A COMPARATIVE STUDY ON ACHIEVEMENT IN CHEMISTRY THROUGH MULTIMEDIA APPROACH AND E-CONTENT MODULE AT HIGHER SECONDARY LEVEL

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ABSTRACT

Educational Technology is fundamentally aimed at improving the efficiency of education systems by increasing the, rate depth precision and value of learning which taken places. Students and teachers must have sufficient access to digital technologies such as Multimedia and internet. E-learning helps the learner to access to the learning program any time convenient to the learner. The present investigation was intended a comparative study on achievement in chemistry through Multimedia approach and e-content module at higher secondary level. Pre-test Post-test Equivalent Group design was used. The sample consisted of 132 XI Standard students from Thiruvalluvar Higher Secondary School (THSS), Gudiyattam, Vellore District in Tamil Nadu. The findings of this study is that in Multimedia Approach, Innovative Videos with periodical clearance in doubt makes the students to understand the concepts easily.

Keywords: Higher Secondary Level, Multimedia Approach and e-content Module.

INTRODUCTION

Education is a process of developing a process through which an individuals' physical, mental, emotional and social development takes place. It makes an individual adaptable to the dynamic nature of the society and instills all the competencies or qualities through which he or she can occupy a suitable position in the society. Drever states "Education is a process in which and by which knowledge, character and behavior of young are shaped and moulded". (Jasim Ahmad, 2009, p.2) Skinner defined "Educational psychology as the branch of psychology which deals with teaching and learning". (Rabia Bukhari, 2013, P.2) The teacher's goal is to help students grasp the development of knowledge as a process rather than a product. (Ajoy Chatterjee, 2007, p. 3)

Teaching is a process of educating a person with theoretical concepts and is a kind of a knowledge transfer between a teacher and a student. The role of the teacher is to acts as a facilitators of learning by

leading discussion, providing opportunities to ask open-ended question, guiding the process and tasks and enabling the active participation of learners and to engage with ideas. Teachers are occupied in schools with main purpose of educating the children to grow as good citizens in the world. (Selvi, knowledge and curriculum, 2016, p-) Henry P. Smith define Learning as the acquisition of new behavior or the strengthening or weakening of old behavior as the result of experience. Learning is modification of one's behavior through practice, training and experiences. Learning is adaptation of behavior to one's environment. Learning is what one gains as knowledge reading, self-experience or teaching by others. (Nagarajan, K., 2018, P.1-2)

Teaching use of technology is to place tools in the hands of the student, who uses these to solve the problem. This is a major shift from the 'sage-on-a stage' paradigm and it is a shift that faculty at all professional levels are reluctant to undertake. (Manish Tiwari, 2005, p.125) Educational Technology is fundamentally aimed at improving the efficiency of education systems by increasing the, rate depth precision and value of learning which taken places. Students and teachers must have sufficient access to digital technologies such as Multimedia and the internet in their classrooms, schools, and teacher education institution. (Shehzad Ahmad, 2007, P.3). E-learning helps the learner to access to the learning program any time convenient to the learner. Learners can be at any place to log on. (Mishra, R. C., 2005, p.105)

NEED OF THE STUDY

The investigator worked as a PG school teacher for two years and worked as an Assistant professor for the past 12 years. During her experience, she noticed that students struggled in understanding some valuable points in chemistry. This makes the investigator find the reason behind their struggle. She noticed that students had less interest in understanding the basic factors in chemistry. She tried different methods to clear their doubts. But due to the short time in completing the syllabus, there is no possibility to follow it. So there is a need for time-consuming and more interesting learning material. Students show more interest in working Computers, Mobiles, and interested in viewing modern Animated Cinemas and TV shows. This shows that students like new technologies which can be time-consuming and reused. So the investigator planned to introduce a new method like Multimedia and e-Content in teaching for the students to have better achievement.

OBJECTIVES OF THE STUDY

1. To find the difference between the Pre-test and the Post-test performance on Achievement in Chemistry for the Experimental Group-I and Experimental Group-II students at Higher Secondary Level.
2. To find the difference between the Experimental Group-I and Experimental Group-II students in the Post-test performance on Achievement in Chemistry at Higher Secondary Level.

HYPOTHESES

1. There is a significant difference between the Pre-test and the Post-test performance on Achievement in Chemistry for the Experimental Group-I and Experimental Group-II students at Higher Secondary Level.
2. There is a significant difference between the Experimental Group-I and Experimental Group-II students in the Post-test performance on Achievement in Chemistry at Higher Secondary Level.

METHODOLOGY

The Experimental method was used in this study. The sample is drawn by applying a purposive sampling technique and it consisted of 132 XI standard students from Thiruvalluvar Higher Secondary School (THSS), Gudiyattam, Vellore District in Tamil Nadu. Four Units from XI standard Samacheer Kalvi Syllabus was taught to these students. The investigator constructed and validated the Achievement in the Chemistry test. It consisted of 100 multiple choice questions (25 from each Unit) these were selected on the basis of higher values of discrimination indices above 0.20 and difficulty indices between 25% to 75%. After the experimental treatment, a post-test was given to the samples. The statistical techniques used in this study were 't' - test.

Review of Related Studies:

Vasuki, Sudha, & Arthy Poornima (2014) reported about the Development and Validation of E-Content on French Revolution at Secondary Level. The objective of the study was to test the effectiveness of the developed e-content through peer group evaluation by way of the survey. Convenience sampling techniques was used for this study. 20 M.Ed. students from Department of Educational Technology at Bharathidasan University in Tamil Nadu were taken as their sample. The findings showed that the e-content is effective in teaching History at secondary level and there is no significant difference between the urban and rural, male and female scholars with regard to the effectiveness of e-content.

Belias Dimitrios, Sdrolias Labros, Kakkos Nikolaos, Koutiva Maria & Koustelios Athanasios (2013) studied the difference between traditional teaching methods and teaching through the application of information and communication technologies in the accounting field. The main aim of this study was to identify and present different views and research findings on the key issue of teaching accounting, internationally. The findings of this study stated that from the availability of the former teaching practices, students mainly prefer personalized teacher-centred methods; they also recommend the aforementioned practices as ancillary tools to the traditional method, rather than key learning tools in the courses taken.

Rosa & Preethi (2012) studied about the effectiveness of multimedia instructional package for teaching marketing management among higher secondary school students. The main objective of this study was to find out the effectiveness of multimedia instructional package prepared in teaching of marketing management at higher secondary level and to find out the effectiveness of multimedia instructional package over existing method of the achievement of marketing management of higher secondary level. The sample

consisted of 90 higher secondary school students (XII standard) from Palakkad district. The findings from this study stated that multimedia instructional strategy has greater effectiveness than the present method and Multimedia instructional package is more effective in teaching marketing management.

Ramganesh (2012) focussed a study on Effect of Self-regulatory Strategies with Interactive Multimedia on Problem solving ability of higher secondary students in Physics. The main objective of this study was to find out the effectiveness of Self-regulatory strategy with multimedia learning materials among the students. 90 high school students from standard XII of S.R.V.S National higher secondary school, Karaikal was taken as sample for this study. The findings showed that Self-regulatory strategies with multimedia were found to enhance self-regulatory awareness, Student Attitude towards learning Physics and knowledge towards Information and Communication Technology.

Results and Discussion:

Differential Studies:

Hypothesis 01: There is a significant difference between the Pre-test and the Post-test performance on Achievement in Chemistry for the Experimental Group-I and Experimental Group-II students at Higher Secondary Level.

Table- 1

Pre-test Vs Post-test

Experimental Group-I

The table 1 furnishes the data of the Pre-test and Post-test performance on Achievement in Chemistry for the Experimental Group-I at Higher Secondary Level.

Unit	Group	Mean	S.D	't'	L.S
1	Pre - test	23.21	13.48	25.60	S
	Post- test	81.45	12.02		
2	Pre - test	25.58	8.53	29.53	S
	Post- test	80.48	12.87		
3	Pre - test	26.85	14.80	21.48	S
	Post- test	75.82	12.34		
4	Pre - test	25.39	16.54	21.76	S
	Post- test	79.15	11.56		

S- Significant

From the table-1, it is inferred that there is a significant difference between the Pre-test performance and the Post-test performance on Achievement in Chemistry Units 1 to 4 for the Experimental Group-I students at 0.05 level of significance in favour of the Post-test. The mean value of Post-test performance for

the Experimental Group-I is greater than the mean value of the Pre-test. It is due to the Effectiveness of Teaching through Multimedia Approach.

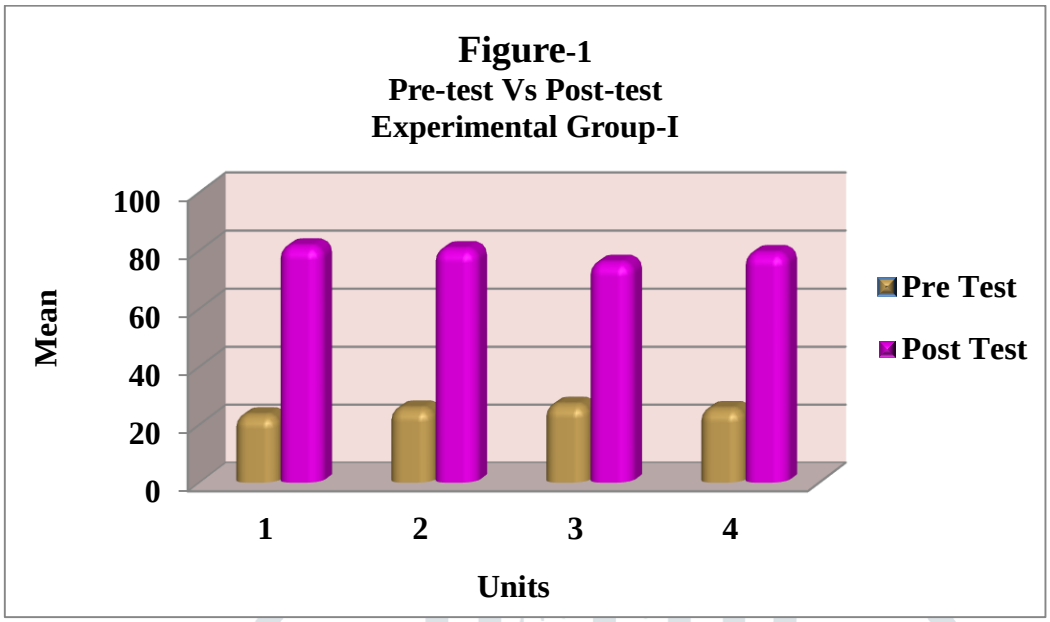


Table-2 furnishes the data of the Pre-test and Post-test performance on Achievement in Chemistry for the Experimental Group-II at Higher Secondary Level.

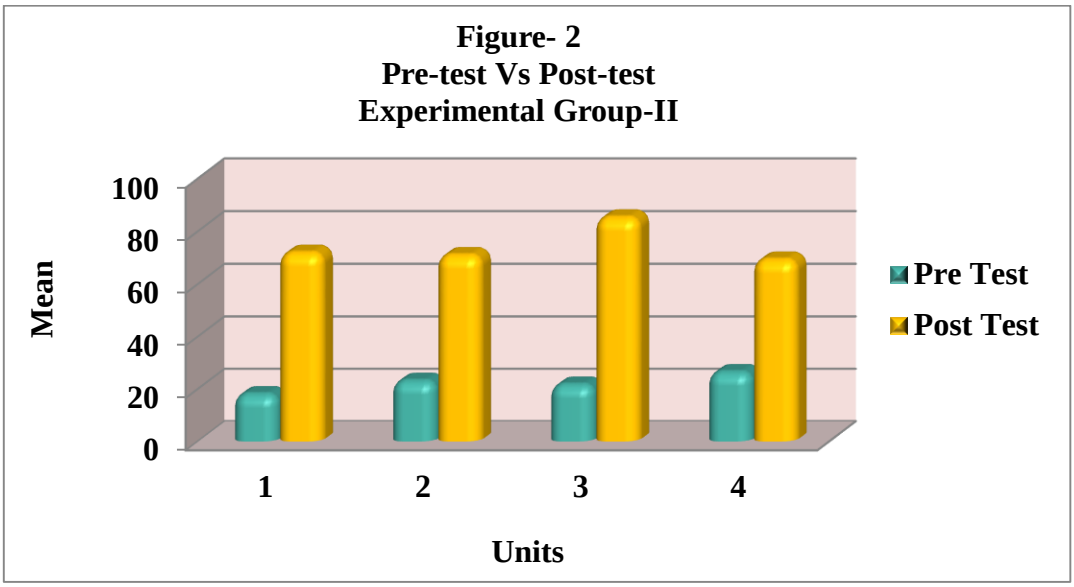
Table- 2

Pre-test Vs Post-test

Experimental Group-II

Unit	Group	Mean	S.D	't'	L.S
1	Pre - test	18.00	12.62	24.87	S
	Post- test	71.88	12.47		
2	Pre - test	23.09	10.28	22.26	S
	Post- test	70.97	12.26		
3	Pre - test	21.64	10.85	33.96	S
	Post- test	85.27	11.79		
4	Pre - test	26.42	16.20	17.25	S
	Post- test	69.27	15.03		

From the table-2, it is inferred that there is a significant difference between the Pre-test performance and the Post-test performance on Achievement in Chemistry Units 1 to 4 for the Experimental Group-II students at 0.05 level of significance in favour of the Post-test. The mean value of Post-test performance for the Experimental Group-II is greater than the mean value of the Pre-test. It is due to the Effectiveness of Teaching through the e-Content Module.



Hypothesis 02: There is a significant difference between the Experimental Group-I and Experimental Group-II students in the Post-test performance on Achievement in Chemistry at Higher Secondary Level.

The table 3 furnishes the scores of the Post-test performance on Achievement in Chemistry for the Experimental Group-I and Experimental Group-II students at Higher Secondary Level.

Table 3

Experimental Group-I Vs Experimental Group-II

Post-test

Unit	Group	Mean	S.D	't'	L.S
1	Experimental-I	81.45	12.02	9.10	S
	Experimental-II	71.88	12.47		
2	Experimental-I	80.48	12.87	8.01	S
	Experimental-II	70.97	12.26		
3	Experimental-I	75.82	12.34	9.60	S
	Experimental-II	85.27	11.79		
4	Experimental-I	79.15	11.56	5.41	S
	Experimental-II	69.27	15.03		

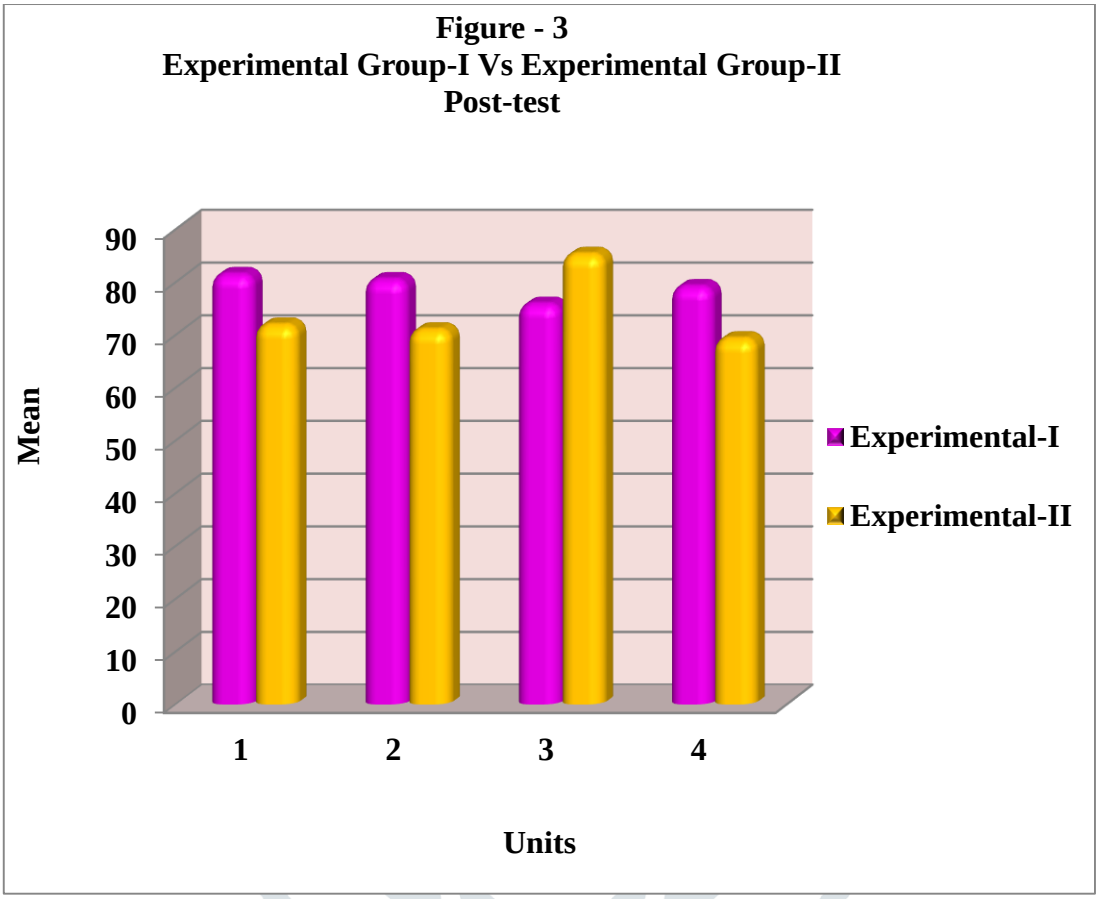
From the table-3, it is inferred that there is a significant difference between the Experimental Group-I and the Experimental Group-II in the post-test performance on Achievement in Chemistry Units 1, 2 and 4 at Higher Secondary Level.

The Post-test mean values of the Experimental Group-I in Unit-1 (81.45), Unit-2 (80.48), and Unit-4 (79.15), is greater than its peer Post-test mean values of the Experimental Group-II in Unit-1 (71.88) Unit-2 (70.97), and Unit-4 (69.27), It shows the effectiveness of teaching through Multimedia Approach. Teacher

and students interacted interestingly. The post-test performance showed a difference at 0.05 level of significance in these three units in favour of Experimental Group-I students.

The Post-test mean values of the Experimental Group-II in Unit-3 (85.27), is greater than Post-test mean values of the Experimental Group-I in Unit-3 (75.82), It shows the effectiveness of teaching through e-Content Module. The post-test performance showed a difference at 0.05 level of significance in unit-3 in favour of Experimental Group-II students.

Figure - 3
Experimental Group-I Vs Experimental Group-II
Post-test



In this e-Content Module the student was unable to clear their additional doubts periodically. In Multimedia, teacher-students interaction improved their relation and Innovative Videos with periodical clearance in doubt makes the students easily understand the concepts.

CONCLUSION

Post-test performance for Achievement in Chemistry through Multimedia and e-Content is greater than the mean value of its pre-test. The students Achievement scores are greater when learned through Multimedia than e-Content Module. The students learned well through Innovative Videos in the presence of Teacher Educator and clarified their doubts periodically.

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