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UTILIZATION OF EDUCATIONAL MEDIA FOR TEACHING OF PHYSICS AT HIGHER SECONDARY LEVEL

Abstract

Students learn science from a variety of sources. Some understand science through the media like television programmers, computer etc while others many like to visit museums and science centers. Depending upon the interest and needs of the learners, the teacher decides to use different types of teaching aids to facilitate class room's instruction. The overall purpose of study was Utilization of educational media for teaching of physics at higher secondary level. The study specifically analyzes the practices of educational media in physics classroom. The survey research technique was adopted. The questionnaire, interview and observation were the major instruments. Triangulation approach was used to analyze the data. Concrete recommendations were made on the basis of findings.

Keywords: Utilization, educational media, teaching of physics.

Introduction

The progress of nation depends upon the education and research. Curriculum changes are moving fast, education is changing fast and followed by instructional methods. Dynamic, approaches are being introduced day by day. The aim of this modern education is to stir up the hidden curiosity and desire of thinking skills, nourishing their behaviors, attitudes and believes in order to develop basic and important. The freedom should be given to students to ask, inquire, explore and be creative.

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Before the learner was passive and teacher was the main source of knowledge only learning inception of modern instructional methods. But in present years the both have equal challenges in the endear ours. Use of technological tools enhance learning.

It is observed that learner focused on what is being taught by the teacher in the classroom session. Audio visual aids have a good impact upon student and teachers and make the lecture more interesting. They play a vital role in focusing the attention of learner towards the topic.

Five senses are the sources for effective learning, especially seeing, hearing and touching brings maximum knowledge for the individual. Bruner a psychologist at New York university advocates, research has shown that people remember 10% of what they hear, 20% of what they read, 80% of what they see and do (lester,2012).Audio visual aids are the effective communicative tools between the teachers and learners. These aids not only save the time but also support to create the curiosity, creativity and critical thinking. It emphasizes on the cognitive development of learner and works on developing sound foundation for higher studies (jadal, 2011).

Literature Review

Moeller, & Reitzes,. (2011) emphasized the improvising apparatus, making charts and models, doing experiments, conducting exhibitions and demonstrations, setting apparatus, they Provides first-hand experience. These activities make the learning easy, effective and fast, it saves a lot of student-teacher time and energy. Improvised aids are useful because, it motivates the learners to create his own teaching-learning material from objects which are easily available to him. Improvised aids promote 'learning by doing and also trigger creativity.

Bude Su. (2009), observed that learners do various things themselves, students are actively involved when teaching aids are used. Teacher can use teaching aids to arouse curiosity, to trigger

scientific thinking and to help learners identify the cause-effect relationship and provides freedom of thought and actions.

The student can discuss their observations, work in groups, can talk and analyze, comment and elaborate their viewpoints. Thus the students feel free when teaching aids are used in the classroom.

According to Dahar and Faize (2011) charts are cheap, handy and easy to use aids which can assist the teacher to help learners to understand the concept in better way. For example, various processes, flow diagrams etc. can be effectively explained using a chart. They help to secure better attention of learners and arouse their interest.

According to Nzewuihe (2011) blackboard should be used to develop a summary of the content in which various concepts are linked to each other properly. Colored chalks can be used to draw flow charts, concept maps, diagrams etc. to highlight various aspects. Flow diagrams, concept maps, figures, pie charts, bar graphs and other pictorial forms have a high retention and should be used to represent knowledge. Subject, date, topic and sub-topic should be written on the blackboard and before leaving the class, to clean the blackboard for the other teacher to use it. Whiteboards may also be used as screens for Liquid Crystal Display (LCD) projectors or OHP projectors. Greater reflectivity of whiteboard results in brighter projected images.

Selvi (2007) discussed that a model is a three-dimensional projection or representation of a real object. The interested and colorful chart helps the learner to focus within the boundaries on the content and too many lines and pictures make it a complex aid thus defeating the purpose. They help the learner to form better perceptions because a three-dimensional view is available; they give a notion of reality as they bear a close resemblance to the real objects.

Brinkerhoff (2006) focuses the most common use of ICT in education is to support teaching and learning. This approach integrates ICT into existing educational practices, ranging from

teachers using presentation of software with interactive white boards in face to face sessions, through the course delivered completely on line, often taken at a distance, choice and control of the technology are determined by the needs of the curriculum, institutional policy and commitments, and the discretion of teachers.

Ling (2009) stresses ICT in some cases has been found to be good motivator, pupils working on the computer showing high levels of enthusiasm. ICT can clearly make difference to pupil presentation of their ideas. At a super field level this can refer to the increased attractiveness of presentations designed using the sophisticated word-processing. Difficult ideas may often be made more readily understandable by being made visible through ICT. A concept such as the flow of electronic current can be drawn on a black board, and animation on the computer can pupils' understanding.

Jadal (2011) discussed that in classrooms, teleconferencing is used to allow the learners to avail of the experiences of the persons or experts who are unable to come physically to interact with the learners. Through this mode the students may ask their doubts/questions to the concerned person and learn from him/her.

Gillani (2005) pointed out that important concepts and definitions may be placed on transparencies/slides. Elaborate explanations may be provided orally by the teacher. Diagrams, figures, pictures, processes, flow diagrams and concept maps may be effectively used to enhance understanding by using projected aids.

Teaching aid needs regular up gradation and evaluation. As time passes the needs of our students also change, so the teacher needs to adopt teaching aids regularly. Teachers are made aware of the different experiences and their relative values by looking at the positions they occupy.

The learning experiences are arranged in an increasing order of abstractness from bottom to top. It shows that there is no perfect learning experience; different experiences have different effects. It

is for the teacher to provide a combination of experiences for effective concept comprehension.

Objectives of the study

Following objectives were formulated in this study.

1. To analyze the practices of educational media in physics classroom.
2. To assess the application of ICT's in teaching learning process.
3. To explore the students' perception about the use of audio-visual aids in classroom.
4. To suggest the ways and means for effective use of educational media in teaching learning process.

Methodology

It was a survey type study. The population of the study consisted of all the principals of colleges, physics teachers and science students of public sector colleges of Sindh. The stratified random sampling design was adopted. 210 physics teachers, 75 principals and 165 science students were drawn from 528 public sector colleges in Sindh. Two questionnaires for teachers and students were developed, interview was conducted for physics teachers and observation checklist was developed for class observation. The triangulation approach was adopted for data analysis.

Item analysis

Questionnaire

	Statement	S.F	M.F	U.F	χ^2
1.	I use different AV aids (charts, white boards, picture) while teaching.	20	68	122	74.39
2.	I use instructional technology during the lecture.	15	30	165	194.98
3.	I use the computer lab for integrated lesson.	10	20	180	259.98
4.	I use of instructional technology results in learning.	15	26	169	210.87
5.	I promote the students to maintain the soft board in the class.	00	25	185	287.84

Referring the table of χ^2 we found that the tabulated value of $\chi^2 = 5.99$ with $df = 2$ at $\alpha = 0.05$ is smaller than the calculated value of $\chi^2 = 74.39$. Hence H_0 was rejected and it was concluded that there was significant difference in views regarding the use of different av aids. From the inspection of the table it was clear that most of the college teachers believed that teachers didn't use different av aids (charts, white boards, picture) while teaching.

Referring the table of χ^2 we found that the tabulated value of $\chi^2 = 5.99$ with $df = 2$ at $\alpha = 0.05$ is smaller than the calculated value of $\chi^2 = 194.98$. Hence H_0 was rejected and it was concluded that there was significant difference in views regarding the use of instructional technology. From the inspection of the table it was clear that most of the college teachers believe that teachers didn't use instructional technology during the lecture.

Referring the table of χ^2 we found that the tabulated value of $\chi^2 = 5.99$ with $df = 2$ at $\alpha = 0.05$ is smaller than the calculated value of $\chi^2 = 259.98$. Hence H_0 was rejected and it was concluded that there was significant difference in views regarding the use of the computer lab. From the inspection of the table it was clear that most

of the college teachers believe that teachers didn't use the computer lab for integrated lesson.

Referring the table of χ^2 we found that the tabulated value of $\chi^2 = 5.99$ with $df = 2$ at $\alpha = 0.05$ is smaller than the calculated value of $\chi^2 = 210.87$. Hence H_0 was rejected and it was concluded that there was significant difference in views regarding the use of instructional technology. From the inspection of the table it was clear that most of the college teacher strongly believe that teachers didn't use of instructional technology results in learning.

Referring the table of χ^2 we found that the tabulated value of $\chi^2 = 5.99$ with $df = 2$ at $\alpha = 0.05$ is smaller than the calculated value of $\chi^2 = 287.84$. Hence H_0 was rejected and it was concluded that there was significant difference in views regarding the maintaining the soft board in the class. From the inspection of the table it was clear that most of the teachers believe that they didn't promote the students to maintain the soft board in the class.

Interview protocol

Do you use ICT while teaching?

Scale	Yes	No	Total
Frequency	1	19	20
Percentage	5	95	100

The above table shows that 95% teachers didn't use the ICT. Hence it was concluded that most of teachers did not use of ICT while teaching, due to lack of skill and training.

Do you use A.V aids while teaching?

Scale	Yes	No	Total
Frequency	3	17	20
Percentage	15	85	100

The above table shows that 85% teachers didn't use the A.V aids while teaching. Hence it was concluded that teachers did not use A.V aids while teaching.

Classroom observation

Used the A.V aids during the lecture.

Scale	Frequently	Sometime	Never	Total
Frequency	-	1	9	10
Percentage	-	10	90	100

The above table indicates that 90% of the teachers did not using the A.V aids during the lecture. The answer of teachers in questionnaire and interview showed the same result because they didn't have knowledge and skills. The management has not provided the materials for A.V aids.

Finding

Positive trend of opinion was found in respect of the following items of the questionnaire.

- Competitive environment is promoted in the class.
- Manage classroom activities smoothly.
- Share the learning problems to teachers?
- Promote work hard to inculcate the concepts?
- Teaching styles impress.
- Conducts the class properly.
- Develops a command over the subject.
- Create novel ideas about to the topic.

- Ensures the classroom discipline.
- Understands the learning problems of students.
- Encourages you to ask relevant question.

Negative trends of opinion were also found in respect of the following items of the questionnaire.

Teachers

I use different teaching (lecture, lecture demonstration, problem solving) method according to the content/context.

- Use different strategies keeping in view the individual differences in lesson Planning.
- Develop lesson plan is developed for lecture.
- Use ICT to clear the student's concepts.
- Use different av aids (charts, white boards, picture) while teaching
- Use instructional technology during the lecture.
- Use the computer lab for integrated lesson.
- Employ instructional technology and its feedback in learning.
- Use multiple question techniques.
- Encourage the students to maintain the soft board in the class.
- Test is conducted as per plan.
- Different project are assigned to students.

Principal

The principal's feedback included:

- Teachers use the different methods according to the content.
- Teachers usually use the different a.v aids while teaching.
- Teachers give attention individually as far as possible.
- Teachers use technology for delivering the lecture.
- Teachers make the lesson plan. .
- Students participate fully in group discussion.
- Teachers provide the notes.
- Teachers give the assignments.

- Teachers give the small project related to the content.

Student

- Teacher pays attention to the students individually.
- Teacher uses the instructional technology during lecture.
- Teacher controls the whole class properly.
- Teacher promotes the students to maintain the soft board in the class.
- Teacher manages the classroom activities (quiz, exp projects) properly.

Recommendations

Analysis of the data led to the formulation of the following recommendations:

- ◆ The academically expert and, professionally competent physics teachers may be appointed in the educational institutions.
- ◆ Sufficient audio-visual aids may be provided to teachers in order to enhance the effectiveness of the process.
- ◆ Seminars workshops (related to teaching) may be arranged time to time.
- ◆ The selection of content at appropriate level may be based upon the interest and needs for development of scientific skills, and attitudes of students.
- ◆ Research projects may be assigned to students according to their mental approach. Latest software regarding the science education and internet facilities be provided in the college.
- ◆ It is vital to regulate science education in collaboration with Pakistan Science and Research Council.
- ◆ Counseling and guidance in the science (physics) may be provided.
- ◆ Internal evaluation system may be strengthened.
- ◆ Teacher may promote the healthy questioning according to the content application.
- ◆ Teacher may join in service training or practical base short course may be arranged periodically

- ◆ Different learning technologies may be used to enhance the learning of students.
- ◆ Students may be encouraged to participate fully in activities and projects.
- ◆ The course of strategic academic planning and management may be included in the training of teachers and principals.
- ◆ Professional qualification may be compulsory for teaching before joining the services.
- ◆ Small project may be assigned to students according to the content and mental approach.
- ◆ Teacher, opinion may be given prime importance in the development and implementation of physics curriculum.
- ◆ Teachers may develop critical thinking and scientific behaviors in the students.
- ◆ Follow up study may be carried out by the management to remove the problems in teaching.
- ◆ Teachers may learn about content enrichment, technology of learning, philosophy of education and vital models of learning and principles of learning.

Conclusion

The purpose of physics teaching at higher secondary level is to enable learners to grasp systematically the basic knowledge of physics needed for the further study of modern science and technology and to understand its applications. It should help them to acquire experimental skills, develop the ability to think and cultivate a dialectical materialist view point and make them aware of need to struggle for the modernization. The primary purpose of physics teaching is to develop the scientific culture and attitude in students and to familiarize them with the important role played by physics in their daily life.

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