The Impact of Database Technology on Learning Physics at Undergraduate Level

R. Nandhakumar, K. Govindarajan

Abstract: *With the advent of the computer technologies, the learner's capabilities are increased. An effective system of learning leads to result in the learner's abilities, development of their competencies and transformation of their interests. Students undergoing undergraduate programmes are learning the subject matter effectively and interacting on content easily with the support of various kinds of computer technologies. If the learners are rightly oriented about the technology in learning, it will certainly be a helping tool in uplifting the learning abilities. Database technology is an emerging technology used in many fields. The researcher developed software using database technology with the objective to find out level of performance in learning among the undergraduate students who are opting physics as main subject. To study the effect of database technology as compared to the conventional methods of learning, the investigator adopted Two group Experimental design where two groups were treated with different learning strategies. A sample of 71 undergraduate students from 4 Arts and Science Colleges in Thanjavur district of Tamilnadu state in India are selected for the study. The present study is an attempt to examine the impact of database technology on learning physics at undergraduate level. The researcher employed experimental method for the study. Data were analyzed using Z-test. Findings reveal that there is a significant difference in the usage of database technology among male and female students, rural and urban students and Tamil and English medium students. This software can be used to store, retrieve and update the selected content from the electronic resources.*

Keywords : *Computer technology, Database Technology, Learning of Physics, Learning resources*

I. INTRODUCTION

Physics still continues to be an important discipline in all the Indian universities. The study of physics inculcates rational, logical and creative approach. Students who are opting physics as main subject have faced difficulties in learning. One of the problem generally faced by the learners are selecting and organizing the appropriate learning resources.

Though lot of facilities available now a days, still students are facing difficulties in identifying the appropriate learning materials and store it for future references. Technology enabled learning is the application of some form of digital technology to teaching and /or learning in an educational context. (Kirkwood and Price., 2016).[2] A software developed using database technology will support learner to store, update and retrieve appropriate learning material. It is the learner centered approach.

II. SIGNIFICANCE OF THE STUDY

India, today, has about 50,000 higher education institutions catering to about 36.6 million learners(MHRD, 2018).[3]. Computers have a tremendous influence on learning of subjects like Physics in colleges. Database technology is applied to promote learning skills. Database is an assembled group of data. Database is a computerized record keeping system. A database allows easy and efficient storage, retrieval and modification of data regardless of the amount of data being used. Fast workability, ability to analyze large amount of data at one time, ability to get information in a variety of media, advantage of updating the data and interactivity are some of the advantages that the use of information and communication technology in learning has. (Gibson et al., 2018) [1] Techniques and technological devices have been developed to store and manage information. The concepts, principles, phenomena and experimental procedures in physics are to be searched from different resources like books, internet etc., The students use internet for knowledge development, seeking career guidance and professional development. (Nirmal and Udayarekha., 2017)[5].There is provision for storage. Learner can store in sequential order and further use it whenever it is necessary. Achievement test is conducted to study the effectiveness of database technology in learning of physics.

III. STATEMENT OF THE PROBLEM

Physics as a discipline has several sub branches. From the learner's view point, finding appropriate learning material is a difficult task. This is because there are several learning resources including books, internet, and journals are available. It is difficult for the learner to search the appropriate learning material according to their level of intelligence. The investigator has made an attempt to study the effect of Database technology developed for learning Physics.

R.Nandhakumar*, Research Scholar, Department of Education, Alagappa University, Karaikudi.Tamilnadu

Dr.K.Govindarajan, Assistant Professor and Research supervisor Department of Education, Alagappa University, Karaikudi.Tamilnadu.

The investigator has selected the problem "The impact of Database Technology on learning Physics at Undergraduate level".

IV. OBJECTIVES

- To find out the level of usage of database technology among undergraduate students.
- To find out the level of performance of undergraduate students opting Physics as main subject.
- To find out difference, if any, in usage of database technology with regard to gender.
- To find out difference, if any, in usage of database technology with regard to locality.

V.HYPOTHESES

- There is no significant difference in the usage of database technology among undergraduate students.
- There is no significant difference in the use of database technology on learning Physics with respect to gender.
- There is no significant difference in the use of database technology on learning Physics with respect to locality.

VI. METHOD ADOPTED FOR THE PRESENT STUDY

The experimental method was adopted for the present study to find out the impact of database technology on learning Physics at Undergraduate level.

VII. POPULATION AND SAMPLE FOR THE PRESENT STUDY

The population for the present study consists of the Undergraduate students who are opting Physics as main subject in Arts and Science colleges affiliated to the Bharathidasan University. A sample of 71 undergraduate students from 4 Arts and Science Colleges in Thanjavur district is selected for the study. The size of the experimental group is 38 and 33 students are in the control group.

VIII. PROCEDURE

For the present study, the researcher has developed and used the software using database technology. This software was made available in the cloud.[4] Each student who has opted to use database technology has assigned login credentials.

The researcher conducted an achievement test. The students of control group were subjected to the pre test. The control group was exposed to the conventional method of learning. After the completion of the learning sessions, the investigator administered the post test.

The experimental group was subjected to the pre test. Then the experimental group was exposed to the database technology. They were permitted to take own time to complete the learning. The students were again assessed with the help of the achievement test which was used for pre test.

IX. STATISTICAL TECHNIQUES USED

For analysis of data, the investigator used mean, standard deviation, Z test.

X.DATA ANALYSIS

Hypothesis 1:

There is no significant difference in the usage of database technology among undergraduate students

Table- I: Mean Gain Scores between Experimental and Control Groups

Group	Mean and Standard Deviation			Z-Value	Result
	Size(N)	Mean gain Score	S.D		
Experimental group	38	13.51	6.82	3.54	Significant
Control Group	33	10.63	6.64		

(At 0.05 level of significance)

The calculated Z value 3.54 is greater than the critical value 1.96 corresponding to the 0.05 level of significance. This indicates that the difference in mean scores under consideration was significant. Therefore there is significant difference between the experimental group and control group.

Hypothesis 2:

There is no significant difference in the use of database technology on learning Physics with respect to locality.

Table- II: Area – wise comparison of Achievement gain scores and students learn using Database Technology

Area	Mean and Standard Deviation			Z-Value	Result
	Size(N)	Mean gain Score	S.D		
Rural	28	12.39	5.47	1.3	Not significant
Urban	10	13.82	7.11		

(At 0.05 level of significance)

The calculated Z value 1.30 is lesser than the critical value 1.96 corresponding to the 0.05 level of significance. This indicates that the difference in mean scores under consideration was not significant. Therefore there is no significant difference between the rural students and urban students in using the database technology for learning physics.

Hypothesis 3:

There is no significant difference in the use of database technology on learning Physics with respect to gender.

Table- III: Gender – wise comparison of Achievement gain scores and students learn using Database Technology

Area	Mean and Standard Deviation			Z- Value	Result
	Size(N)	Mean gain Score	S.D		
Female	21	14.72	5.98	2.88	Significant
Male	17	11.48	7.59		

(At 0.05 level of significance)

The calculated Z value 2.88 is greater than the critical value 1.96 corresponding to the 0.05 level of significance. This indicates that the difference in mean scores under consideration was significant. Therefore there is significant difference between the male students and female students in using the database technology for learning physics.

XI. FINDINGS

- There is a significant difference between the use of database technology and the conventional learning methods.
- The level of performance of students who are opting database technology is high.
- There is no significant difference between students with rural background and students with urban background in using the database technology for learning Physics at the undergraduate level.
- There is significant difference between male students and female students in using the database technology for learning Physics at the undergraduate level.

XII. RESULT AND DISCUSSION

The researcher has developed the software and used experimental method to study the effect of database technology in learning of physics at under graduate level. After collecting the data the researcher analyzed using the statistical techniques. Results of the data analysis shows that the database technology provides significant change in the learning process. It is better than the conventional method of learning. However the performance of female students is slightly below the performance of male students.

XIII. RECOMMENDATIONS

- The database technology can be effectively used to store, update and retrieve the learning materials. Students must be encouraged to use the software.
- Learner centered learning is to be encouraged at the higher education

XIV. CONCLUSION

Computer technologies are used to resolve many problems in our life. Appropriate technology can be selected to develop the effectiveness of learning. Students who are opting physics as main subject are facing many problems in searching resources, storing in electronic gadgets and retrieving it whenever it is needed. Database technology is one of the computer technology that will help the learner to select, store and retrieve the subject matter. This will help them increase their abilities, develop their competencies and extend their interests.

REFERENCES

1. D.Gibson, T.Broadley, J.Downie, P.Wallet, "Evolving Learning Paradigms: Re-setting baselines and collection methods of ICT in Education", in *Journal of Educational technology and Society*, 2018, 21(2), pp.62-73.
2. Kirkwood and L. Price.(2016) "Technology Enabled Learning"-Implementation Handbook .[online] available http://oasis.col.org/handle/11599/2363.
3. MHRD, "All India Survey of Higher Education 2017-18". New Delhi; Department of Higher Education, 2018
4. R. Nandhakumar, K.Govindarajan (2019), "An effectiveness of database technology on some selected cognitive variables with respect to learning of Physics at undergraduate level" available http://139.59.57.143/CVLP/
5. Nirmal and Udayarekha, "Students attitude towards the use of internet for learning and career orientation – A study",in *Journal of Educational and Psychological research*, 2017,2(1), pp.24-37

AUTHORS PROFILE

R. Nandhakumar is undergoing Ph.D programme in Education at Alagappa University, Karaikudi, India under the supervision of Dr.K.Govindarajan (Second Author) who is working as an Assistant Professor at Alagappa University.. The author has completed his Post graduate degree in Physics from Annamalai University, Computer Applications in University of Madras and Education in Madurai Kamaraj University. The Author has published two articles in Physics, one in Computer applications and five in Education. He has presented more than 20 papers in national and international conferences. He has conducted project work in the field of telecommunication, Doctoral research in crystallography and now he is doing research in the field of learning of physics and database technology. He has completed 15 years of service in teaching at college level.

Dr. K. Govindarajan is working as Assistant Professor and Research supervisor in the Department of Education at Alagappa University, Karaikudi. The author has got his post graduate degrees in Commerce, Education and Businesss Administration from the Madurai Kamaraj University, Post graduate degree in Psychology from the University of Madras , Master of Philosophy from the Manonmaniam Sundaranar University.and Ph.D in Education from the Alagappa University, Karaikudi. He has put in more than 20 years of teaching experience in various universities like SASTRA University, Vinayaka Missions University and Alagappa University. He served as the Principal of the Department of Education at Vinayaka Missions University. He served as the Coordinator for B.Ed programmes of Distance mode at SASTRA Univerity and member of Board of studies in Alagappa University, SASTRA University and Vinayaka Mission University. He has acted as chief superintendent for conducting University examinations of University of Madras and SASTRA University. He has conducted research in various fields like Educational Psychology, Education Management, and Educational technology and Research methodology is his area of interest. He has visited Singapore, Malaysia and Srilanka to act as a chairperson in international conferences. He has published 80 articles in reputed journals and presented papers in national and international conferences. He has organized many International and National conferences and workshops. He wrote and published seven books on different topics. He is the member of Editorial board of reputed Journals. He has guided 22 students at M.Phil level and 42 candidates at PG level. Currently 4 Ph.D scholars and 4 M.Phil scholars and pursuing their programmes under his guidance.

Retrieval Number: D7557118419/2019©BEIESP
DOI:10.35940/ijrte.D7557.118419
Journal Website: www.ijrte.org

5338

Published By:
Blue Eyes Intelligence Engineering
& Sciences Publication