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General Article

# Action Plan and emerging trends in Teaching Learning Process

**Pranjal Kumar Phukan**
Author, ESG Researcher & Business Strategist, Dibrugarh, Assam, India.

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**Abstract**

"Quality" is the single most issue in education. It is very difficult to give a comprehensive definition of quality. It generally signifies the degree of excellence. Different countries around the world have, therefore, in their various ways been attempting to address the concept of 'quality' and determine the ways and means by which it may be created, fostered and increased in schools and other types of educational institutions. However, the quest for quality has been the major concern of the entire human civilization. Quality is a continuous improvement in performance to satisfy the customer's needs and expectations. Quality is regarded as a prime requisite to develop human skill in the knowledge era. Today's competitive environment demands better quality of education and only those institutions which can impart quality education on continuous basis shall be in a position to exist and compete globally. Quality in a system improvement is an unending journey. It needs deliberate and persistent attempt in a systematic way. Quality does not come by chance. It is a continuous process. It comes through strategies of better Human Resource Development. It comes by comparison preferably with the best. It comes when everyone works in a right way.

**Keywords:** Quality, system improvement, knowledge era, human resource

## 1. Quality Concerns in Teaching Learning Process

Quality education is required to enable persons, societies and nations to acquire the skills and competencies required for living meaningfully in a competitive, globalize world. It is now being increasingly realized that there must be a balance between "Quality and Quantity" that drives the educational development in most of the cases. This shift in accent from quantity to quality has obviously brought in new implications and expectations in the role of education at school level. Some of the glaring concerns in respect of Quality Education:

### 1.1 Concern for Curriculum

Quality of education would depend upon the content of education. It must fulfill the standards of excellence but it is seen that present curriculum in schools is traditional which has no relevance in the present context of globalization. The course of study should be relevant to the world in which we live. The patterns of course and their curriculum should be well designed. School teachers should be actively involved in the revision and modification of the old course and introduction of new courses.

Courses should be so designed that they will have global and futuristic value.

### 1.2 Concern for Infrastructure

The lack of atmosphere of knowledge is made worse by Lack of appropriate infrastructure facilities. There are under-equipped laboratories and ill- stocked and ill- maintained libraries in most of the govt. high and Sr. Secondary schools. The infrastructure facilities need to be strengthened for quality improvement. Libraries should be adequate stocked. Apart from

Corresponding author : pranjal_xlri@yahoo.com
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physical infrastructure that provides students with high-speed terminals to access the Internet.

**1.3 Concern for Teacher**

The quality and efficiency of education depends to a great extent on the quality of teachers who truly add value to the students. In Punjab the teacher is considered to be the least development resource. We have hardly given the attention and consideration to select right kind of people for teaching profession and providing them the best possible training and ensuring their status in keeping with the importance and responsibility of their work. Professional development of teachers is must for quality education. The Professional development of teachers is mainly concerned with competencies, commitment and value frames associated with teacher work whereas in the present scenario, teaching work is confined only to lectures and directing notes. Quality and knowledge of the teachers must be enhanced. The best brains must be encouraged to take up teaching profession. Only teachers with high intellectual capacities, self-confidence and good communication of education skills alone can ensure quality.

**1.4 Concern for students**

Quality education should result in students acquiring necessary competencies as an outcome of their education. When the concept of school education is reduced only to passing examinations and obtaining certificates, when teachers are not committed and where academic atmosphere conducive to the pursuit of scholarship is not available, the students lose their interest in studies and look upon the college years only as a waiting period till they get some job on the awarding of a degree. For bringing competencies and qualitative development of students, the school administration should arrange following :

**1.4.1** Orientation for Employment and Entrepreneurship.

**1.4.2** Developing communication skills and personality.

**1.4.3** Creating awareness about near future challenges.

**1.4.4** Enlighten on career planning and build self-confidence to succeed.

**1.5 Concern for Research**

The quality of education goes along with the quality of research. One of the reasons for poor quality education in India is that we are lagging far behind in terms of research. Mostly colleges and universities teachers conduct research only for sake of Ph.D. Degree. The research topics of various disciplines have no relevance. School teachers should be motivated to conduct research work. Research must be socially and economically more relevant.

**1.6 Concern for Management**

Quality education also relates to management. Only good and efficient management can produce better quality. Our education system is still dominated by traditional rules and regulations that offer little scope of improvement of work culture. The work culture of schools is still in static and rigid mode of functioning leading to bureaucratic controls. Schools and boards are becoming only examination politicized. The present system of appointments of higher authorities of school education boards needs to be changed in such a manner that only persons of academic stature and integrity are appointed. Political interference should be stopped. Every institution should be clear about its goal and targets and make a perspective plan for short and long term growth. It is also necessary to introduce transparency in administration.

**1.7 Examination and Evaluation**

Evaluating many thousand students is in fact a difficult task. Conducting the examination in time and declaring the result within limited time is a very tough job. Evaluation shall be linked to students' progress by making the students to learn the unlearned contents and acquire the needed skills. But this is not happening in our present system of examination. The teachers who teach are the evaluators in continuous and comprehensive evaluation. A teacher in such a process has a greater degree of responsibility and conducts itself accordingly. The competency and objectivity of teachers has to be ensured.

**Emerging Trends in Teaching Learning process**

This is an existing time if you work in education or are a student. The wealth of new technologies available to universities is transforming the learning landscape. There are new and innovative ways to learn, a multitude of new resources and far better ways to access them. Even the design of universities is changing with technology inspired learning spaces and automated attendance monitoring being used.

**1.7.1 E-Learning-**

E-learning is a type of teaching and learning that one can be obtained by the means of on-line technology. It has demonstrated several advantages over traditional learning, especially in promoting 'learning anytime & anywhere' and 'as a self-paced learning'. E-learning material or e-content can be of various forms: audio-video programmes programmed learning material, web

pages and multimedia rich interactive CD-ROM.

**1.7.2 Digital learning resources and assessments**

The days of learning by reading books and testing by writing papers are coming to an end. Developments in digital technology are enabling educators to provide a range of different learning opportunities. In particular, online environments are helping institutions to offer personalized learning, new ways to collaborate, and more innovative teaching methods.

**1.7.3 Use of gaming technology for deep learning**

Young people's love of gaming technology makes it the ideal tool for immersive learning, enabling students to learn by doing in a safe, virtual environment.

**1.7.4 Use of Mobile technology**

Mobile technology is changing the face of the modern university as it enables students to learn in different ways, in different places and even at different times. One of the benefits of mobile technology is that it enables learning to take place outside the classroom. Students can work in areas that are better suited to their own needs, such as in a library or even at home.

**1.7.5 Developing hi-tech learning spaces**

The influx of new technologies mentioned above is having an impact on the ways in which students learn and this change in behavior is leading to new learning space design. Libraries for example, are no longer just repositories for books, they are 21st century learning centers that also provide digitalized books, videos, presentations, podcasts, and have features such as writable surfaces, video editing software, and portable furniture.

**1.7.6 Artificial intelligence**

Artificial intelligence is set to have an enormous impact on education. It has the potential to replace teachers for the delivery of some lessons and, if used to automate the marking of work, could dramatically cut down on workload. Unlike teachers, an AI system can also give unlimited students simultaneous one to one attention, helping deliver the ideal personalized education.

**1.7.7 Learning with technologies**

Another view found around the world surrounds the use of technologies as a key to students improving their learning and 'marketability'. Within the realm of technologies, teaches encourage students to innovate, bringing them full-circle into the 21st century where visibility and adaptability rule.

**1.7.8 MOOCs & eLearning**

Free education has materialized in the form of eLearning and Massive Open Online Courses as a direct result of students wanting to learn but not having the resources to do so whether that means they don't have the money or the background to achieve their learning goals.

**1.7.8 Talking education**

Educators believe using taking or videos to review lessons and teach concepts helps students learn and retain more. Between TedEd and TeacherTube, education talks a lot about everything. Students love movement, television, and film so utilizing these snippets of information transforms the meaning of learning especially for many students who are strapped for time.

**1.7.10 Blended learning**

Blended learning is the notion that it should 'blend' online media with the traditional classroom set up. This is also known as technology mediated learning or hybrid learning, as it combines the two attributes. The ideology behind blended learning has great benefits for both student and teacher as it provides access to a broader range of learning resources that are more cost effective than the traditional paper textbook.

Science is an essential tool for enabling people to address complex challenges in local communities and at a global scale, more readily access economic opportunity and, rein in life-threatening problems such as those wrought by a global pandemic.

Science does not replace values, ethics, faith, and aesthetics; rather, it provides people with the means for understanding the world in which they apply all those things. Neglect, misunderstanding, or rejection of science resulted in tragic surges of the pandemic. It is apparent that the country needs millions of trained, creative scientists and support technicians, and it is apparent also that large numbers of world-class scientists are not a substitute for an entire citizenry that understands and embraces science. Science in society and in the schools must be for all, not only for reasons of fairness and equity, but also so that a democratic society can deal with the problems that confront it. Yet, science education is not the national priority it needs to be, and states and local communities are not yet delivering high-quality, rigorous learning experiences in equal measure to all students from elementary school through higher education.

This paper tries to lays out a vision for equitable access to quality science learning experiences across primary to post graduation education that will enable all people to develop the scientific literacy they need for personal and professional success.

These priorities which are included in the paper:

1. Providing time, materials, and resources for science instruction;

2. Developing and supporting a strong, diverse science teaching workforce;
3. Designing supportive pathways for students in science;
4. Employing well-designed assessments and accountability systems for science; and
5. Using evidence to document progress and inform on-going improvement efforts.

**Action area 1 : Elevate the status of science education :**

**Recommendation 1:**

NEP 2020 should encourage national stakeholders, including federal agencies, along with those in the education, business, non-profit, scientific, and philanthropic sectors, to focus resources and leverage their assets to increase the quality of and accessibility to science education.

**Recommendation 2:**

Accountability for science should focus on students gaining conceptual understanding of science and should not be based on single tests. It should involve a system of assessments and indicators that together provide results that complement each other and provide information about the progress of schools, districts, and states.

**Recommendation 3:**

A state level accountability system for science needs to include assessments that support classroom instruction, assessments that monitor science learning more broadly (at the school, district, and state levels), and indicators that track the availability of high-quality science learning opportunities.

**Recommendation 4:**

These stakeholders (including professional organizations, advocacy groups, scientists, and business and industry) will need to balance advocacy for STEM broadly with attention to the importance of high-quality learning experiences in science as well as in each of the other STEM disciplines.

**Action area 2 : establish local and regional alliances for stem opportunity**

**Recommendation 5:**

Plans should include, at minimum, strategies for:

1. Providing access to high-quality science learning experiences across education system and addressing existing disparities in access;
2. Providing high-quality instructional materials and other resources to support these experiences;
3. Building a high-quality, diverse workforce for teaching science to include provisions for professional development and on-going support;
4. Creating pathways for learners in science across grades 6 through graduation level with supports for learners who want to pursue STEM careers.

**Action area 3 : document progress toward bitter, more equitable science education**

**Recommendation 6:**

States should develop and implement data-driven, state level plans for providing equitable K-16 science, technology, engineering, and mathematics (STEM) education with specific attention to science. These plans should include "STEM Opportunity Maps" that document and track where opportunities are available, where there are disparities in opportunity, and how much progress is being made toward eliminating disparities and achieving the goals of the state STEM education plan.

**Recommendation 7:**

The central & state government should develop an annual "STEM Opportunity in the States" report card that documents the status of science, technology, engineering, and mathematics (STEM) education across each of the states and territories and tracks equity of opportunity for students in science and in the other STEM disciplines.

**2. Science is essential to framing**

The plant physiologists study how plants handle stress and adapt. One way to accomplish this is to conduct genotype studies and monitor how different varieties handle water stress. Once you find a genotype that exhibits the results you want, you study the plants to identify what traits they have to better handle stress. That's critical information that can be used in future crop breeding and potentially making genetic modifications. The goal is to find and develop crops that require much less water."

The plant physiologists work side-by-side with the agricultural engineers, who develop and study remote sensing technology in particular how to "take information from a plant without touching it, using drones, and RBG or thermal imagery.

To disseminate knowledge the farm produces, the scientists publish papers and also host field days for farmers and agricultural associations. But science can't be a one-way street. Farmers know their land better than anyone else. They need to be invited into the conversation with scientists because farmers are researchers too as they are experts that scientists need to listen to.

**3. Transforming science education**

Students across elementary, secondary, and postsecondary education need opportunities to do the

things that scientists do: pose questions, carry out investigations, analyse data, draw evidence-based conclusions, and communicate results in various ways. They need to engage with scientific phenomena and, as scientists do, debate with peers to develop the conceptual understanding of science that leads to factual understanding as well.

Science should also be meaningful and relevant to students so that they no longer ask, what does this have to do with my life? In the classrooms we envision, students will be able to make connections between the experiences they have in their homes and communities and the content they are learning in science. When educators limit science teaching to a set of facts to be memorized, they subvert students' natural inclination to grapple with problems.

Meaningful science experiences that provide opportunities for students to explore questions they are passionate about foster the development of critical thinking and scientific skills, reinforce that science is relevant to students' daily lives, and inspire them to consider science-related fields as career paths.

Effective teachers of science understand that their job is not merely to impart knowledge but rather provide opportunities for students to build their knowledge through problem solving and experimentation. In their classrooms, students learn by doing. Teachers play a key role as facilitators of small teams of student scientists working to conduct investigations, gather evidence, and discuss and debate with teammates what conclusions they can draw from the evidence.

They know how to set up open-ended investigations through which students may arrive at and debate different conclusions that are always based on logical reasoning, evidence, and analysis. They recognize that communication in all forms is an essential part of science, and that in addition to teaching science, they are building critical communication skills. Their teaching is grounded in the belief that every student can succeed in the science classroom and it is their job to support those who are struggling.

**4. Challenges**

- Less exposure to science in elementary school could be problematic for students who do not have access to science learning opportunities in their homes and communities.
- While some K-12 students today carry out investigations, analyse data, draw evidence-based conclusions, and communicate results, few students have these kinds of high-quality science learning experiences consistently across their educational journeys.
- There is also a substantial opportunity gap; students in high poverty elementary and middle schools are less likely than students in more affluent schools to do "hands-on" work.
- And for many students, instructional materials, supplies, and other critical curriculum resources are insufficient.
- Elementary and middle school students in schools that enrol high percentages of students living in poverty have less access to space to conduct investigations and are far less likely to have ample supplies to support the investigations they do conduct than their peers in schools where students are more affluent.
- The pandemic also revealed the sharp disparities in access to technology to support learning including lack of adequate broad band services, which is a particular problem for low-income families and in rural areas.
- The problem of teachers' lack of preparation to teach science is more acute in schools that serve higher percentages of students living in poverty. In these schools, students are more likely to be taught by inexperienced teachers and, in secondary schools, are less likely to be taught by a teacher with a relevant degree or advanced courses in the subject taught.
- Staffing shortages are more acute in schools that serve higher percentages of students living in poverty and in rural areas. Staffing patterns vary across states and are highly localized partly because teachers tend to work close to where they did their training and residing.
- There are also regional variations in access to postsecondary institutions that can shape the paths students take after high school. For a variety of reasons like jobs, family, cost, ties to the community, many students choose to pursue postsecondary education close to home. Uneven geographic distribution of colleges and universities means that in some areas of the country students do not have access to a public college option, or to a college that matches their level of academic credentials. This is more likely to be the case in rural or moderately sized communities leaving students in these communities with fewer options.
- Quality of science instruction is also a problem in postsecondary education. Lecturing is still prominent in undergraduate STEM courses; one study reported it was used on average 75 percent

of the time and that students spent an average of 87 percent of their class time listening to instructors.

**5. Solutions**

- First, educational institutions along with government bodies shall need to provide the time, materials, and resources necessary to support high- quality science learning experiences for all students across the elementary to post graduation continuum.
- Teachers are the engines of better, more equitable science education. At every stage of the elementary to post graduation continuum, students need science teachers who both understand science and know how to teach it in engaging, student-centred ways that reflect current evidence about how people learn. Professional development for all elementary to post graduation teachers of science is therefore essential.
- One promising approach focused on the transition from high school to college is to deploy trained mentors and advisors to help students figure out how to navigate the transition. Such mentors or advisors can provide personalized guidance on what courses to take; how to transfer between institutions; or how to search for research opportunities, internships and apprenticeships with local employers.
- The institution wide approach to promoting students' success is based on giving students clear, coherent, and structured educational experiences that build in a variety of academic and non-academic supports. The pathways model has four pillars of implementation:

1. Clarify the Paths
2. Help Students Get on a Path
3. Help Students Stay on Their Path
4. Ensure Students Are Learning

- Assessing science learning in ways that are aligned will require approaches that go beyond single tests of factual knowledge. Traditional, large-scale, multiple-choice tests cannot capture the ability of students to engage in the practices of science and reason about evidence. An advantage of the new approach to science instruction is that it provides many opportunities for assessing learning informally (formative assessment) as students engage in investigations, create representations, and discuss evidence. However, designing useful and meaningful formal assessments such as tests will require careful articulation of the desired learning goals and how students can demonstrate that they have achieved them.
- Local and regional data will reveal where there are opportunity gaps (lack of resources, lack of access to advanced courses, lack of experienced science teachers) and provide a way to track progress in addressing them. Indicators to measure equity of access to high-quality science learning opportunities can include:

- the amount of time elementary schools devote to science instruction each week;
- the number of science courses required for high school graduation;
- student access to rigorous science coursework and Career and Technical Education coursework grounded in science;
- qualifications and experience levels of senior school science teachers;
- access to internships and apprenticeships;
- success rate of pathway efforts and other mechanisms to promote advancement into STEM fields

**6. Conclusion**

Education has always been facing the challenge in ensuring that quality of teaching and learning takes place effectively. Quality cannot improve by itself. It requires reforms in teacher training; improvement in the facilities and infrastructure in schools; change in methods of teaching to make it attractive to the students. The need of the hour is that the teacher should realize that the student too has his own knowledge and that it can also be put in the classroom in the teaching learning process in order to make the classroom transaction a process of dialogue and discovery. The technological advancement in education is accelerating rapidly and changing the way students learn, replacing traditional teaching methods and resources with digital course materials and makes the teaching learning process more effective.