BEST PRACTICES OF INVOLVING STUDENTS IN LEARNING - A SPECIAL MODEL IN COMPUTER NETWORKING

P. Sridhar Acharya

Srinivas Institute of Management Studies, Pandeshwar, Mangalore, Karnataka

Abstract:

In modern days computer science and technology is a subject which keeps on upgrading from time to time. The effect of up gradation results in continuous up gradation in computer networking. The students who have taken computer science and engineering as the branch of interest need to upgrade themselves in the same speed as the changes in the technology. This leads to the various challenges to be taken by the teachers in teaching those subjects. The challenges in teaching include various computer topologies, layers in computer networks, protocols, servers and clients etc. The above mentioned subjects are very complicated and not practical oriented. The students should understand the theories on the same day the teacher teaches. If not they will not be able to follow the next days' classes. Understanding the theory is not as simple as practical subjects. In practical oriented subjects the students will get hands on experience in understanding the concepts. This is not possible in teaching the theory part of the computer networking. This results in lack of interest in the students inside the class as well as outside the class. In this paper various methods are introduced like usage of animated PPTs which explain the working of computer networking, involving students in various games to teach the concepts, considering several examples of known etc. In this paper a term called virtual reality is introduced which tries to show the virtual activities a reality.

Index Terms: virtual reality, protocol, networking & animated presentations

1. Introduction:

Education is the process of learning or acquiring knowledge or finding out something which are known to someone but not others. Education can be practiced by means of storytelling, training, teaching or by discussions. [1] Educators are normally take responsibilities in guiding the seekers of education. In the prehistory the adults used to share their knowledge's and experiences to the youngsters so as to prepare the next generation to face the society. The medium of education could be the communicating local language and the subject could be the experiences of the elders. [2] In India the education system was considered to be Gurukula system where the seekers were supposed to live in the house of the teacher for nearly eighteen years. The different types of knowledge wre given to different types of people based on cast. Brahmins were taught vedas, upanishats, puranas, and other allied subjects. The Kshatriyas were taught war field skills, the Vyshyas were taught the skills used in commerce and the education to the shoodras were denied. [3] The imact of muslim rulers in India brought changes in the education system. The islamic institutions started showing their prominence in India by introducing Madarasas and Maktabs which started teaching islamic holy books and grammars.[4]

The traditional education system was totally changed by British rulers when they started ruling India. When Lord William Bentinck was ruling India (1828-1835) he appointed Thomas Babington Macaulay, a renowned educationist, the chairman of the Committee of Public Instruction to change the traditional education system. He introduced the English education system. He stopped the Gurukula based education system. Slowly the education system changed to a school based or college based and University based education system where all should go and teach or study. The effect of this system is the current classroom based teaching learning system.

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2. Challenges in the Current Education System:

The present classroom based teaching and learning model gives raise to various challenges to be faced by the system in imparting the knowledge. The challenges like immaturity present in the youth, problem of discipline, unemployment, lack of parental support, poverty, political distraction and media trying to disturb the learning environment. Students are not interested in studies because of the above mentioned problems. The respect to the teacher from the student is another big challenge. During Gurukula system since the student was living with the teacher he used to respect the teacher may be out of love and fear. He used to show his dedication to the teacher. He used to consider the teacher as a parent. A respectful environment use to be there in Gurukula. The teaching learning system changed due to the implementation of Macauly's education system where he imposed the western culture in Indian education system. This modern teaching learning system reduced the student teacher relationship. This resulted in diversion of attention from studies, lack of interest in studies.

Teaching the modern technology to the students has many challenges to be faced. Students learn things faster if they experience the learning. Practical subjects will be easier for the students to learn and understand. It is very difficult to teach the theory subjects which will have theorems, assumptions, postulates etc. which will not give any practical idea to the students. Students normally find the subjects like computer networking, TCP/IP protocol and programming, data mining, distributed computing etc. difficult ones because they cannot get the idea while learning. The resultant of teaching such subjects is students easily tend to sleep in the class however the teacher is good in teaching.

3. Active Involvement of Students:

It's a challenge for the teacher to involve the students actively while teaching such theory subjects. In this paper various techniques that could be adopted to involve the students actively in the class for the subject Computer Networking. The paper will concentrate on some topics in computer networking and suggestions as how to involve students actively in explaining the same. Some of the topics in computer networking that are difficult to teach are
- ✓ Network Topologies. [5]
- ✓ Network Addressing.
- ✓ DNS resolution.
- ✓ Routing the packets with the help of Routing Tables.
- ✓ Sliding window protocol.

4. Innovative Methodologies Used to Involve the Students Actively:

Innovative teaching methodologies are introduced here. The main object of this new technique is to see to it that the students participate actively in the session. While introducing the new methodologies the following points are seriously considered.
- ✓ Interest of the students in attending the class.
- ✓ Complication in the subject.
- ✓ Mental stress in attending the class for five to eight hours.
- ✓ Other external environmental influences.

Considering the above challenges following are the few methods to be applied to improve the learning environment.

4.1 Use of Animated PPT Slides.

Usually it is highly impossible to teach the core technical theories like Routing the IP datagram using Table driven routing using the traditional methods. To make the students understand easily and remember, it is advisable to use the PPT with animation

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which shows how the IP datagram moves from source to destination. The animated PPT clarifies various questions like the movement of IP datagram, need of source and destination IP address, use of intermediate routers, use of Routing table etc. It is very clear that use of PPTs especially the animated one has more effect on the students than the traditional classroom based teaching.

4.2 Involving Students in Role Plays.

By listening the students can easily forget the subjects, by reading they can learn a little bit of the subject where as by doing (actively involving) students can clearly understand the subject. If the students understand the subject they cannot forget the same. Considering this another innovative teaching methodology is introduced here where in student centric role plays are adopted to teach the complicated subjects. Here are some examples to show how effectively students are used to play the game and understand the subject.

4.2.1 Teaching the Various Network Topologies.

In a computer networking there are several network topologies like Star topology, ring topology, bus topology etc. while teaching these topologies use the students as the nodes of the topology and then explain how the topology is working. The following diagram shows how the ring topology can be explained using students.
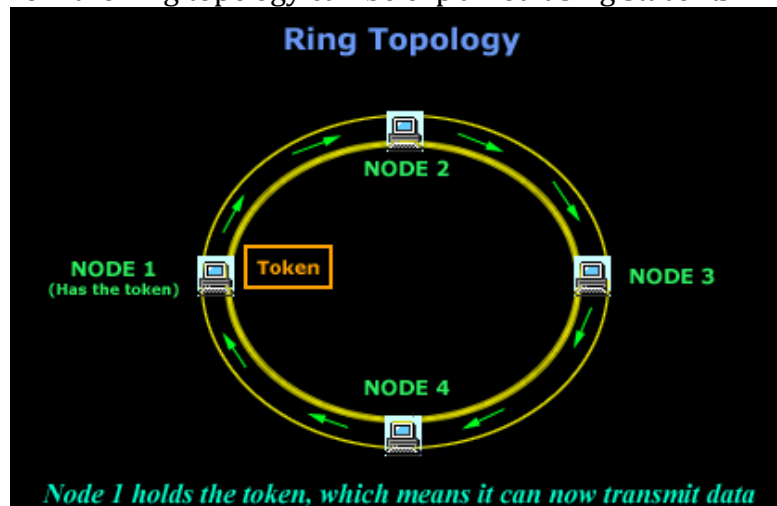

Figure 1: Ring Topology [5]

The figure 1 gives the working of the ring topology using a token passing system. To make the students understand better the same figure can be arranged by involving the students and asking them to stand in a circle as shown below

Figure 2: Human Ring

Here while explaining the theory a teacher can give any object like duster or chalk piece as a token for passing and explain the concept to the students. Similar concepts can be extended to other topologies.

4.2.2 Teaching the DNS Resolution:

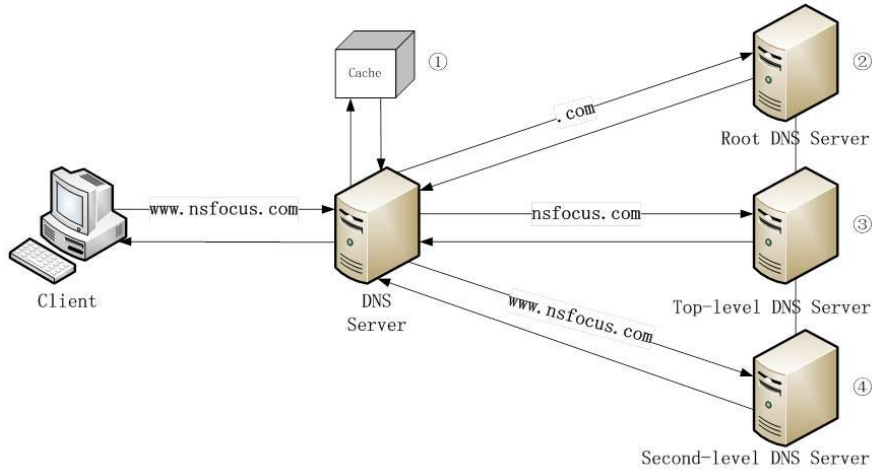The DNS resolution is shown in the following figure.

Figure 3: DNS resolution

The students find it very difficult to understand the figure even if the teacher is very experienced in teaching. Instead of explaining the figure if the teacher involves the students in explaining the above concepts then students easily understand the concepts. The innovative method is as shown in the figure
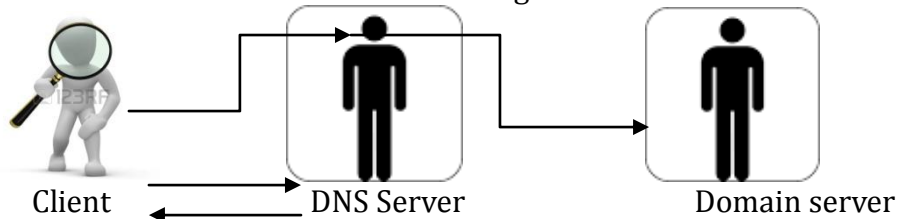

Figure 4: DNS resolution using student role play

The students are arranged as the client, DNS server, Domain server as shown in the figure. The student who is playing the role of a DNS Server is given a paper with Domain name of different servers with the IP addresses. When the student having a role of client is given a task of identifying the IP address he approaches the DNS server asking for IP address of the required domain. The DNS server will refer to the paper given to him and gives the IP address to the client. Then the client approaches the desired domain server referring the IP address. This is an easy method to explain the DNS resolution involving the students. Similar concepts can be applied in teaching complicated subjects in computer networking.

5. Conclusions:

The innovative methodologies used here are more effective in teaching and learning environment. Here both the teacher and the students always participate actively in the sessions whether it is morning, afternoon or evening classes. But the teacher is always under stress to finish his portion before the semester end university examinations. The above mentioned methodologies will lag the teacher in finishing his syllabus. The students who participate actively in the session may forget the concepts in the course of time if they don't revise at home. In this case the whole effort put by the teacher in conducting the classes actively involving the students will be a waste.

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6. References:

1. Dewey, John (1944) [1916]. Democracy and Education. The Free Press. pp. 1–4. ISBN 0-684-83631-9.
2. Assmann, Jan (2002). The Mind of Egypt: History and Meaning in the Time of the Pharaohs. p. 127.
3. Prabhu, Joseph (2006), "Educational Institutions and Philosophies, Traditional and Modern", Encyclopedia of India (vol. 2) edited by Stanley Wolpert, pp. 23–28, Thomson Gale, ISBN 0-684-31351-0.
4. Kumar, Deepak (2003), "India", The Cambridge History of Science vol 4: Eighteenth-Century Science edited by Roy Porter, pp. 669–687, Cambridge University Press, ISBN 0-521-57243-6.
5. Douglas E. Comer Jan (2006) "Internetworking with TCP/IP: Principles, protocols, and architecture" Prentice Hall Publications pp. 52