. Their aim lies at making students work in groups and reflect on their own thinking processes to a given situation or problem. These activities enable students to understand fundamental concepts in an intuitive way. In such a setup, teachers are encouraged to group students on the basis of their abilities and students learn by hands-on activities which are not strictly time-bound. Indoctrinating

critical thinking and problem solving from an early age blends the academic and social lives of the learners and prepares them for facing future challenges with ease.

There has been a great deal of advocacy over the years for the improvement of the quality of teaching and to make learning more learner-centric. However, the majority of students in India do not get to experience a well-planned, interactive teaching pedagogy. Additionally, our education system is neither linked with the vocations of the future nor is



it preparing the children for innovation or real-life situations. The 2005 National Curriculum Framework (NCF) guidelines given by the National Council of Educational Research and Training (NCERT) have tried to implement a child-centred approach in all subjects. The evaluation pattern has been designed to enhance every aspect of the students' personality. Special consideration has been given to inculcate the qualities required by the 21st century learners, such as creativity, innovation, leadership quality, problem-solving skills and critical thinking approaches.

INITIATIVES TAKEN BY S. B. PATIL SCHOOL

The S. B. Patil Public School has taken various steps to mitigate gaps in the learning process. We have digitised the teaching-learning process to make it more interesting and engaging. It enables students to understand concepts with ease and retain information for a longer period of time. Digitisation makes the abstract concept easier to grasp via audio-visual aids. Digital language, science and maths labs bring the world into the classroom. Moreover, individualised worksheets help to evaluate the skills

acquired by the students. Digitisation also enables teachers to keep the parents aware of the school's activities.

We have also tried to incorporate different pedagogies catering to different learners. In addition, subjects such as maths, science, languages and social sciences are based on the philosophy of 'learning by doing'. Furthermore, co-scholastic aspects are integrated with scholastic subjects to provide a more holistic approach. We are also trying to integrate social and vocational activities through various club activities and hobbies.

ECO CLUB

The school has an Eco club that arranges cleanliness drives in the labour colonies and tree plantation programmes in the school premises. In this, the instructors explain and carry out the process of generation of organic manure. The Eco club collects and disposes off e-waste and also organises special assemblies to explain the effects of e-waste. The club also organises workshops for teaching students to make eco-friendly Ganesh idols.

LITERARY AND IT CLUBS

Similarly, the Literary club aims at improving the writing skills of students by arranging dramas, mono acts, speeches, debates, recitation events, and publishing a quarterly newspaper. We have also started activities that promote video journalism and launched a school radio station. The IT club focuses on the use of various tools, such as Photoshop and Microsoft Office. It also trains students to work on PowerPoint presentations, create cartoon strips and learn web designing.

ART AND CRAFTS

Both male and female students are taught stitching, embroidery and jewellery-making.

HANDS-ON LEARNING

Our projects and games are designed to inculcate the attributes of leadership and teamwork in students. Science and robotics enhance their innovation skills. Keeping in mind the rapid globalisation, foreign languages



MADHUBALA PRAKASH GAIROLA

Principal of S. B. Patil Public School

Madhubala Gairola, currently Principal of S. B. Patil Public School, Pune, has been in the field of education since 1979 and has taught in various schools in Mumbai. She has 14 years of administrative experience in State and CBSE board schools, and possesses a hard-working disposition and missionary spirit. She received the Alert Knowledge Services Education Highly Effective Principal Award in 2018.



are taught to students and, trips are organised to foreign countries. In addition, experts from foreign countries are invited to provide different perspectives to students on various topics. Field visits and educational trips to farms and industries are also organised to keep students connected to real life. Moreover, vocational workshops are conducted to provide an insight to the students about various vocational skills and unlock their potential to succeed in any field. Doctor visits are held to keep the students aware of health issues and

the latest developments in the field of medicine. Furthermore, students are trained in yoga, meditation, karate and many indoor and outdoor games to keep childhood obesity at bay.

A complete teaching-learning process has been constructed by S. B. Patil Public School to meet the future requirements of students. We have adopted new pedagogies successfully to adapt our students to the challenges of tomorrow.

Next.

Life Skills

6

IN TODAY'S WORLD, THE MOST CRUCIAL SKILLS
ARE TO

ADAPT AND SURVIVE

Make students life-ready with Next Life Skills

- ✓ Value Education For Grades 1-5
- ✓ Life Skills For Grades 6-8

Next Value Education and Next Life Skills series aims to instil basic values and develop life skills in students for their holistic development, employability and lifelong competency.



The image shows a classroom setting. A female teacher, Neera Singh, is standing in front of a whiteboard, holding a green book. She is wearing a blue and white patterned dress over a white scarf. Behind her is a whiteboard with the Next_Education logo and the slogan "Creating a Brighter Tomorrow for today's students". Above the whiteboard is a TeachNext™ device mounted on a stand. To the right of the teacher is a large projection screen displaying a 3D anatomical model of the human brain. The brain is shown from three perspectives: a top-down view of the cerebrum, a side view of the cerebellum, and a bottom view of the medulla oblongata. Each perspective is labeled with a black arrow pointing to the corresponding part of the brain.

NEERA SINGH

Principal of Rajmata Krishna Kumari Girls' Public School, Jodhpur

Neera Singh is the Principal of Rajmata Krishna Kumari Girls' Public School, Jodhpur since 2008. She has teaching experience of English across various schools of Delhi and Jodhpur. She has 25 years of experience in the field of education and has received several awards and accolades such as commendation letters from the HRD Ministry, Government of India and from CBSE.

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A Next_Education Initiative

RELEVANCE OF TECHNOLOGY TO K-12 SECTOR



TECHNOLOGY AS A TOOL TO REFORM AND CHANGE CLASSROOM TEACHING IS ALWAYS A SUPPLEMENT AND NOT A SUBSTITUTE FOR GOOD TEACHING. TECHNOLOGY IS A MEDIUM FOR ENGAGING STUDENTS VIA AUDIO-VISUAL FEATURES, BUT A TEACHER IS ALWAYS REQUIRED SO THAT THE TECHNOLOGY CAN BE INTEGRATED WITH THE CONTENT TO MAXIMISE LEARNING OUTCOMES.

NEERA SINGH

The idea that technology can act as a tool of intervention in human affairs in order to improve living standards dates back to the philosophical discourses of the 19th century. While different scholars have looked at technology from different perspectives (economics, engineering, science, politics), our aim is to discuss its relevance in the K-12 sector and the potential it might hold for growth and development.

Information technology (IT) and IT enabled services are now the norm across many premier educational institutions. These have proven to be indispensable tools for a child's learning- be it for gathering information via the Internet or using software designed for specific purposes (statistical programs, scientific calculators, modelling applications etc.). Moreover, even tech-friendly classroom environments are becoming the norm in many places. LCD projectors and interactive smart boards are now a common sight in some of the best institutes. However, an important problem that remains to be addressed is that of access to technology .While it may be easy to

come to a consensus on the aforementioned points, it is vital to talk about K-12 schools, especially in the public sector, that lack access to this technology. Many government schools lack adequate physical infrastructure to accommodate its students, let alone the capacity to install such technology. If we are to truly utilise technology to change the way we imagine classroom environments, then we must also work towards its affordability and accessibility. Otherwise, there is a risk of widening the already existing chasm between private and government K-12 schools.

Finally, one must also remember that technology as a tool to reform and change classroom teaching is always a supplement and not a substitute for good teaching. Technology is a medium for engaging students via audio-visual features, but a teacher is always required so that the technology can be integrated with the content to maximise learning outcomes. Hence, the changing models of classrooms have made the teachers more irreplaceable than ever before.



“It is still crucial that every child shifts from interacting with technology to creating new technologies.”

ANAND RAMASWAMI
Vice President - Academics at Next Education

In his crisp black shirt and dark blue jeans, Anand Ramaswami, Vice President of Academics at Next Education exudes remarkable confidence, a quality that has helped him reach great heights in his career. Having worked extensively in the education sector, he is passionate about technology altering the way knowledge is delivered and consumed, not just by the students but by the entire academic fraternity. He has spent much of the last few years driving experimental and uncompromising leadership in the K-12 segment.

The first time I met him, he struck me as a person with profound intellect and wit, making you wish you could assimilate some of it. Today, he's with us to talk about why kids should learn coding at an early age.

Importance of Coding

A chat with Anand Ramaswami

Me: Can anyone be a coder? I used to have strong opinions about this, and I feel like I've lost them along the way.

Anand: You want strong opinions? Anybody can code. You know, kids these days learn how to put simple algorithms together to solve logical puzzles, build mini bots and even perform simple operations such as drawing a square even before they learn to write elaborate essays. Anybody with a normal IQ can manage that. But saying that anybody can be a coder is kind of like saying anybody can compose a sonata. As with any creative skill, no two coders can be compared as there can be multiple algorithms to achieve the same functionality.

Me: You seem to think of coding as a creative skill. Most coders would agree, I am sure.

Anand: Coding is a unique interaction in which you can make things happen on a screen or with a robot. And creativity is in finding the unique way in which you can make these things happen. Depending on the objective, algorithms can either make

the functionality faster, more secure, optimise its use of memory or even accommodate scalability. For example, Facebook has had to continually scale up its server capacity without sacrificing speed to accommodate its growing number of users. Though there are multiple ways in which the coders can tackle this problem, the objective is to find the most optimal solution. Coding is one of the very few skills that requires both conditional reasoning and creative thinking.

LEGO Boost Robotics Creative Toolbox is another popular toy among kids between the age of five and nine years.

Scratch, developed by a team in MIT is also a great place to start. This visual programming language is a great way to introduce kids to coding. To code in **Scratch**, one simply has to snap blocks together into a stack. These stacks of blocks control the behaviour of different characters in your game



NIVEDITHA MURTHY

Senior Copywriter, Next Education

Niveditha has worked extensively with the education industry, helping EdTech startups revitalise their web presence and improve their traffic trends. She is proficient in content strategising and creation and is interested in emerging trends and technologies in the education sector.

Me: At what age should kids start to learn coding?

Anand: It is never too early to get kids interested in coding. There are several toys and games to teach early coding skills to pre-readers. Most coding toys work by using a companion app to teach kids how to combine commands to make the toys generate sounds, lights and movement. Some of the best coding toys in the market today are **Osmo Coding Jam kit**, and **Bee-Bot**.

or in the story that you are trying to create. After you have created your program, you can share your project with others.

For slightly older kids, **Blockly** by Google is a good way to improve and share basic digital skills. The **Blockly** library represents coding concepts as interlocking blocks. With custom blocks, kids can create their own app too.

It is still crucial that every child shifts from interacting with technology to

**Coding is the language
of the future.**



creating new technologies.

Me: But why is it important for kids these days to learn coding? I remember my computer lab period was mostly about how to write Word documents.

Anand: We have come a long way from that. Today, I have a computer in my pocket that is much faster and has more memory than a home PC back then. It is connected to every other computer on the planet and can virtually access anything, almost instantaneously. The pace of change in computing is extraordinary.

Why is it so important to teach our children to code? We are already living in a world dominated by computers. Your smart fridge is connected to software-controlled networks; your television is delivered over the internet; and we are all shopping online. Early exposure to technology has reshaped the way kids communicate, socialise, create and learn. Due to their increased interaction with

technology, these digital natives, think and process information differently. Coding is the language of the future.

Will every job in the future involve coding? Probably not. But it is still crucial that every child shifts from interacting with technology to being an active co-creator. This is not primarily about equipping the next generation to work as software engineers, but about promoting computational thinking. Computational thinking combines mathematics, logic and algorithms, and teaches kids newer ways to solve problems. Computational thinking teaches them how to tackle large problems by breaking them down into a sequence of smaller, more manageable problems.

The applications of this approach stretch beyond writing code. Fields as diverse as biology, archaeology and music are applying the computational approach. Computational thinking is a skill that every kid should learn. Even if they never become professional software engineers, they will benefit

from knowing how to think this way. It will help them understand and master technology of all sorts and solve problems in almost any discipline.

Me: Computational thinking, I understand, is an essentialist concept. What other skills do kids pick up when they learn coding?

Anand: Those amazing success stories that we love to read, are usually the outcome of a person's ability to see a problem and come up with an effective and functional solution. Coding is just the execution of that creative process. It helps kids develop creative problem-solving skills.

It teaches kids to visualise. The kids, first 'think' of a program that they want to create. The ability to think out-of-the-box and visualise how something will work teaches kids to find newer ways to solve problems. To be able to look at a page of text and 'see' what it will do is a fantastic



skill. Computers are very linear in their processing, so as a coder, the kid needs to be able to adopt strong analytical and linear thinking skills. There are many different ways to solve a problem, and coding helps kids arrive at multiple solutions to a single problem by honing their logical-thinking process.

Me: How can teachers help in getting kids excited about coding?

Anand: Teaching kids how to code is on many teachers' minds these days. With all the discussions about bolstering STEM (Science, Technology, Engineering and Mathematics) education in the country and with the economy pushing technology companies to the forefront, it's clear that change is inevitable, and coding must become as integral a part of education as reading, writing, and maths.

Teachers can help spark and sustain a child's interest in coding both inside

and outside the classroom. Most kids like to create things, so coding will also come to them as naturally as painting a picture or building something with Lego blocks. Capture students' interest by emphasising on creativity, and they'll naturally learn some core coding concepts along the way. Keep it fun and don't force it. Just as all kids do not like to paint, all kids may not like to code either.

Remember that coding is a skill that relies on problem solving, so it is fine for kids to work in pairs. This is actually an excellent way to teach teamwork and develop leadership skills in kids. Collaboration and teamwork are skills that are extremely necessary in today's professional world.

Allow the kids to engage independently in the learning process. Accept that there will be many errors along the way. Help kids identify and resolve them.

Evaluate them on the process, than on just the end-result.

Me: One thing has been playing on my mind since the beginning of this interview. I would really like to know how Next Education is helping the cause.

Anand: Next Education's initiative, Robotics is a great tool to initiate kids to coding. We aim to promote robotics as a tool for application of concept-based learning in a classroom environment using STEM. The idea is to rediscover and redesign learning by engaging students with a query-based approach and to be creative in solving open-ended challenges.

In Robotics, we provide the students everything that they require. From hardware components to build robots to the various softwares required for programming, it is an easy-to-use hands-on kit which can help kids focus all their energy into simply being creative and developing a practical approach. The kit contains different kinds of sensors that a robot can use



to react to its environment and take decisions. With this, students learn that senses such as touch, sound and light can be replicated in a robot.

Our robot programming software, THINK developed in association with IIT Bombay, offers a graphic drag-and-drop coding interface for amateur coders. This provides self-explanatory, visual programming blocks that enable them to write powerful pieces of code with ease without getting bogged down by complex syntax and constructs of a textual programming language. Real-life problems often do not have a unique solution, but robotics offers students the flexibility to be imaginative and approach the same problems in their own unique way.

In addition to this, we also conduct teacher training programs to help school teachers initiate and execute coding lessons effectively in the classroom. These trainings are conducted by a team of academic consultants,

By getting kids started on algorithmic or computational thinking skills early in their lives, we give them the same agency to create a new future that the 3 Rs gave us when we were in school.

in association with IIT Bombay. We have conducted over 500 workshops on *Scratch* and *BASIC-256* in the last one-and-a-half years in as many as 30 states and 893 cities across India.

Me: What interests me is the balance between how Next Education is student-centric, and yet, is helping teachers meet the common goal.

Anand: I think the trick is in trying to understand the experience of learning to code from a student's point of view and doing whatever it takes to aid the process. For the past few months, we have been working on a few exciting new projects. We are working on developing our own platform on which kids can learn to code.

Me: Something on the lines of Code.org?

Anand: Absolutely. But for kids. We are also working on building a new kit for Robotics based on *Raspberry-pi 3*. A few other exciting new MOOCs for school teachers are also in the offing.

Me: I have a final question for you. There's a famous quote by Barack Obama in support of adopting computer science in American schools, "Computers are going to be a big part of your future.. and that future is yours to shape." What are your thoughts on this?

Anand: Computers are here to stay. And coding will certainly become an integral part of the school curriculum. The 3 Rs of 'reading, writing, and arithmetic' that were deemed mandatory by all schools would need a fourth R, algorithm to be added to the list. By getting kids started on algorithmic or computational thinking skills early in their lives, we give them the same agency to create a new future that the 3 Rs gave us when we were in school.

Importance of MIS in Schools

MANAGEMENT INFORMATION SYSTEM (MIS), A SUITE OF INTEGRATED APPLICATIONS THAT WAS INITIALLY USED FOR BUSINESS MANAGEMENT, HAS TODAY BECOME IMPERATIVE IN MANAGING ADMINISTRATIVE FUNCTIONS IN A SCHOOL.

PREMA MURALIDHAR

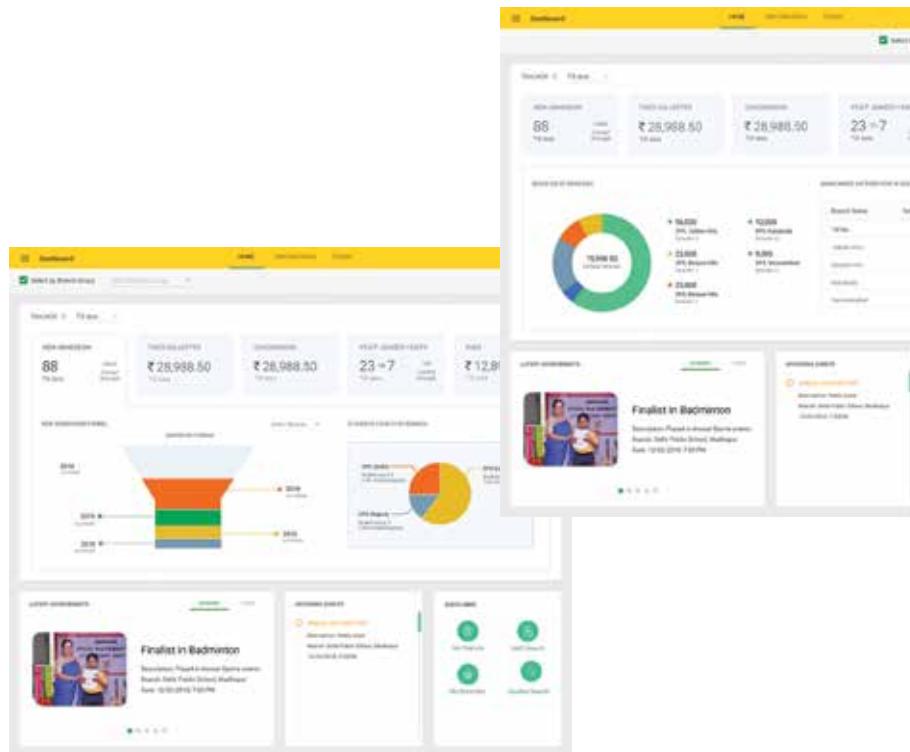


Management Information System (MIS), a suite of integrated applications that was initially used for business management, has today become imperative in managing administrative functions in a school. The National Policy on Information and Communication Technology in School Education, by the Department of School Education and Literacy, Ministry of Human Resource Development, Government of India, 2012, states that, "School MIS will emerge as a single-window clearing house on all information related to the secondary school system. The information will facilitate research and analysis of activities and guide decision-making at different levels in the educational system, contributing to enhanced efficiencies."

The CBSE has also upheld such a vision of including MIS in all schools to ensure effective management of academic functioning of a school.

MIS' initial entry into a select few schools in India has paved the way for the solution to be seen as a quality

An effective tracking mechanism enables the principal, students, parents and teachers to gauge the learning outcomes and help improve, sustain and challenge performance of students, and work towards a holistic development.



PREMA MURLIDHAR

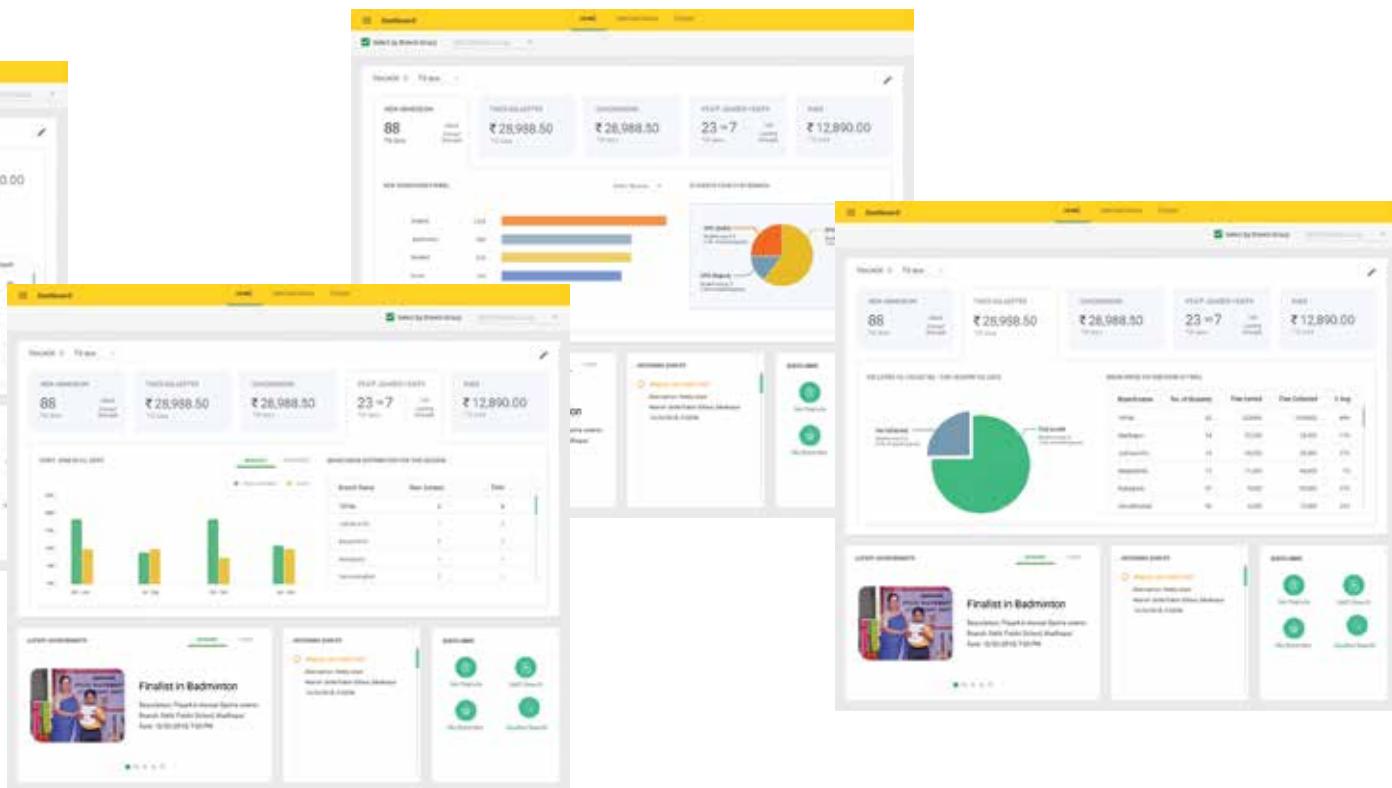
Academic Evangelist, Member of Advisory Board,
Next Education India Pvt. Ltd.

Prema Muralidhar, currently the General Manager of Academics and Audit at Next Education, possesses over 32 years of experience in the field of education, both as a teacher and an administrator, in India and abroad. She has also worked for the Directorate of Technical Education, Sultanate of Oman. She is a recipient of the Celebrity Teacher Award from Chamber of Education, New Delhi. She is also a National Assessor of schools certified by the Quality Council of India (QCI).

tool for the day-to-day management of a school. Ideally, a school management system needs to be integrated with other systems built on different platforms. It should also be tailor-made to cater to the individual and exclusive needs of each school/institute based on its topographical conditions. The software (product) thus developed would provide individual stakeholders with analytical commentaries where the rate of progression of

the school/institute can be seen, felt and experienced.

It is also essential that the academic and non-academic features are integrated effectively so as to obtain meaningful insights into various aspects. For example, if a student has been ill and not attended school for a week resulting in below-par performance in exams, the system should be able to suggest the reason behind the poor performance. An analysis of the



attendance module and examination modules should provide these details. However, it is also essential that rules and regulations are standardised, policies and procedures are defined by the framing committees so as to effect correct implementation and review of insights.

The school management system thus developed ensures that feedback collected from various stakeholders at regular intervals are analysed, evaluated, interpreted and shared with stakeholders in the form of database and graphical representations where reports can be generated depending on the need. Thus, MIS will help to establish an efficient monitoring mechanism. Successful implementation of MIS would help the school management to scale up their operations and review periodic deviations, so as to take necessary interventions and get back on the planned track. MIS can be

the institution's guide to review the organisation's performance as against the targets set. The school management can track learning progress and teacher productivity as well.

An effective tracking mechanism enables the principal, students, parents and teachers to gauge the learning outcomes and help improve, sustain and challenge performance of students, and work towards a holistic development.

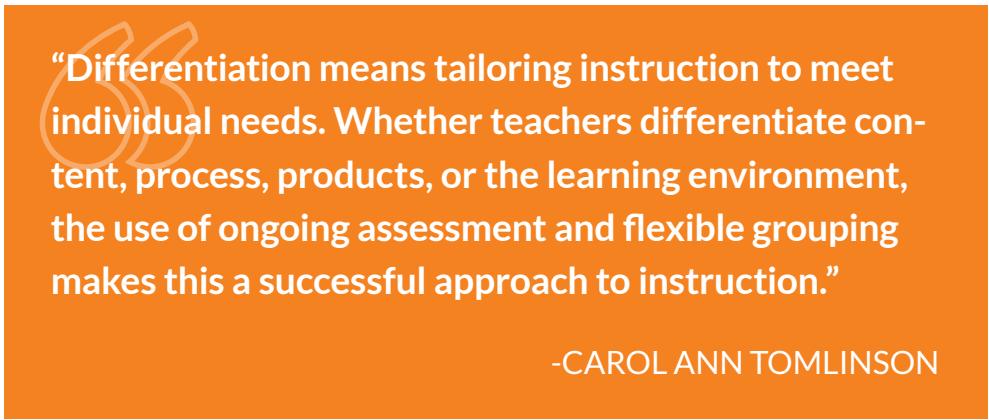
The challenge for schools has always been to ensure security of their databases and of the MIS processes. Therefore, it is vital for both the user and the vendor to draw clear lines of control and render support in the areas specified. Most schools which opt for an appropriate solution find it tough to 'brace the unknowns', or tackle bugs that crop up while feeding data or generating reports. Thus,

continued customer support during all phases of implementation will not only eliminate apprehensions but also help in changing the scenario in schools from a 'person-centred approach' to a 'system-centred approach'. In keeping with the latest advancements in technology, MIS now uses cloud computing platforms and services.

Before implementing an ERP solution such as MIS, the concerned stakeholders should understand its benefits first, support its implementation, see how it excites the institution and then start believing in the importance of the project. The success mantra to scaling up an institution lies in the effective implementation of a school management system that can not only save time money and effort but also portray transparency, accountability, credibility and reliability, ensuring confidentiality and security of information at all levels.

Differentiation: What Works and What Doesn't

It is challenging and detrimental to fit all learners within a single framework of outcomes and deal with the academic and behavioural ripples that affect the dynamics of not just the classroom but also the academic future of learners.



“Differentiation means tailoring instruction to meet individual needs. Whether teachers differentiate content, process, products, or the learning environment, the use of ongoing assessment and flexible grouping makes this a successful approach to instruction.”

-CAROL ANN TOMLINSON

In its simplest form, differentiation can be understood as teachers tailoring their pedagogical practice to suit the needs of different learners. They do so to ensure that the entire class has the opportunity to learn and perform to the best of their abilities. Learner readiness, learner's interests or learning preferences are the typical parameters on the basis of which teachers differentiate their practices. Differentiation can happen at three levels:

1. **Differentiating content** – diversifying the way of presenting information to learners. This can be made possible with the use of different modes of information such as print, audio-visual, pictorial, models, manipulatives and simulations. There is no definite way to deliver information.
2. **Differentiating process** – widening the range of the activities through which learners can master the content. This can be made possible by designing activities that engage learners through multiple ways of interaction and expression.
3. **Differentiating products** – varying the ways in which learners can demonstrate their learning. This can be achieved by making the assessments diverse. A score on a written test must not be the only measure of a learner's understanding of any given concept.

Differentiation at these levels require teachers to have clear defined strategies to reach their goals and outcomes. According to Tomlinson, "Often, that's where we miss the boat."

WHY DO WE MISS THE BOAT?

While the focus of differentiation has long been on learner preferences, it is about time we looked at differentiation as the very nature of learning and teaching. First of all, not all concepts can be taught in a singular manner. Different concepts require different kinds of delivery and visualisation for the effective achievement of the desired learning outcomes. It is not just the learner who defines differentiation. There are four reasons other than learner diversity that are worth examining in any context of differentiation.

i. THE TEACHER'S STYLE AND PREFERENCES

While we consider the classroom to be learner-centric, it is often at the cost of overlooking what a teacher has to offer in a classroom. Teachers have their own personal pedagogical beliefs and preferences. They also have unique teaching styles. These

would have taken years to develop, right from the impressions formed as a learner, to a trainee teacher and sometimes, even as a researcher. Can a pedagogic sermon on differentiation and instruction in a two hour workshop or conference enable a large-scale behavioural change? Such skepticism is pertinent because planning a differentiated lesson means planning multiple lessons

within a single lesson plan. This, for a teacher operating alone in a classroom of thirty to forty learners can be exhausting. So what can work? Team teaching is one of the ways to make possible the implementation of differentiation in a classroom.

The team teaching model enables teachers to share the extra responsibilities involved in differ-



Teachers have their own personal pedagogical beliefs and preferences. They also have unique teaching styles. These would have taken years to develop.

entiation through collaboration, encourages sharing of materials and most importantly, enables taking turns in teaching differently, yet in a way that suits each teacher. While it does push the boundaries of habit in a teacher, it isn't overwhelming to warrant a dismissal.

ii. PRESCRIBED TEXTBOOKS

While the world has taken tremendous leaps in technology, our classrooms largely function with the good old key orchestrator—the textbook. When teaching, assessing and learning tantamount to only finishing the chapters of a textbook, writing answers at the back of the book and learning assigned chapters for tests, where is the scope for differentiation? Now, reading and listening, are two ways we acquire information. Writing and speaking are two ways in which we produce or express information. An interactive balance of these ways are needed even within a classroom. A textbook cannot be the sole proprietary source of information. Information must be presented visually and aurally for a comprehensive insight into any concept. Similarly, assessments must not be based on written tests alone, but should also include oral tests. This might sound simplistic and something already in practice. But are you teaching and assessing your thirty learners in all the four ways, across all the concepts? Do you have the time and the planning for it? How many such concepts would you be able to teach and assess in an academic year? So what works? An adaptive technology that paces with each learner, allows the freedom of



SOORYA MENON
Product Manager

Soorya Menon has over thirteen years of experience in English language teaching and curriculum designing for the K-12 sector. She has completed her PhD in English Language Education from the English and Foreign Languages University. Currently, she is researching on the impact of digital education in the K-12 sector in India.

choice of input and makes it easy for the teacher to keep a track of every learner, should be the way ahead.

iii. DOCUMENTATION

This probably requires the least discussion in the Indian context. A case in point would be the retraction of the CCE method by the CBSE. Founded on the principles of continuous assessment, and an effective method of assessment in contexts elsewhere in the world, CCE failed in India. Teachers were found doing more busywork than productive work. Their time was spent on hours of paperwork, creating and implementing assessments around the year based on a flawed framework. Those details are outside the scope of this article. However, this is more or less the same reason why differentiation has received the proverbial 'throw the baby with the bathwater' treatment. It is preempted as a strategy that requires extra time, effort and copious amount of documentation. This worry is irrelevant with the advent of effective analytics tools, enabled by smart technology, that does away with cumbersome paperwork.

iv. STANDARDS BASED INSTRUCTION

While national standards can serve as useful benchmarks, they can also be highly restricting in

terms of creative boundaries. If you are asked to teach, so that learners can describe how coal can be used to produce electricity, you will seldom think of drawing a flowchart as an acceptable evidence instead of explaining the concept through a fifteen sentence paragraph. As a result, all the thirty learners will learn to describe the process only by writing a fifteen sentence paragraph. While the ones with a flair for writing may get by in this process of assessment, the others fall invariably into a trap of rote memorisation, and this becomes a habit hard to break. This is probably the most serious reason why differentiation fails. While learning and instruction is differentiated, assessment methods are standardised and require one single way of responding that pertains to a particular skill set that has been long established as an industry standard. Hence, teachers dismiss differentiation and help learners "catch up" through instruction, while the learners "keep up" with rigorous grade-level instruction.

A clearer and more inclusive interpretation of standards that suit varying ways of assessing the learning of a student would be the way ahead, at least until the middle school, where targeted writing lessons over the course of years can help hone writing

When educational endeavours are being made to deliver curriculum programs that address the very basis of differentiation, through interactive whiteboard content, hands-on materials, print materials, experiential learning kits and lesson plans that make their implementation feasible, the onus is no longer on the teacher to source multiple content or plan a lesson with multiple levels of differentiation.



skills to suit the demands of standardised assessments in higher grades.

MAKING IT WORK

From the above discussion, it seems evident that two prime factors need to be addressed to make differentiation feasible and effective.

i. MANAGING TIME AND EFFORT

Differentiation allows learners to learn and demonstrate what they know through multiple methods. It demands the teachers to add depth to the teaching-learning process, by sourcing and putting together multiple sets of content. It is, therefore, perceived to complicate a teacher's work.

This is a problem not just restricted to large classrooms. A

heterogeneous class of fifteen students could be as taxing as a class of thirty. The degree of heterogeneity, the teacher's attitude, expertise and beliefs are factors that need to be considered.

However, with the advent of technology, this problem has been more than solved. It should in fact be considered nonexistent. When educational endeavours are being made to deliver curriculum programs that address the very basis of differentiation, through interactive whiteboard content, hands-on materials, print materials, experiential learning kits and lesson plans that make their implementation feasible, the onus is no longer on the teacher to source multiple content or plan a lesson with multiple levels of differentiation. An adoption of

such a curriculum program fulfills the needs of a classroom, where every kind of learning preference is addressed, without worrying about the number of learners and time consuming work to manually address each learner's learning path individually.

Technology by design helps teachers become facilitators in the truest sense.

The teacher no longer has to read out only from a textbook and explain the working of the digestive system. 3D models of the system are available, both as manipulatives and as audiovisuals to show, and not just tell how the digestive system works. Similarly, chemical reaction simulators allow the teachers to show how a reaction works and the learners to under-

Technology also makes data handling easier for teachers by providing a detailed analysis of the performance of each student. Adaptive systems make differentiation less of a polite fiction and more of an effective reality.

stand hands-on, using multiple examples by simply varying the components and values in the equation, without the worry of the cost incurred if each student were to perform the experiment in a lab multiple times.

Technology also makes data handling easier for teachers by providing a detailed analysis of the performance of each student. Adaptive systems make differentiation less of a polite fiction and more of an effective reality.

Further, when the team teaching model, as discussed earlier in this article, is adapted, it eases the effort and time required to handle the volume of work that differentiation demands.

ii. REIMAGINING OUR INTERPRETATIONS OF NATIONAL STANDARDS

The second reason that differentiation has received much flak is because terms like "differentiated instruction", "differentiated learning", "differentiated curriculum" and "differentiated assessment" throw open a multitude of directions, and teachers do not have clear guidance to either reach level novice or to navigate to level expert at differentiation. What are we differentiating? Is it the curriculum, the instruction, the assessment, or the learning?

In the context of interpreting predefined national standards as a list of learning outcomes, we run the risk of oversimplifying classroom practices, restricting them to the achievement of outcomes and ticking things off the academic calendar. To enable differentiation, we need to reimagine standards to include multiple ways of understanding and shift the focus to deep learning. While technology addresses the differentiation of content, and to a certain extent, methodology by design, it is within the micro practices in the classroom where the teacher can make a difference. The teacher can make it work by turning the restrictions laid down by national standards into opportunities.

Take the example of the teaching of writing to middle school and high school learners. The national standards require learners to write an essay on any given topic. The standards define essay to have an introduction, a body and a conclusion. It also requires learners to use grade appropriate language, relevant ideas and examples. In a class of thirty, learners might be at different levels in terms of the different parameters standardised for judging a learners ability to write an essay. An effective system that

differentiates feedback to learners and allows for feedback cycles have research-backed evidence of academic gains than simple correction of essay scripts and grading them as A or B or a 7 out of 10. Such strategies need to be based on concepts and context, as much as on learner and teacher preferences, to facilitate deeper learning.

LOOKING FORWARD

A focus on deeper learning is pertinent in the light of the findings published by ASER in the past twelve years. Many children in elementary schools need urgent support for acquiring foundational skills like reading and basic arithmetic. In the 2018 report, it was found that even in learners aged between 14-18 years, who have completed eight years of schooling, "a significant proportion still lack foundational skills like reading and math."

Now, there are a host of factors that have resulted in such gaps. Differentiation may not be the solution for everything, but it is evident how every articulation of implementing differentiation points to the much needed solution for problems such as these gaps, that is, a no-compromise balance between effectiveness and equity.

Differentiation is not easy. There's no doubt that it's a huge challenge. However, it's more challenging and detrimental to fit all learners within a single framework of outcomes and deal with the academic and behavioural ripples that affect the dynamics of not just the classroom but also the academic future of learners.



Effective Pedagogy in Social Sciences

Social sciences is important as it enhances comprehension, application, analysis, evaluation and creativity; skills which are vital in day-to-day life.

SWATI PANT & UTTAMA DEB

India is known for its diverse ethnicity, culture, languages, and rich history. But ironically, the study of social sciences, the umbrella discipline in which these fields belong, has long been given step-motherly treatment in our education system. Right from middle school, students consider social sciences which includes history, political science, anthropology and economics as burdensome; something that involves long essays, drab theories and tough-to-remember dates and statistics. This attitude towards the subject leads students to believe that social sciences would not be of any help to them in the long run.

Going beyond the classroom, there exists a common misconception that as a stream, social sciences does not

contribute to the economic development of the country in comparison to other disciplines such as science, technology, engineering and mathematics (STEM). This results in STEM receiving considerably higher investment and support from the government and universities. Moreover, the existing pedagogy encourages rote learning, and mugging up of historical facts and theories which have no bearing on real life issues, making the subject boring and repetitive.

WHY IS SOCIAL SCIENCES IMPORTANT?

IT INculcates Life Skills:

Social sciences is important as it enhances comprehension, application, analysis, evaluation and creativity; skills which are vital in day-to-day life. Learning about diverse topics enables students to gain well-rounded information, based on which they can make observations and connections between related concepts, ideas and resources. Appropriate experiences further enhance students' understanding about how different things and people affect their day-to-day lives. For example, in order to gain a proper understanding of poverty in the society, students are required to study subjects such as history, economics and politics.

IT BUILDS A CONNECTION BETWEEN THEORIES AND IDEAS:

A good grasp of social sciences is necessary to understand vital issues that concern society and gain the

correct perspective. Considering the same example of learning about poverty, students first need to acquire information and comprehend ideas such as discrimination, resource allocation and political priorities. Then they need to understand, analyse and evaluate the existing connections between those ideas and theories to make sense of how poverty affects certain populations in the country. This knowledge can be further put to use to foster students' creativity and help them come up with solutions and policies to reduce poverty. They could further present their ideas in the form of debates, essays, role plays or class projects.

IT HELPS TO UNDERSTAND HUMAN BEHAVIOUR:

Social sciences helps students observe, learn and understand human behaviour, values and attitudes, and the interrelationships that exist among people across the world. They also learn about social strata, the norms of society and the need for various governing bodies and other institutions. This, in turn, helps students develop a wider perspective of society and its different elements.

IT HELPS TO APPRECIATE CULTURAL DIVERSITY:

Social sciences makes students understand about the diverse and multicultural nature of society. This helps them recognise the benefits and challenges of living in a world with multiple cultures and ideologies. This awareness makes them develop an understanding of their rights, duties and responsibilities and the fact that

in order to live and coexist peacefully, each and everyone needs to respect, trust and balance various opinions, values and attitudes, lifestyles, cultures and practices, and ideologies existing in society.

THE NEED FOR CHANGE

Social sciences essentially involves the study of human beings. As elaborated earlier, the wide spectrum of disciplines covered under the subject have a significant impact on our society and the economy. It is high time the social sciences pedagogy is directed towards encouraging students to critically examine their assumptions, engage with social issues and take action.

we all know about the events that took place during the freedom movement in India and recognise our freedom fighters. Yet, we do not assess how our present socio-political scenario has evolved.

Instead of making the subject matter a mere collection of theories, numbers and dates, it should involve assessment, practice, intuition and deductions. For example, we all know about the events that took place during the freedom movement in India and recognise our freedom fighters. Yet, we do not assess how our present socio-political scenario has evolved. Similarly, we also know that India is the largest democracy but we do not

It is important to establish a respectful relationship between teachers and students. This implies that teachers and students should be able to establish good communication links and be ready to give each other a chance to discuss their perspectives and learn from each other .

attempt to analyse the reasons behind its transformation to this state. Thus, drawing conclusions after thorough assessment of relevant content is one of the ways to bring in an effective change in social sciences pedagogy.

EFFECTIVE MEASURES

CONTINUITY AND ALIGNMENT:

To optimise learning of any subject, it is important to build up on what students already know. Continuity and alignment in the content taught can thus make learning social

sciences more relatable. To facilitate this, teachers should make an attempt to access and assess the prior knowledge of students. Revisiting known facts and theories gives an opportunity to students to apply what they have learned, something which is seldom followed while studying social sciences.

RELEVANT CONTENT:

It is a well-known fact that the lessons learned through real-life experiences are retained in our minds for a longer period of time. The diversity of the classroom is immensely beneficial for the teaching of social sciences; for

discussing ideas based on a variety of perspectives and to encourage critical thinking. Involving students to share their cultural knowledge and experiences proves to be a helpful tactic in getting acquainted with new concepts. Conversely, if teaching does not involve diversity, students might develop a biased understanding of a topic, besides losing interest in the subject. It must also be ensured that the content being taught has some point of relevance for the students. Moreover, the teachers should ensure that the learning being imparted is inclusive in nature and does not promote stereotypes and biased understanding.

COMMUNITY AND DIALOGUE:

It is important to establish a respectful relationship between teachers and students. This implies that teachers and students should be able to establish good communication links and be ready to give each other a chance to discuss their perspectives and learn from each other. Secondly, creating and encouraging dialogue via activities, such as group tasks or class discussions, has been statistically proven to be a successful strategy in effective learning.

SWATI PANT

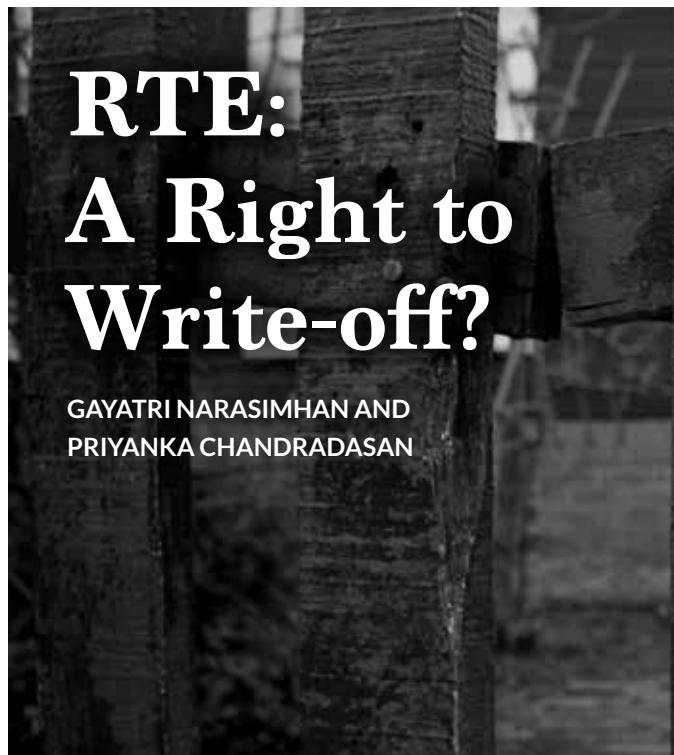
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RTE: A Right to Write-off?

GAYATRI NARASIMHAN AND
PRIYANKA CHANDRADASAN



"You shall not pass" was the single greatest weapon teachers and schools could unleash on students. The last benches of classrooms had reeked of failure and fear of detention for many years until 2009. Underlining the constitutional provision of education being a fundamental right, the Right to Free and Compulsory Education Act, or the RTE Act was passed to make education free and compulsory for all children aged six to fourteen.

For the uninitiated, The RTE Act makes education 'compulsory' for all, reinforcing that the onus of educating children is on parents and the State. It requires all private schools to reserve 25% of the seats for socially and economically backward children. RTE prohibits all unrecognised schools from practice and strictly rules out donation, capitation fees and any kind of screening test of the child or parent for admission. Besides ensuring infrastructure with all the above regulations, RTE has another ripple-creating measure in store – the No Detention Policy or the NDP. NDP means that no child shall be held back, expelled or required to pass a board examination until the completion of elementary education.

All said and done, there were two triggers that led us back to the tainted brown papers of 2009 and 2017, one being the recent recommendations of the government's think tank, NITI Aayog, and the other being the amendment to the RTE Act by the government. In its Action Plan for Education, NITI Aayog suggests that RTE is more of 'Right to School' than 'Right to Learning' and that NDP is hampering educational outcomes by killing competition. A discussion on these two strong attacks on RTE is long due.

THE FIRST ATTACK: TREATING THE SYMPTOM

The Annual Status of Education Report (ASER) is guaranteed to concern anybody who takes a look. The inability of a large number of Class 5 students to read a Class 2 level text is a clear indication of poor quality of education in the country. This condition, however, has now brought about a blame game where all stakeholders are trying to peg the blame on different educational policies. When it was the Central Advisory Board of Education's turn, its sub-committee hung the albatross around the neck of the much debated 'No Detention Policy'.

The Committee put forth recommendations from 28 states out of which 23 were against the No Detention Policy. The reason for rejection was grounded upon a belief that lack of examinations killed competition and that promoting students without a check has impaired the quality of education. The burden of proof is unusually upon those who reject this claim, for they are a minority in this case. Several studies have concluded that it is not just the lack of examinations, but also the poor quality of education, lack of infrastructure, teacher vacancies and ad-hoc teachers that have had an effect on learning outcomes. ASER Trends Over Time Report is a clear proof that educational outcomes have been on a downward slope since 2006. This destroys the argument that NDP, which is in effect since 2009, is the chief reason for fall in the quality of education.

Some of the states that have testified against NDP state an increase in dropout rates in higher grades as the reason, while the others in favour comment that NDP has brought down dropout rates. In fact, the rationale behind NDP was to keep up

The RTE needs to be modified to actually become a Right to Learning, instead of being, as it currently is, a Right to go to School.”



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the morale of students by not detaining them upon failing high-stake exams. According to the National Family Health Survey 4 (2015-2016), one of the top six reasons for school dropouts was 'repeated failure' in the final examinations. Educationists have time and again proven that the year-end examinations, at the local or national levels, are not good indicators of students' learning levels, which resulted in introducing Continuous and Comprehensive Evaluation (CCE) coupled with No Detention Policy. At this juncture, to roll back NDP, while the root cause of low learning levels is elsewhere, is akin to treating the symptom rather than the disease.

THE SECOND ATTACK: RIGHT TO SCHOOL OR RIGHT TO LEARNING?

Under Section 20.9, NITI Aayog's Action Plan says,

"The Right To Education (RTE) Act stresses on inputs, causing resources to be focused on things like building schools, hiring teachers, having playgrounds and libraries while learning outcomes have steadily dropped since the introduction of the Act. The RTE needs to be modified to actually become a Right to Learning, instead of being, as it currently is, a Right to go to School."

First of all, let us consider the prerequisites for learning in a school. The list would include students, schools, teachers and a good curriculum.

The think tank states appropriately that enrollment has been close to 100% in primary education in the recent years. How-

ever, enrollment cannot be an indicator of students being in school every day, learning. Schools situated in difficult terrains often have no teachers at all, or function with a single teacher who juggles cooking mid-day meals, maintaining records and managing to teach a handful of students in the time he or she has to spare.

What is the reason for such high rates of teacher absenteeism or shortage? Studies conducted by UNESCO in developing countries including India, Bangladesh and Peru in 2002, suggest that teachers in schools with good infrastructure have 10% less absenteeism than teachers in schools with deficient infrastructure. Like in any other profession, teachers have the right to a safe and clean workplace and a school with good sanitation facilities; offices for teachers are definite brownie points for teachers to be at work every day.

Therefore, we need to view Right to School as the stepping stone for learning and not place schooling and learning in juxtaposition.

With centuries of colonial weight on its back, India's tryst with education has finally sprouted its own wings with RTE and its progressive ideas about education. One does not abandon a building in construction because the dirt and dust paint an ugly picture. It is important to stand by it. There sure is a need for periodic status surveys to monitor which way education is headed. But to arrive at a conclusion based on these status checks, that RTE is a failure to be written off, is not the right way to proceed. All our school system needs right now is to give RTE some time and resources, to watch it unfurl and bear fruits of collective thought, efforts and patience.



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Education Today Ought to Empower Students to Solve Real-life Problems

“Knowing how to think empowers you far beyond those who know only what to think.”

- Neil deGrasse Tyson

TARUN GANGWAR

The education systems across countries seem to be coming more and more in agreement with the above quote from the famous American astrophysicist. There is, however, a long way to go as the current education system still seems to be in the shackles of the centuries-old approach which was developed for a fairly different agenda. Before we discuss in detail this perspective shift that is knocking at our doors, let us gain some historical insights into the current schooling system.

Here is an excerpt from Sugata Mitra's (the famous educator behind the hole-in-the-wall experiment) 2013 TED Talk where he beautifully explains the genesis of the current schooling system:

I tried to look at where did the kind of learning that we do in schools come from? And you can look far back into the past, but if you look at present-day schooling the way it is, it's quite easy to figure out where it came from. It came from about 300 years ago, and it came from the last and the biggest of the empires on this planet. ["The British Empire"] Imagine trying to run the show, trying to run the entire planet, without computers, without telephones, with data handwritten on pieces of paper, and traveling by ships. But the Victorians actually did it. What they did was amazing. They created a global computer made up of people. It's still with us today. It's called the bureaucratic administrative machine. In order to have that machine running, you need lots and lots of people. They

made another machine to produce those people: the school. The schools would produce the people who would then become parts of the bureaucratic administrative machine. They must be identical to each other. They must know three things: they must have good handwriting, because the data is handwritten; they must be able to read; and they must be able to do multiplication, division, addition and subtraction in their head. They must be so identical that you could pick one up from New Zealand and ship them to Canada and he would be instantly functional. The Victorians were great engineers. They engineered a system that was so robust that it's still with us today, continuously producing identical people for a machine that no longer exists.

The irony is, the current schooling system fails to account for the most common technology that has been deeply seeded in our day-to-day lives

However, with the advent of new technologies, the ‘demands’ of the market are changing. The skills that were highly sought after yesterday, are becoming obsolete today and there is little doubt about the fact that the jobs of today will cease to exist tomorrow (Remember, there used to be a job of a ‘typist’ who used the ‘typewriter’!). In fact, according to a recent report, titled Realising 2030: A Divided Vision of the Future, published by Dell Technologies, 85% of the jobs in 2030 (when a Grade 5 student from today’s classroom will take up a job) have not been invented yet!

The irony is, the current schooling system fails to account for the most common technology that has been deeply seeded in our day-to-day lives: the INTERNET. Before the Internet was easily accessible, ‘knowing’ a lot of things was assumed to be a sign of being ‘smart’ or ‘intelligent’. It was an era where ‘information’ was not easily

accessible and therefore ‘knowing’ things was important. However, with the advent of the Internet, ‘knowing’ has become redundant as you can always Google it (the biggest sign of this is that ‘google’ is now also a verb and not just a noun!).

The question then is, what do these changes mean for our schooling system? What can we do to ensure that our school curriculum and pedagogies remain relevant to a world which is rapidly changing?

Educators across the world seem to have found the answer already:

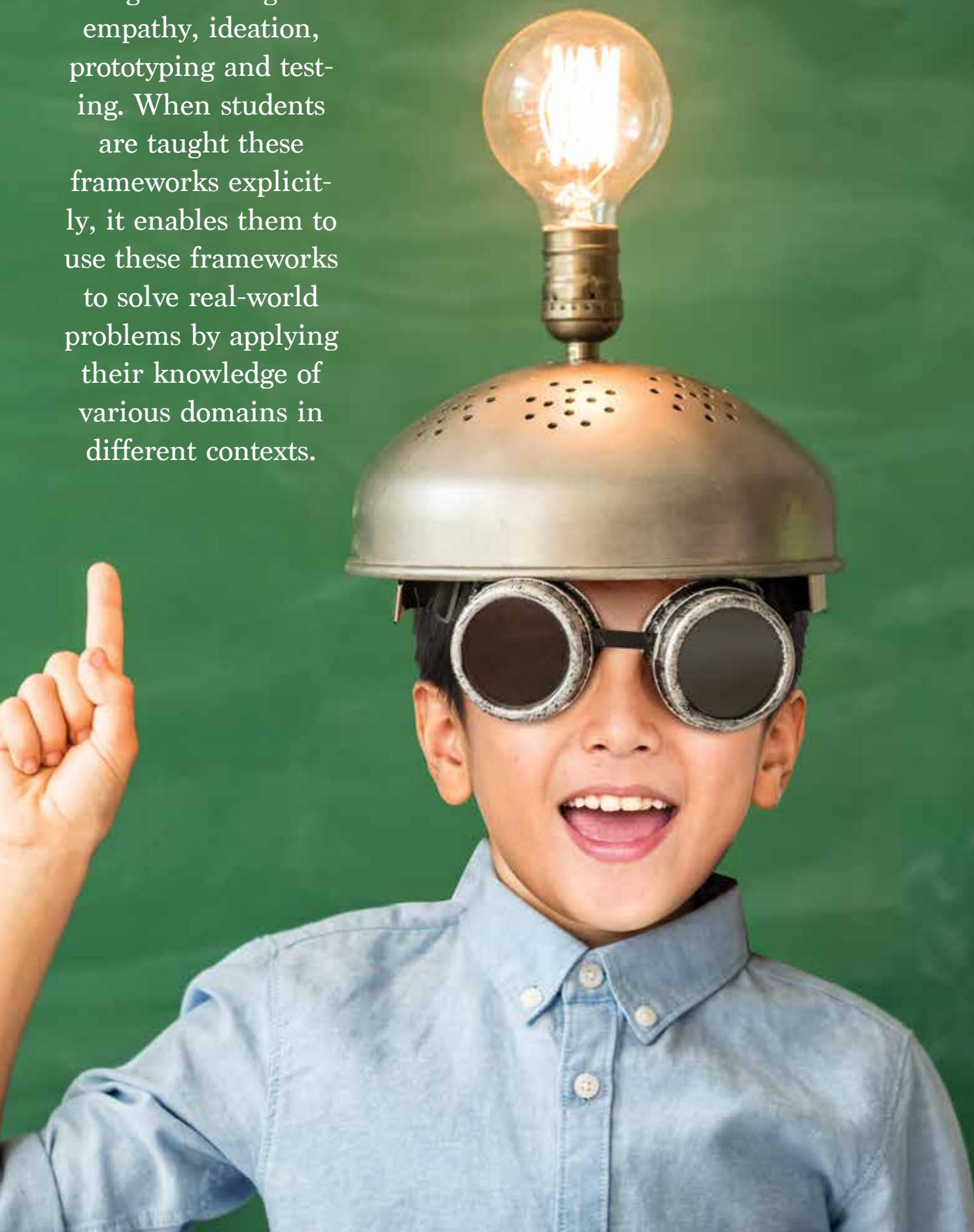
THINKING SKILLS

Educators across the globe have started advocating thinking skills as a key learning outcome. To understand what thinking skills are, let us understand some of the thinking skills in detail.

DESIGN THINKING SKILLS

Design thinking is defined as ‘a human-centred approach to solve real-world problems’. The core elements of design thinking are empathy (understanding the problem from the user’s perspective), ideation (brain-storming to generate ideas), prototyping and testing. When students are taught these frameworks explicitly, it enables them to use these frameworks to solve real-world problems by applying their knowledge of various domains in different contexts.

The core elements of design thinking are empathy, ideation, prototyping and testing. When students are taught these frameworks explicitly, it enables them to use these frameworks to solve real-world problems by applying their knowledge of various domains in different contexts.



COMPUTATIONAL THINKING SKILLS

Computational thinking is an approach to solve complex real-world problems in a logical manner. It involves decomposing a large problem into smaller parts and recognising patterns to find a solution. This further helps develop critical thinking skills in students.

Thinking skills empower students to solve problems in different contexts. Hence, it is important to teach them 'how to think' instead of 'what to think'.

The key challenge today is to integrate thinking skills with the curriculum. Some large-scale initiatives have helped in the learning of these skills in the classroom. One such initiative is the Computer Masti Curriculum designed by IIT Bombay Computer Science Professors. Computer Masti by Next Education is currently one of the most preferred books for teaching computer science in schools. It teaches the concepts of computer science to students while developing their computational thinking skills.

The key challenge today is to integrate thinking skills with the curriculum. Some large-scale initiatives have helped in the learning of these skills in the classroom. One such initiative is the Computer Masti Curriculum designed by IIT Bombay Computer Science Professors.

However, to integrate thinking skills with education on a large scale, we need a lot more path-breaking educational products. We also need to make major efforts to create awareness amongst various school stakeholders about the significance of thinking skills and the training of teachers to incorporate the elements of thinking skills in the classroom.

There's a long way to go but we seem to have figured out the starting point.



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An educator with a passion for technology, Tarun Gangwar has completed B.Tech and M.Tech from the Indian Institute of Technology, Bombay. He has extensive experience in curriculum design for the K-12 sector. He had also co-founded an edtech company that aimed to integrate computer science curriculum with STEM subjects.

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