



## Impact of Authentic Learning on the Satisfaction, Knowledge and Skills of Distance Learners in Context-Aware Ubiquitous Learning Environment

Vol. IV, No. II (Spring 2019) | Page: 115 – 125 | DOI: 10.31703/grr.2019(IV-II).13

p-ISSN: 2616-955X | e-ISSN: 2663-7030 | ISSN-L: 2616-955X

Zubia Noreen\*

Muhammad Ajmal†

Arshad Awan‡

**Abstract** *This study was aimed to measure the impact of authentic learning on the satisfaction, knowledge and skills of the learners in context-aware ubiquitous learning environment. For this purpose an E-module based on authentic learning activities was developed. This was a single group pre-survey and post survey experimental study. All the students of M.Phil. DNFCE at AIOU in semester spring 2016 were taken as sample. The data was collected through questionnaires based on five point Likert scale. The descriptive statistical analysis (mean and Standard deviation) found suitable for the study and Pair T-test was used to compare the opinions of the learners of experimental group before and after the experiment. It is suggested that the activities based on authentic learning enhance students' satisfaction, knowledge and skills so it may be practiced at the higher education level for better results and the students of AIOU may be prepared for 21st century in digital era.*

**Key Words:** Activity based Learning, Authentic Learning, Electronic Learning, Ubiquitous Learning

### Introduction

In the 21<sup>st</sup> century, almost every institution expects the university graduates to be capable to work with the desirable skills required for their jobs. They wish to appoint workers who have novel ideas, good communication skills and problem solving skills. On the one hand, distance education is playing a vital role all around the globe in academic and professional growth. Further; a speedy transformation in the digital world has moved distance education towards context-aware ubiquitous learning. On the other hand, still traditional approaches to higher education in the distance education system do not provide those skills to the graduates. To inculcate these skills in students in order to prepare them for workplace in their chosen professions; it's needed to initiate authentic learning in the ubiquitous learning environment.

According to Panchabakesan (2011) "Distance education should bring students together, advanced and real-time multimedia technology should be used to enhance the teaching effectiveness and to improve the interaction between instructors and students. With symmetric audio and video capabilities, students can quickly communicate their ideas with the instructor and other students". According to the Herrington and Oliver (2006) "The Internet has fundamentally changed the instructional process in higher education. The Internet has provided educators with a powerful tool to create effective and immersive learning environments and provides efficient and collaborative forms of communication for students with their instructors and with each other". That's the reason, trend in e-learning is increasing day by day all over the world. With the advancement of technology, e-learning is becoming more flexible and reachable for every individual. The instructors of e-learning should push their teaching methods towards experimentation, innovation and practical learning. The distance education institution may also modify their syllabus according to the need and criteria of organizations for whom these workforces are supposed to be prepared. The latest generation of e-learning is u-learning.

\*Ph.D Scholar, Department of Distance and Non-Formal Education, Allama Iqbal Open University Islamabad, Punjab, Pakistan. Email: [zubia.noreen002@gmail.com](mailto:zubia.noreen002@gmail.com)

†Associate Professor, Department of Distance and Non-Formal Education, Allama Iqbal Open University Islamabad, Punjab, Pakistan.

‡Assistant Professor, Department of Computer Science, Allama Iqbal Open University Islamabad, Punjab, Pakistan.

## The Components of Paradigm Shifts



**Figure 1:** Paradigm shift of E-learning

<http://research.ncku.edu.tw/re/articles/e/20090904/4.html>

According to Yahya and Ahmad (2010),

“Ubiquitous learning, also known as u-learning is based on ubiquitous technology. Ubiquitous learning or u-learning is a new learning paradigm. It is said to be an expansion of previous learning paradigms as we move from conventional learning to electronic-learning (e-learning) and from e-learning to mobile-learning (m-learning) and now we are shifting to ubiquitous learning (u-learning). The most significant role of ubiquitous computing technology in u-learning is to construct a ubiquitous learning environment, which enables anyone to learn at anyplace at any time”.

According to the previous researches permanency, accessibility; immediacy and interactivity are the common characteristics of ubiquitous-learning. But the major characteristic of ubiquitous learning is context-awareness. According to Hwang, Tsai and Yang, (2008) “context-aware ubiquitous learning environments are formed as a result of utilizing mobile devices, wireless communication and sensor technologies in learning environments”.

“Learning by doing is the basis of authentic learning and is considered one of the most effective strategies for instruction (Lombardi, 2007)”. According to Bell (2010) “Authentic learning which a strategy is found under deeper learning, its goal is to provide students with critical thinking, problem solving, creativity, and collaboration skills. Research shows that through authentic learning approaches students raise test scores” Use of Authentic learning in ubiquitous learning environment is to utilize the theories and the skills which they learn during the course work and later they get real world applications and guide the students in such a way that they bridge the gap between the learning materials and the application.

This is not an easy process and to achieve this target constant contribution of both the teacher and student is required. Designing e-learning courses according to the authentic learning means to include more real-world context and the learning units may pursue this procedure. Firstly the students will learn the content and secondly they apply this learning during the practical assignments. On the third place feedback can be given to them and fourthly they again apply this knowledge and finally get the feedback from the tutor.

In online courses where authentic learning is applied are helpful to direct the students towards self-guided exploration, to solve real-world problems and thoughtful group discussions, so these online learners are able to apply their knowledge and skills in a realistic context. For instance, they make use of their newly learned knowledge and skills to accomplish a real world task which encourage collaboration among peers with self-guided instruction to provide meaningful authentic learning experience in ubiquitous learning environment.

## Objectives

1. To develop E-module based on authentic learning activities to teach in ubiquitous learning environment for distance learners.
2. To explore impact of authentic learning on distance learners in context-aware ubiquitous learning environment.

## Hypothesis

1. H<sub>01</sub>: There is no significant increased satisfaction of distance learners to learn through authentic learning activities in ubiquitous- learning environment.
2. H<sub>02</sub>: There is no significant improvement in the knowledge and skills of distance learners after doing authentic learning activities in ubiquitous –learning environment.

## Delimitations of the Study

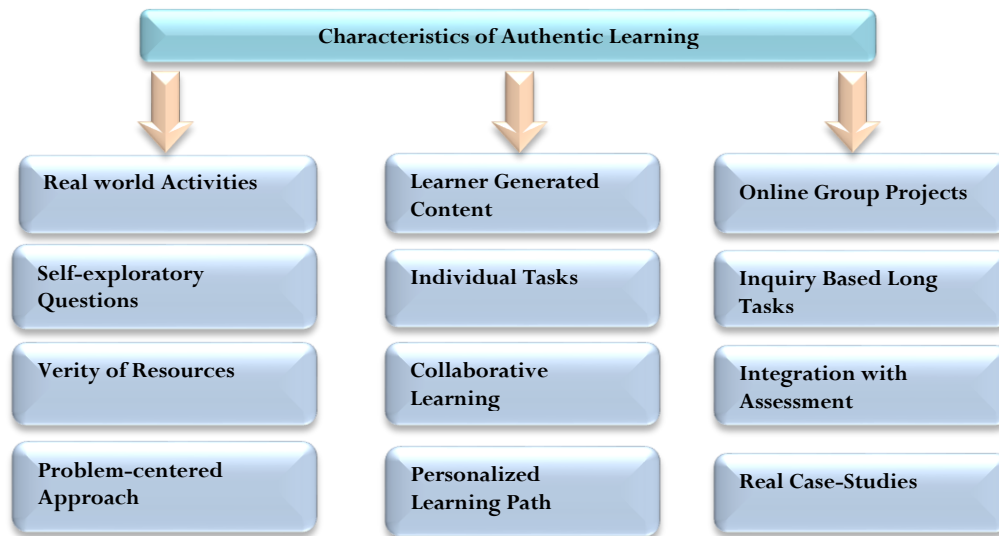
The study was delimited to:

- i) Allama Iqbal Open University
- ii) Faculty of education
- iii) Students enrolled in M.Phil. and Ph.D. education.
- iv) Year 2014 to 2016

## Literature Review

According to the Gearhart (2012) “Authentic learning is a pedagogical approach that allows students to explore, discuss, and meaningfully construct concepts and relationships in contexts that involve real-world problems and projects relevant to the learner. Students are presented with problem-solving activities that incorporate authentic, real-life questions and issues in a format that encourages collaborative effort, dialogue with informed expert sources, and generalization to broader ideas and application”

Reeves, Herrington, and Oliver, (2002) state that “In reflecting on the characteristics of authentic activities described by researchers, following design characteristics of authentic activities have been identified in the literature”.



**Figure 2:** Characteristics of Authentic Learning

[www.researchgate.net/publication/221093780\\_Patterns\\_of\\_Engagement\\_in\\_Authentic\\_Online\\_Learning\\_Environments](http://www.researchgate.net/publication/221093780_Patterns_of_Engagement_in_Authentic_Online_Learning_Environments)

Real world activities are the heart of authentic learning where learners face real challenges. Online learners are able to apply learning content in a real situation instead of memorizing the theories. In Authentic Learning online learners are encouraged to think and explore the questions from the different perspective of content. They must search out the answers by their selves so that critical thinking can be inculcated within the students. In the authentic learning variety of resources are given to the learners and especially in the online learning they get

different kinds of leaning resources to get the required data and to eliminate the boring element. To enhance the motivation and engagement of the online learners, a problem-centered approach is used in authentic learning; in this way they are preparing to solve the real life problems which are not theoretical rather it may benefit their everyday lives. A central part of the authentic learning is to make learners able to read, understand, assess, systematize and then apply the information to solve practical problems. In this way they are able to have high order thinking and may generate their own content innovatively. In the authentic learning the learners are given individual tasks as well so that they may do it independently and get confidence on their abilities.

“Authentic approaches to teaching and learning recognize the importance of collaboration” (Mathur & Murray, 2006). Online collaboration in authentic learning is helpful to get the benefit from the experiences of the fellow learners. Interaction with teachers, peers and community make them able to engage in purposeful online assignments and discussions. In the distance education system, every individual faces different challenges in their daily lives and have different objectives to achieve their goals. So personalized learning path is an essential part of the authentic learning as it enables individuals to achieve their goals at their own pace. In the online learning environment there are rare face to face sessions with teachers and peers so the group projects reduce the feelings of isolations and interactivity makes the learning process interesting.

Inquiry based long tasks are given to the online learners so that they can go in the depth of the problems and can give the possible solutions as well. Most of the practical assignments are aligned with the assessments so that students perform given assignments with interest and motivation In the online learning by using authentic learning activities it is preferred to use real-world examples, stories, and case studies to understand the subject matter more realistically and the learners may understand how to use the information in real world context

“The Authentic Learning Model improves knowledge retention and real-world application. Online learners have the power to hone their skills and abilities at their own pace. However, they can also make the most of social learning opportunities. Authentic Learning also helps online learners assimilate and retain the subject matter more effectively, as they are able to personalize the learning process and tackle challenges from multiple angles”. Retrieved from ([www.sccetv.org](http://www.sccetv.org) by Karen Ogen)

According to Mathur and Murray (2006), “There are many strengths of the Internet for authentic learning. It supports lifelong learning; it shifts the instructional paradigm from a teaching environment to a learning environment; it provides communication tools that support dialog within and between diverse communities of learners”.

## **Methodology**

The ubiquitous learning application was developed for an ongoing doctoral research work of one of the researchers of this study and the following research based on authentic learning was conducted on that context aware ubiquitous learning application.

## **Research Design**

This was a pre-survey and post-survey single group experimental study in which data was analyzed by quantitative methods.

## **Instrument**

A pre- survey and a post- survey questionnaire was developed to collect the data after the experiment and the questionnaire was confirmed after the opinion of experts.

## **Population and Sampling**

Census sampling technique was used so all the students enrolled in M.Phil. DNFCE at AIOU in semester spring 2016 was taken as sample.

## **Procedure**

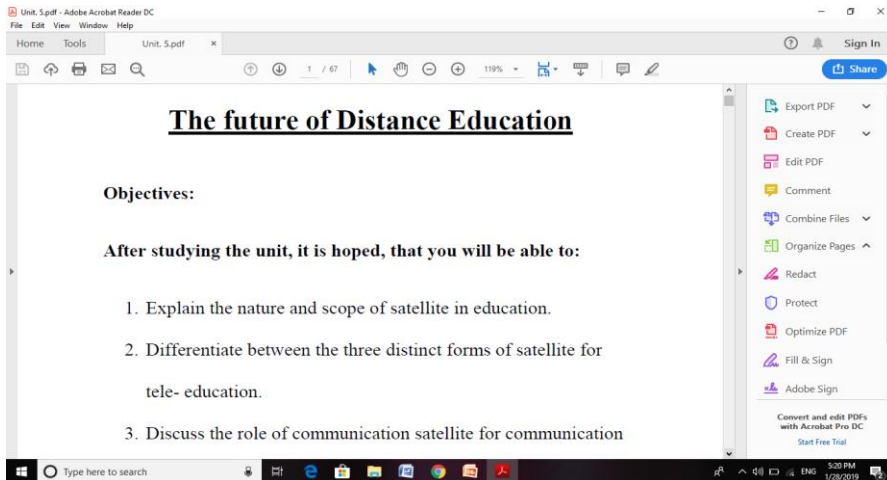
The experiment was conducted in the main campus of AIOU Islamabad during the M.Phil. 2<sup>nd</sup> semester workshop. The duration of the experiment was two weeks. E-module was developed from the M.Phil. education

book “Distance Education” and all the activities were designed keeping in view authentic learning characteristics within context-aware ubiquitous learning environment (ULMS).

### **Development of E-Module Based on Authentic Learning**

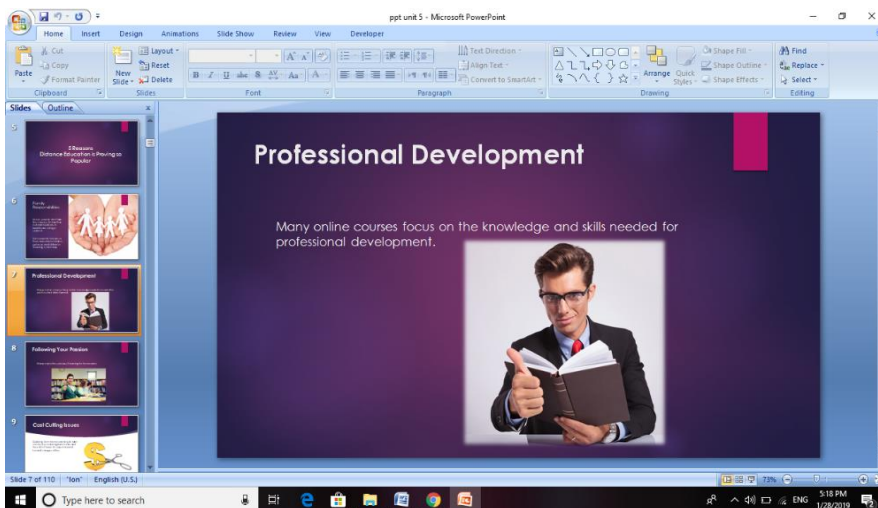
The course was delimited to M.Phil. Education (DNFE) and one chapter was taken as sample “The Future of Distance Education” from Distance Education book from the M.Phil. course at AIUU.

The complete chapter was improved in detail and digitalized to upload on context- aware ubiquitous learning environment.



**Figure 2:** Sample unit for experiment (Screenshot from the ubiquitous application)

To make this chapter more attractive and for brief reading and understanding, a power point presentation was made and uploaded on the context-aware ubiquitous learning system.



The activities were designed by keeping in view the characteristics of authentic learning in the context-aware ubiquitous learning environment.

**Table 1.** Activities according to the characteristics of Authentic Learning

SR#.	Characteristics of Authentic Learning	Topic	Activities
1.	Real-World Activities	Distance Education	Conduct a small survey on “The reasons for opting distance education system rather than formal education” from 30 distant students and share its findings on Ubiquitous Learning Management System (ULMS).
2.	Learner Generated Content	E-learning	What are the main differences between E-learning, Mobile learning and Ubiquitous learning? Please make comparison on a chart/A4 paper and make its picture for sharing on ULMS.
3.	Online Group Projects	Online Learning	Make a report as group project on the initiative taken by universities in Pakistan to promote Online-learning in the past 5 years.
4.	Questions leads self-exploration		Read this full article <a href="http://ijodel.com/wp-content/uploads/2016/03/001_Alfonso_Garcia.pdf">ijodel.com/wp-content/uploads/2016/03/001_Alfonso_Garcia.pdf</a>  Synthesize this paper in two paragraphs.
5.	Personalized Learning Path	Online activities	Prepare a list of online activities in your own time which helps you to engage in academic tasks for long span of time.
6.	Real Case-Studies	Problems of Distance learners	Find-out a distance student from your university who left the studies during the academic year. Write up his/her case-study by highlighting the problems faced by him/her.
7.	Problem centered-approach	Problems in E-learning	Take an interview of your favourite distant-teacher and discuss the problems in e-learning program at AIOU and what are their solutions?
8.	Individual Tasks	Future of Distance Education	Please make a pictorial power point presentation on “Future dimensions of distance education”.
9.	Inquiry-base Long-tasks	Social Media	Kindly search at least 5 facebook academic pages which may be beneficial for the students of AIOU. Stay connected and give the detail report after one month with evidence.
10.	Variety of resources	Ubiquitous Learning	Use variety of online sources For instance YouTube, Facebook, Twitter, Slideshare, Linked-In, Blogs, Google scholar, Journals etc. to make e-book on “ <b>Ubiquitous Learning</b> ” containing videos, PPTs, E-text and important links. .
11.	Collaborative Learning	ICT	Participate in the discussion about “Role of ICT in the field of distance education (pros and cons) on ubiquitous LMS live chat.
12.	Integration with assessment		Read the full chapter “Future of distance education and give the correct answers of the following questions.

**Table 2.** Activity from the unit integrated with Assessment Answer the following Questions:

---

1	Q. 1 Studying at home can help to save _____ by reducing travel costs such as bus and train fares, fuel expenses and parking fees. 1. Money 2. Fuel 3. Time 4. Health
2	Q2. _____ comprises all forms of electronically supported learning and teaching. 1. Multimedia 2. E-learning Internet 4. Mass media
3	_____ has the benefits of mobility and its supporting platform and enhance the broader learning experience. Distribution methods 2. E-learning Mobile learning 4. Instructional methods
4	Q. 4 _____ is a computing environment that facilitate the learning process in the right time at the right place and in the right way. 1. E-learning 2. M.learning 3. U-learning 4. Blended learning
5	Q.5 _____ combine face-to-face traditional classroom experience along with live e-learning programs. 1. Educational technology 2. Online learning 3. Blended learning 4. Ubiquitous learning
6	_____ a variety of support services are given at the different stages of student learning phases in distance learning. 1. E-learning 2. ICT 3. Mass media 4. Blended learning
7	E-learning has been moved towards _____ in which two way communications medium is used to make learning process more interactive 1. M. learning 2. Web.1 3. Web. 2 4. U-learning
8	Q.8 The utilization of _____ is increasing in e-learning to promote interaction and collaboration among teachers and between students 1. Web.1 2. Television 3. Radio 4. Chatrooms
9	Through _____ program source codes are openly available. 1. Podcast 2. Vodcast 3. RSS 4. Open source
10	_____ is a software application which is used to make planning, implementation and assessment for a specific learning procedure in e-learning. 1. LMS 2. U-learning 3. ORE 4. M. learning

## Data Analysis

The descriptive statistical analysis (mean and Standard deviation) found suitable for the study and Pair T-test was used to compare the opinions of the distance learners of experimental group before and after the experiment.

## Hypothesis Testing

H<sub>01</sub>: There is no significant increased satisfaction of distance learners to learn through authentic learning activities in ubiquitous- learning environment.

**Table 3.** Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre-satisfaction	1.7558	2	.15674	.11083
	Post-satisfaction	3.8208	2	.00589	.00417

## Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Pre-satisfaction & post-satisfaction	2	1.000	.000

## Paired Samples Test

		Paired Differences					T	Df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval				
					Lower	Upper			
Pair 1	Pre-satisfaction – post-satisfaction	-2.0650	.15085	.10667	-3.42033	-.70967	-19.359	1	.033

There is statistically significant difference between the satisfaction level of students before and after experiment of authentic learning through ubiquitous application as  $p=.033$  (which is less than .05). It is evident from Table3 that post-satisfaction mean (i.e.=3.8208) is greater than pre-satisfaction mean (i.e. = 1.7558) at  $p=.033$ , so it is concluded that there is significantly increased satisfaction of distance learners to learn through authentic learning activities through ubiquitous learning environment. So the null hypothesis was rejected.

H<sub>02</sub>: There is no significant improvement in the knowledge and skills of distance learners after doing authentic learning activities in ubiquitous –learning environment.

**Table 4.** Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre-knowledge	1.8300	2	.14142	.10000
	Post-knowledge	3.6750	2	.10607	.07500

## Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Pre-knowledge & post-knowledge	2	-1.000	.000

## Paired Samples Test



		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre-knowledge	1.8300	2	.14142	.10000
	Post-knowledge	3.6750	2	.10607	.07500

**Paired Samples Correlations**

				N	Correlation		Sig.		
		Paired Differences		95% Confidence Interval of the Difference		T	Df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1	Pre-knowledge - post-knowledge	-1.8450	.24749	.17500	-4.06859	-.37859	-10.543	1	.000

There is statistically significant difference between the knowledge level of the students before and after experiment of authentic learning through ubiquitous application as  $p=.000$  (which is less than  $.05$ ). It is evident from Table 4 that post-knowledge mean (i.e.=3.6750) is greater than pre-knowledge mean (i.e. = 1.8300) at  $p=.000$ , so it is concluded that there is significantly increased knowledge of distance learners to learn through authentic learning activities in ubiquitous- learning environment. So the null hypothesis was rejected.

**Table 5. Paired Samples Statistics**

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre-skills	1.6109	11	.19186	.05785
	Post-skills	3.7545	11	.28324	.08540

**Paired Samples Correlations**

		N	Correlation	Sig.
Pair 1	Pre-skills & post-skills	11	.498	.119

**Paired Samples Test**

		Paired Differences		95% Confidence Interval		T	Df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1	Pre-skills - post-skills	-2.14364	.25089	.07565	-2.31219	-1.97509	-28.338	10	.000

There is statistically significant difference between the skill acquisition of the students before and after experiment of authentic learning activities in ubiquitous learning environment as  $p=.000$  (which is less than  $.05$ ). It is evident from Table 5 that post-skills' mean (i.e.=3.7545) is greater than pre-skills' mean (i.e. = 1.6109) at  $p=.000$ , so it is concluded that there is significantly increased skill acquisition level regarding using latest technology in

education through authentic learning activities of distance learners in ubiquitous- learning environment. So the null hypothesis was rejected.

## Results

1. There is statistically significant difference between the satisfaction level of students before and after experiment of authentic learning activities as  $p=.033$  (which is less than  $.05$ ). It is evident from table-1 that post-satisfaction mean (i.e. =3.8208) is greater than pre-satisfaction mean (i.e. = 1.7558).
2. There is statistically significant difference between the knowledge level of the students before and after experiment of ubiquitous application as  $p=.000$  (which is less than  $.05$ ). It is evident from table-1 that post-knowledge mean (i.e. =3.6750) is greater than pre-knowledge mean (i.e. = 1.8300).
3. There is statistically significant difference between the skill acquisition of the students before and after experiment of ubiquitous application as  $p=.000$  (which is less than  $.05$ ). It is evident from table-1 that post-skills mean (i.e. =3.7545) is greater than pre-skills mean (i.e. = 1.6109).

### Result shows impact of Authentic Learning in Context Aware Ubiquitous Learning Environment:

	Before Experiment	After Experiment
1. Satisfaction	Pre-satisfaction =1.7558	Post-satisfaction= 3.8208
2. Knowledge	Pre-know ledge =1.8300	Post-knowledge=3.6750
3. Skills	Pre-skills=1.6109	Post-skills=3.7545

## Conclusion

Ubiquitous learning allows students to learn anywhere/ anytime in a self-directed environment and the modules based on authentic learning provide focused instruction based on practical skills and individuals' pace of learning. "There is a great deal of pressure on universities to provide quality learning outcomes for students who study at a distance, and the Internet has been identified as a means to provide that service. In this practice, educators are effectively ignoring the great potential and the significant affordances of the Internet to enable authentic tasks to guide student learning" (Reeves & Herrington ( 2002). This study focused on the integration of authentic learning practices with the context-aware ubiquitous learning for the development of an interactive and practical/skilled based learning environment. To design instruction for authentic learning in ubiquitous learning environment, the instructor played the role of facilitator in the learning process. Every student got the opportunity to build relationship of his/her existing knowledge with the real world. The results show that most of the distance learners were satisfied with the authentic learning activities and ubiquitous learning environment and they strongly agreed that activities based on authentic learning and context aware ubiquitous learning management system are better than traditional distance education system and they feeling themselves more motivated. Moreover, they are more interested in doing the practical activities rather than the bookish knowledge. Furthermore, most of the learners agree that their knowledge and skills regarding authentic learning in the ubiquitous environment were enhanced. Hence it is concluded that this study helped the students to think critically, solve problems, work with creativity and collaborate with rest of the class fellows. If the learners continue with the same pattern of learning they may be a better workforce in their chosen profession.

## Recommendations

It is suggested that activities based on authentic learning enhance students' satisfaction, knowledge and skills so it may be practiced in the higher education level for better results. Especially, context-aware ubiquitous learning system based on authentic learning may be adopted in the distance education system at AIOU to prepare the students for 21<sup>st</sup> century in digital era. Academicians may include authentic learning activities as assignments and students may be trained to work in ubiquitous LMS and practical assignments before starting the workshops.

## References

- Bell, S. (2010). Project-based learning for the 21st century: Skills for the future. *The Clearing House*, 83(2), 39-43.
- Gearhart, D. (2012). Authentic learning in online courses: A course design model. In *Interactivity in e-learning: Case studies and frameworks* (pp. 82-94). IGI Global.
- Hwang, G. J., Chin-Chung, T., & Yang, S. J. (2008). Criteria, strategies and research issues of context-aware ubiquitous learning. *Journal of Educational Technology & Society*.
- Jones, S. M., Casper, R. M., Dermoudy, J., Osborn, J. E., & Yates, B. F. (2010). Authentic learning: A paradigm for increasing student motivation in an era of mass education. In *Teaching Matters 2010 Conference* (pp. 52-59).
- Lombardi, M. M. (2007). Authentic learning for the 21st century: An overview. *Educause learning initiative*, 1(2007), 1-12.
- Mathur, S., & Murray, T. (2006). Authentic assessment online: A practical and theoretical challenge in higher education. In *Online assessment, measurement and evaluation: Emerging practices* (pp. 238-258). IGI Global.
- Reeves, T. C., & Herrington, J. A. (2006). Creating authentic learning environments through blended-learning approaches.
- Panchabakesan, S. (2011). Problems and prospectives in distance education in India in the 21st century. *Problems of Education in the 21st Century*.
- T.C., Herrington, J. and Oliver, R. (2002) *Authentic activities and online learning*. In: HERDSA 2002 Quality Conversations, 7 - 10 July 2002, Perth, Western Australia pp. 562-567. [www.elearningindustry.com/educational-technolog](http://www.elearningindustry.com/educational-technolog)  
[www.research.ncku.edu.tw/re/articles/e/20090904/4.html](http://www.research.ncku.edu.tw/re/articles/e/20090904/4.html)  
[www.researchgate.net/publication/221093780\\_Patterns\\_of\\_Engagement\\_in\\_Authentic\\_Online\\_Learning\\_Environments](http://www.researchgate.net/publication/221093780_Patterns_of_Engagement_in_Authentic_Online_Learning_Environments)  
[www.sctv.org/stories/education/2018/12-ways-technology-can-support-authentic-learning](http://www.sctv.org/stories/education/2018/12-ways-technology-can-support-authentic-learning)
- Yahya, S., Ahmad, E. A., & Jalil, K. A. (2010). The definition and characteristics of ubiquitous learning: A discussion. *International Journal of Education and Development using Information and Communication Technology*, 6(1), 1