



STRATEGIES IN TEACHING LEARNING PROCESS

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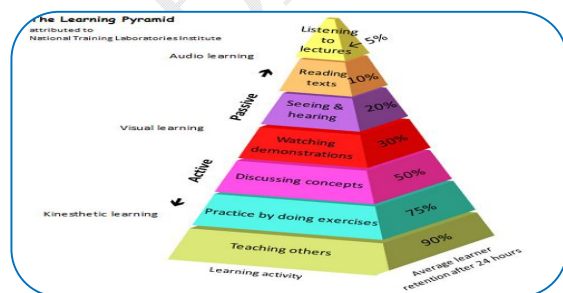
ABSTRACT :

This paper, deals with the highlight a few of the strategies that have been practiced during my period as a teacher of chemistry at the Secondary School level. As I undertook steps to help engage my students in the subject, I realized the benefits that these strategies had on student learning - both in content, life skills, advantages and attitudes. In a brief discussion of some of the research in education that provides justification for many of the classroom strategies that I have practiced over the years. The paper concludes by requesting teachers of chemistry to break away from the shackles of traditional teaching methods and take bold steps towards making the teaching of Chemistry more interesting and alive for our children. The use of innovative teaching strategies would add to your existing workload. I can assure you that with a little planning and organization and implementing one strategy at a time along with refining old strategies can enrich your curriculum and the experience learners get from an Economics class. Think about the power we have as teachers - we develop the human mind and can therefore make a positive impact on young adults who will step out into the world as global citizens. We want our children to be holistically developed where emphasis moves away from intellectual development to social, emotional, physical development along with attitudes, values and skills that make them better human beings. As teachers of Chemistry we have the ways and means to achieve all that we aspire for our children. It's time we take the first step forward towards achieving this objective with a positive attitude in chemistry education.

KEYWORDS : Innovative Strategies, Chemistry, Secondary Level.

INTRODUCTION:

This paper deals with the highlight a few of the strategies that have been practiced during my journey as a teacher of chemistry at the Secondary School level. As I undertook steps to help engage my students in the subject, I realized the benefits that these strategies had on student learning - both in content, life skills, advantages and attitudes. In a brief discussion of some of the research in education that provides justification for many of the classroom strategies that I have practiced over the years. The paper concludes by requesting teachers of chemistry to break away from the shackles of traditional teaching methods and take bold steps towards making the teaching of Chemistry more interesting and alive for our children.



SCIENCE AND TECHNOLOGY EDUCATION

The new modes of delivery and innovative programme content and support services to reach out more effectively to a diversifying client group. Education programmes in schools, non-formal education, universities, professional and technical training

institutions and public extension services are all involved to varying degrees and at different levels in these new trends in the development of science and technology education. These types of trends are largely responsible for diversifying the structure and curricula offerings of educational institutions. Earlier practices, in which the curriculum was drawn up within science itself, with an emphasis on conceptual knowledge, have changed. Newer approaches highlight the social needs and uses of science, a reduced emphasis on book learning, a greater use of the immediate physical environment, and the practical application of science and technology in such areas as health, nutrition, sanitation, population, environment conservation, and resource development and use. Science and technology have become an integral part of the school curriculum up to the end of the secondary cycle, with some general schools even running factories, farms and community projects, which, in turn, yield additional resources. School science is being linked more strongly to everyday situations, to the new technology and to issues in society and the local community.

Teaching modalities are moving away from teacher-centred learning to shared learning in classrooms to help create conditions in which teachers and students learn together. Teacher competence is being upgraded to enable the use of computers, the development of problem-solving skills and a creative outlook as regards science. Closer understanding is sought among science curriculum developers, teacher educators and science teachers, with regard to the interaction of science, technology and society in the context of the students' environment and their abilities to cope with contemporary problems and issues. Outside resource personnel, such as scientists and engineers, are also contributing to the teaching programmes in schools. The increasing use of local, low-cost teaching materials, sometimes at the initiative of teachers themselves, has done much to help overcome the shortage of software and reduce the dependence on imported teaching materials. Member Countries are also strengthening delivery systems for adult and out-of-school target groups through such means as: training personnel; mobilizing new sources of expertise and resources; diversifying modalities of delivery through the use of books, posters, television, radio, magazines and correspondence and increasing community involvement in such crucial areas as health, hygiene, sanitation and nutrition and environment.

A VOYAGE OF TEACHING

The classroom was very much like any traditional teacher - a person who carried a set of notes, a text book, some chalk and used the blackboard to teach. Students listened to, took notes with an occasional interruption in the form of a question. Within a few days realized that students would not remember many a things that had been spoken about in earlier classes or they would be disinterested, doodling or looking out of the window during class. This made question how much Chemistry concept was being learnt and whether the teaching style was appropriate. We take the first step towards improving my lectures and embarked on experimenting with Interactive Lectures.

INTERACTIVE LECTURES

Whilst literature may ask teachers to move away from the traditional chalk and talk method of teaching, many of us do realize the importance of lectures in our classrooms. Yet it is in a traditional lecture that we find most students bored, disengaged and distracted. If this method of teaching is the most significant way of imparting the curriculum in any classroom, then why can't we modify it to make it more enriching for the students? Why can't we make lectures more interactive wherein students feel involved and a part of the learning process? My trial began with lectures being interspersed with small written and oral

activities which broke the monotony of listening to the teacher. For instance, after completing the concept of the relationship between elasticity of demand and expenditure, students were given 2-3 application questions that needed to be discussed in small groups and the findings had to be reported out. For example they needed to discuss the impact of a global warming and its related adverse effect. Questions such as these helped students better understand concepts and their applicability in the real world scenario of the pollutions.

Another activity which is very useful in interactive lectures is brainstorming. This short exercise, in small groups or pairs gives an idea as to how much students are aware of a topic before it is introduced in the classroom. For example, before starting the New Economic Policy in Class IX, students were asked to discuss their ideas of why the New Economic Policy had to be implemented in India in 1991 along with some of the key policy changes. This helped ascertain the level of understanding from Class X. Brainstorming could be used at anytime during the lecture as it helps engage students in a topic.

Another exercise that enhances learning is when students are asked to provide examples on a concept. For example, once they have understood the difference between final and intermediate goods, students were asked to suggest situations when a good of their choice is intermediate and when it is final. Through this exercise I found that conceptual understanding became better as students applied learnt concepts immediately and did not have to wait till the entire chapter was over. Also, this process allowed them to clarify doubts as concepts are learnt. Lectures can also be made interactive by asking learners to narrate their personal experiences that are related to a topic. For instance, our Class IX students went on a week-long pollution sensitization programme. Their experiences became a wealth of information when urban development was learnt in the classroom. Students shared episodes, anecdotes and other observations that were relevant to what is being discussed in the classroom. Further, peers supported a child's narration where additional inputs were required. All this brought in camaraderie and created a non-threatening and conducive environment for learning.

TEACHER DRIVEN POWER-POINT PRESENTATIONS

The student could not understand the difference between the two ideas. I thought about how the concepts could be simplified and attempted making a power-point presentation on it. The visual presentation helped the student understand the concept with greater ease. Subsequently, it was the students who suggested that topics that include graphs and concepts be taught through power point presentations. Experimentally by converting one lesson into power point. The result on learning outcomes was encouraging. The power point presentation was able to make a static equilibrium diagram more dynamic - students saw how movements and shifts in demand and supply curves take place. Colour coding helped to make diagrams clearer and improved attention spans. Presentations then moved towards showing non diagrammatic concepts such as output multiplier through pictures and animations. The visual impact assisted students to better grasp abstract concepts.

Indian chemists offer a wide scope for using power point presentations to engage students in discussions to better understand and articulate ideas. In fact several of our Indian chemists' chapters have only pictures depicting the central ideas of the chapter. The presentation is shown and students deliberate on what the pictures show, its causes and potential solutions. When students were shown the picture, it brought a highly energized, animated and passionate discussion on the impact of globalization - students were able to discern on the positive and negative aspects of globalization. Thus, discussion went beyond the

academic curriculum and all that a teacher had to do was to moderate, facilitate and guide the discussion towards achieving the goals that I had set out for that class.

PROBLEM SOLVING BASED LEARNING

Many a times problem solving is an effective strategy to help students construct their concepts. For example, one of the first concepts of microeconomic theory is that of scarcity and choice leading to opportunity cost. In order to teach this topic, a problem is posed on planning a school leaving party. Information is given regarding the money they can spend on things like food, music, decorations, venue etc. Each group of students needs to decide on which option it will choose giving the rationale behind the choice. Through this exercise students themselves come up with the economic problem of wants being unlimited and resources being scarce due to which choice needs to be made. Also they are able to comprehend that there is an opportunity cost attached to every choice or decision that is made. I find that the problem solving method forms a wonderful way of helping students construct their own knowledge based on their findings on a given problem. Clearly, the teacher's role in this method of teaching is that of a facilitator and guide, wherein she can probe and ask questions as to why students have made certain suggestions.

PEER-TEACHING AND LEARNING

Students teaching each other in a variety of ways are another strategy to enhance learning. Some of the ways through which students learn from each other are discussed below:

(a) Power point presentations:

This strategy has been used successfully in teaching economic and social infrastructure. Students were broken into groups and each group had to research and develop a power point presentation on one economic or social infrastructure. Students made the effort to research beyond the text book and gather very interesting information on their respective topic. A spirit of enquiry was instilled through this exercise. Students learnt the effectiveness of teams - they were also able to discover each other's talents and used them advantageously – someone researched, someone wrote the text, another found relevant pictures and developed the presentation, whilst yet some others presented it to the class. Beyond getting new insights into a topic, presentations honed communication skills and enhanced student confidence. Further, students tended to be more attentive to what their peers had to say as they could question them freely during the presentation.

(b) Jigsaw reading:

This is a strategy that I stumbled upon in one of the workshops and find it very useful for topics that require a large number of points to be covered – such as factors affecting elasticity of demand. The class is divided into groups and each group reads only one factor – and ensures that every group member understands it. The teacher then asks any one group member to articulate the understanding of the group. Students pose their questions to the presenting group and the teacher once again becomes a facilitator of learning.

PERFORMANCE RELATED TASKS

This strategy is closest to my heart as it uses several of the above detailed strategies to teach one concept. For instance in order to teach functions of money, the class was divided into groups. Each group was given an end product through which they had to present the problems of a barter system and therefore the functions of money. These included:

- (a) **Dramatization:** Dramatization of ideas is a powerful medium through which children can learn. In the process of enactment, they internalize the overarching ideas on a topic and are able to recall them at a later date. In addition to reading and learning the content, theatre gives tremendous scope for students to imbibe life skills such as communication, team work, time management etc and also showcase their creativity.
- (b) **Song or Lyrics:** Another strategy that allows students to showcase talent and simultaneously learn content is through preparing songs and lyrics. I distinctly remember one group who presented the entire drawbacks of the barter and functions of money as a radio channel which included a news item, song, chat show and radio advertisement. After viewing this presentation, I realized the immense creativity our students have but we seldom give them a chance to integrate it into mainstream subjects.
- (c) **Wall magazine:** Another way of asking children to read and present content is through a wall magazine. Again this task allows students to display their creative skills in chemistry related displaying the content. It builds team spirit and makes learning enjoyable as constructive ideas.

PROJECT BASED LEARNING

Under the project based learning approach, students are given a real world situation which they analyse and present using their academic knowledge and creativity. Project work takes the central ideas of a topic beyond the academic curriculum. Whilst many teachers view projects as an individual activity with the findings being presented in a project file, my experience shows projects are an effective way of ensuring collaborative small group learning. It is a powerful method of developing research skills, data collection and communication skills along with critical and creative thinking and self reflective skills. In addition it also teaches students project management skills such as time management, presentation and team work. We have used group projects to discuss topics such as Comparative Development Experiences of India and its Neighbours. Initially when my students submitted their projects they were not up to the mark. I always felt that they were lacking either in presentation or content or the approach they had taken to do the project. Self reflection and discussions with department members on the lack of success of this method in the classroom led us to realize that the fault lay with the instructions that were given to students. Lack of clarity on expected outcomes led to varied interpretations of the project which translated into inappropriate projects being developed. It was then decided to give students clear cut assessment criteria along with a rating scale. This helped streamline and improve the quality of student output. For example if they do a consumer survey project in statistics then students clearly know that they shall be graded on the hypothesis being tested, questionnaire developed, appropriate data presentation, data analysis including approach taken, conclusions drawn towards accepting or rejecting the hypothesis along with neatness and submitting work on time. I strongly believe that it is important for any teacher to give the assessment criteria to her students prior to undertaking any activity. This helps students understand what is expected from them and allows them to focus on wanted deliverables rather than unwanted ones.

CONCLUSION

The use of innovative teaching strategies would add to your existing workload. I can assure you that with a little planning and organization and implementing one strategy at a time along with refining old strategies can enrich your curriculum and the experience learners get from an Economics class. Think about the power we have as teachers – we develop the human mind and can therefore make a positive impact on

young adults who will step out into the world as global citizens. we want our children to be holistically developed where emphasis moves away from intellectual development to social, emotional, physical development along with attitudes, values and skills that make them better human beings. As teachers of Chemistry we have the ways and means to achieve all that we aspire for our children. It's time we take the first step forward towards achieving this objective with a positive attitude in chemistry education.

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