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THE INTEGRATION OF E- TECHNOLOGY IN LEARNING AND INSTRUCTIONS FOR CHEMISTRY COURSE

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ABSTRACT

This paper aims to determine the degree of satisfaction of students for the course work developed in their chemistry course. The other intention of this is to determine preference of students when it comes to learning and instructions. Aside from the usual face to face student-teacher interaction a specially designed course work was developed for students taking Chemistry in Malayan Colleges Laguna. The course work developed is a technology-based instructional material which is student-centered and constructivist in nature. A computer aided instruction wasestablished and linked to online learning to further increase the knowledge of students. The entire course work was given to the students and can be viewed and reviewed anytime. Lectures, quizzes, instructions, online activities and other important facts such as objectives, references and about the author can be found in the course work. The reliability of the instrument was tested using cronbach alpha reliability test and validated before distributing it to the respondents. Using a likert scale, the results showed that the course work developed for chemistry brought a high satisfaction ratingfrom students enrolled in chemistry and they prefer the combination of face to face interaction and online learning.

Keywords:e-Technology, Online Learning, Instructions, Computer Aided instructions,chemistry.

1. Introduction

Computer-Assisted Instruction (CAI)is usually used by teachers in the academe. It isa program of instructional material offered by means of computer systems or computer. The advent of computer in education started in the 1960's and has become widespread in use from early education to higher level. They either provide a forthright presentation of data or a

comprehension is being tested by means of a tutorial basis.(Britannica, 2014).The effectiveness of computer aided instructions is usually compared to the so called traditional method instructions. The use of CAI is proven to be more effective compared to the traditional one. The effects were based on knowledge, comprehension and applications levels of the cognitive domain in a particular course. Students learning in knowledge were higher, better for comprehension and application was feasible for cognitive domain (Aktaruzzaman & Muhammad, 2011).

CAI is widely used in all areas. It can also be used in industry, sports, and in all areas of education especially in math and science. Yushua and Wessels in 2004 studied the CALM or the Computer Aided Learning of Mathematics in the Prep-Year Mathematics Program at King Fahd University of Petroleum & Minerals. Diverse kinds of software were used in the search of optimizing the recitation/problem session hour of the mathematics classes. Teachers enjoyed doing quizzes and students enjoyed answering the online quizzes. As a result of this study most of the students believed that the software helped them in learning mathematics thus making the software recommended for adoption in all mathematics courses.

CAI is completely personalized because students can proceed based on their performance. They can move in their own pace in covering the material compared to the chalk and talk which cover all the material all at the same pace. This suggests that a model of classroom management must be applied to all students in order to divide the group instructions and the individualized one. In this case CAI is more appropriate to use to increased personal instructional time. CAI is a way of student intervention therefore making it easier for all(Barrow, et al., 2009). For passive active learners or PALS, CAI lesson was found to be a more reliable predictor of performance structured and subjectlearning style significantly influenced subjects' ability to advance a mental map that revealed a logical order for the material presented in the lesson (Romoser & Eberts, 2000).

On line learning likewise offered a good way of enhancing the performance of students in chemistry, algebra and calculus. It was compared with the students doing the traditional way learning versus the use of online technology. Study showed that there was a significant increase in the performance of students with regards to the long exams scores and the percentage of passers. The use of technology greatly affects their performance since students nowadays are 365days and 24/7 online. With the generation i, the use of computer is no longer inevitable because this is their generation and they possess a multitasking skills(Dampil, 2015; Abdon, Sept.-Dec., 2014; Suello, 2014).On- line learning knocks the developments in information technologies, computer,computer system and communication. Students are able to learn anytime at their own convenience in a cooperative learning environment. On line learnersencourages the international integration of education by making learninglimitless. It is

said in a powerful instrument in advancing knowledge and management in knowledge seeking environment. The learner centered approach was recommended to support the learning on line initiative and address its implication on content design (Wee Keng & Chen, 2001).

With the advancement of Computer Aided Instructions and the growing on-line learning in education, the integration of the two components in learning can be integrated to produce a more convenient way of student intervention. The e- technology offered by these are suitable for the current generation which is the generation i. Generation i are ready for online technology and technology (Red, et al., 2013).

2.The Course Work

The designed course work will help you explore on different information about chemistry. This includes the objectives of the course, information about the author, instructions about the quiz, the quiz itself, online homework and assignment, review of different topics and even the references used. This contains 495 slides excluding the one which can be found in the link provided.The different figures shown below can be found in the computer aided instructions(CAI) and in the web where the information of the course and online activities are linked. Figure 1 showed the CAI Homepage. Each polygon in the homepage is linked either in the presentation or in the web.

Figure 1: The CAI Homepage

Each polygon in the CAI homepage will give you the desired information you need. It has different parts which is very useful for the students.

2.1 Parts of the Course Work

2.1.1Objectives

Objective contains all the purpose of the course starting from the very beginning down to the end of the course. Clicking the objective will display all the objectives of the course.

Figure 2: The figure linking to the objectives

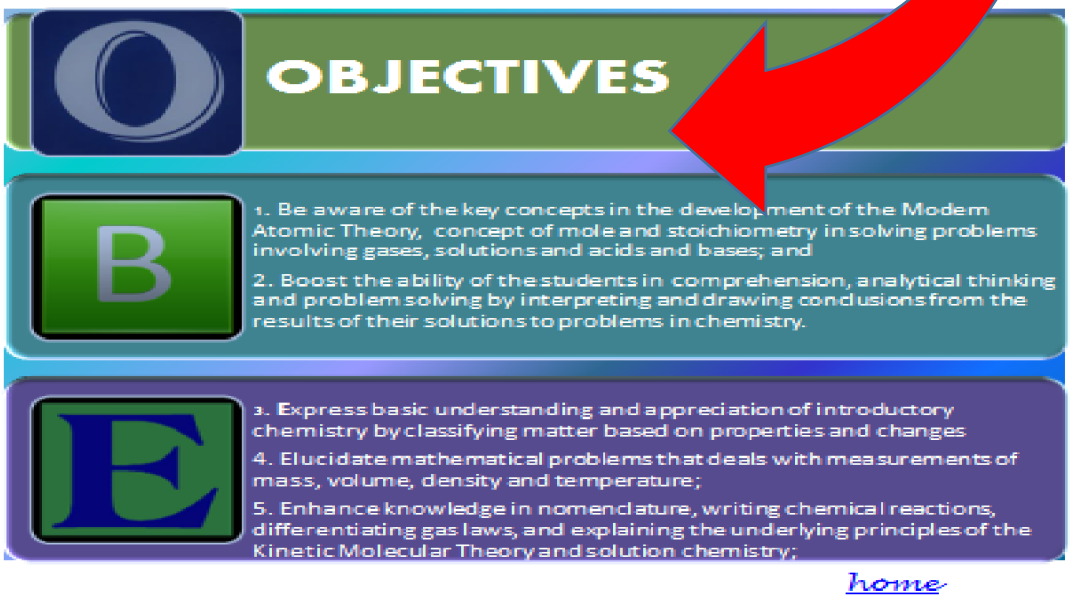

Figure 3: The Objectives

2.1.2 Author

Author is the one responsible for this coursework.Clicking the author will give you the information of the author, her affiliation, education, country of origin and employer.

Figure 4: The figure linking to the Author

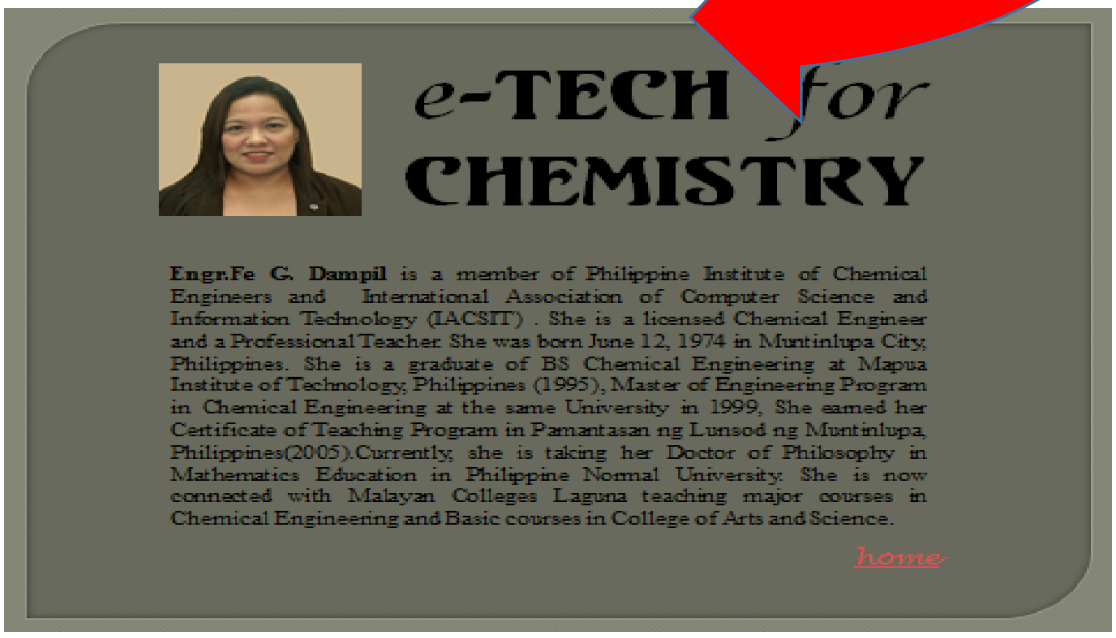

Figure 5: Facts about the Author

2.1.3 Instructions

Instructions are the information of what to do, how to do and the operation to do it.Clicking the instructions will display all the categories such easy, average, and difficult. It will also display the number of items for each category, the time allowed to answer, and the score for each category.

Figure 6: The Figure linking to the Instructions

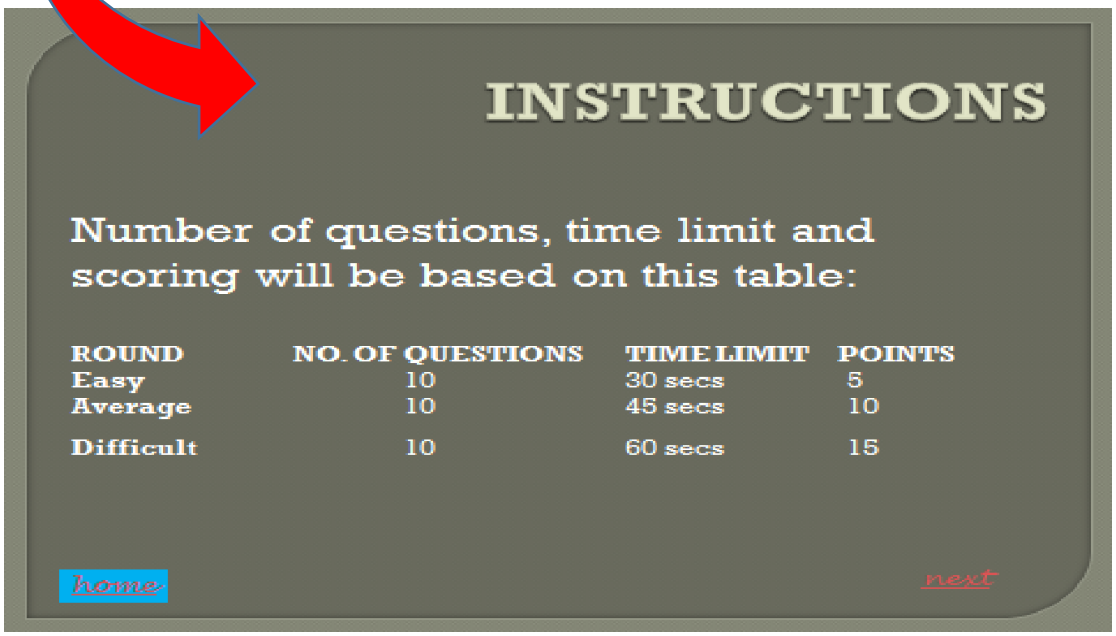

Figure 7: The Instructions

2.1.4Quiz

Quiz is a test of what you have learned from the course. It is a measure of knowledge retention. Clicking the quiz will give you the different questions from each category. The categories are easy, average and the difficult round.

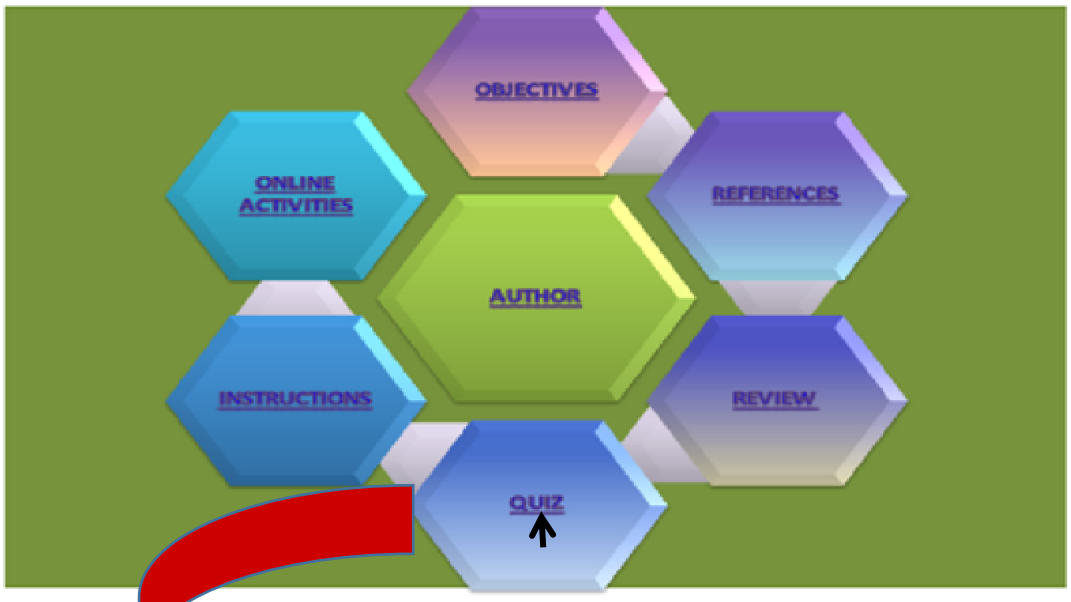

Figure 8: The Figure linking to Quiz

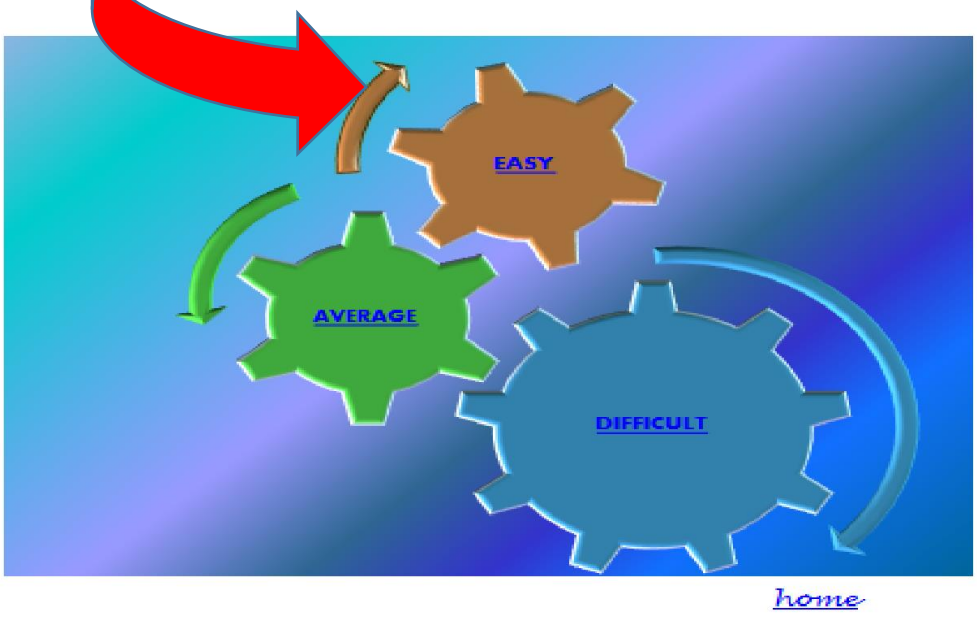

Figure 9: The Quiz

2.1.5 Online Activities

Online activities provide the online quiz or exam, homework, assignment. One has to encode the access code to be able to access those activities. By clicking the online activities you will be directed to the site of the website which is the E connect page..

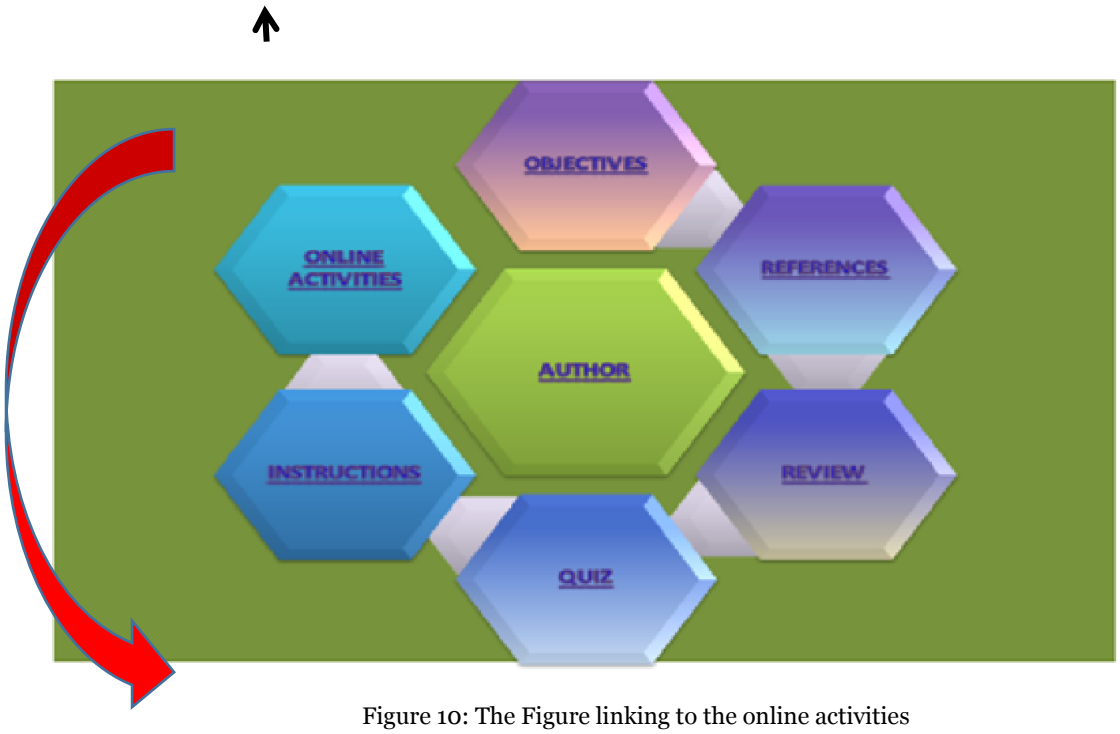

Figure 10: The Figure linking to the online activities

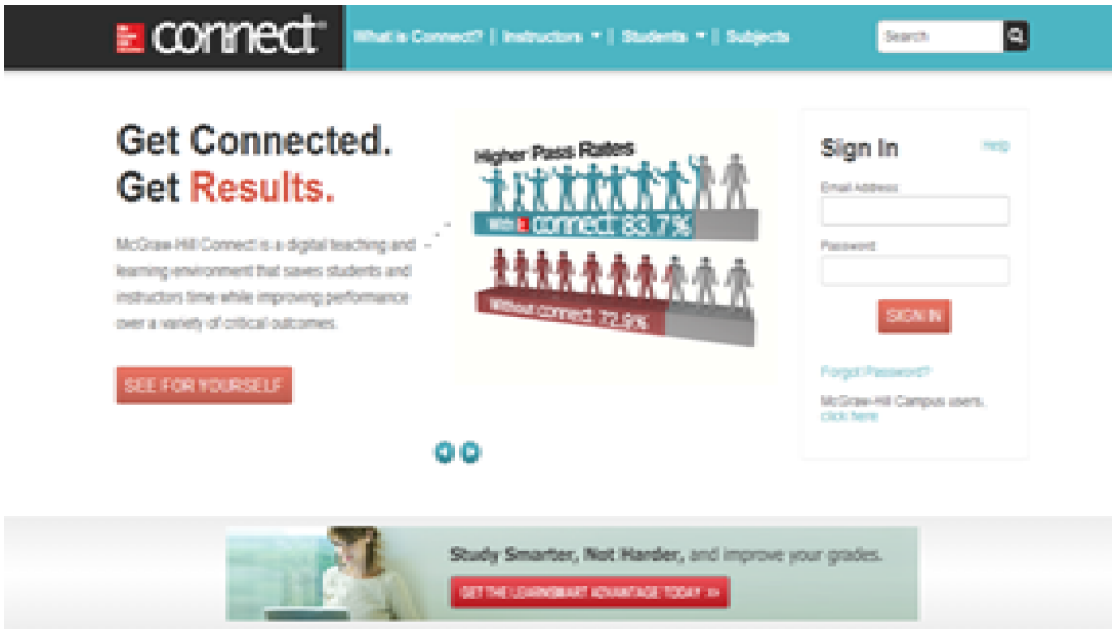

Figure 11: The E-connect page for online activities

2.1.6. Review

Review page gives you all the information of the course. It has different pictures, videos and animations stored and linked to other site. Clicking the Review page will direct you to those

topics.

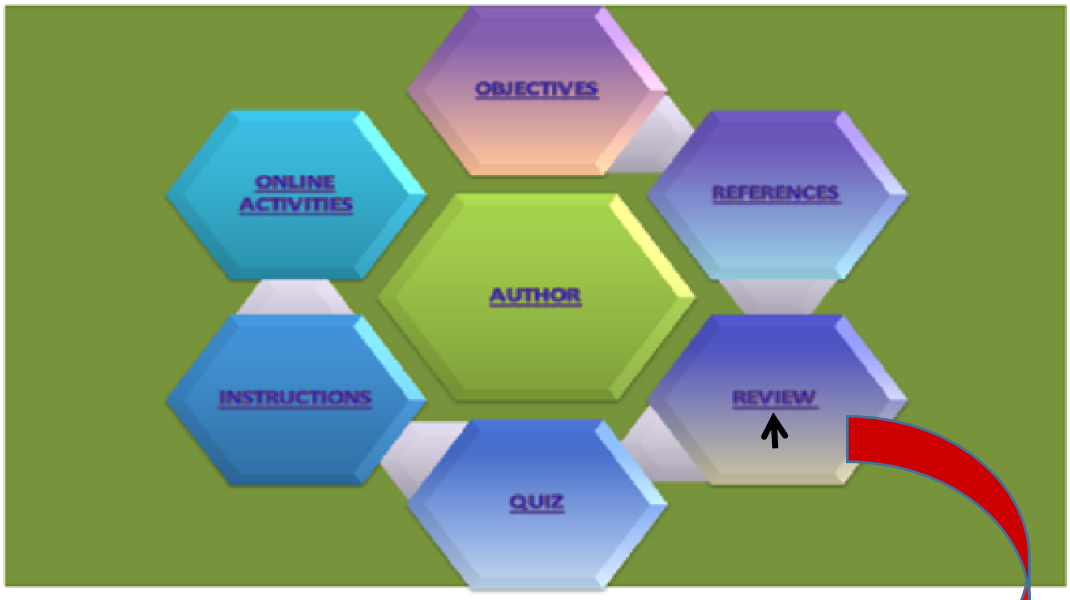

Figure 12: The Figure linking to Review Page

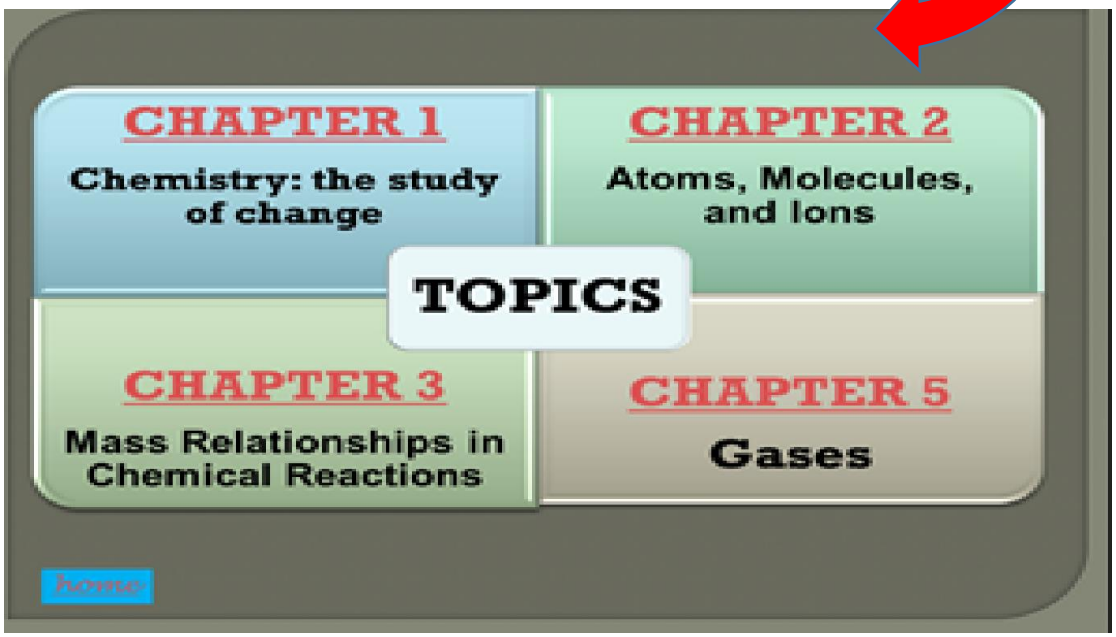

Figure 13: The Different Topics forReview Page

2.1.7. References

References provide all the sources of information stated and contained in the course work. The reference material came from journal, dissertation, theses, books, internet and more.

Clicking the reference will give you all the sources.

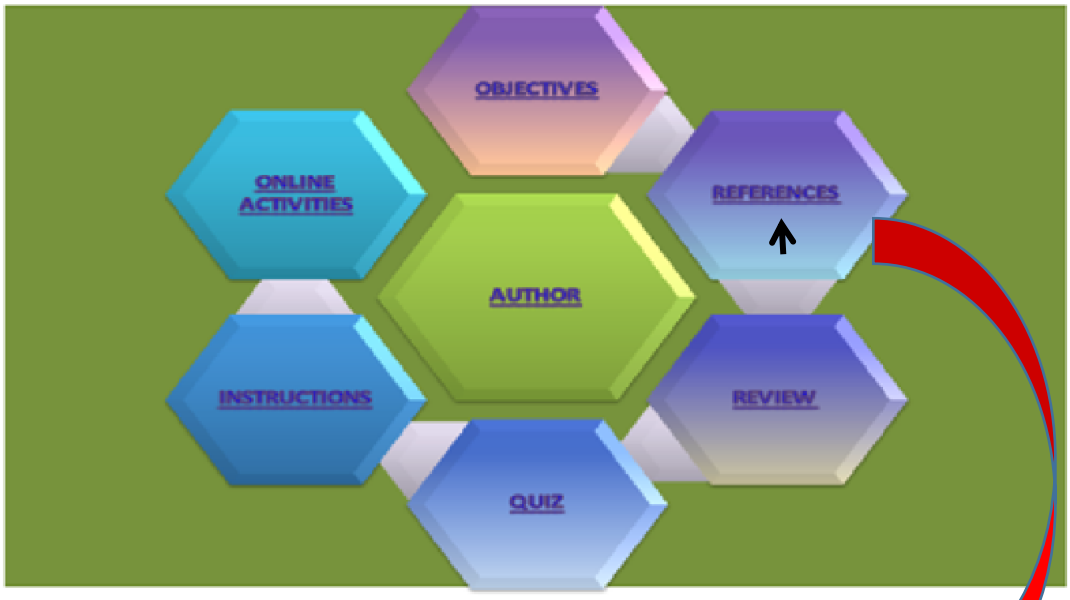

Figure 14: The figure linking to the References

Figure 15: References

3. Methodology

The course work developed is primarily for the students of Chemistry. The instrument used was validated and the reliability was tested by determining its cronbach alpha. The population considered for the reliability test is 40 respondents and the actual population

considered for the determination of satisfaction rating is 80. The average mean for each part of CAI and the overall average were computed to determine the overall satisfaction rating of students for the coursework developed. The percentage increases in chemistry concepts were also determined.

3.1 Instrument

Name:_____
Address:_____
Age:_____gender_____
Course:_____
Occupation:_____

Please check the box for each statement below to show how much you are satisfied with it.

1- Not at all satisfied
2- Slightly satisfied
3- Moderately satisfied
4- Very satisfied
5- Extremely satisfied

		1	2	3	4	5
	Objectives					
1.	Has a good idea of what is expected and why it is expected.					
2.	Objective varies at different levels.					
3.	Present a clear picture of course purpose					
4.	Provides a sense of how knowledge will increase in the course and encourages higher order skills.					
5.	Encourages good comprehension, analytical thinking and problem solving					
	On line homework					
1.	The question is clear					
2.	Question can be easily understood					
3.	The time allowed to answer each question is enough					
4.	Each question were discussed in the classroom					
5.	Each questions develops critical thinking					
	quiz					
1.	The question provided matches the level of difficulty					
2.	The time for each category is enough					
3.	The scores for each category matches the level of difficulty					
4.	The questions were discussed in the classroom					
5.	There are enough questions for each level					
	Review					
1.	All topics in the course syllabus can be found.					
2.	Presentation is clear and can be easily understood					
3.	Animations provided helped the easy understanding of the topic					
4.	Pictures provided gives an informative impact					
5.	Information presented in logical, interesting sequence					
	Instructions					
1.	The instructions can be easily understood.					
2.	The mechanics are clearly stated					
3.	It can be followed easily					
	references					
1.	References are current and up to date					
2.	References came from different sources such as dissertation, theses and others.					
3.	References are arranged and formatted					

Which of the following approach would you like to use? Please check

Face to face_____ online learning_____ face to face and online learning_____

4. Results

After conducting the face validity and reliability test the result showed that it is valid and reliable since it gave a cronbach alpha of 0.7338. The following values of average means for review, instructions, quiz, references, objectives and online activities are given respectively; 4.3351, 4.3319, 4.285, 4.2097, 4.248. The overall average mean for the course work developed is 4.255 and 79% of the students preferredthe combination of face to face and online learning for learning and instructions.

5. Conclusion

From the output of the coursework developed we can simply say that the integration of e-technology in learning and instruction is a useful tool to meet the preference of students. By meeting their preference motivation can be easily injected in the process of learning thus will enhance their knowledge. With the use of computer aided instruction and linking it to online learning would also increase their skills since this is one way of student intervention. A specially designed coursework could be developed depending on the nature of the child. Since the generation today is technologically inclined the use and integration of technology in all aspect is needed because this will suffice the need of students.

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