

Attitude of Tertiary Level Students' Towards Web- Based Instruction (WBI) In Chemistry

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ABSTRACT

In the present era, the rapid developments in information technologies influence economic and social systems. Students' attitude to learn chemistry is a complex construct. This influence is increasingly perceived especially in the field of education. Developing positive attitudes towards science is one of the key goals for learning science. Online learning has become popular because of its potential use and flexibility in accessing the content and also instruction at any time, from any place. Usage of web-based instruction is becoming widespread in higher education. Web-based instruction (WBI) is rapidly an emerging paradigm in the delivery of education. Internet provides ocean of knowledge which can be made available to all students. The aim of the research is to ascertain the attitude of the students towards WBI in chemistry at tertiary level. Survey method was adopted in this study. The sample consists of 74 students; of which 34 were from Government College and 40 were from Private College. A tool attitude questionnaire (ATWBI) was used to collect data. Findings of the study indicated that attitude of students towards chemistry subject was less due to inadequate teachers, approach to the material, and poor non-formal instructional materials. Moreover, the study showed no differences in the attitude based to gender.

Key words: Attitude, Chemistry, Tertiary Level and Web-Based Instruction.

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INTRODUCTION

Web-based instruction (WBI) has received considerable scrutiny over the past ten years. (Fullerton, 2009). The use of the Internet for learning purposes has received increasing attention over recent years (Hong, 2003). The advance of online technology and instructional delivery such as Web based learning (WBL) has heralded new changes in education (Poon, 2004). The rapid advancement of technology has transformed the conventional classrooms into virtual classrooms in which interaction is not only much quicker but there is great improvement in the quantity and quality of course delivery (Kaur, 2015). WBI is known as a media rich, online environment allowing people to interact with others asynchronously or synchronously in collaborative and distributed environments (Dede, 1995). This increasing

utilization of the Web, particularly in the tertiary setting, allows instructors to explore ways of taking advantage of the Web's potential to provide for learning experiences that go beyond that possible in the traditional classroom environment (Lockyer, 1998). Higher education institutions are increasingly embracing the Internet as a tool to support academic courses and/or programs (Weiss, 2001).

The development of online learning offer opportunities for teachers to create support and engage students in learning. Use of WBI system is becoming very popular and demanding among the instructors and the learners for the purpose of the distribution and delivery of the study material, and other education resources (Saini, 2014). There has been an unbelievable increase in the

Table 1. Mean scores of attitude of tertiary level students towards WBI in chemistry regarding the gender.

Gender	Very much				Some What				Not at all			
	Mean	SD	t-value	Sig	Mean	SD	t-value	Sig	Mean	SD	t-value	Sig
Male (18)	14.44	2.406			6.50	1.978			5.06	1.056		
Female (59)	10.90	1.423	7.763	.000 (Sig)	8.95	1.676	5.201	.000 (Sig)	6.15	1.460	2.955	.004 (Sig)

development of technology- based learning and teaching. Large numbers of educational institutes are now offering web- based courses. The increased use of technology in the teaching and learning process has highlighted the importance of understanding how these technologies improve the learning process (Hammoud, 2008). The integration of Internet and Web technologies with online learning has shifted the focus from a teacher-centered classroom toward a learner-centered environment which empowers the learners with the control over the course contents and the learning processes (Fotos, 2004). Technological advancement has led to important changes in the way education is being imparted (Suri, 2013). Attitudes are a personal factor and they are referring to one's positive or negative judgement about a concrete subject. Attitudes are determined by the analysis of the information regarding the result of an action and by the positive or negative evaluation of these results (Ajzen, 1980).

The purpose of this study therefore is to investigate the attitude of tertiary level students' towards WBI in chemistry in order to proffer useful suggestions. Ghassan (2007) conducted a study to identify the learning difficulties in chemistry through cross pollination of reviews. Finding of the study suggested reducing the problems based on the understandings of the attitude and motivation. According to McKimm (2003) web based learning is useful for students to receive constructive, timely and relevant feedback on their progress. WBL was a useful learning tool for the students (Das, 2015). Salta (2011) identified the factors that could positively influence students' attitude to learn chemistry; these factors could be organized into three main categories: Teaching approaches, Educational tools and Non-formal educational material and activities. For enhancing attitudes in learning chemistry. Hofstein (2011) suggested three key factors that should be considered: (i) the methods used to present the content (for example, relevance, and historical approach), (ii) instructional techniques that are implanted, and (iii) gender issues Handelsman (2005) a students' attitude is of concern to the educator as it may influence the students' engagement with course material, connectedness with peers (and the institution), and possibly, academic achievement and progression through an undergraduate programme.

OBJECTIVES OF THE STUDY

Following were the objectives of the present study (1). to assess the level of tertiary level chemistry students' attitude towards WBI in chemistry and (2). To find the difference, in the attitude towards WBI among tertiary level students with respect to gender and locality.

HYPOTHESIS

There is no significant difference in the mean scores for attitude of tertiary level students towards WBI mean scores of male and female students. There no significant difference in the mean scores for attitude of tertiary level students towards WBI in relation to their locality.

MATERIALS AND METHODS

Survey method was adopted in this study in order to find out the level of attitude on WBI in chemistry. The sample of the study was 77 final year chemistry under graduate students in Ariyalur District, Tamilnadu, India in the Academic Year August 2015 to 2016. In this sample, 32 Chemistry students were from Government College, and 45 Chemistry students were from a private college. A tool (Questionnaire) was developed by the investigators with 26 questions with three options namely very much, somewhat and not at all to assess the attitude of WBI.

Hypothesis I

There is no significant difference in the mean scores for attitude of tertiary level students towards WBI mean scores of male and female students. Table 1 shows that the male chemistry students (14.44) and female chemistry students (10.90) responded very much, 6.50 male and 8.95 female students elicit somewhat and 5.06 male and 6.15 female students revealed that they not at all have attitude of WBI. The calculated 't' values for the responses very much, somewhat and not at all are 7.763, 5.201 and 2.995, respectively at 0.05 level of significance. Hence the null hypothesis is accepted. From this it is also inferred that male tertiary level learners have

Table 2. Mean scores of tertiary level students attitude towards WBI based on locale.

Locality	Very Much				Some What				Not at all			
	Mean	SD	t-value	Sig	Mean	SD	t-value	Sig	Mean	SD	t-value	Sig
Urban (32)	12.41	2.461			8.06	2.285			5.53	1.218		
Rural (45)	11.24	2.002	2.281	.025(Sig)	8.60	1.814	1.149	.254(not Sig)	6.16	1.551	1.897	.062 (not Sig)

better attitude than the female students towards WBI for learning chemistry.

Hypothesis II

There is no significant difference in the mean scores for attitude of tertiary level students towards WBI in relation to their locality. Table 2 revealed that mean scores of tertiary level students attitude towards WBI based on locale are as follows 12.41 urban and 11.24 rural students responded very much, somewhat is stated by 8.06 urban and 8.60 rural and 5.53 urban and 6.16 rural responded not at all. The calculated 't' values 2.281, 1.149 and 1.897 shows that the urban and rural area chemistry students responses that is, very much, somewhat and not at all, respectively at 0.05 level of significance. From this it is inferred that urban area tertiary level learners have better attitude than the rural area students towards WBI for learning chemistry.

Major Findings of the Study

The following are the major findings of the study. Male tertiary level students have more attitude than female students towards WBI and Urban area students were better than rural area students in terms of their attitude towards WBI in chemistry.

DISCUSSION

Robertson (1995) revealed that their results indicated that male students had more positive attitudes towards WBL than female students. In present investigation also male students had more positive attitudes towards web based learning Erdogan (2008) found that web based education on attitude toward learning suggested that use of the web had positive effects for learning and interested in the lessons. Present study also revealed the same. A study done by Philomina (2015) revealed that female students outperformed the male students in terms of the usage of technology but in present study male outperformed the female students.

RECOMMENDATIONS FOR POLICY MAKING

The main focus of the study was to evaluate the level of

tertiary level chemistry students' attitude towards WBI. Based on the findings following recommendations were evolved. Teachers should take initiative to develop attitude towards WBI by providing opportunities to explore WBI. Urban area students were found to be better than rural area students in their attitude towards WBI in chemistry. To overcome this problem our government should take initiative to establish Computer Assisted Learning (CAL) centers to develop computer skills among the rural area students. Undergraduate students in Government College were found better than students studying in private college in their attitude towards WBI. Learning experiences should be provided to ensure the increase of attitude in WBI. Students with personal computer of their own are found to be better in their attitude in chemistry than undergraduate chemistry students without having personal computers. Boys are found to be better than girls in their attitude towards WBI in chemistry. The finding made the investigator to recommend that educators at tertiary level should ensure all students have equal computer access and training. Urban area students are found to be better than rural area students in their attitude towards WBI. This finding leads to conclude that the learning atmosphere should be congenial to the rural area students to enhance their attitude. Teachers should provide opportunities for the students to do their own projects to demonstrate their web based skills. Government should take action to reduce the cost of internet, in order to develop attitude among students towards WBI.

SUGGESTIONS FOR FURTHER RESEARCH

Based on the findings the following suggestion were made, it is understood from the present study that students of chemistry have less attitude towards WBI. It is suggested that a further study may be attempted to find out the factors which positively contribute or negatively contribute in developing the attitude of the students.

CONCLUSIONS

Attitude is one of the popular hypothetical construct applied by researchers to explain phenomena of one's interest, the way people think, how they feel and how they carry out things (Fazio, 2007). What promotes

attitudes toward learning chemistry remains unequivocal, In this study, an attempt was made to analyze gender related to the attitudes toward learning chemistry, The findings revealed that whether the student is a male or female, he/she has a low attitude toward learning chemistry, the causes could be basically due to the difficulty of the material, the low awareness of the importance of chemistry in our daily life, lack of exposure and fieldtrips, unattractive and low equipped laboratories, together with the poor motivated teachers. Negative attitudes of students towards the subject were due to inadequate teachers' approach to the material, and poor non-formal instructional materials (Najdi, 2012). These findings, hopefully, will provide some useful information on how to bridge between students' attitude toward chemistry and the material, by paying attention to college education that addressed the non-formal learning. The present findings also provide insight information to the college science teachers and science curriculum planners to revise their teaching and learning methods, so that students' attitude towards learning and engagement in chemistry activities increase.

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Appendix. Note: A-Very much B- Somewhat C-Not at all.

S/no	Statements	A	B	C
1.	It is interesting to learn through web			
2.	Online instruction improves my learning capacity			
3.	WBI can be used to learn other subjects also			
4.	WBI enhance effectiveness in learning			
5.	Web can be used as a learning tool			
6.	Learning through WBI helps the learner to visualizes the ideas and concepts			
7.	WBI is a best way of learning			
8.	WBI is a barrier for the planning of their learning			
9.	WBI saves time and energy			
10.	WBI helps to retain the concepts in the long term memory			
11.	Concepts can be easily understood learning through WBI			
12.	Learning through web extract the relevant information in learning chemistry more effectively			
13.	WBI provides interesting learning experience			
14.	Learners of chemistry motivated themselves using WBI			
15.	WBI enhance the interest of students in their learning			
16.	WBI reduces workload			
17.	WBI increases self-confidence			
18.	WBI gives self-satisfaction in learning chemistry			
19.	Learning process is strengthened using WBI			
20.	Knowledge can be updated through web			
21.	Self-evaluation is possible through WBI			
22.	Learning through web is more expensive			
23.	WBI is more difficult in learning chemistry			
24.	I study web-based courses in the future			
25.	Information can be searched quickly using web			
26.	Learning through web makes me to learn further			