Role of Information Technology Tools in Self-Learning Initiatives; and, in Classroom Teaching and Learning

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Abstract- **There is impressive developments in the Information Technology Application Software Tools. These tools can enrich the content delivery of the text book materials for teaching and learning. There is currently the Compact Disc supplement available with printed materials and several internet documentations to illustrate this development and aid. What this author finds is not simply viewing those documentations but to a certain extent making them on their own helps the teachers and students. To what extent should academic exercises involve making of such educational materials requires a critical consideration.**

Keywords- **Human Resource Management, Education, Effective Information Transfer, Teaching and Learning, Technology Enhanced Learning, Total Quality Management, Enriching Internet Contents**

I. INTRODUCTION

Learning by attending the class-room lectures is the well known, currently prevalent and popular method for learning. Thus formalized system of schools and colleges are much in demand for securing recognizable certificates of qualification. These efforts of class-room teaching/learning have much to benefit from the use of PowerPoint Presentation application and visualization soft wares. The computational source languages and the related compilers can also be included among the informatics based tools. The PowerPoint and visualization soft ware are easily recognized as informatics based IT Tools (*Information Technology Application Software –I.T.A.S.*) but the computational facility has much less attributed as IT tool. All these tools cited above can be useful as self-learning tools. Java scripts come under a special category of Application extremely useful for facilitating teaching/learning in class-room or for self-learning initiatives. Particularly the necessity for the multimedia utilities is not quite well appreciated. It is a overall impression that prevails currently seems to be that these multimedia use is glamorous and only adds to cosmetic changes.

In spite of all the admiration for e-learning initiatives, there is not much support for adapting these methods for teaching; many have more misgivings on the learning process, than envisaging any tangible achievements by the media enabled teaching methods – a concern of human resource development for material resource management (**1**).

II. FOCUS ON ITAS FOR EDUCATION

First and foremost in the utilization of these currently developing ITAS is that these are features which also have to be learnt by those who do not specialize in ITAS but only wish to use the ITAS for delivering information through these media on even subjects unrelated to Information Technology. In this context, academic tasks of the teaching/learning kind, learning to use these tools comes under the category of *"know-how-to-use"* rather than the study of Information Technology itself as a subject of study. The subject of study may not be the information technology or any specific software development, but may be any subject not related to Information and Communication Technology and Computer Science. But teaching/learning process is basically an exercise in communication, which is information transfer, information retrieval and processing (**2**). The research and development in Information Technology can have a branch for Educational technology (**3**), and this would make the IT tools easily available for teachers and learners to get to know how to use them. Learning the use of these tools for educational purpose should be more or less a need-based-learning, rather than going through a course of study to acquire a certificate of comprehensive proficiency. Getting such a certificate of proficiency in the use of IT tools can be a vocational training rather than using them as aid in understanding of other main stream subject matter which is not much related to the IT subject itself.

It is highly recommended that the use of these tools are learnt by those who are themselves interested in learning science subjects and depending on technical assistants to prepare these materials not only reduces the effectiveness of teaching/learning exercise but also be sometimes counterproductive in the sense that when a job requirement is specified by the academic person, the technical person may put in such features in the output which in his opinion is a capability which does more than what the teacher/student requires, and running these application in a classroom may be distracting the students towards the admirable versatility of the IT tool rather than getting the specific point being clarified. In that sense it would be an effective demonstration file for sales promotion of the soft ware, and pointing out this to be unsatisfactory would discourage the certified efficient technical assistant, which in a sense is something which a humane teacher, as an educator, would not want to be the result. In this context the technical assistant should go through an in service training in the unrelated subject of study in the organization where his employment is tenable. And, the assistant would have to learn another unrelated subject without using the IT application in which he is well trained, which is an in service training to appreciate the needs of the users – a tolerance building measure commensurate with the standards of technical skill. (**4**).

III.   HOW ITAS TOOLS CAN BE AN AID

The use of IT tools by teachers in the class room must be with great restraint for reasons to be explained in due course in this article. Undoubtedly, ITAS tools are inevitable provisions for making more effective the information transfer (**3**) as required in the class-rooms. In several subjects of study, it becomes necessary to illustrate motions of objects in different spaces which could be an evolution in time typically (**5**). There are certain depictions of dependent variables as a function of independent variables to specify and define the states of systems. It is a general experience that simple drawings or few drawings even if they are simple, may not be enough to adequately convey what the mathematical expressions stand for these situations. Then, the animation schemes available in the PowerPoint applications are extremely useful. Moreover, a teacher who applies his skill in preparing such presentations finds for himself a better perspective obvious on this context to express better and deliver the materials to the learners. With reference to time-evolutions, a particular phenomenon might be occurring in a particular characteristic time scale (probably for common perspective too fast, or too slow to perceive a change.

These can be illustrated at the convenient time scale and subsequently emphasize on the time scales and explain how just this time scales can make a difference whenever it does.

Citing an instance, consider the case of the mechanism of wave motion – a progressive transverse wave and a stationary transverse wave (**6**) – the depiction and the effective perceivable picture would depend upon the frequency and wavelength or velocity. A PowerPoint animation can be very effective in conveying the different aspects effectively; and using these animation schemes if done by instructing a technical person, the teacher in the class-room may not be much at comfort for unfamiliarity with the making of the presentation file. For a teacher to learn the animation schemes would be a hard task to accomplish and requires out of the way interest in teaching the subject of wave motion to get motivated to go through a required need based effort. Applying the combination of schemes to move the particular object would provide an altogether different perspective and enable an exclusive rendering of the subject at ease. The mathematical expressions can be made better appreciable to the learners. This experience once gained would be an asset to the teacher.

At this stage a word of caution lest over-enthusiasm becomes a disadvantage. Truely this proficiency with ITAS tools brings great advantage to teaching exercise. Learners also grasp better. Now is the task of setting question paper and subsequent evaluation. With all the advantages of IT tools, it is important that examinations are held with the same conventional outlook and more or less a traditional way that students/examinees do not feel strange by the un-conventional turn of events brought about by the use of ITAS outputs in the classrooms. Thus the purpose of all the effort with IT tools would be that the complicated phenomena gets better explained and thus reduces memorization efforts in explaining the various aspects related to the principles and phenomenon. While teaching with the aid of IT tools, the teacher should pose questions on the intricate aspects and answer them also; so that, all these would be vividly recalled by the students at the time of answering such questions. And, it is such questions often and repeatedly asked to test the quality of students but these are highly taxing in view of the practicalities of depicting them and difficulty of visualizing them. The mathematical expressions invariably used to resort to for explaining would be much better memorized by such effective teaching with the aid of the IT tools. During the examination there should be no need to play those animation features or prepare such features to answer the questions.

Thus in view of the ITAS tools are aid the teachers should expose probing questions and provide appropriate answers explaining them all with IT tools, and a conventional question would be answered as is appropriate but with much better ease by the students. In fact simple student exercises can be included in the form of questions in these PPT / VIDEO files which will enable to modify the files to answer the questions for better grasp by self learning by the students (**8**). The PPT utility has the erasable document feature because the file contents can be modified any time it is so required. If the same file is converted into video, the animations can be retained but the video itself would not be as easily modified as the presentation application file. On the other hand, giving to the students a un-editable video file, the students would be able to view repeatedly the video without being much concerned about the possibility of default settings in the computer system would modify the contents, in particular the animation features. The student's potential for grasping complicated subjects would get better expression. In fact, the students of a class do not all have the same ability to grasp the subjects and by encouraging to describe and ask questions on the phenomena being displayed, it is possible to know student's individual perception level and appropriately make slight modifications to highlight differences which are implicit. Thus an individual attention is facilitated and it is not a once and for all forever kind of material. The questions set to the students should not be such as that would require describing what they viewed in the class room illustration; in one way this would turn out to be a running commentary and that is a different skill than mastering the subject matter that is taught. However what is happening in front of the students must be describable by the students unlike recitation of the contents in a printed book. Thus even when the students try to describe the time dependent events as they view it must be only trying to answer a question on the subject of study. The video on Inversion of ammonia (**9**) is typically full of only queries than clarifications. This encourages students to make and know the differences better-a need based learning.

IV. CONCLUSIONS

This is the point which requires the discretion of curriculum designers and the teachers; to differentiate between the rendering of the subject matter content - lucidly and vividly for all the intricacies of the principles and phenomena –and setting questions in the examinations to enable the evaluation of the potential of the student for grasping intelligently the contents.

This is the innovative thinking that is called for by the curriculum designers. An exposure to IT tools this way can eventually enable the use of information from internet for supplementing the class room effort with prescribed text books. How to know what is authentic and what is not authentic in the internet documentations could be part of education and introducing the informatics as practical method. The prescribing of text books for a course of study in spirit is the similar exercise that the curriculum designers go through. In fact, a lot of such internet documentations are available to enable teachers to make a self study of the IT tools while learning to use them for class room rendering. A class room in principle is a lecture hall in a workshop, symposium, or seminar etc. A series of lectures held on a topic in a workshop need not end in that lecture hall itself. Since it is a special occasion, the lectures in the series can be delivered with the aid of presentation files (**6**) and the same may be made available to the participants subsequently from the internet.

Further, this training as part of formal education would enable the learners to be better teachers; and remote teaching and learning by e-tutoring could be of immense help. Thus teaching as an exercise in information transfer gets better credibility since genuinely informatics and data-base approaches becomes part of learning. While having to learn a subject as the set target, learning with the aid of ITAS by grasping from IT enabled methods of information transfer, makes possible simplifying the task, at the same time highlight the fact that multimedia only facilitates main task and does not distract. The need-based use of informatics, without fear or favor inherently for information transfer during teaching/learning, holds a promising trend for the future and securing better learning provisions for the posterity. The emphasis on need-based use of informatics seems a way to realize the "Learning Schools" (**10**) which implies learning throughout life to establish a trend for continuous improvement sustainably over the generations. For such an endeavor a beginning has to be made by every teacher to spend time on the ways the media can be utilized by experiencing the facility these can bring about in the rendering the lecture materials. It can be the simplest way, to make a beginning with the applications like the PowerPoint Presentation and Excel worksheet since these are default applications installed when Office application features are provided supported by the Operating Systems in the Personal Computers.

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[6] https://www.youtube.com/watch?v=tNVK-mN3OvE wave motion in a medium.wmv. This is a class-room illustration of how waves are made of in medium. The mechanism, in terms of the motion of the particles of a medium is illustrated. Animation features of the MS PowerPoint have been adequate for the illustrations. A YouTube upload of this author.

[7] https://www.youtube.com/playlist?list=PL158BAC87668F5D5A
This is a playlist uploaded into video consisting of 12 videos of about 15 minutes duration each. At the end of the webpage: http://www.angelfire.com/art3/saravamudhan/seminar_usic.html there are five power point files used in the seminar talk for downloading and viewing.

[8] https://www.youtube.com/watch?v=hKPxikMLtzU This is a esr_display_xpversion.WMV and includes exercises for students. This file was made just because of request from students (as mentioned in the video file itself) for better explanations than in the manuals and in the books.

[9] https://www.youtube.com/watch?v=N3odbSWuwuk This is an animation exercise to be viewed at primary/secondary school levels since there is scope for more queries about what really happens and how really it happens. This is much better to get students inquisitive than a lengthy lecture only with printed materials. Actual practice with manipulating the molecular changes with time for a conversion and back helps them to know what questions to ask about this phenomenon. That the presentation this way confuses more (more queries are raised and not much answers) is true because it justifies that ignorance on scientific matters cannot be bliss!

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