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IMPACT OF VIDEO-BASED DIGITALLEARNING METHOD IN LEARNING CHEMISTRY AMONG THE STUDENTS OF STANDARD IX

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ABSTRACT

The present study illuminatesVideo-Based Digital learning methodwhich enhanced the achievement of students in learning chemistry. Many studies performed on effectiveness of Video-Based Digital leaning method in chemistry. In many studies, it was found that the Video-Based Digital learning methodwas significantly superior to conventional methods in learning chemistry at school level. ***Objectives of the study:****1.To find out the significant difference in achievement mean score between the pre test of control group and post test of control group.3.To find out the significant difference in achievement mean score between the pre test of Experimental group and post test of Experimental group. 3.To find out the impact of Video-based Digital learning method in learning Chemistry.* ***Methodology****: Equivalent group Experimental method was adopted in the study.* ***Participants****: sixty students of standard IX were selected as sample from Kerala.* ***Instrumentation:*** *Researcher's self-made achievement test was used as instrumentation for the study.* ***Findings:****Video-based Digital learning learningmethod is more effective than traditional methods in learning chemistry for the students of standard IX.* ***Educational implications****: It can be implemented in other levels and all other schools in Kerala.*

KEY WORD: *Video-based Digital learning method, Control group, Experimental group and Text book of science.*

INTRODUCTION

Chemistry is an experimental science and cannot be separated from laboratory work. For students to have a meaningful learning coupled with in-depth understanding of chemistry, they need to be able to conduct experiments and be familiar with a range of laboratory skills. It is therefore necessary to give them supplementary experience in laboratory work.Many studies suggested integrating technology that includes video in teaching and learning may increase students' understanding, attention and interest in exploring scientific ideas. It is a worldwide demand for integrating technology in science teaching. This paper presents an analysis of the types of educational video based digital learning that were used in the field of chemistry education as well as identification of exemplars, the advantages and disadvantage of each educational video based digital learning, particularly in the field of chemistry. Therefore, with the improvement of technology, chemistry learning has to be more attractive and interactive to provide meaningful learning to the student (Pryor & Bitter, 2008). Technology, as a teaching aid, can provide the picture of the concept behind the process that is applied. Innovative and interactive approaches to teaching and learning of chemistry engage students more intimately as compared with the customary classroom method (Lerman, 2003).

REVIEW OF RELATED STUDIES

Nadelson, Louis S et.al (2015) investigated the Consistent, high-quality introductions to organic chemistry laboratory techniques effectively and efficiently support student learning in the organic chemistry laboratory. In this work, we developed and deployed a series of instructional videos to communicate core laboratory techniques and concepts. Using a quasi-experimental design, we tested the videos in five traditional laboratory experiments by integrating them with the standard pre-laboratory student preparation presentations and instructor demonstrations. We assessed the influence of the videos on student laboratory knowledge and performance, using sections of students who did not view the videos as the control. Our analysis of pre-quizzes revealed the control group had equivalent scores to the treatment group, while the post-quiz results show consistently greater learning gains for the treatment group. Additionally, the students who watched the videos as part of their pre-laboratory instruction completed their experiments in less time.

NEED AND SIGNIFICANCE OF THE STUDY

Students of standard IX studying in Kerala faced problems in learning chemistry. Conventional teaching methods practiced in the classroom transactions were not fruitful to achieve the expected scoring of marks of the learners in chemistry. Conventional methods of chemistry class room transactions at standard IX have been created monotony and reduced the interest of the learners. Hence the researcher endeavored to find an innovative method namely Video-based Digital learning methodfor learning of chemistry and found out the effectiveness of the Video-based Digital learning methodin the classroom among the selected students.

STATEMENT OF THE PROBLEM

Students of standard IX studying in Government Model Higher secondary school faced some problems to learn Chemistry by using traditional teaching methods. Traditional methods did not enhance the competency of the learners in Chemistry. Due to the problems of learning chemistry, many students failed to continue their studies. Hence the Investigator adopted Video-based Digital learning method **to eliminate the problems of bloomers, learners of Government Model Higher secondary school.**

SCOPE OF THE STUDY

Video-based Digital learning method**is more lucrative of the students in learning Chemistry. Activating the students by using different methods namely** Video-based Digital learning method **for teaching hard spots of the learners in chemistry can be a successful task. Learners of government schools concentrate on** Video-based Digital learning method**which endeavours to increase the scope of the learners with enthusiasm. All types of learners are bewitched by** Video-based Digital learning method**in learning Chemistry. It can be extended to all High schools and Higher secondary levels for learning Chemistry.**

OPERATIONAL DEFINITION

Impact –refers to using Video-based Digital learning methodamong the students of standard IX in learning chemistry in science book of standard IX. **Video-based Digital learning method**– refers to combination of Video-lesson, Video clippings, Static and Digital learning. Adopting all the selected Video-based Digital learningas treatment given to the students for enhancing effectiveness in achievement score of chemistry. **Learning –** Learning Chemistry at standard IX in Kerala .**Chemistry** – Chemistry at standard IX prescribed by the KeralaText Book society. **Students** –Students of IX studying in Government Model Higher secondary school, Kozhikode. **Standard IX-** Ninth standard is considered after passing eighth standard**.**

OBJECTIVES

1.To find out the significant difference in achievement mean score of the students between the pre-test of control group and the post- test of Control group among the students of standard IX inGovernment Model Higher secondary School, Kozhikode(Urban) with respect to (a)Electron configuration (b) Ionic Bonding (c) Covalent bonding(d) Electro Negativity (e)Polar nature (g) Valency(h) Oxidation.
2.. To find out the significant difference in achievement mean score of the students between the Pre-test of Experimental group and the Post- test of Experimental group among the students of standard IX in Government Model Higher secondary School, Kozhikode(Urban) with respect to (a)Electron configuration (b) Ionic Bonding (c) Covalent bonding(d) Electro Negativity (e)Polar nature (g) Valency(h) Oxidation.

HYPOTHESES

1.There is no significant difference in achievement mean score of the students between the pre-test of control group and the post- test of Control group among the students of standard IX in Government Model Higher secondary School, Kozhikode(Urban) with respect to (a)Electron configuration (b) Ionic Bonding (c) Covalent bonding(d) Electro Negativity (e)Polar nature (g) Valency(h) Oxidation.
2.. There is no significant difference in achievement mean score of the students between the Pre-test of Experimental group and the Post- test of Experimental group among the students of standard IX in Government Model Higher secondary School, Kozhikode(Urban) with respect to (a)Electron configuration (b) Ionic Bonding (c) Covalent bonding(d) Electro Negativity (e)Polar nature (g) Valency(h) Oxidation.

DELIMITATIONS OF THE STUDY

1. This study is confined to conduct Experimental study only one school.
2. The study is confined to adopting Video-based Digital learning methodonly problematic areas in learning Chemistry.
3. The study is confined to ninth standard students belong to Government Model Higher secondary Schoolof Kozhikode district only.
4. The study is confined to ninth standard in Chemistry only.
5.Control group 30 sample and Experimental group 30 sample were confied for the study
6.Video-based Digital learning methodis based on the hard spot of the learners in science.

RESEARCH DESIGN

Method: Equivalent group Experimental method was adopted in the study.**Sample:** 60 students from Government Model Higher secondary School, Kozhikode(Urban) were selected as sample for the study. 3o students were considered as Control group and another 30 was considered as Experimental group.**Tools:** Achievement test was used as **Reliability of the tool:** 1.The reliability co-efficient for Achievement testwas established by split- half method and the correlation was calculated as **0.72**. **Validity of the Tool:** After pilot study, the tool was given to the experts in the field of education to get their valuable suggestions and opinions with regard to construction.

ACTIVITIES IN THE STUDY

1. Demonstration Video.
2. Multimedia laboratory Learning Science
3. Two videos-based lessons illustrated the step-by-step procedures of an experiment demonstrating the reactivity of elements were used for the classroom instruction.
4.Classroom instruction was designed to convey three activities to be performed by the students during the lesson. At the beginning of the instruction, students were systematically grouped and a worksheet was distributed among the groups. The worksheet required students to identify their previous knowledge, experiences and information about the subject.
5.After logical conclusions were turned in by each student, the second video clip was played to demonstrate another set of chemical reactions.

This activity engaged students in moving between utilization of video and their scientific understanding in learning science or chemistry. It led students to concentrate and pay full attention to the video played to comprehend the concept, thereby forming the best conclusion along with a strong explanation. Results from the interviews after finishing the activity indicated that about 50% of students preferred the video method while another 50% favoured the live demonstration.

ANALYSIS AND INTERPRETATION

The collected data were screened and grouped. In the present study t testwas employed to measures difference between two variables and the data was analyzed with the help of SPSS. The results and interpretation were tabulated and presented as follows –

Hypothesis-1:There is no significant difference in achievement mean score of the students between the Pre-test of control group and the Post- test of Control group in Government Model Higher secondary School with respect to (a)Electron configuration (b) Ionic Bonding (c) Covalent bonding(d) Electro Negativity (e)Polar nature (g) Valency(h) Oxidation.

Table :1

Mean difference between the Pre-test of control group and the Post- test of Control group in Government Model Higher secondary School with respect to (a)Electron configuration (b) Ionic Bonding (c) Covalent bonding(d) Electro Negativity (e)Polar nature (f) Valency (g) Oxidation.

Sl.No	School name	Dimension	Tests	N	Mean	S.D	't' value	Level of Significant at 0.05 Level
1(a)	Government model Hr.sec school	Electronic configuration	Pre-test control group	30	1.03	0.765	0.32	NS
			Post-test control group	30	1.07	0.691		
(b)		Ionic Bonding	Pre-test control group	30	0.90	0.960	0.57	NS
			Post-test control group	30	0.83	0.913		
(c)		Covalent Bonding	Pre-test control group	30	1.10	1.807	1.65	NS
			Post-test control group	30	0.87	1.332		
(d)		Electro Nagativity	Pre-test control group	30	1.04	0.77	0.32	NS
			Post-test control group	30	1.08	0.69		

e		Polar nature	Pre-test control group	30	0.67	0.661	0.57	**NS**
			Post-test control group	30	0.63	0.615		
f		Valency	Pre-test control group	30	0.33	0.479	1.00	**NS**
			Post-test control group	30	0.33	0.479		
g		Oxidation	Pre-test control group	30	0.93	0.980	2.00	**NS**
			Post-test control group	30	1.00	1.050		

The calculated 't' values are (a), (b), (c), (d), (e) ,(f) and (g) respectively 0.32, 0.57, 1.65,0.32, 0.57,1.00 and 2.00 is less than the table value 1.96 at 0.05 level. The null hypothesis is accepted. Hence,there is no significant difference between the Pre-test of control group and the Post- test of Control group in Government Model Higher secondary School with respect to (a)Electron configuration (b) Ionic Bonding (c) Covalent bonding (d) Electro Negativity (e) Polar nature (f) Valency (g) Oxidation.

Hypothesis-2:: There is no significant difference in achievement mean score of the students between the Pre-test of Experimental group and the Post- test of Experimental group in Government Model Higher secondary School with respect to (a)Electron configuration (b) Ionic Bonding (c) Covalent bonding(d) Electro Negativity (e)Polar nature (f) Valency (g) Oxidation.

Table :2

Mean difference between the Pre-test of Experimental group and the Post- test of Experimental group in Government Model Higher secondary School with respect to (a)Electron configuration (b) Ionic Bonding (c) Covalent bonding(d) Electro Negativity (e)Polar nature (g) Valency (h) Oxidation.

Sl.No	School Name	Dimension	Tests	N	Mean	S.D	't' value	Level of Significant at 0.05 Level
(a)	Government Model Hr.sec school	Electronic configuration	Pre-test Experimental group	30	0.55	0.711	10.08	**S**
			Post-test Experimental group	30	2.68	1.118		
(b)		Ionic Bonding	Pre-test Experimental group	30	0.62	0.665	6.52	**S**

			Post-test Experimental group	30	2.08	0.975		
(c)		Covalent Bonding	Pre-test Experimental group	30	1.18	1.528	11.20	**S**
			Post-test Experimental group	30	5.38	1.959		
(d)		Electro Negativity	Pre-test Experimental group	30	0.42	0.644	7.90	**S**
			Post-test Experimental group	30	2.08	1.075		
(e)		Polar nature	Pre-test Experimental group	30	0.65	0.618	4.48	**S**
			Post-test Experimental group	30	1.33	0.479		
(f)		Valency	Pre-test Experimental group	30	0.37	0.490	5.83	**S**
			Post-test Experimental group	30	0.97	0.183		
(g)		Oxidation	Pre-test Experimental group	30	1.17	1.117	6.29	**S**
			Post-test Experimental group	30	3.08	1.463		

The calculated 't' values are (a), (b), (c),(d),(e) ,(f) and (g) respectively 10.08,6.52,11.20,7.90,4.48,5.83 and 6.29 is greater than the table value 1.96 at 0.05 level. The null hypothesis is rejected. Hence,there is significant difference between the Pre-test of Experimental group and the Post- test of Experimental group in Government Model Higher secondary School with respect to (a)Electron configuration (b) Ionic Bonding (c) Covalent bonding(d) Electro Negativity (e)Polar nature (f) Valency (g) Oxidation.

FINDINGS AND DISCUSSIONS

1. There is no significant difference in achievement mean score of the students between the Pre-test of control group and the Post- test of Control group in Government Model Higher secondary School with respect to (a)Electron configuration (b) Ionic Bonding (c) Covalent bonding(d) Electro Negativity (e)Polar nature (g) Valency(h) Oxidation.
2. There is significant difference in achievement mean score of the students between the Pre-test of Experimental group and the Post- test of Experimental group in Government Model Higher secondary School

with respect to (a)Electron configuration (b) Ionic Bonding (c) Covalent bonding(d) Electro Negativity (e)Polar nature (f) Valency (g) Oxidation.

Taylor and Francis analyses that there are five types of videos that were widely used in chemistry classroom teaching such as demonstration video, instructional video, simulation video, tutorial video and video games. In one hand, several advantages are identified: first, the use of educational video is self-accessible; second, interesting; third, safety for students to conduct the hazardous experiment. On the other hand, several barriers are identified: first, using educational video should be aligned with educational standards; second, limited hours of school; third, accessibility at school.

EDUCATIONAL IMPLICATIONS

- The students may be given through orientation on the nature, the functions and effects of different teaching techniques in learning science concepts, which can create interest and involvement among students in learning chemistry.
- The academicians and the authorities may work out the practicability of the *Video-based Digital learning method*for students that may help them to overcome the difficulties faced in learning chemistry.
- Teachers may be trained to prepare Video-based Digital learning methodfor different subjects.

CONCLUSION

This study has revealed that the Video-based Digital learning methodfor learning chemistry is more effective than conventional methods in the classroom among the selected students . The study confirmed the learning through Video-based Digital learning methodwhich helped in improving the achievement scores of students in Chemistry. Hence, it is the need of the day to develop and introduce such Video-based Digital learning methodthat may be suitable for Indian schools, for the betterment of all the students.

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