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## PERVASIVE LEARNING ACCEPTANCE AND USAGE IN UNIVERSITIES OF HYDERABAD, PAKISTAN: A STUDY OF UNIVERSITIES

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**ABSTRACT**

*Pervasive learning is a new student-centered learning paradigm, which includes formal learning, informal learning, and social learning. Consequently, the purpose of this study discusses the pilot study testing process of the proposed research model before initiating primary research on pervasive learning. The main aim of conducting a pilot study is to assess the questionnaire's validity and reliability. Information was gathered through a self-administered research method from 52 entities affiliated with higher educational institutions in Hyderabad. The results agree that most factors in the proposed model have Cronbach's alpha in the range of 70 and above is good and 80 and above is better, accordingly indicating better reliability of the variables of this study. Hence, the factors in the questionnaire are acceptable for future larger-scale studies. The findings provide valuable insights into the structures that may affect the use and subsequent outcomes of ubiquitous learning adoption in universities in Asian countries such as Pakistan. In this regard, to contribute to the research body, the researchers define the process and method for testing the pilot study before starting the main study. The proposed research model is constructed on the (UTAUT) model, which attempts to shed light on students' intentions to use information communications technology and students'*

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*usage behavior This study arose from the acceptance and use of ubiquitous learning in universities in Hyderabad and Jamshoro, Pakistan, and all hypotheses were accepted.*

## **KEYWORDS**

*Pervasive Learning, Information Communication Technology, Information Systems, Unified Theory of Acceptance and Use*

## **INTRODUCTION**

Today, information communication technologies have revolutionized the development of learning strategies and educational environments. Introducing a new learning paradigm whose rapid expansion is pervasive learning. There is no doubt that the expansion of modern technology has transformed our daily lives. It allows students to access learning resources anytime, anywhere. With the growing need to improve access to higher education, studying in higher education institutions has quickly become widely accepted and used (Cope and Kalantzis 2009). Higher educational institutions in Asian countries are now using information communication technologies to enhance education in the form of pervasive learning (Pimmer and Gröbriel 2016). Higher education institutions in Pakistan employ traditional teaching methods. Over the years, but as time has passed, technology has taken place in the country for effective teaching and learning. The old fashion method should be improved to the current practice of learning in Pakistan.

Ubiquitous learning is not new in other developed countries, but developing countries like Pakistan need to focus on improving uptake and learning. Use of these methods in teaching and learning (Aboagye 2021). It stated (Furion2015) that the traditional methods are known as face-to-face methods confined to specific locations such as classrooms, specific syllabuses available only in textbook form, or lectures given by teachers at specific classes. After class, there is no communication between teachers and students due to the lack of technology access (Tang et al., 2020). In developing countries such as Pakistan, the old-fashioned method is still used. It is a kind of real-time interaction between teacher and student, where the classroom is at the center and no other technology or method is available, passively student taking notes, teaching information, and learning.

These methods are not effective in helping students learn scientific concepts in the long run. It is only good for real-time interaction between teachers and students (Wang., G & Wang 2014). Ubiquitous learning has taken the reins of conventional education, breaking free from the limitations of the classroom. contemporary technology, particularly the internet, has revolutionized what was once confined within the four walls of a traditional educational setting. The transition from

antiquated approaches to utilizing technological tools is referred to as pervasive learning. It is a form of continuous and spontaneous learning that takes place in diverse contexts and environments, rather than being restricted to a particular one (Baccour et al., 2022; Thomas 2005; Shuib 2015). PL in education refers to the integration of learning into various aspects of a student's life, rather than confining it to an out-of-date classroom setting.

Previous research has shown that Pervasive Learning facilitates learners' access to information and communication anytime, anywhere (Shuib 2015). A prevailing trend in education involves the development of learning environments that are more scalable, captivating, and impactful, aiming to equip students for success in the 21st century.

### **LITERATURE REVIEW**

Pervasive Learning is learning that uses technology that is present in students' daily lives. Rather than being isolated in one geographic location, such as a classroom, Pervasive Learning can occur anytime, anywhere. A learning management system (LMS) can be used to support pervasive learning, allowing students to access course materials and other learning resources at their convenience, from any location, and through various devices. (Mphahlele, R. S. 2023; Suartama et al., 2020; Dicerbo & Forcheri 2010) García et al., 2011).

This contributes to a smoother and adaptable learning journey as students have the flexibility to access content and interact with course materials according to their individual preferences rather than being confined to a set location or timetable. In this article, William emphasizes that pervasive learning goes beyond incorporating the newest educational concepts and techniques. It encompasses a vision of learning that applies to every phase of our lives. Learning occurs not only within the confines of a classroom but also extends to our homes, workplaces, playgrounds, libraries, museums, nature, and everyday interactions with others (peña-Ayala & Cárdenas 2016).

Examples of useful dissemination learning adoption of LMS in education include Moodle (Luján-García & García-Sánchez 2015), WebCT, Blackboard, and Desire2Learn (Laine et al., 2009; Alijawarneh 2020). Existing literature indicates that the acceptance of LMS for widespread learning adoption among higher education students varies by country (Mphahlele, R. S. 2023; Laine et al., 2009). LMSPLE acceptance rates are high in the East, whereas in the West (Mwalumbwe & Mtebe 2017; Baccour et al., 2022). According to market research future report in 2022, the market for future pervasive technologies is anticipated to achieve a Compound Annual

Growth Rate (CAGR) of 22.31% reaching a valuation of US\$2.31 billion. (Market Research 2022).

It holds considerable importance to examine the factors impacting the acceptance and use of higher education among students in Asian nations like Pakistani universities. Consequently, it is essential to identify and comprehend the reasons for embracing or rejecting technology, as emphasized by Venkatesh in 2022. This study delves into the factors that influence students' willingness to embrace learning management systems as valuable tools for integrating ubiquitous learning in Pakistan universities. A review of technology adoption and use has largely focused on the information and communications technology sector, and the success of pervasive learning in Pakistani universities depends on student acceptance. In Pakistan, students were surveyed to gauge their opinions and biases regarding the adoption of P-learning. The study considers independent factors such as Context Awareness, self-directed learning, personal innovativeness, adaptability, compatibility, hedonic motivation, performance expectancy, and facilitating conditions, while the dependent variable is behavior intention. The objective of this paper is to suggest a theoretical model for pervasive learning based on the feedback received from students in Pakistani universities, employing the UTAUT model.

This study serves as a preliminary investigation preceding the main study, resembling it on a larger scale. It is an experimental undertaking conducted on a comparable scale to ensure the success of the actual study. These pilot studies assist researchers in thoroughly refining their data collection plans, focusing on both data content and the associated procedures.

A trial questionnaire was the primary objective of the pilot study (Jakada et al., 2020). The purpose of conducting a pilot study is to (a) test the adequacy of the study tools, (b) assess the feasibility of a full-scale project, and (c) determine whether the study protocol is accurate and feasible. (d) Reveal logistical issues; (e) collect primary data; (f) ensure that sampling frameworks and methods that are effective (g) determine sample size. (h) Substantial funding agencies where the main research is feasible and worthy of funding. Previous literature strongly supports the need to conduct pilot studies to identify future risks associated with sample size, data collection methods, sample selection, data management, and data analysis (Jakada et al. al., 2020; Moore 2013).

## RESEARCH OBJECTIVES

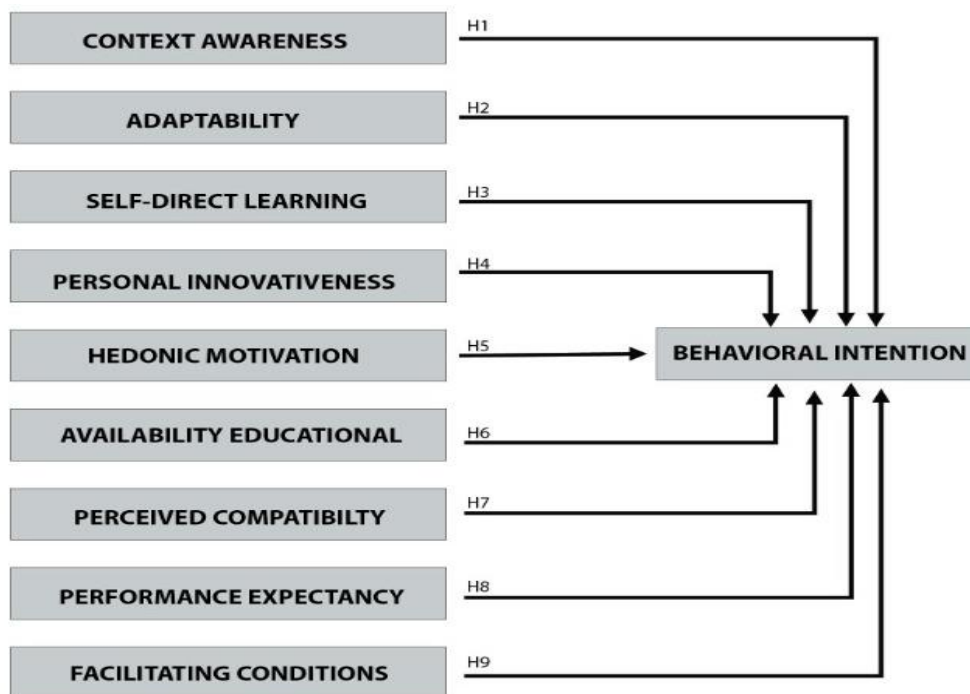
1. To develop a questionnaire by communicating the factors that influence the acceptance and use of p-learning in Pakistani universities.
2. Examine the reliability and validity of questions.

## RESEARCH METHODOLOGY

In this study, based on a review of previous studies, we develop a new research model by combining the seven external factors obtained from the literature review analysis with the Unified theory of acceptance and use model. Researchers have found that UTAUT has higher explanatory power than other related theories of information communication technology.

The proposed model in Figure 1 was designed to explore how various external factors play a role in promoting student acceptance and use in higher educational institutions in Pakistan. External variables included in the proposed model include: performance efficacy, facilitation condition, context awareness, adaptability, hedonic motivation, self-directed learning, personal innovativeness, availability education, perceived compatibility, and behavioral intention were relevant variables.

**Figure 1: The proposed theoretical research model**



The selection of respondents in this pilot study was founded on a stratified technique. This technique is sampling method was chosen because it yields a sample population that is most representative of the overall study population (Jakada et al., 2020). The sample consisted of pervasive learners from higher educational institutions in

Pakistan. Consequently, in this study, samples were collected from four higher educational institutions, including the University of Sindh, Mehran University, LUMHS University, and Sindh Agriculture University Tandojam. Respondents are postgraduate students at higher educational institutions in Pakistan. Participants were chosen according to specific conditions:

- 1) They should be enrolled in a postgraduate (courework program at a public university.
- 2) they must possess a learning management system and have engaged with an extensive learning environment for a duration of at least six months, outlined by Rafiq et al. (2022).

During the covid-19 most Pakistani universities used different types of pervasive learning environments (PLE), accordingly the researcher selected four public universities from Pakistan for pilot study the University of Sindh which uses pervasive learning environments such as LMS software, MUET University using Microsoft software as a PLE, LUMHS using LMS as PLE and Sindh Agriculture University Tandojam used Team Software as PLE. Pre-testing was performed before pilot study testing.

The pretesting phase involves having expert panels and respondents go through a questionnaire to identify and address concerns related to the design of the instrument or questionnaire, as indicated by Jakada et al. (2022). Pretesting a survey serves the purpose of ensuring participants have a comprehensive understanding of the survey content. moreover, this step enables researchers to rectify any shortcomings before distributing the final questionnaire to the designated respondents, thereby reducing the likelihood of potential bias, as highlighted by Sekaran and Bouge (2018).

Ultimately, the questionnaire underwent revisions based on the feedback received. The pretesting phase led to modification in the questionnaire, as items were adjusted based on the pretest outcomes to improve both surface and content validity, along with reliability. These statements employ a 7-point Likert Scale, where participants indicate their agreement level on a scale spanning from 1 to 7. The detailed items for each category can be found in Table 2 (1 representing strongly disagree, 7 denoting strongly agree). In line with the suggestions from Serkan & Bougie (2018), this research adhered to the principle of using concise and straightforward statements or questions, ensuring none exceeded 20 words per sentence. Consequently, the questionnaire items in this study followed this guideline.

Sekaran & Bougie (2018) also recommended ensuring that the language and expressions in the survey align with the respondent's comprehension level. They conducted a pilot test over one month. The self-administered questionnaire was

distributed from September to October 2022, with all participants being randomly selected. The data collection process spanned four to six weeks. A preliminary study of the instrument involved distributing questionnaires to 89 students from a higher educational institution in Pakistan. Out of the 89 surveys, 37 were excluded due to incompleteness or failure to meet the initial criteria. The remaining 52 responses yielded a response rate of 46.28%. the self-administered questionnaire, which took 15-25 minutes to complete, provides 52 potential responses for further analysis. After data collection, we confirmed the proposed construct validity and followed the suggestions of other studies to statistically determine the normality of this study. Perspectives were examined and their internal consistency was maintained (Sekran, 2019).

### DATA ANALYSIS

89 pilot surveys were handed out, and 52 making up 46.28% of the original sample were collected. The information supplied by the participants was subsequently processed using SPSS software version 25.0 (Social Sciences Statistical Software Package). Table 1 Results by gender, age, education level, and universities of participants. Most participants were male (69.2%), while female participants were (30.8%) The majority (88.5%) of respondents were between the ages of 20-29.

The second highest number (9.6%) and the third highest were between the ages of 40 and 49 (1.9%) The highest level of education for the majority of participants surveyed in this pilot study was a postgraduate degree (34.6%), followed by Bachelor's (32.7%), masters (21.2%) and Ph.D. (11.6%) came from four universities, with the largest group of respondents (34.6%) from Sindh Agricultural University, Tandojam University. The second largest number of respondents were from MUET University (26.9%). (21.2%) from LUMHS University and (17.3%) from SAUT.

### Demographics of the piloting study participants

**Table 1: Demographic profile of respondents**

| VARIABLE  | Category     | Frequency | %    |
|-----------|--------------|-----------|------|
| GENDER    | Male         | 36        | 69.2 |
|           | Female       | 16        | 30.8 |
| AGE       | 20-29        | 46        | 88.5 |
|           | 30-39        | 5         | 9.6  |
|           | 40-49        | 1         | 1.9  |
| EDUCATION | Bachelors    | 17        | 32.7 |
|           | Postgraduate | 18        | 34.6 |
|           | MS           | 11        | 21.2 |
|           | PhD          | 6         | 11.5 |

|                     |                     |    |      |
|---------------------|---------------------|----|------|
| <b>UNIVERSITIES</b> | University of Sindh | 9  | 17.3 |
|                     | LUMHS               | 11 | 21.2 |
|                     | MUET                | 14 | 26.9 |
|                     | SAUT                | 18 | 34.6 |

A self-administered questionnaire was deemed appropriate for gathering data from students in higher educational institutions in Pakistan. The survey specifies that all questions can be answered within a time frame of approximately 15 to 25 minutes. Hence, it is presumed that the allotted completion time is adequate for eliciting responses from participants. To prevent unanswered questions, participants were required to complete the first page of the questionnaire before progressing to the next, minimizing data loss, in subsequent primary studies.

**Table 2: Measurement items**

| <b>Construct</b>                    | <b>Items</b>                                                                                                  |
|-------------------------------------|---------------------------------------------------------------------------------------------------------------|
| <b>Performance Expectancy (PE)</b>  | I feel that pervasive learning methods are useful in learning methods.                                        |
|                                     | Using Pervasive Learning methods enables me to accomplish tasks more quickly.                                 |
|                                     | Pervasive Learning improves learning and teaching effortlessness                                              |
|                                     | Pervasive learning methods let me learn to relate task more quickly lets me learn related tasks more quickly. |
|                                     | I feel that pervasive learning methods are useful in learning methods.                                        |
| <b>Facilitating Conditions (FC)</b> | I know necessary to use the p-learning system.                                                                |
|                                     | If I encounter any technical issues, there's a designated individual or team ready to assist.                 |
|                                     | I possess the required resources for utilizing pervasive learning.                                            |
| <b>Context awareness (CA)</b>       | I can obtain relevant information when needed                                                                 |
|                                     | I can access relevant information and services based on my current location.                                  |
|                                     | I can obtain information that is relevant to my present circumstances.                                        |
| <b>Adaptability (A)</b>             | Through pervasive learning, I can quickly learn new ways to solve problems.                                   |
|                                     | I love learning new ways of doing tasks/assignments through pervasive learning.                               |
| <b>Behavioral</b>                   | I plan to incorporate Pervasive Learning into my future                                                       |

|                                      |                                                                                                                                   |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| <b>Intention (BI)</b>                | endeavors.                                                                                                                        |
|                                      | I intend to integrate pervasive learning into my future pursuits.                                                                 |
|                                      | I intend to utilize pervasive learning in my plans.                                                                               |
|                                      | I would suggest Pervasive learning to my fellows                                                                                  |
| <b>Hedonic Motivation (HM)</b>       | Using Pervasive Learning Technology is pleasurable.                                                                               |
|                                      | Using Pervasive Learning Technology is enjoyable.                                                                                 |
|                                      | Using Pervasive Learning is entertaining.                                                                                         |
|                                      | Using Pervasive Learning Technology is pleasurable.                                                                               |
| <b>Self-Direct Learning (SDL)</b>    | I create my study schedule.                                                                                                       |
|                                      | I reach out for assistance when encountering challenges in Pervasive learning.                                                    |
|                                      | I effectively organize and utilize my time.                                                                                       |
|                                      | I have established my goals for Pervasive Learning.                                                                               |
|                                      | I hold elevated expectations for my performance in Pervasive Learning.                                                            |
| <b>Personal Innovativeness (PI)</b>  | If I come across a new information technology, I would explore opportunities to experiment with it.                               |
|                                      | I am typically the first among my peers to experiment with new Pervasive Learning methods.                                        |
|                                      | Generally, I tend to be cautious about experimenting with pervasive learning.                                                     |
| <b>Availability Educational (AE)</b> | I have an adequate mobile internet connection to use the Pervasive Learning application from anywhere.                            |
|                                      | The Internet connection I use through my mobile phone is not costly.                                                              |
|                                      | I always have access to a high-speed Internet connection from anywhere through my mobile phone to use Pervasive Learning          |
| <b>Perceived Compatibility (PC)</b>  | The pervasive learning applications suit my requirements.                                                                         |
|                                      | The pervasive learning application aligns seamlessly with my preferred method of accessing learning services.                     |
|                                      | I prefer virtual interaction with the Pervasive Learning application over in-person interactions at physical offices.             |
|                                      | I favor engaging with pervasive learning applications virtually rather than having face-to-face interactions at physical offices. |

Normality refers to the distribution of data that measures variation in variables (Mishra et al., 2019). Normality is an important step to take early in multivariate analysis. According to (Abulela & Harwell 2020), the normality of the data distribution is necessary for the validity of the data, otherwise, all statistical results

are invalid if the variation of the data is large enough concerning the normal distribution. The two most important components of normality are skewness and kurtosis (Bono & Blanca 2019). A skewed construct is a construct whose mean is not in the center of the distribution as it deals with the symmetry of the distribution whereas kurtosis is related to the peak of the distribution. It can show distributions that are too sharp or too flat. A construct may have significant skewness, kurtosis, or both, but when the distribution is normally distributed, the skewness and kurtosis have a value of zero. The construct can also be positively or negatively skewed or kurtosis.

Statistical descriptive tests measuring skewness and kurtosis were applied in SPSS 25.0 and all constructs were found to be normally distributed. However, the values result in mixed directions, including negative and positive skewness and Kurtosis [skewness and Kurtosis]. Results are presented in tables (Descriptive and reliability). Reliability, as defined, refers to the progression of consistency among variables. As highlighted by Amirrudin and Suphar (2022), the effectiveness is contingent on the prerequisite of reliability.

Consequently, to evaluate the effectiveness of validity, it is imperative to initially evaluate the reliability of the instrument. In this research, Cronbach's alpha is employed to appraise consistency. Cronbach's alpha is a statistical method used to test the reliability of constructs in research. In most studies,  $\alpha$  values above 0.7 are acceptable levels (Surucu 2022) Cronbach's  $\alpha$  ranged from 0.731 to 0.973 for most constructs in this study. See Table 3. All constructs exhibit robust internal consistency, as evidenced by Cronbach's alpha values surpassing 0.7. Consequently, the results suggest that there is no need to revise the items for improved measurement reliability based on the Cronbach's alpha coefficient. The questionnaire is deemed satisfactory. Table 3, which presents the descriptive and reliability results, displays the mean, standard deviation, and Cronbach's alpha for all constructs.

**Table 3: Descriptive and reliability**

| Construct                          | Number of items | N. statistic | Mean   | SD      | Skewness | Kurtosis | Cronbach's alpha | Internal consistency |
|------------------------------------|-----------------|--------------|--------|---------|----------|----------|------------------|----------------------|
| <b>Performance Expectancy (PE)</b> | 5               | 52           | 5.7115 | 1.57600 | -1.626   | 2.489    | .837             | Good                 |
| <b>Facilitating Conditions</b>     | 3               | 52           | 5.6346 | 1.44207 | -1.239   | -.808    | .758             | Acceptable           |

|                               |   |    |        |         |        |        |      |            |
|-------------------------------|---|----|--------|---------|--------|--------|------|------------|
| (FC)                          |   |    |        |         |        |        |      | e          |
| Context awareness (CA)        | 3 | 52 | 5.1154 | 2.06420 | -.898  | -1.028 | .930 | Excellent  |
| Adaptability (A)              | 2 | 52 | 5.1538 | 2.19075 | -.844  | -1.524 | .863 | Good       |
| Behavioral Intention (BI)     | 4 | 52 | 5.8846 | 1.26264 | -1.841 | 2.352  | .731 | Acceptable |
| Hedonic Motivation (HM)       | 4 | 52 | 5.4038 | 1.90211 | -1.464 | .888   | .782 | Acceptable |
| Self-Direct Learning (SDL)    | 5 | 52 | 5.4038 | 1.70650 | -1.283 | -.778  | .859 | Good       |
| Personal Innovativeness (PI)  | 5 | 52 | 5.2500 | 1.85636 | -.821  | -1.080 | .971 | Good       |
| Availability Educational (AE) | 5 | 52 | 5.3269 | 2.07432 | -1.142 | -1.213 | .816 | Good       |
| Perceived Compatibility (PC)  | 5 | 52 | 5.1538 | 1.88268 | -.818  | -1.094 | .973 | Excellent  |

## RECOMMENDATIONS

In the present study, a viable theoretical model is put forth, an encompassing external variable such as performance efficiency, facilitating condition, context awareness, adaptability, behavioral intentions, hedonic motivation, self-directed learning, personal innovativeness, educational availability, and perceived compatibility within the context of pervasive learning in Higher educational institutions in Pakistan.

Hence, this research offers empirical backing for an expanded UTAUT model, Preliminary studies are crucial before the primary investigation on the acceptance and utilization of P-Learning among students in higher educational institutions in Pakistan. The questionnaires tested exhibited favorable usability and positive response rates, affirming the reliability of conducting larger surveys in the future. Furthermore, the pilot study showcased a self-management approach to data collection. This article underscores the significance of pilot research and contributes to the advancement of the best practices in pervasive learning (PL) research. The favorable received from postgraduate participants during the pilot study affirmed the appropriateness of the instruments for the main study, a pivotal outcome. In conclusion, as demonstrated by

this pilot study within the realm of pervasive learning, the paper underscores the significance of pilot research in refining research design and contributing to the knowledge base of both pilot research and pervasive learning.

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