

EFFECTIVENESS OF E-CONTENT IN BOTANY

K. Nachimuthu

Professor & Head, Department of Education, Periyar University, Salem, Tamil Nadu, India

Received: 07 Sep 2018

Accepted: 12 Sep 2018

Published: 26 Sep 2018

ABSTRACT

A digital text and images are designed for display on web pages which is suitable for particular audiences are called as 'e-Content'. E-learning is a process and e-Content is a product. For the e-Content development aspect, each one is used to develop the phases' viz., analysis, design, development, implementation, and evaluation. Types of contents are based on three bases viz., according to uniqueness; format and interactivity. The main aim of the study is to develop and validate an e-Content and to find out the effectiveness of it in Botany subject. 174 eleventh standard samples were used. The author concluded that teaching through e-Contents were an effective manner and the application of e-Content in teaching learning process had a significant impact on Botany.

KEYWORDS: *E-Content, Teaching of Botany*

INTRODUCTION

In a classroom, technology stimulates the learner and gets the learner involved in the learning. Books are an extension of the brain; video is an extension of the eye; audio is the extension of an ear; audio conferencing is the extension of mind & vocal cord; the computer is an extension of fusion of mind, hands & eyes; satellite technology is an extension of human reach and computer network is an extension of human cooperation.

E-Content is the latest method of instruction that has attracted more attention to gather with the concept of models. The demand for e-Content is likely to grow in the future. e-Content is digital information delivered over a network-based electronic devices or prepared by the subject experts, i.e. symbols that can be utilized and interpreted by human actors during communication processes, which allow them to share visions and influence each other's knowledge, attitudes or behavior. It allows for user involvement and may change dynamically according to the user's behavior.

TYPES OF CONTENT

Based on the desired outcome of education and the level of uniqueness of the content utilized by the organization the researchers classify the type of content used during the e-learning process. Content is classified mainly into three types of content; according to the uniqueness, according to format and according to interactivity. Under each of these classifications come several factors. For example, according to Uniqueness consists of two categories viz., off the shelf content and customized content. Likewise, according to Format, it specified whether the content will be designed into textual content, audio content, video content, graphical content, animated content, and simulated content. According to Interactivity consists According to Interactivity into two forms according to the level (low& high) and complexity of interactivity.

IMPORTANCE OF E-CONTENT DEVELOPMENT

Ministry of HRD, Government of India has introduced several e-Content development programs viz., National Programme on Technology Education Learning (NPTEL) by offering free online video lectures in engineering, science and humanities courses from 2016 onwards. E-Content and multimedia materials typically refer to the presentation of material in different forms (Higgins & Dermer, 2001). The strategies have included PowerPoint (Mayer, 2012), Educational games (Nachimuthu, 2015), and computer-assisted video learning (Vijayakumari, 2011) in a variety of content areas, in addition to auditory and video media. Numerous studies in specific areas such as teacher education have produced significant results favoring electronic gadgets (Borko & Pitman, 2008) If we observe the students, they can utilize the following electronic gadgets; (a) Listening to music; (b) Playing PC & video games; (c) Talking on the iPhone; (iv) Sending text & picture messages; (v) Watching videos and or Television; (vi) Using Facebook, Twitter & LinkedIn ; (vii) Utilizing videos from YouTube, Skype, other Yahoo and Google messengers (Champoux, 2005).

As per the UGC (University Grants Commission, India) guidelines of e-content development needs the following categories viz., (i) home; (ii) objectives; (iii) subject mapping; (iv) summary; (v) text with pictures & animations; (vi) video and audio; (vii) assignments, quiz & tutorial; (viii) references, glossary & links; (ix) case studies; (x) FAQ"s; (xi) download; (xii) blog and (xiii) contact. These categories are arranged sequentially by subject experts along with technical supporters and to develop the e-content materials.

OBJECTIVES & HYPOTHESES OF THE STUDY

The objectives of the study are; (i) to develop and validate an e-content package in the teaching of botany at the higher secondary level and (ii) to find out the effectiveness of e-content in the teaching-learning process of botany. The hypotheses of the study are; there is no significant difference between the pre-test and post-test scores of the control and experimental group in relation to the e-content in botany learning achievements. An e-content in botany consists of flowering plants in families in the Eleventh standard – First-year Botany released by the book of Tamil Nadu Text Book Society viz., (i) Fabaceae, (ii) Apocynaceae, (iii) Solanaceae; (iv) Euphorbiaceae and (v) Musaceae.

SAMPLE FOR THE STUDY

The Simple random sampling method was adopted in the experimental study. And the size of 174B.Ed trainees with pure Science group was selected among 3400 populations of twenty-five higher secondary schools in Namakkal District of Tamil Nadu State of Indian Country. In this study, pure science eleventh standard students were selected. Among the 174 samples, 87 students have been selected for the experimental group and remaining eighty-seven for the control group. The time was noted down as per the questions involved in the validated e-Content and that scoring was taken as their achievement.

METHODOLOGY OF THE STUDY

In the experimental method, the data collected were put into the appropriate statistical analysis. Mean, standard deviation and 't' test. For this research, an e-Content package for Botany based content of 'Flowering Plants in Families' were prepared in Adobe software file in July 2018. The validity of the e-Content document by biology postgraduate teachers in Namakkal district and Botany professors of Periyar University, Salem in the Tamil Nadu State of India,

keeping in mind the following criteria: a) technologically friendly; b) learner friendly; c) learner-centric; d) teacher friendly; e) employing learner-centric pedagogy; f) self-evaluative and g) object-based learning and teaching.

Dick & Carey (1990) classifies the e-content development models are (i) An instructional design model by Kemp, 1977; (ii) Systematic approach model by Vernon & Donald, 1980; (iii) A Systematic Design of Instructional model by Dick & Carey, 1990; (iv) Systems Reusable Information Object Strategy model by CISCO, 1999; (v) ADDIE process model by DeSimone, Werner, Harris, 2002 and (vi) Content-based model by Cernea, 2005. The ADDIE model was followed in this study.

E-Content duration has been estimated on the basis of the number of hours that are required to transact the content in the classroom. In the present study, the investigator decided to develop the e-content in HTML format based on the objectives. In this stage, the topic divided into sub-topics. Appropriate images, animations, and videos were collected. The investigator prepared the script and messages were carefully planned and sketched out. The audio part of the script was what would be said and what sound effect would be recorded. The 'visual' part of the script shows every shot that will be used in the final production. The first step of the video shooting, the investigator prepared a working document of video in the e-content. The investigator used two-column formats. In this format, the first column contains a content part, which the last column contains an interactive mode of e-content. This content is given to the students for self-learning all the contents like objectives, glossary, script, video, related links, quiz for evaluation were given in the module. The e-content was validated by using expert validation. That Content Generation Levels are four quadrants viz., e-Tutorial, e-Content, Web resources, and self-assessment.

- e-Tutorial: It includes Video and audio contents in an organized form, animation, simulations, and virtual labs;
- e-Content: It includes Textual Document, Portable Document Format or e-books or Illustration, Video Demonstrations / Documents and Interactive simulations wherever required;
- Web Resources: It includes Related Links, Open Content on Internet, Case Studies, Anecdotal Information, Historical development of the subject, Articles and
- Self-Assessment: It includes MCQ, Problems, Quizzes, Assignments and Solutions, Online feedback through discussion forums & Setting up the FAQ, Clarification on general misconceptions.

ANALYSIS OF THE STUDY

An achievement questionnaire was also prepared by the investigator related to the learning unit of Botany part and that was found out with face validity and reliability (0.82). It consists of 50 questions with MCQ type. There are also five plant families of e-Contents were prepared and stored in a single file as 'Flowering Plants in Families'. The collected data were analyzed and interpreted to mean, standard deviation and 't' test. The statistical treatment was given to test the hypothesis and to find out that, there is no significant mean difference in the achievement of botany between the group taught through the e-Content material and the group taught through lecture method of teaching. The table-1 shows the comparison of pre-test scores of the control and experimental group.

Table 1: Comparison of the Control and Experimental Group in Pre-Test

Gender	N	Mean	S.D	'T' Value	Significance
Control Group (Pre)	87	54.85	7.14	0.4978	0.05 level
Exptl. Group (Pre)	87	55.39	7.17		

From the table-1, the calculated 't' value 0.49 is lesser than the critical value of 1.96 corresponding to the 0.05 level of significance indicates the support of the null hypothesis. This implies that the control group and experimental group don't differ significantly in their achievement in the pre-test in learning Botany.

Table 2: Comparison of the Control and Experimental Group in Post-Test

Gender	N	Mean	S.D	'T' Value	Significance
Control Group (Post)	87	56.12	07.33	4.6549	0.05 level
Exptl. Group (Post)	87	61.44	07.74		

The table-2 shows the comparison of post-test scores of the control group and the experimental group. The calculated 't' value 4.65 is greater than the critical value of 1.96 corresponding to the 0.05 level of significance indicates the non-support of the null hypothesis. Hence the null hypothesis is rejected. This implies that the control group and the experimental group highly significant difference in their achievement in the post-test scores in learning Botany

Table 3: Comparison of Pre and Post-Test Scores of the Control Group

Gender	N	Mean	S.D	'T' Value	Significance
Control Group (Pre)	87	54.85	07.14	1.1576	0.05 level
Control Group (Post)	87	56.12	07.33		

The table-3 shows the comparison of pre and post-test scores in the control group. The calculated 't'-value 1.16 is lesser than the critical value of 1.96 corresponding to the 0.05 level of significance indicates the support of the null hypothesis. This implies that the pre and post-test scores of the Control group do not differ significantly in their achievement in learning Botany.

Table 4: Comparison of Pre and Post-Test Scores of the Experimental Group

Gender	N	Mean	S.D	'T' Value	Significance
Exptl. Group (Pre)	87	55.39	07.17	5.3485	0.05 level
Exptl. Group (Post)	87	61.44	07.74		

The table-4 shows the comparison of pre-test scores and post-test scores in the experimental group. The calculated 't'-value 5.35 is greater than the critical value 1.96 corresponding to the 0.05 level of significance indicates the non-support of the null hypothesis. This concludes that the experimental group differs significantly in their achievement in the pre and post-test scores in learning Botany.

FINDINGS OF THE STUDY

Advantages of e-Content development is to be meaningful and must be able to make a difference, i.e. from being unknown to known, from being known for being better understood, from being understood to have provided enlightenment, from being just stored knowledge something that is shared and made available to others. There are two forms of e-Content viz., SLO and Modules. Short Learning Objects (SLO) are a new way of thinking about learning content. They are much smaller units of learning, typically ranging from two to three minutes. It may be a description of an item, equipment, a concept, a process or an activity. Modules are larger independent structural experiences, containing

objectives, learning activities and assessment. In other words, it is a comprehensive package containing a lesson. It contains lecture modules with inbuilt visuals, text, quiz, FAQs, assignments, glossary, case studies, references, discussion, and download. The output is deployable on the web or compact disks.

The findings of the study are; a) Teaching through e-Content is effective; b) While administering the e-Content to the higher secondary level, it is found that e-Content promotes active participation; c) The e-content is found to have a beneficial effect on the learner achievement as a result of the unique combination of tutorial interactive and visual capabilities; (d) Educational e-Content materials were created more achievements in higher secondary level because of self- learning strategy particularly in Botany classrooms. The e-Content package makes and stimulates each student's individual or self-paced with the enjoyable learning process in their subjects. E-Content package encourages cooperation and active learning and promotes students' own pace of learning. In the e-Content method, they will exchange their knowledge with each other so that at the end of the learning process the students will get the complete information about the unit.

RECOMMENDATIONS

The following recommendations are given based on the findings and conclusions

- Develop a partnership between educational institutions and industry for the continuous development of new content and methodology taking into account contemporary technology.
- Distribution of the e-content to teachers and students, for supplementing and complementing the process of teaching and learning in higher education.
- Laboratory demonstration like dissection of plants and animals can also be taught through e-content can sacrifice its life.

CONCLUSIONS

Any content product available in a digital form and it typically refers to music, information, and images that are available for distribution on electronic media is called as e-Content. (Anurag Saxena, 2011). For the e-Content development aspect, each one is used to develop the following phases of the ADDIE model viz., analysis, design, development, implementation, and evaluation. E-learning is a process and e-Content is a product. This e-content approach to teaching has become an answer to the complicated problems and un-identified areas. The application of e-Content is teaching-learning in Botany at higher secondary level process had a significant impact. As the technology becomes user-friendly the creation of e-Content by teaching community will be much easier. These electronic contents are generally designed to guide students through a lot of information in a specific task. The quality of learning depends not only on the form of how the process is carried out but also on what content is taught and how the content is presented.

REFERENCES

1. Anurag Saxena. (2011). *Pedagogical Designs for Generation of Contents for the Community, Community Development Theme*, Indira Gandhi National Open University Publications, New Delhi. 01-03.
2. Borke & Pittman, M.E. (2008). Video as a tool for fostering productive discussions in Mathematics professional development, *Teaching and Teacher Education*, 24(2), 417-436.
3. Cernea Michael M (2005). *Studying the Culture of Agri-Culture, The Uphill Battle for Social Research in CGIAR, Culture and Agriculture*, 27 (2), 73–87.
4. Neelamma, G., and Gavisiddappa Anandahalli. "Authorship pattern and research collaboration of journals of botany." *IAET: International Journal of Library and Educational Science* 2.4 (2016): 1-40.
5. Champoux, J. E. (2005a). Comparative analyses of live-action and animated film remake scenes, *Educational Media International*, 42 (2), 133–155.
6. Cisco (1999). *Cisco, Form 8-K, Current Report, Filing Date Aug 26, 1999. secdatabase.com. Retrieved March 25, 2018.*
7. Desimone, R. L., Werner, J. M., and Harris, D. M. (2002). *Human resource development (3rd ed.)*. Harbor Drive, Orlando: Harcourt College.
8. Dick, W. & Carey, L. (1990), *The Systematic Design of Instruction, Third Edition*, Harper Collins.
9. Dick, W., and Carey, L. (2014). *The Systematic Design of Instruction, 8th ed*, Pearson Education.
10. Higgins, J. A., & Dermer, S. (2001). *The use of film in marriage and family counselor Education, Counselor Education and Supervision*, 40(3), 182–192.
11. Kemp, R (1977). *Controversy in scientific research and tactics of communication, Institute of Science and Technology, University College, Cardiff* 25(3), 515-534.
12. Mayer, Richard, E (2012). *Multimedia Learning, Cambridge University Press, IInd, edition, New York*, 126-130.
13. Nachimuthu, K (2015). *Impact of Multimedia effect on Science Classrooms, Journal of Education in Twenty-First Century, APH Publishing Corporation, New Delhi*, 2(1), 274-280.
14. Vernon, S & Donald, G.P (1980). *Teaching and media: a systematic approach*, Englewood Cliffs, N.J: Prentice-Hall.
15. Vijayakumari, G (2011). *Role of Educational Games improves meaningful learning, Journal of Educational Technology, I-Manager Pub, July-Sep 2011*, 8(2), 08-11.