Effect of Multi Media Teaching on Achievement Motivation and Scientific Attitude

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Abstract
Multimedia refers to content that uses a combination of different content forms. This contrasts with media that use only rudimentary computer displays such as text-only or traditional forms of printed or hand-produced material. Multimedia includes a combination of text, audio, still images, animation, video, or interactivity content forms. Multimedia is usually recorded and played, displayed, or accessed by information content processing devices, such as computerized and electronic devices, but can also be part of a live performance. Multimedia devices are electronic media devices used to store and experience multimedia content. Researches have shown that multimedia teaching has its positive effect on achievement, achievement motivation and scientific attitude. In the present study, attempt has been made to find out the effect of Multi Media Teaching on achievement in biology. Objectives of the Study were 1. to study the effect of multimedia teaching on achievement motivation, 2. to find the effect of multimedia teaching on achievement motivation of boys and girls in experimental group. 3. To study the effect of multimedia teaching on scientific attitude, 4. to find the effect of multimedia teaching on scientific attitude of boys and girls in experimental group. Hypotheses of the study were 1. Multimedia teaching would increase the achievement motivation, 2. The increase in achievement motivation of boys and girls in experimental group would be same in experimental group, 3. Multimedia teaching would improve scientific attitude, 4. The development of scientific attitude of boys and girls would be same in experimental group. Sample consisted of 9th standard students of Samhitha High School, Kurabrahalli, Bangalore. Cluster and Random sampling was employed in the selection of the sample. Tools used were 1. Achievement Motivation Test by Duo-Mohan (DMAMS, 1998) and 2. Scientific Attitude Test by Bajwa and Mahajan (2009). T-test was used for the analysis of the data. Findings of the study were 1. achievement motivation was significantly increased in experimental group rather than control group, 2. Multimedia teaching significantly increased achievement motivation among both boys and girls in experimental group, 3. Scientific attitude was significantly promoted in experimental group than control group, 4. Multimedia teaching significantly promoted scientific attitude among both boys and girls in experimental group.

Keywords: Multimedia Teaching, Scientific Attitude, Effective Learning, Achievement Motivation,
1. Introduction

Today in the midst of social and technological explosion in various fields of knowledge as well as in the techniques by which, this out bursting knowledge is communicated, the teacher can no longer be the sole and mere information giving instruments in the class room. Further, the growing school population and its concomitantly eager and more diverse variety of classes make it increasingly more difficult for a single teacher to “reach and child” with the information giving methods that we generally follow in the class room. These methods have failed to bring about effective learning and effective learning is brought about essentially by effective teaching. By effective teaching, the investigator refers to the mode of teaching which can develop certain essential abilities or potentialities which the pupil are endowed with. After all learning means bring about changes in the behaviour of an individual. In other words, the learning out comes of any educational system should be to develop certain existing potentialities of the individual and thus in the process their academic performance is improved to maximum extend. In a vase country like India, enormous work is now being done in the field of education, but it is not still possible to equip each and every school with all the facilities for teaching science. The secondary school s need high quality teaching aids. Multi media as a teaching aid, is very much effective with colour, sounds, graphics, which have found in the audio media and video media and movie media. Any diagram can be explained in detail with 3D effect which helps the students to understand clearly. Multi media can present biological information concepts so as to develop general skills. The students can get a live vision of the aspects and scientific factors. Multi media includes use of computers. The students who have favorable attitude towards the computer can very effectively use multi media. If the students have unfavorable attitude, m they may be interested in learning by using multimedia (Nimavathi and Gnanadevan, 2008).

One of the techniques to improving the students’ meets the academic needs and helps them developing science knowledge, skills, motivation attitude is providing multimedia during the process of teaching and learning in the classroom. Multimedia classroom provide the students chances for interacting with diverse texts that give them a solid background in the tasks and content of mainstream secondary school courses. The writing aims to find out some advantages of the use of multimedia in the classroom. Also, the involvement of technology in the classroom can not denied giving positive point to improving the quality of teaching and giving more various techniques in teaching science. Through the media the teacher could give more opportunity to students to express their opinions and enjoy during the course. The highly presence and motivation also bring positive aspects to students so that they can improve their skills. Multimedia refers to content that uses a combination of different content forms. This contrasts with media that use only rudimentary computer displays such as text-only or traditional forms of printed or hand-produced material. Multimedia includes a combination of text, audio, still images, animation, video, or interactivity content forms. Multimedia is usually recorded and played, displayed, or accessed by information content processing devices, such as computerized and electronic devices, but can also be part of a live performance. Multimedia devices are electronic media devices used to store and experience multimedia content.

2. Multimedia Classroom

The time it takes to earn the degree in education today is based on an increasingly outdated model: so many hours in a classroom entitle a student to a receipt in the form of a grade, and so many receipts
A paper by Yashpal Sudhanshu and Dr. C.V. Satyaprakasha, titled "Effect of Multimedia Teaching on Achievement Motivation and Scientific Attitude," discusses the impact of using multimedia in teaching. The authors argue that traditionally, classroom teaching involves teachers standing in front of students, giving explanations, informing, and instructing. However, with the development of technology, multimedia in the classroom is becoming more prevalent. Multimedia classrooms differ from traditional classrooms in terms of seating arrangements and the use of equipment. Multimedia teaching is used to enhance linguistic and knowledge development. Through interactions with multimedia texts on topics of interest, students become familiar with academic vocabulary and language structures. This results in better understanding and retention of information.

The paper also highlights various studies that support the application of multimedia in the classroom. It emphasizes that the design of multimedia is crucial for it to have any effect on learning. A review of related research indicates that multimedia teaching has its effect on achievement motivation and scientific attitude.

3. Achievement Motivation

Achievement motivation is the desire to excel at tasks. Individuals with high achievement motivation tend to set goals that are neither too easy nor extremely difficult. Easy tasks do not present a challenge and are of no interest. Extremely difficult goals increase the risk of failure. Individuals high in achievement motivation excel in performance when placed in situations that activate their achievement motive. This includes scenarios that challenge them to do their best, in which they have difficult goals or in which they compete against others. Studies conducted by researchers such as Nirmala et al., 2006, and Girija N. Srinivaslu, support the findings presented in the paper.
4. Scientific Attitude

Education Commission (1964-66) states that Science education must become an integral part of school education; and ultimately some study of science should become a part of all courses in the humanities and social sciences. The quality of science teaching is to be developed considerably so as to achieve its proper objectives and purposes, viz., to understand basic principles, to develop problem-solving, analytical skills and ability, to apply them to the problems of material environments and social living besides promoting the spirit of enquiry and experimentation. Science strengthens commitments of man to free enquiry and search for truth as its highest duty and obligation. By its emphasis on reason and free enquiry, it even helps to lesson ideological tensions. The Directorate of Extension Programmes for Secondary Education, Government of India, in its brochure on ‘Evaluation in General Science’ sets one of the objectives of teaching general science in secondary schools as the pupils should adopt the scientific attitude in making statements, accepting information and forming beliefs. Vaidya (1999) explained that scientific attitude as open mindedness, curiosity, judgements based upon scientific facts alone, willingness to test and verify conclusions, faith in cause and effect relationship, honest reporting, rejection of the principle of authority and more faith in the books written by specialists in their fields etc. Studies conducted by (Abdul Gafoor, 2006; Nalini, 2011) had conducted studies and proved that the scientific attitude of the students was promoted through multimedia teaching techniques. Hence, keeping in mind the importance of using multi media teaching, its positive effect on increasing the achievement, achievement motivation and scientific attitude and also the need for research in this area the present investigation is taken up.

5. Statement of the Problem

Effect of Multi Media Teaching on Achievement Motivation and Scientific Attitude

6. Objectives of the Study

1. To study the effect of multimedia teaching on achievement motivation.
2. To study the effect of multimedia teaching on scientific attitude.
3. To find the effect of multimedia teaching on achievement motivation of boys and girls in experimental group.
4. To find the effect of multimedia teaching on scientific attitude of boys and girls in experimental group.

7. Hypotheses of the Study

1. Multimedia teaching would increase the achievement motivation.
2. Multimedia teaching would improve scientific attitude.
3. The increase in achievement motivation of boys and girls in experimental group would be same.
4. The development of scientific attitude of boys and girls in experimental group would be same.

8. Sampling Procedure

For the present study, two sections of 9th standard consisted of 38 and 39 students of Samhitha High School, Kurabrahalli, Bangalore has been chosen as the sample. Sampling procedure was based on cluster
and random sampling because from many of the classes only two section of class $9^{th}$ student was taken as sample from that school in Bangalore city. The Sample distribution is shown in the table-1.

Table-1 Sample Distribution

<table>
<thead>
<tr>
<th></th>
<th>Experimental Group</th>
<th>Control Group</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boys</td>
<td>38</td>
<td>39</td>
<td>77</td>
</tr>
<tr>
<td>Girls</td>
<td>15</td>
<td>21</td>
<td>21</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>77</td>
</tr>
</tbody>
</table>

8.1 Variables
8.1.a Dependent Variables
1. Achievement Motivation. 2. Scientific Attitude

8.1.b Independent Variables
Multimedia Teaching and Gender

8.2 Tools

8.3 Statistical Techniques
t-test was used for the analysis of the data

9 Analysis and Interpretation of Data
9.1 Analysis of Gain in Achievement Motivation
Comparison of Gain scores of Experimental and Control Group in Achievement Motivation.

**Hypothesis 1:** Multimedia teaching would increase achievement motivation.

For testing the stated hypothesis, the gain scores of experimental score and control group in achievement motivation were obtained by subtracting pre-test scores from post-test scores. Mean, standard deviation and t-value were computed and are presented in table 2.

Table-2 Mean, Standard Deviation and t-value of Gain Scores of Experimental and Control Group in Achievement Motivation

<table>
<thead>
<tr>
<th></th>
<th>Experimental Group</th>
<th>Control Group</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>22.98</td>
<td>9.74</td>
<td>2.99**</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>20.76</td>
<td>18.02</td>
<td></td>
</tr>
</tbody>
</table>

**Significant at 0.01 level.
Table shows that there is a significant difference between mean gain scores of experimental and control group in achievement motivation. The obtained t-value 2.99 is more than the table t-value 2.64 i.e. for 75 degrees of freedom at 0.01 level of significance. Hence, there is a significant difference between mean gain score of experimental and control groups in achievement motivation. Thus, the hypothesis multimedia teaching would increase achievement motivation is accepted. From the table it also becomes clear that the mean for achievement motivation (M=22.98) in experimental group is found higher than that of control group (M=9.74). The significance of the result might be due to several factors. In multimedia teaching the members of experimental group achieve their goal by asking, reacting, participating, questioning, comparing the facts and concepts etc. to regular observing the diagrams, videos and with flow chart from the teachers and by discussing, sharing and exchanging the information with one another. Students were allowed to talk freely with their teachers without any fear. Therefore they were feeling safe, secured and they were felt alienated. Because of the use of multimedia package, flexibility and freedom, they were very much interested, attentive and completely involved in classroom. After the transaction of lesson, they received praise based on how well they develop and arrange the knowledge and how they have done in the classroom. Therefore, multimedia teaching helped students in acquiring not only the knowledge, but also helped in developing interest and strong motivation to learn science. Thus, all the above factors might be attributed to increase achievement motivation of the students of experimental group, whereas, in case of control group, since the students were expected to learn mostly through teacher’s direct teaching, they were just passive listeners. Their needs and interests were not taken care of as teachers might not have used different Medias of teaching. Some times during the conventional method of teaching, transmission of the lesson had taken place by teacher asking and students answering questions and vice-versa. Such kind of method of teaching might not have clear the doubt of students and contributed to any kind of motivation to learn science. Hence, it can be concluded that multimedia teaching is better than conventional method of teaching in increasing achievement motivation of the students. Researchers such as (Nirmala et. al., 2006; Girija N. Srinivaslu, 2011) have reported that multimedia teaching had positively affected the achievement motivation of the students. The present study also indicated that the similar results for achievement motivation.

9.2 Analysis of Gain in Achievement Motivation with respect to Gender in Experimental Group

Comparison of total gain scores in achievement of boys and girls would be same in experimental group.

Hypothesis 4: The increase in achievement motivation of boys and girls in experimental group would be same. For testing the stated hypothesis, the gain scores of boys and girls achievement motivation in experimental group were obtained by subtracting pre-test scores from post-test scores. Mean, standard deviation and t-value were computed and are presented in table 3.

<table>
<thead>
<tr>
<th>Boys</th>
<th>Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>22.89</td>
</tr>
<tr>
<td>SD</td>
<td>22.30</td>
</tr>
<tr>
<td>t-value</td>
<td>0.046</td>
</tr>
</tbody>
</table>

Table-3: Mean, Standard Deviation and t-value of Gain Scores of Boys and Girls Achievement Motivation in Experimental Group
Table shows that the obtained t-value 0.046 is less than the table t-value 2.02, i.e. for 36 degree of freedom at 0.05 level of significance. Hence there is no significant difference between mean gain scores of boys and girls in experimental group in achievement motivation. Thus, the hypothesis, the increasing of achievement motivation of boys and girls in experimental group would be same is accepted. The significance of the result might be due to several factors. In multimedia teaching the members of experimental group achieve their goal by asking, reacting, participating, questioning, comparing the facts and concepts etc. to regular observing the diagrams, videos and with flow chart from the teachers and by discussing, sharing and exchanging the information with one another. Students were allowed to talk freely with their teachers without any fear. Therefore they were feeling safe, secured and they were felt alienated. They were always sure that their friends and teacher are there to help and guide them in learning. Because of flexibility and freedom, they were very much interested, attentive and completely involved in classroom. After the transaction of lesson, they received praise based on how well they develop and arrange the knowledge and how they have done in the classroom. Therefore multimedia teaching helped students in acquiring not only the knowledge, but also helped in developing trust, concepts, value and friendliness with others. The views, ideas and information of each student was recognised and valued by others during achieving in the classroom. Thus, all the above factors might be attributed to increase achievement motivation of the students (both boys and girls) of experimental group is same, because both boys and girls receive the multimedia teaching in same manner. Hence the increasing of achievement motivation in boys and girls in experimental group is equally.

9.3 Analysis of Gain in Scientific Attitude

Comparison of Gain Scores of Experimental and Control Group in Scientific Attitude.

Hypothesis - 2: Multimedia teaching would improve Scientific Attitude. To test the above hypothesis, gain scores of scientific attitude of experimental and control group were obtained by subtracting pre-test scores from post-test scores. Mean, standard deviation and t-value were computed and are presented in table 4.

Table 4: Mean, Standard Deviation and t-value of Gain Scores of Experimental and Control Group in Scientific Attitude

<table>
<thead>
<tr>
<th>Experimental Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>Mean</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>Standard Deviation</td>
</tr>
<tr>
<td>6.28</td>
<td>1.26</td>
</tr>
<tr>
<td>10.60</td>
<td>10.94</td>
</tr>
<tr>
<td></td>
<td>2.04*</td>
</tr>
</tbody>
</table>

*Significant at 0.05 level only.

Table shows that the mean gain scores of the experimental group are more than that of the control group in scientific attitude. The obtained t-value 2.04 is more than the table t-value 1.99, i.e. for 75 degrees of freedom at 0.05 level of significance. Hence, there is a significant difference between mean gain score of experimental and control groups in scientific attitude. Thus, the hypothesis multimedia teaching would promote scientific attitude is accepted. From the table it also becomes clear that the mean for scientific attitude (M=6.28) in experimental group is found higher than that of mean for scientific attitude (M=1.26) in control group. The significance of the result might be due to several factors. In multimedia teaching, the members of experimental group gain more knowledge with receiving, responding, organising and obtaining the value, believing the facts and proofing the
concepts etc. from the uses of multimedia materials. Teachers helped them in believing the facts and proving the concepts and aware them to avoid the superstitions. Because of flexibility and freedom, they were very much interested, attentive and completely involved in the classroom. Therefore multimedia teaching helped students acquiring not only the scientific knowledge, but also helped in developing concepts, value, scientific thinking, critical inquiry and removing of superstitious. Thus, all the above factors might be attributed to promote scientific attitude of the students of experimental group, whereas, in case of control group, since the students were expected to learn mostly through teacher’s direct teaching, they were just passive listeners. There was less scope for the students to think critically, arrange the concepts, discussed with friends and teachers. In contrast in multimedia teaching set up, all the students were constantly engaged in understanding of process going on, critical inquiry of various systems and various part of the organism. All the above discussed situation of multimedia teaching could be attributed for the promoting of scientific attitude. Hence, it can be concluded that multimedia teaching enhances the acquisition of affective level objectives than conventional method of teaching and regarded as a better and effective method of teaching in promoting scientific attitude. Earlier to this study, many researchers like (Abdul Gafoor, 2006; Nalini, 2011) had conducted studies and proved that the scientific attitude of the students was promoted through multimedia teaching techniques. The present study also supported the earlier studies i.e. the result obtained for scientific attitude measures indicated that multimedia teaching had significantly promoted scientific attitude of the students.

9.4 Analysis of Gain in Scientific Attitude with respect to Gender in Experimental Group

Comparison of Gain scores of boys and girls scientific attitude in experimental group.

**Hypothesis-6**: The development of scientific attitude of boys and girls would be same in experimental group. For testing the above hypothesis, gain scores of scientific attitude of boys and girls in experimental group were obtained by subtracting pre-test scores from post-test scores. Mean, standard deviation and t-value were computed and are presented in table 5.

<table>
<thead>
<tr>
<th>Boys</th>
<th>Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>Standard Deviation</td>
</tr>
<tr>
<td>7.32</td>
<td>9.68</td>
</tr>
</tbody>
</table>

Table shows that the obtained t-value 0.13 is less than the table t-value 2.02, i.e. for 36 degrees of freedom at 0.05 level of significance. Hence, there is no significant difference between mean gain score of boys and girls scientific attitude in experimental group. Thus, the hypothesis, the development of scientific attitude of boys and girls in experimental group would be same is accepted. The significance of the result might be due to several factors. In multimedia teaching, the members (both boys and girls) of experimental group gain more knowledge with receiving, responding, organising and obtaining the value, believing the facts and proofing the concepts etc. from the teachers and students, by discussing and sharing, exchanging the information with one another. Students were allowed to talk and ask the question freely with their teachers freely without fear. Teachers help them in believing the facts and proofing the concepts and aware them to avoid the superstitions. Because of flexibility and freedom, they were very much interested, attentive and completely involved in the classroom. After the transaction of the lesson, they received praise.
based on how well they develop and arrange the concepts and facts. Therefore multimedia teaching helped students acquiring not only the scientific knowledge, but also helped in developing concepts, value, scientific thinking, critical inquiry and removing of superstitious. Thus, all the above factors might be attributed to promote scientific attitude of the students of experimental group. In multimedia teaching both boys and girls equally benefited through develop the affective domain knowledge and removing the superstitious. Hence, it can be concluded that multimedia teaching promoting and developing the scientific attitude among boys and girls in experimental group equally.

10. Findings of the Study

1. Achievement motivation was significantly increased in experimental group rather than control group.
2. Scientific attitude was significantly promoted in experimental group than control group.
3. Multimedia teaching significantly increased achievement motivation among both boys and girls in experimental group.
4. Multimedia teaching significantly promoted scientific attitude among both boys and girls in experimental group.

11. Educational Implications of the Study

The positive effectiveness of multimedia teaching on achievement in biology, scientific attitude and achievement motivation leads to the following educational implications.

1. The result in terms of improvement achievement motivation indicates that the students of experimental group have acquired the skills, interest and strong motivation to learn science etc., better than the students of control group. This result clearly revealed that properly structured multimedia classes can provide opportunities for the students to interact, interest and strong motivation to learn science etc., and would lead to the improvement of achievement motivation.
2. The results in terms of promoting scientific attitude indicated that the students of experimental group have acquired the scientific attitude like receiving, responding, organising and obtaining the value, believing the facts and proofing the concepts etc., better than the control group. The results clearly revealed that properly structured multimedia classes can provide opportunities for the students to proofing the concepts and believing the facts etc., and would lead to promoting the scientific attitude.
3. This method can be effective to all students with different learning abilities as individual differences can be overcome in multimedia teaching.
4. Pre-service as well as in-service teachers can be trained in multimedia teaching to implement it effectively in their classroom.
5. On experimental basis, multimedia teaching can be adopted in some schools for all subjects to improve school effectiveness.
6. Improvement can be brought about for the students with histories of poor academic achievement and achievement motivation using multimedia teaching.
7. Frequent use of multimedia teaching classes help students to develop interest, affection, proper attitudes towards the class, subject, teacher and also peers.
12. References