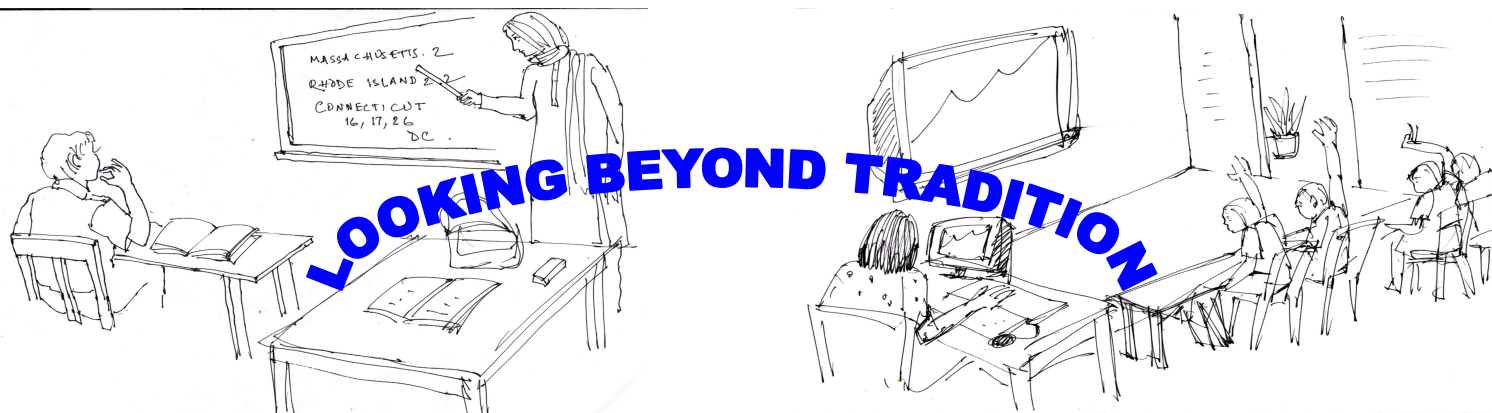


TEACHING PRACTICES USING ICET



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Abstract

This paper describes the frameworks and cognitive ICET tools that have been identified and some have been taken into use to enhance practicing teachers' pedagogical content knowledge in science education as well as outlining constructive time management techniques so that quality time may be made available and devoted for actual teaching and its preparation. The framework has been evolved from my on the job knowledge and experience of last 25 years in different schools in India and abroad. At the outset I must admit that I am an end of the line user of technology and not a System or a Software engineer. I can at best identify my problems while teaching and express how best I may be assisted by an ICET tool in mitigating my problem. As I walked through this long and arduous path of my teaching career, I encountered problems, addressed and analyzed them in right earnest, came out with solutions, implemented them, modified them to suit local conditions and reaped rich dividends in my teaching process. I tried and adopted the existing tools to deliver the message via "chalk-and-talk" method and OHP transparencies of a particular institution where ever I served, which duly supplemented and complimented my teaching techniques from time to time. In this paper I have tried to highlight few such tools and techniques that I found to be highly effective.

Keywords

1. Introduction

2. Lesson plan
3. Teaching method
4. Evaluation
5. Report cards
6. Attendance
7. Conclusion

TEACHING PRACTICES USING ICET

Introduction

I started my teaching career in a remote place in Rajasthan in a newly formed primary school. The mention of this background is necessary to suitably project my transition and migration from a zero technology atmosphere to one of the most highly technology assisted schools in the country, The Heritage, Kolkata. In these long years I graduated from chalk, duster and black board to high speed computer & internet connection in my class room, laboratory and home, audio & video projection facilities, i-pods, laptops, digital and video cameras to name a few. With the help of all these aids one can present the entire world's information bank to the door steps of the students but then the question remains how much! A doctor does not prescribe the medicine alone; he categorically mentions the correct dosage, the timings of administration of medicines and then carefully monitors the patient's recovery pattern. Similarly a teacher must know how much to impart in the limited time at her disposal, always keeping in mind the level, syllabus and curriculum and then keep monitoring the response level of the class. A teacher has to follow a strict regime of fixed class timings, school timings, vacations & holidays, examinations, outdoor activities etc and hence has to devote adequate time in carefully planning her time tables and lesson plans.

The framework of effective teaching lies on two factors 1. proper micro-planning of the lessons & 2. use of most innovative teaching aids to connect all the senses of students to the basic concept of the topic learnt.

Lesson Plan

Lesson plan has to get integrated to the macro plan of a particular class and the school as a whole. We carryout a detailed and minute planning of the entire syllabus, breaking it up in topics and sub topics to suit the allotted time of a period in a class. While such allotment is made, duration of a term, holidays and vacations, out door and extra curricular activities, periodical tests and examinations, preparation time and summing up activities after an examination etc are taken into consideration. We only take the assistance of technology for interchange of views and to ensure that there is no serious deviation in our methodology and content and uniformity exists at our level. The entire process is extremely time consuming and painstaking. The formatting and layout of a lesson plan will not vary drastically from place to place and school to school only basic contents and heading of topics may vary from ICSE / CBSE / STATE BOARD or any other curriculum.

The kind of quality and up to date information available in the internet is amazing. Besides the availability of text of a particular lesson, the animations, drawings video clips etc are of great help in teaching science subjects if they are suitably edited and incorporated in the lesson plan. I on my part had been practicing this habit of downloading the latest from the internet and keep updating my lesson plans which I have carefully drafted for each of my teaching topic. Once I finalize a particular lesson plan on a specific subject in **PPT form** incorporating certain new text or **animation** or drawing or **video clipping**, I download the same in a CD as my teaching assistance. Today I am a proud owner of an excellent library of CDs covering almost each topic of the syllabus of Biology which I keep updating from time to time.

What more a teacher wants;

Lesson plans, being repetitive in nature and an essential and obligatory part of a teaching system, is ideal for being technology driven. The entire gamut of preparation and execution of lesson plans should be addressed holistically and single software be written with ease and lucidity where in each subject may be addressed separately and the same will ultimately integrate into entire school's lesson plan containing all subjects of all classes. The software will primarily address layout and formatting as per the school calendar of a particular academic year at the levels of individual teachers. These teachers may have to just fill in the blanks to get their lesson plan ready for the entire year in no time, as the software will automatically take care of the updated school calendar and its integration at school level.

We do mail our lesson plans to each student at the beginning of the academic session for their guidance and compliance. Any deviation/revision of the lesson plan at the middle of a term or session is communicated to the students through mail. Thus till date the use of ICET tools in preparation and execution of lesson plans is restricted to use of PC/laptop and internet, with an ardent desire of assistance of a suitable software in future. This, if developed with the close assistance and inputs from like minded teachers, will save precious productive time of a teacher to a great extent and help in devoting more time in preparation and actual teaching process and also help the school administration in better coordination and monitoring of curriculum at all levels and at all times.

Teaching Method

Effective Class room teaching.

The ICET tools have better penetrated the domain of actual teaching or in other words deliverance of a lecture. As explained above I have created a library of CDs on almost each topic of the subjects I teach in PPT form. These are excellent tools in my hand and make teaching that much easier and effective.

Source: vision learning

With the help of video projection system in the class or at the laboratory I can easily explain critical subjects to my students with the help of animations or sectioned diagrams. While studying science, the penetration of a subject in the formative minds of a student is

much more, once he/she sees or feels it happening or functioning in front of their eyes so that they:-

1. Comprehend the topic much better.
2. Make a particular concept clear.
3. Develop interest to know the concept.
4. Analyze and apply.
5. Create long lasting memory/correlation of a concept.

[e.g. Please Ctrl+click on appendix [‘A’](#) to view some slides to give an example on topic: enzyme]

Various student friendly simple experiments & worksheets are also downloaded from the net as effective teaching aids.

[e.g. Please Ctrl+ click on appendix [‘B’](#) to find one of such simple experiment which have been downloaded from the internet for the student to have a better conceptual knowledge]

Various specific accessible educational links are provided to students as self study assignments.

Many a time I found the use of **visualizer / epidiascope** in our audio-visual room is very effective where projecting various important informative pages of books along with PPT presentation could be used together to convey the lesson to a large sized class.

Laboratory Work

In practical classes, especially while teaching Botany or Zoology,

- Certain specimens of plants and animals cannot be made available because of their obscurity. Where as most of these specimens are displayed in the internet in some form or the other. Though it is a very painstaking job to locate such information in the internet, but once done, these have immense value to the students in visualizing an object and are spared of the ordeal of imagining or making intelligent guesses. I keep renewing my lesson plans on a particular subject with fresh information posted in the internet from time to time **keeping in mind that the core objective of teaching should never deviate by the use of an innovative method.**
- Certain topics on human organ such as original slides of T.S of pancreas or spinal cord or slides on blood cell when depicted in monitor in enlarged form along with actual slides students view with the help of microscope, makes the teaching not only interesting but extremely informative and absorbing.

Research-based project work

To make a project on a subject specific selected topic is a part of academic curriculum in which students find technology the most useful tool. To prepare a case study which is an integral part of their project, each student has to be in contact with the person for suitable information. Many a time this is not possible because of the unavailability of the person or not willing to share their secrets /problems with anybody in public, but they could be connected through chat, email or voice mail by students to complete their project in an innovative way by using an multi-sensory interactive application of multimedia which I am sure will produce future students who are creative: think critically and analytically, to solve problems.

e.g Three of my students have been guided to collect information from an AIDS, HIV patients and a person who underwent DNA fingerprinting session for identity test through voice mail and e-mail, to complete their case studies.

Technology makes education seamless.

- Close to the examinations or on any occasion I resort to voice chat with my students whenever they need certain clarification out of school hours so that they do not have to wait till the next day we meet to clarify their doubts.
- Whenever we proceed on holidays or excursions, if we encounter certain specimens of interest to us, we generally capture those in our digital/video cameras and on return download them in our computer and then put to display for information of all concerned.
- My biology students of classes 11 & 12 were taken to attend a video-conferencing with two experts, from New Delhi and New York, on a global issue like AIDS and its measures.

What more a teacher want

It is desired that if a specific peer group is created where- in subject teachers may interact and exchange views with each other, crossing the geographical boundaries of a town/state/nation, and clarify their respective doubts, post and acquire new information, learn new techniques especially in the field of science, discuss interesting case studies, it will be of great help. This will break the myth of paucity of information in the hands of a teacher in undeveloped/underdeveloped town/country and hence their students will be benefited to that extent.

Our education system in higher classes being examination and competition oriented with high volume of syllabus content, teachers are not left with spare time and liberty to experiment and research their teaching methods. They follow the beaten and proven path of glory and success and i.e. his or her student must score high marks in examinations and clear out side competitive examinations. I do not think this practice can be changed in coming decades come what may we preach and propagate. Hence external agencies may deliberately carryout researches in consultation with in service teachers suiting local conditions and then suitably devise new methods and implement them by training up those in service teachers and then monitor the out come for modifications required if any.

I sincerely feel this particular conference is a robust and positive step towards that direction.

Feedback of student's performance through evaluation technique is the yard stick to measure the outcome of effective teaching methods.

Evaluation-

- The evaluation of students in our school is well managed by posting their figurative and subjective assessment in a spread sheet carefully devised as per MS excel program. Here in the performance of a student gets high lighted in their progress graph and we teachers can take clear position about the talented ones and the under performers. As the academic session progresses we can keep altering our corrective or suggestive methods guided by the progression of the student and if required co opt the services of counselors or parents in order to obtain better performance from the student.

- Software based Biology quiz held to evaluate their knowledge.

Following support systems, like annual academic reports and attendance percentage, are mandatory without which whole teaching process remains incomplete, technology is used to make these system more flexible and to save time.

Report cards:

Performance graph to get feedback: Modification in the teaching material and method is done after analysis of student's performance in their weekly/monthly examination. *[[e.g. Please Ctrl+click on appendix [‘C’](#) to view student's performance curve]*

- In our school we use software which is uniform for the entire school in order to make an informative report card containing exhaustive information about the student. Most of this report card is menu driven but for the portions of pen picture where in subjective writing has to be incorporated. Till the availability of this software, it was an arduous task for teachers to prepare the report card at the end of each term. The then process was rather time consuming and cumbersome and used to be at the cost of our valuable teaching and preparation time. *[[e.g. Please Ctrl+click on appendix [‘D’](#) to view a report card]*

Attendance

We use excel to make a complete report about the attendance percentage per term for each student. This is a very handy document and is taken into use whenever any information is sought regarding the student's diligence and regularity affecting his or her behavior or in academic performance. This saves us from complicated calculations we used to undertake from time to time again at the cost of our valuable teaching and preparation time.

[[e.g. Please Ctrl+click on appendix [‘E’](#) to view attendance screenshot]

Conclusion

The education policy makers are concerned today to lessen the burden of our students so that grow naturally and blossom into maturity with right kind of education at their disposal. They are equally concerned that the teaching fraternity finds more time to research and acquire more and more quality information and pass it to their students so that the canvas of their exposure becomes unlimited. Answer to all these problems lie in the optimum use of ICET techniques. If we want to progress, technology has to come to our assistance. Probably cost constraints in an under developed country like ours deprive us of reaching our goal of bringing the entire country's teaching and student fraternity at an even keel and connect them with technology for getting access to unlimited information and knowledge.

Thus solution lies in making technology affordable so that teachers and students at all levels may take into use all the ICET tools freely and lift standard of our education system to the desired level.

Teaching is a challenge. Learning is a challenge. Combining both effectively is a challenge. Technology strengthen the relationship between teaching and learning processes, reduces stress, makes a course more interesting and even enhance recall of the material taught.