Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 7, Issue, 02, pp.12800-12802, February, 2015

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

ISSN: 0975-833X

RESEARCH ARTICLE

EFFECTIVENESS OF E-CONTENT ON "CRYSTAL SYSTEMS" IN TEACHING PHYSICS TO FIRST YEAR ENGINEERING STUDENTS

***, [1] Mr. P. Gershom Jebaraj and [2]Dr. K. Mohanasundaram**

[1]Department of Physics, V.S.B. Engineering College, Karur, Tamilnadu, India
[2]Principal, Government Arts College, Kumbakonam, Tamilnadu, India

ARTICLE INFO

Article History:
Received 25th December, 2014
Received in revised form
29th December, 2014
Accepted 05th January, 2015
Published online 28th February, 2015

Key words:
e-Learning, e-Content,
Engineering Physics,
Crystal Systems,
Achievement, Effectiveness.

ABSTRACT

In this era of modernization, possibilities are emerging to provide technical education in an innovative way to meet global demands with the tremendous developments in technology. Educational Technology has been widely used all over the world. The Engineers of today and tomorrow are expected to be far more creative. A study was undertaken to develop an e-Content on 'Crystal Systems' which is prescribed in the Syllabus of First Year Engineering Physics subject of "Anna University, Chennai, Tamil Nadu". This study also measured the effectiveness of the developed e-Content. A pre-test, post-test two group experimental design was adopted. Samples of 60 First Year Engineering students were exposed to different treatments such as e-Content and conventional method of teaching. Their achievement scores were analyzed using different statistical techniques. It is found that the experimental group students who taught with the help of e-Content material scored more than the control group in learning "Crystal Systems".

INTRODUCTION

Engineers of today and tomorrow are expected to be far more creative and innovative. With the help of new kind of educational programmes we can provide multidimensional and multi disciplinary educational experiences to the learners. Electronic learning or e-Learning is a general term used to refer computer enhanced learning. It is the employment of technology to enrich learning process. It complements traditional learning. It puts the learner in the center instead of the educator. It is dynamic, operates in real time, empowering, individual, comprehensive and effective. It allows the learners to interact with the learning material for maximum retention of the gained knowledge.

Objectives

Main objective of the present study is to find out how far the developed e-Content on "Crystal Systems" is effective over the conventional method.

Following are the other objectives of the present study

1. To develop an e-Content on **"**Crystal Systems".
2. To validate the developed e-Content.
3. To find out the effectiveness of developed e-Content in improving the academic achievement of first year Engineering students.
4. To find out the differences in academic achievement between the First Year Engineering Students learning "Crystal Systems" through e-Content with respect to the variables such as Gender (Male, Female), Type of Student (Hosteller, Day Scholar), Seat Allotment (Government Quota/Management Quota).

Hypotheses

1. The first year Engineering students learning "Crystal Systems" through e-Content and through conventional method differ in their academic achievement.
2. The male first year Engineering students learning "Crystal Systems" through e-Content and through conventional method differ in their academic achievement.
3. The female first year Engineering students learning "Crystal Systems" through e-Content and through conventional method differ in their academic achievement.
4. The first year Engineering students staying in hostel learning "Crystal Systems" through e-Content and through conventional method differ in their academic achievement.
5. The first year Engineering students coming as day scholars learning "Crystal Systems" through e-Content

Corresponding author: Mr. P. Gershom Jebaraj,
Department of Physics, V.S.B. Engineering College, Karur, Tamilnadu, India.

and through conventional method differ in their academic achievement.

6. The first year Engineering students admitted under Government Quota learning "Crystal Systems" through e-Content and through conventional method differ in their academic achievement.
7. The first year Engineering students admitted under Management Quota learning "Crystal Systems" through e-Contents through conventional method differ in their academic achievement.
8. The e-Content is more effective in improving the academic achievement of First Year Engineering Students in understanding the "Crystal Systems" than the conventional teaching method.

Experimental Procedure

First Year Engineering Students of two different Classes of V.S.B. Engineering College, Karur were selected as the sample for the present study. In one Class 30 students have been selected for Experimental group and in another Class 30 students have been selected for Control group on the basis of pre achievement scores. The sample for the study was further divided into various groups based on Gender, Type of Stay and Seat Allotment. Here both the groups were equally matched in terms of their knowledge at Pre-test level. The study followed pre test, post test equivalent groups design. The samples of two groups were subjected to different treatments. After one week, the experimental group was taught through the e-content and the control group was taught through the traditional teaching.

At the end of the treatment, the post-achievement test was administered to both the control group and experimental group. It is shown in Table 1. The difference between the mean scores of control and experimental group was analyzed by using appropriate statistical techniques. The results are tabulated in the following Tables. The scores obtained by the First Year Engineering Students were converted into percentages for easy analysis.

Tools

The following tools are employed in this present study:

1. Intelligent Test–Test of "g": Culture Fair-Scale 2, (Form B), developed and validated by R.B. Cattell and A.K.S. Cattell.
2. e- Content on "Crystal Systems" developed and validated by the investigators for teaching Physics to the First Year Engineering Students.
3. Achievement Test in "Crystal Systems" developed and validated by the investigators to measure the academic achievement of the First Year Engineering Students.

Data Analysis

The marks scored by the First Year Engineering Students in the Pre and Post Achievement tests were analyzed using "t" Test. It is shown in the Table 2.

The mean Gain score for the control and experimental group are shown in Table 3.

Table 1. Design of Experiment

S.No	Control group	Experimental group
1	Pre-test	Pre-test
2	Conventional Teaching	Teaching through e-Content
3	Post test	Post test

Table 2. Analysis of Pre-Test and Post-Test scores of Control and Experimental Groups

Test	Variable	Group	N	M	S.D	"t"	Level of Significance
Pre-Test	Whole Group	Control	30	14.50	1.68	1.17	Not Significant
		Experimental	30	14.63	1.72		
Post-Test	Whole Group	Control	30	47.60	7.54	19.43	Significant
		Experimental	30	76.58	5.95		
Post-Test	Male	Control	14	45.78	7.85	16.03	Significant
		Experimental	17	77.35	4.64		
Post-Test	Female	Control	16	46.70	7.09	15.76	Significant
		Experimental	13	79.65	5.46		
Post-Test	Hosteller	Control	16	43.40	6.80	13.45	Significant
		Experimental	15	78.75	4.95		
Post-Test	Day Scholar	Control	14	39.50	6.75	12.95	Significant
		Experimental	15	79.05	5.10		
Post-Test	Government Quota	Control	13	47.78	7.85	16.03	Significant
		Experimental	16	77.65	4.45		
Post-Test	Management Quota	Control	17	45.70	7.25	15.65	Significant
		Experimental	14	74.65	5.50		

Table 3. Mean gain score for the control and experimental groups

Group	N	Mean Gain	Possible Maximum Gain	% of Gain
Control	30	38.85	100	38.85
Experimental	30	74.75	100	74.75

Findings

It is observed that the pre-test scores of the control group and experimental group is almost same with no significant difference between them before treatment. When the post-test scores are considered, both the groups had shown significant differences.

1. The male students in the experimental and control groups differ in their achievement. The female students in the experimental and control groups differ in their achievement.
2. The experimental and control group Engineering students those who are staying in Hostel differ in their achievement. The experimental and control group Engineering students those who are coming as Day Scholars differ in their achievement.
3. The experimental and control group Engineering students admitted under Government Quota differ in their achievement. The experimental and control group Engineering students admitted under Management Quota differ in their achievement.

From the Table 2, significant statistical difference is noted between the scores of pre-test and post-test of both the experimental and control groups. Hence, it is concluded that the First Year Engineering students in the experimental group who learned "Crystal Systems" through the developed e-Content are at the higher level in their academic achievement than the students of the control group who learned "Crystal Systems" through conventional method. So the developed e-Content is more effective than the conventional method in teaching "Crystal Systems" to the First Year Engineering Students.

Recommendations of the Present Study

1. Teaching Engineering Physics Subject through conventional methods should be reduced. Newer instructional technologies like e-Contents shall be introduced in Engineering Colleges for all subjects. e-Content approach shall be extended to teach the subjects like English, Chemistry Mathematics, Environmental Science and other core subjects in all the Engineering Colleges.
2. The Assistant Professors, Associate Professors and Professors of the Engineering Colleges shall be trained to develop e-Contents in their own field. In-service training and orientation programmes shall be conducted for them in regular intervals regarding the development and implementation of e-Contents.

Conclusion

The investigators have developed an e-Content on "Crystal Systems". This present study clearly indicated that the developed e- content on "Crystal Systems" is more effective in teaching Engineering Physics to the First Year Engineering Students.

e- Learning is the latest catchphrase today. It breaks all barriers such as geographical, cultural, gender and time. It will enhance the flexibility and innovativeness of open learning. The learners will find more and more avenues of learning and they can get the knowledge that will be more relevant in this age of digital revolution.

REFERENCES

Anandakrishnan, M. 2008. Educational Responses to Global Competitiveness. Education Plus. The Hindu, January 7, 2008, pp-8.

Gershom Jebaraj, P. 2013. A Text Book of Engineering Physics-I. *S C M Publishers,* Erode.

Jebaraj G. P. and Mohanasundaram, K. 2008. Effectiveness of e-Content in Teaching of Physics at Tertiary Level. *Journal of Educational Research and Extension,* Volume 45 (1), January- March 2008, ISSN: 0973-6190, pp1-8.

Jeya Shanmugaraja *et al.* 2012. A study of Effectiveness of e-Content on Teaching Zoology at Higher Secondary Level. *International Journal of Current Research,* Volume (4), Issue (09), pp 205-206, ISSN:0975-833X.

Lizeron Eremias, R. and Subash, 2013. e- Content Development: A Milestone in the dynamic progress of e-Learning. *International Journal of Teacher Educational Research (IJTER),* Volume (2), No.(1), January 2013, pp43-49, ISSN: 2319-4642.

Mohanasundaram, K. and Gershom Jebaraj, P. 2007. Integrating Mobile Phone Technology in Teaching – Learning process at Higher Education Level. *University News,* Volume (45), Number (46), November 12-18, 2007, ISSN: 0566-2257, pp 8-12, 15.

Muppudathi, G. 2013. A Study on Experts' Validation of E-Content. *Indian Journal of Applied Research,* Volume (3), Issue (11), Nov 2013, pp150-151, ISSN - 2249-555X.

Nachimuthu, K. 2012. Need of e-Contents Development in Education. *Education Today, An International Journal of Education and Humanities, APH Publishers, New Delhi,* Volume (03) No. (02) July-Dec 2012, pp72-80, ISSN: 2229-5755.

Pio Albina, A. and Edward William Benjamin, A. 2013. Effectiveness of e-Content in teaching Mathematics for XI Students. *Indian Journal of Applied Research,* Volume (3), Issue (9), Sept 2013, pp183-184, ISSN: 2249-555X.

Ravi P Bhatia, 2011. Features and Effectiveness of e-learning Tools. *Global Journal of Business Management and Information Technology,* Volume 1, Number 1 (2011), pp. 1-7.

Rekha, N. and Muthuchamy, I. 2013. Development and Validation of e-Content on DNA Replication in Botany at Higher Secondary Level. *International Journal of Scientific and Research Publications,* Volume (3), Issue (6), June 2013, pp1-3, ISSN:2250-3153.

****