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# Effectiveness of E-Learning in Teaching Chemistry with Reference to Quality of Picture and Video

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**Abstract:** The effectiveness of e-learning program is teaching advanced picture and video production is an art that requires great sensitivity to the process of providing constructive knowledge that helps students to learn and grow. Some students experience difficulty in developing narrative sequences or determinants of motion picture and video. But when students learn to work jointly through the revision process as part of an advanced video production course in senior higher secondary school, they tend to develop higher expectations for the quality of their academic work and apply a more rigorous framework of analysis to the media messages they encounter, including fiction motion pictures documentary films, story-based interactive games, and short-form platforms such as commercials or music videos of the chemistry subjects. The researcher desires that more number of educational institutions should teach the topic Chemistry by using on-line method and make the process of teaching and learning more effective based on the quality of picture and video to maintain the effectiveness of E-learning in teaching chemistry.

**Keywords:** E-Learning in Chemistry, Effectiveness Methodology, Quality of Picture and Video

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## 1. Introduction

The effectiveness of e-Learning is defined based on how well the e-Learning performed, compared to traditional face-to-face teaching with the same content. The e-Learning is the platform to perform face-to face teaching in order to be considered effective. With this in mind, it becomes important to take another critical look at the key factors, since the new research methodology affects their perceived importance. This means that some of the factors like interaction and practice may have surfaced as critical during the review, because these factors illustrate the strong sides of face-to-face teaching. A given e-Learning solution must, entail these factors to be effective when compared to face-to-face teaching. Is the most effective e-Learning an online replication of the classroom setting? Should different modalities have the same measures of performance, or should we consider e-Learning to be a unique learning process and thus use different definitions of effectiveness? major concern of studies on multimedia annotations was the competitions among media, including texts, pictures, videos and audios, for vocabulary learning. That is, how each annotation type,

for example, textual definitions, pictures, animations, films and sound video, or how combinations of the aforementioned annotation types, could help language learners learn unknown vocabulary words. The combination of textual definitions and pictures has thus far been believed to be more effective for vocabulary learning than single annotations as textual definitions or pictures; it is also more effective than combinations of textual definitions and other types of media (Shahrokni, 2009; Yeh & Wang, 2003; Yoshii, 2006; Yoshii & Flaitz, 2002). Above discussions is the comparisons between results of textual definitions and still images and those of textual definitions and dynamic videos (Akbulut, 2007; Al-Seghayer, 2001; Chun & Plass, 1996a, 1996b). The reason making video and films inferior to pictures, based on a further examination done in this study, is that the concepts conveyed by the target words in the old research studies may not have needed such dynamic videos as animations and films. Simple pictures together with textual definitions could have served the purpose of defining the target words. Thus, the purpose of this study is to investigate the dynamic videos,

such as animations picture, assist language learners in their learning vocabulary words that entail video presentations, in particular, those that convey meanings difficult for learners to understand.

### 1.1. Teaching Chemistry

Teaching Chemistry here refers to teaching of the concept Chemical Bonding for the First Year Higher Secondary Students.

### 1.2. Objectives

To find out the association between the observed and expected frequencies of the E-learning programme in the following factors:

- Quality of pictures
- Quality of the Video

### 1.3. Hypotheses

There is no significant association between the observed and expected frequencies of the E-learning programme in the following factors:

- Quality of pictures
- Quality of the Video

## 2. Materials and Methodology

### 2.1. Sample of the Study

The sample of this study consisted of 243, Higher Secondary First Year students from seven chemistry classes

**Table 1.** Association between the observed and expected frequencies of the Quality of pictures in the E-learning programme.

Quality of picture	Expected			Observed			N	df	Chi- Square Value	Level Of Significance
	G	M	P	G	M	P				
	81	81	81	152	81	10	243	2	124.46	0.01

G – GOOD M - MODERATE P - POOR

The table shows the expected and observed frequencies of Quality of pictures in E-learning programme. The total number of sample is 243. Here the observed frequency is 152, 81 and 10 respectively with respect to Good, Moderate and Poor. The Chi-square value of Quality of pictures is 124.46 which is significant at 0.01 level for df 2. Therefore the expected and observed frequencies for the quality of pictures differ significantly.

**Table 2.** Association between the observed and expected frequencies of the Quality of the Video in the E-learning programme.

Quality Of The Video	EXPECTED			OBSERVED			N	df	Chi-Square value	Level Of Significance
	G	M	P	G	M	P				
	81	81	81	159	78	6	243	2	144.66	0.01

G – GOOD M - MODERATE P - POOR

The table shows the expected and observed frequencies of Quality of the Video in E-learning programme. The total number of sample is 243. Here the observed frequency is 159, 78 and 6 respectively with respect to Good, Moderate and Poor. The Chi-square value of Quality of the Video is 144.66

out of Seven Schools from the Union Territory of Puducherry.

### 2.2. Tools Used in the Study

- The E-content (On-line teaching material) software programme in Chemical Bonding was developed by the investigator for Higher Secondary First Year students'.
- An Achievement test to measure the achievement in Chemistry was developed by the Researcher.
- Personal data sheet with opinion about the programme.

### 2.3. Statistical Techniques Used

The researcher used chi-square test to verify whether there is any significant association between the variables: Quality of pictures and Quality of the Video.

### 2.4. Variables Used

- Dependent Variable* - Achievement in Chemistry.
- Independent Variable* - E-learning methods
- Background Variable* – Quality of picture and quality of video

## 3. Analysis and Discussion

The data have been analyzed with SPSS Package and interpretation of data is given below

#### *Hypothesis 1:*

There is no significant association between the observed and expected frequencies of the E-learning programme in the quality of pictures.

Therefore the null hypothesis is rejected. It is concluded that there is a significant association between the expected and observed frequencies for the Quality of pictures of E-learning programme.

#### *Hypothesis 2:*

There is no significant association between the observed and expected frequencies of the E-learning programme in the quality of video.

which is significant at 0.01 level for df 2. Therefore the expected and observed frequencies for the quality of video differ significantly.

Therefore the null hypothesis is rejected. It is concluded that there is a significant association between the expected

and observed frequencies for the Quality of the Video of E-learning programme.

Zhang, D, L. et al, (2006) performed a study on Instructional video in E-learning: Assessing the impact of interactive video on learning effectiveness. The fact that the majority of studies found no significant difference across media types is consistent with the theoretical position that the medium is simply a carrier of content and is unlikely to affect learning per se (Clark 1983, 1994). He suggests that the way in which a medium is used is more important than merely having access to it. Zhang et al. found that the effect of video on learning hinged on the learner's ability to control the video ("interactive video"). The authors used four conditions: traditional face-to-face and three online environments interactive video, non interactive video, and non video. Students were randomly assigned to one of the four groups. Students in the interactive video group performed significantly better than the other three groups. There was no statistical difference between the online group that had non interactive video and the online group that had no video. Therefore, the quality of picture and quality of video can promote the teaching learning process effectively in online teaching chemistry programme.

#### 4. Findings

There is a significant association between the expected and observed frequencies for the Quality of pictures of E-learning Chemistry programme. There is a significant association between the expected and observed frequencies for the Quality of the Video of E-learning Chemistry programme.

#### 5. Suggestions

From the above study, the researcher has an idea that E-learning provides greater opportunities for the students to learn. It is better than the traditional method of learning. It brings a new kind of concrete experiences for the students of higher secondary school. Therefore, the researcher desires that more number of educational institutions should teach the topic Chemistry by using on-line method and make the process of teaching and learning more effective based on the quality of picture and quality of video in the website to maintain the effectiveness of E-learning in teaching chemistry.

#### 6. Conclusion

This paper finds the effectiveness of e-learning in teaching chemistry with quality of picture and video 'learning outcome' as the most prominent variable. The authors highlighted the benefits of reflection on and clarification of the way in which these definitions are used in research and practice. From this study gives purely quantitative measures to fulfil predefined e-learning objectives. The e-Learning makes the understanding solutions effective, this paper explain factors promoting the effectiveness of e-Learning. These factors were classified according to the context in

which the e-Learning solution was used, the artifact and the individuals that used the artefact. Therefore, further categorization into key factors resulted in a model to guide e-Learning design. One of the many questions raised in the discussion was the question of whether e-Learning and traditional face-to-face learning should be measured based on the same definitions of and approaches to effectiveness. To find appropriate answers to this question, the authors suggest that future researchers and designers critically consider the high quality of picture and video can enhance the effective e-Learning in teaching chemistry.

#### Recommendations

There are many understandings of e-Learning effectiveness such as there is a significant association between the expected and observed frequencies for the Quality of pictures and quality of video of E-learning Chemistry programme. It may be sure to clarify what would make your solutions effective. (Table 1 and 2).

To know at what extended level measurements will give you the documentation your stakeholders require and the answers you need to continuously improve your e-learning solutions. Be reflective and consider whether or not your face-to-face and e-Learning solutions should use different definitions of effectiveness. Aim to compare your solution to other solutions using the same effectiveness of the other subjects or content also.

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#### References

- [1] L. L Deborah, B.-m. Tempa and R. M. Gary, 1998. Moving from computer literate to technology competent: The next educational reform. *Computers in Human Behaviour*, 14 (1): 93-109.
- [2] K. Deepak, and Srivastava, 2005. E-learning: A new way of education. *University News*, 43 (26).
- [3] DFES, 2003. Towards a unified e-learning strategy – consultation document. Available from <http://www.dfes.govt.uk/publications/e-strategy/docs/e-strategy.pdf>.
- [4] A. Hannan, and H. Silver, 2002. Guide to innovation in teaching and learning [electronic version]. LTSN Generic centre.
- [5] H. Mahdizadah, B. Harm and M. Martin, 2008. Determining factors of the use of e-learning environments by university teachers. *Computers & Education*, 51 (1): 142-154.
- [6] L. Shu-Sheng, H. Hsiu-Mei and C. Gwo-Dong, 2007. Surveying instructor and learner's attitude towards e-learning. *Computers & Education*, 49 (4): 1066–1080.
- [7] R. H Bruning, Schraw, G. J, Norby, M. N, & Ronning, R. R. (2004). *Cognitive psychology and instruction* (4thEd.), Upper Saddle River, NJ: Pearson.
- [8] A. Davis, (2004). Developing an infrastructure for online learning. In T. Anderson F. Elloumi (Eds.), *Theory and practice of online learning*, 97-114, Retrieved October 25, 2005, from, [http://cde.athabasca.ca/online\\_book](http://cde.athabasca.ca/online_book).

- [9] T. Jonacki, & Liegle, J. O. (2001). Development and evaluation of a framework for creating web-based learning modules: a pedagogical and systems approach. *Journal of Asynchronous Learning Networks*, 5 (1), Retrieved October 28, 2005, from, [http://www.sloan-c.org/publications/jaln/v5n1/pdf/v5n1\\_janicki.pdf](http://www.sloan-c.org/publications/jaln/v5n1/pdf/v5n1_janicki.pdf).
- [10] D. H. Jonassen, Dyer, D, Peters, K, Robinson, T, Harvey, D, King, M, & oughner, P. (1997). Cognitive flexibility hypertexts on the web: Engaging learners in meaning making. In B. Khan (Ed.), *Web-based instruction*, Englewood Cliffs, NJ: Educational Technology Publications, 119-133.
- [11] Ministry of Education (2004). Interim tertiary e-learning framework, Retrieved October 25, 2005, from, <http://cms.steo.govt.nz/NR/rdonlyres/17D7A181-CD49-4D18-84EEE0D57149BC5/0/InterimTertiaryeLearningFrameworkweb.pdf>.
- [12] M. Moore, & Kearsley, G. (1996). *Distance education: A systems view*, Belmont, CA: Wadsworth Publishing Company.
- [13] D. M Norris, Mason, J, Robson, R, Lefrere, P, & Collier, G. (2003). A revolution in knowledge sharing. *Educause Review*, 38 (5), 15-26.
- [14] R. Palloff, & Pratt, K. (2003). *The virtual student*, San Francisco: Jossey-Bass.
- [15] C. Reigeluth, (1999). What is instructional-design theory and how is it changing? In C. Reigeluth (Ed.), *Instructional-design theories and models, VolumeII*, Hillsdale, NJ: Lawrence Erlbaum, 5-29.
- [16] R. Jayakumar & Prof. R. Krishnakumar, Developing teaching material for E-learning Environment– Vol 2, No 8, pp-8-12; 2011. *International Journal of Education and Practice*, ISSN 2222-288X. [www.iiste.org](http://www.iiste.org).
- [17] R. Jayakumar & Prof. R. Krishnakumar, Effectiveness of E-learning in Teaching Chemistry. –Vol. 3, Issue 1, pp. 26-31, June 2011. *Journal of Current Trends in Education and Research, JCTER*, ISSN No. 0975-1114. <http://www.jcter.org>.
- [18] R. Jayakumar & Prof. R. Krishnakumar, Effectiveness of E – learning In Teaching Chemistry with reference to certain selected variables. -2013, Vol. 1 (1): 1-13. *International Journal of Education and Practice*, ISSN 2222-288X [http://www.pakinsight.com/pdf\\_files/art/61/ijep,%201\(1\),%201-13.pdf](http://www.pakinsight.com/pdf_files/art/61/ijep,%201(1),%201-13.pdf).
- [19] R. Jayakumar & Prof. R. Krishnakumar, E-Learning and Achievement in Chemistry among Higher Secondary Students in terms of Usage of Internet and Number of concepts viewed, *International Journal of Multidisciplinary Research and Development*, August, 2014; 1 (2) Part-A: 5-8, e-ISSN: 2349-4182 <http://www.allsubjectjournal.com/archives/2014/vol1/issue3>.
- [20] R. Jayakumar, Effectiveness of E-Learning In Teaching Chemistry With Reference To Assessment Scores And Selected Variables, Vol. 3, Issue. III, October, 2014, *Research Nebula – An International Refereed & Indexed Quarterly Journal in Arts, Commerce, Education & Social Sciences*. ISSN: 2277-8071; Impact Factor: 0.612 file:///C:/Users/Jayakumar/Downloads/Effectiven63549432113048750.pdf.
- [21] R. Jayakumar, Effectiveness Of E-Learning In Teaching Chemistry With Reference To Content Scores And Quality Scores, Volume – I, Issue- I, Oct, 2014 p. 34-39 *Research Demagogue, An International Bi- Annual Peer Reviewed Journal in Education*, ISSN 2350-1081 file:///C:/Users/Jayakumar/Downloads/VolumeIiss635983931151775000.pdf.
- [22] R. Jayakumar, Effectiveness Of E-Learning In Teaching Chemistry With Reference To Presentation And Feedback, An International Indexed Bi-Annual Peer Reviewed Journal in Education Volume II, Issue I, January 2015, pp 75-79, *Research Tracks*, ISSN 2347-4637 [www.ycjournal.net](http://www.ycjournal.net).
- [23] D. Surry, & Farquhar, J. (1997). Diffusion theory and instructional technology. *Journal of Instructional Science and Technology* 2 (1), Retrieved October 25, 2005, from, <http://www.usq.edu.au/electpub/ejist/docs/old/vol2no1/article2.htm>.
- [24] C. Twigg, (2001). Innovations in online learning: Moving beyond no significant difference, Retrieved October 25, 2005, from, <http://www.thencat.org/Monographs/Mono4.pdf>.
- [25] Shi-Jer Lou, (2012) The Turkish Online Journal of Educational Technology – October 2012, volume 11 Issue 4 *Videos And Animations For Vocabulary Learning: A Study On Difficult Words*.