Abstract
Multimedia based laboratory occasionally replaces traditional classrooms experiments due to rapid advances in computer technologies. The multimedia Lab is an interactive environment for education including creating and conducting simulated experiments for biology students in the laboratory. It consists of simulation programs, experimental modules, different tools that operate on objects. The aim of this study is to determine prospective Biology teachers’ attitudes towards multimedia based Biology Experiments. This research was carried out with 120 prospective Biology teachers of Pudukkottai and Thanjavur District of Tamilnadu. In order to get general results about the sample survey methodology was used. Results show that there is significant differences were found between the attitude of gender, Post graduates and under graduates and rural and urban prospective biology teachers towards multimedia based experiments. But for the specialization of subject such as botany or zoology and nature of institution where they undergoing pre-service training has no much influence in the attitude of prospective teachers.

1. Introduction
Information technology has provided new innovations to sustain constructing an artificial educational environment by means of computers. Certain artificial environments sometimes go beyond natural environments, such as simulations and virtual reality, which is a sophisticated educational technology emerging for less than a decade (Hamil, 1993). Multimedia reality is
distinguished by unique sorts of interaction, that responds to users' behaviors and actions in any laboratory conditions. In this 21st century competencies in education are seen more in line with Information communication Technology (ICT). ICT can be used as a tool to improve the quality of education for preparing the society and its man power to face the challenge of future. It requires the proper manpower to handle and use ICT in the schools in a proper way. The emerging technologies have the potential to radically transform the education system in India. Only a creative and enthusiastic teacher can incorporate the modern development of ICT inside the classroom very successfully. Introduction of computer education in schools is a major step in the direction of information and communication technology in preparing the next generation workers. A teacher being a pivot in the process of teaching and learning, knowledge of ICT and skills to use ICT in teaching learning has gained immense importance for today's teacher. A teacher is expected to know successful integration of multimedia based experiments in biology practical’s and demonstrations.

2. Multimedia and Biology Experiments

In the case of science laboratory instruction, technology has reached a threshold where virtual or simulated (learner-centered) approaches can formidably meet or exceed the learning outcomes of expository (teacher-centered) approaches. And research suggests that simulated laboratories can dramatically impact learning in positive ways (Alessi & Trollip, 2001) There also exists a need for the implementation of online or virtual laboratories as supplements or replacements for the traditional high school and college laboratory (Bhargava, Antonakakis, Cunningham, & Zehnder, 2005).

The change in instructional techniques are shaped by the fact that multimedia based learning increases student motivation and creates better learning environments in biology practical’s and experiments. Computer simulations give students the opportunity to take initiative when learning about a given topic. Simulations are important for formulating and, improving the conceptual models that scientist and science teachers use in their practice and experiments.

Computer simulations, a sophisticated form of CAL, make it possible for students to experience and experiment with a variety of biological, scientific, weather, mechanical, business, mathematical, social, and political phenomena with less risk, cost, and time than has ever been possible. However, computer simulations make it possible for students to quickly grasp complex concepts and apply their understanding. In the absence of computer simulations, students usually learn the behavior of complex systems passively through general descriptions and definitions of system elements and primary governing rules. Moreover, because most complex systems involve several levels of positive and negative feedback and intricate interrelationships, general descriptions and basic rules are incapable of conveying much understanding

3. Need and Significance of the study

This study is conducted to find out the attitude of prospective Biology teachers towards the use of computer simulation package in the development of Experiments in Biology Practical’s.

One advantage of using multimedia programs in Biology experiments is that computer simulation programs can increase students’ interest and motivation for doing experiments in Biology and can challenge the students’ fantasy and curiosity within the context of rule-bound ‘play’. Multimedia makes possible experiments, which are difficult to carry out in the students’
laboratory because of complexity of the professional equipment, the high price of equipment, safety problems, ethical problems, and so on.

The emphasis in demonstration by Multimedia is on the integration process of the new knowledge, skills, and critical thinking. Unlike the traditional classroom setting multimedia process allows learners to function in the learning environment that is as close as possible to an actual situation, which provides them an opportunity to make right designs. Simulation has been successfully used to teach in different learning strategy in both laboratory and formal settings in Biology laboratory and experiments.

Simulation provides the opportunity to demonstrate certain phenomena that are difficult or even impossible to observe and discern in other ways in Biology Experiments. The virtual laboratory implementations created with the use of simulations help students learn through trial and error. This encourages students to search the existing ways of identifying solutions to the problems they encounter. It also allows them to replay the videos again and again, whenever and wherever they wish. This study sought to make an analysis of Prospective Biology teacher’s attitude towards the use of different multimedia techniques in the area of Biology Experiments.

4. Attitude of prospective Biology teachers towards multimedia based Biology experiments

Any innovative approach in the field of biology experiments depends on the teacher’s positive attitude towards those technologies that he or she is going to use in the laboratory. Attitude means the individual's prevailing tendency to respond favourably or unfavourably to an object (person or group of people, institutions or events). Attitudes can be positive (values) or negative (prejudice). Social psychologists distinguish and study three components of the responses: a) cognitive component, which is the knowledge about an attitude towards an object, whether accurate or not; b) affective component: feelings towards the object and c) conative or behavioral component, which is the action taken towards the object. In this respect this study intends to find out the use of new technology in the area of biology experiments through simulation, animation or virtual means.

5. Objectives Of The Study

i.) To study the significance of difference in the attitude of male and female prospective Biology teachers towards multimedia based Biology Experiments.

ii.) To study the significance of difference in the attitude of Undergraduate and Post Graduate prospective Biology teachers towards multimedia based Biology Experiments.

iii.) To study the significance of difference in the attitude of Botany and Zoology specialized prospective Biology teachers towards multimedia based Biology Experiments.

iv.) To study the significance of difference in the attitude of Urban and Rural prospective Biology teachers towards multimedia based Biology Experiments.

v.) To study the significance of difference in the attitude of government and self-financing College prospective Biology teachers towards multimedia based Biology Experiments.

6. Hypotheses

i.) There is no significant of difference in the attitude of male and female prospective Biology teachers towards multimedia based Biology Experiments.
ii.) There is no significant difference in the attitude of Undergraduate and Post Graduate prospective Biology teachers towards multimedia based Biology Experiments.

iii.) There is no significant difference in the attitude of Botany and Zoology specialized prospective Biology teachers towards multimedia based Biology Experiments.

iv.) There is no significant difference in the attitude of Urban and rural prospective Biology teachers towards multimedia based Biology Experiments.

v.) There is no significant difference in the attitude of government and self-financing College prospective Biology teachers towards multimedia based Biology Experiments.

7. Sample, Methodology & Tools Used

A sample of 120 Prospective Biology teachers from Pudukkottai and Thanjavur district of Tamilnadu, constituted the sample for the present study. In order to realize the above said objectives, Normative Survey Method was employed by the researcher. The investigator has used questionnaire as a research tool in the present study. The questionnaire consisted of 30 statements. Each item provided five responses. The responses were expressed in five point scale, strongly agree, agree undecided, disagree and strongly disagree and weights of 5,4,3, 2, 1 are given in that order for the favorable statements and the unfavorable statements.

8. Results & Analysis

Table 1: The significant difference between male and female prospective Biology teachers towards multimedia based Biology Experiments

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Mean</th>
<th>S.D</th>
<th>t-value</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>60</td>
<td>120.633</td>
<td>12.496</td>
<td>2.2736</td>
<td>Significant</td>
</tr>
<tr>
<td>Female</td>
<td>60</td>
<td>112.3</td>
<td>15.711</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1 show that the calculated t value 2.2736 is greater than the table value 1.96 at 0.05 levels. So the null hypothesis is rejected. Hence there is a significant difference in the attitude of male and female teachers towards multimedia based Biology Experiments. This indicates that the male prospective teachers have favourable mental disposition in using newer technology in the field of Biology Experiments.

Table 2: The significant difference between UG and PG prospective Biology teachers towards multimedia based Biology Experiments.

<table>
<thead>
<tr>
<th>Qualification</th>
<th>N</th>
<th>Mean</th>
<th>S.D</th>
<th>t-value</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post Graduate</td>
<td>70</td>
<td>121.3429</td>
<td>13.508</td>
<td>3.2762</td>
<td>Significant</td>
</tr>
<tr>
<td>Under Graduate</td>
<td>50</td>
<td>109.64</td>
<td>13.735</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2 shows that the calculated t value 3.2762 is greater than the table value 1.96 at 0.05 level. So the null hypothesis is rejected. Hence there is a significant difference in the attitude of UG and PG prospective Biology teachers towards multimedia based Biology Experiments. This shows that the Post Graduate qualified prospective teachers are highly acquainted in the value of using multimedia based experiments as an alternative method in developing the biology Experiments.
Table 3: The significant difference between the Botany and Zoology specialized prospective teachers regarding multimedia based Biology Experiments.

<table>
<thead>
<tr>
<th>Subject Specialization</th>
<th>N</th>
<th>Mean</th>
<th>S.D</th>
<th>t-value</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Botany</td>
<td>60</td>
<td>117.9667</td>
<td>13.6217</td>
<td>0.7885</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Zoology</td>
<td>60</td>
<td>114.9667</td>
<td>15.7710</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3 shows that the calculated t value 0.7885 is less than the table value 1.96 at 0.05 levels. So the null hypothesis is accepted. Hence there is significant difference in the attitude of Botany and Zoology specialized Prospective Biology teachers towards multimedia based Biology Experiments. This indicates that the subject specialization has no role in determine the attitude in using multimedia based experiments in biology practical’s.

Table 4: The significant difference between the attitude of Urban and rural prospective Biology teachers towards multimedia based Biology Experiments.

<table>
<thead>
<tr>
<th>Locality of the Institution</th>
<th>N</th>
<th>Mean</th>
<th>S.D</th>
<th>t-value</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>54</td>
<td>122.8333</td>
<td>11.4433</td>
<td>3.3526</td>
<td>significant</td>
</tr>
<tr>
<td>Rural</td>
<td>66</td>
<td>111.303</td>
<td>15.1750</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4 shows that the calculated t value 3.3526 is greater than the table value 1.96 at 0.05 level. So the null hypothesis is rejected. Hence there is a significant difference in the attitude of Urban and rural prospective Biology teachers towards multimedia based Biology Experiments. This may be due to that the urban students are highly interactive in modern technological gadgets either in PG level or they are using technologies in their home.

Table 5: The significant difference between attitude of government and self-financing College prospective Biology teachers towards multimedia based Biology Experiments.

<table>
<thead>
<tr>
<th>Type of Institution</th>
<th>N</th>
<th>Mean</th>
<th>S.D</th>
<th>t-value</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government</td>
<td>40</td>
<td>118.15</td>
<td>16.2133</td>
<td>0.5944</td>
<td>Not significant</td>
</tr>
<tr>
<td>Self-financing</td>
<td>80</td>
<td>115.625</td>
<td>14.0049</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5 shows that the calculated t value 0.5944 is less than the table value 1.96 at 0.05 level. So the null hypothesis is accepted. Hence there is no significant difference between attitudes of government and self-financing College prospective Biology teachers towards multimedia based Biology Experiments. This shows that the type of institution has no prominent role in determining the attitude of prospective biology teachers towards multimedia based biology experiments.

9. Discussion
Multimedia based teaching and learning is modern trend in the field of Science education. It provides as much information and knowledge based upon the teachers ability and students strength. Multimedia based learning is a new pedagogical outlook in the mental map of class room teacher especially for Biology Experiments. It is in the hand of teacher who has favourable mental disposition alone can incorporate modern means of experiments in his laboratory. For the effective use of multimedia based experiments inside the classroom teachers place is of vital importance.
The present study reveals that both male and female teachers have positive attitude towards multimedia based biology experiments for biology practicals or demonstration. This may be due to the large awareness of modern technologies such as virtual experiments, simulation mode in biology demonstration, and internet usage of teachers in educational system. This finding is similar to that of the study made by Olumide, Olubukola Joyce (2013) reporting that both students have favorable attitude towards computer simulation in biology learning.

The Secondary Education Commission (1964-66) has remarked that the most important factor in the contemplated educational reconstruction is the teacher, his educational qualifications, his professional training. There is a significant difference in the attitude of UG and PG prospective Biology teachers towards multimedia based Biology Experiments. This is because the PG students are highly oriented the modern use of computer multimedia in biology experiments than their counterparts. The study also reveals that there is significant difference in the attitude of Botany and Zoology specialized Prospective Biology teachers towards multimedia based Biology Experiments. One of the other finding is there exists a significant difference in the attitude of Urban and rural prospective Biology teachers towards multimedia based Biology Experiments. This reveals the opportunity for the urban students frequently acquaint with the modern technologies in their educational system. In addition there is no significant difference between attitudes of government and self-financing College prospective Biology teachers towards multimedia based Biology Experiments. By the multimedia based biology experiments the teachers can continuously seek new ways to capture the attention of students and create active learning environment, where minds are engaged and interest nurtured.

10. Conclusion

Multimedia based Biology experiments allow students to repeat demonstrations that they do not understand or as a review for exams, also maximizing time and space flexibilities, enhancing students’ enthusiasm for learning through interactivity, improving time efficiency, simplifying complex procedures so that more complicated workshops can be conducted, offering a safe demonstration environment, and enabling a convenient platform for student assessments. Students can practice using equipment in virtual realm before wasting resources with operational mistakes. Multimedia enabled Laboratory experiences reinforce critical thinking skills and understanding of the scientific method. Non-traditional, technology-based exercises enrich the laboratory learning experience and increase student interest and satisfaction. For this the teachers should be encouraged, through training and support, to use the web and other information technology systems in their teaching. They need examples and awareness of good practice, and standards should be set in relation to how teachers present information and manage the learning environment. So in the Pre-service training period itself much more training and practical orientation in using multimedia based biology experiments should be used as one of the alternatives in biology practicals.

11. References


