**Implementation of Learning Management System for an In-service Teacher Education Course: Performance and Perceptions**

**Introduction**

The traditional classroom settings in all levels of education are under transformation due to the impact of information and communication technology (ICT) and the Covid-19 pandemic enhanced the changing process happening in the education arena. Various tools and technologies have been used in educational settings for innovating and improving the teaching-learning process from time to time. One such notable and leading technology is the Learning Management System (LMS) which facilitates an ICT framework for teaching and learning. LMS is considered a disruptive and critical technology in higher education. (Renzi, 2008) Today, many educational institutions, non-profit organizations, and corporate entities the world over are offering academic programs and training via LMS (Ortiz, S., & Green, M. (2019). Trends and Patterns of Mobile Learning: A Study of Mobile Learning Management System Access. Turkish Online Journal of Distance Education (TOJDE), 20(1), 161–176).

Teacher education is a higher field that is always at the forefront to adopt the technology for teaching-learning processes. (Holmes, K.A. Student and staff perception of a learnig….Australian Journal of Teacher Education)

Learning Management System (LIMS) is a way to implement blended learning

The present paper reports a pilot study on an LMS implementation at the All India Institute of Speech and Hearing, Mysuru .

This paper reports a study on the perception of students and teachers on an LMS implementation for a special education course at the All India Institute of Speech and Hearing, Mysuru.

**Background**

The All India Institute of Speech and Hearing (AIISH), Mysuru, South India is a pioneering and proactive organization in communication disorders functioning under the Ministry of Health and Family Welfare, Govt. of India. It offers academic programs, conducts research, provides clinical care, and organizes public education activities related to communication disorders and allied areas. As a prominent academic institute of higher learning on communication disorders in the country, the AIISH offers educational programs ranging from diploma to post-doctoral level related to communication disorders. In addition, the Institute offers an undergraduate and a postgraduate program in special education, namely, Bachelor of Special Education and Master of Special Education. educational programmes under two streams: Communication Disorders and Special Education. The Institute is affiliated with the University of Mysore, Mysuru, and follows the Choice Based Credit System (CBCS) of education wherein the students are permitted to opt for courses and subjects of their choice like hardcore, softcore and elective courses, and skill-based courses. In CBCS system, the academic programs are divided into semesters and for the assessment and evaluation purpose, each semester is divided into three components: Component 1 (C1), Component 2 (C2) and Component 3 (C3). The academic scores for C1 and C2 are awarded by the course teacher based on tests, assignments and similar assessments in the class whereas the academic score for C3 is based on an external written/practical examination conducted after completion of the semester by the University. The C1 assessment is carried out after the first half of the semester covering 50% of the course syllabus and c2 at the end of the semester covering the remaining portion of the syllabus.

The AIISH adopts several e-learning ventures to enhance performance the quality and quantity of human resources generated. As a part of such endeavours, the Institute funded a research project to develop an open-source-based e-learning platform for use in higher education programs conducted by the Institute. The platform was developed on Moodle, the world’s most popular open-source learning management system. Initially, on a trial basis, a hard-core course titled ‘Introduction of Cerebral Palsy, Locomotor and Multiple Disabilities’ imparted in the first semester of the Bachelor of Special Education program run by the Institute was set up on the Moodle-based LMS. One of the investigators of the project and an author of this paper was the course teacher. During the first half of the semester, the course was carried out in physical mode and in the second half, the course was delivered using the newly developed Moodle-based LMS.

**Objectives**

The objectives of this study were to:

1. assess the impact of online learning via the LMS on the academic performance of the students,
2. report the teacher’s and students’ perspectives on Moodle LMS-based instruction as a
3. viable means for effective transaction of knowledge,
4. objective and safe methods for carrying out the evaluation,
5. discern channels for extended learning activities
6. recognize technical glitches and procedural snags in using Moodle LMS and trouble-shooting possibilities
7. devise a workable prototype for blended instruction

The study hopes to fill the gap in the literature on the empirical studies on the use of LMS by undergraduate teacher education students in India.

**Methods**

A purposive sample of thirteen students of the 2nd year B,Ed., Special Education program and their course teacher (who is also one of the researchers of this paper) participated in the study and it was conducted in two phases.

The first phase of the study assessed the impact of Moodle-based LMS on the academic performance of the students using one group pre-test post-test quasi-experiment design. As indicated earlier, the first half of the syllabus was taught completely in physical mode adopting the traditional, face-to-face classroom teaching. Followed by this, an internal examination was conducted, and recorded the marks obtained. This was immediately followed by the delivery of the second half of the syllabus completely through Moodle LMS and one more internal examination.

To test the impact of the Moodle-LMS (intervention), marks obtained in the internal examination conducted based on the course delivered in physical mode (pre-intervention) were compared with the marks obtained in the internal examination conducted after the online delivery of the course (post-intervention) as shown in figure 1.

|  |  |  |
| --- | --- | --- |
| O | X | O |
| Marks obtained in the first Internal examination  (Dependable variable) | Delivery of the course on Moodle LMS | Marks obtained in the second Internal examination  (Dependable variable) |

Figure 1: One Group Pre-test Post-test Quasi Experiment

Though there are drawbacks in One Group Pre-test Post-test Quasi Experiment research design (Reichardt CS. *Quasi-Experimentation: A Guide to Design and Analysis*. The Guilford Press; 2019), it is widely used in education research ( Setiawati D, Wiyono BB, Hidayah N, Atmoko A, Setiyowati AJ, (2021). Group Guidance Based On Javanese Character with Merchant Morals to Improve Student Resilience. Pegem Journal of Education and Instruction, Vol. 11, No. 4, 2021, 78-81// Godefridi, I., Suñer, F., Leblanc, C., & Meunier, F. (2021). Using virtual reality and peer feedback to reduce L2 speaking anxiety: an exploratory study. In N. Zoghlami, C. Brudermann, C. Sarré, M. Grosbois, L. Bradley, &S.Thouësny (Eds), CALL and professionalisation: short papers from EUROCALL 2021 (pp.100-105). Research-publishing.net. https://doi.org/10.14705/rpnet.2021.54.1316// The Effect of Quantum Learning Model on Science Teacher Candidates’ Self-Efficacy and Communication Skills// Özlem Afacan1 , İpek Gürel// Journal of Education and Training Studies Vol. 7, No. 4; April 2019// Arista, F. S., & Kuswanto, H. (2018). Virtual Physics Laboratory Application Based on The Android Smartphone to Improve Learning Independence and Conceptual Understanding. International Journal of Instruction, 11(1), 1-16. https://doi.org/10.12973/iji.2018.1111a// Wahyudi, W., Waluya, S.B., Suyitno, H., & Isnarto, I. (2020). The impact of 3CM model within blended learning to enhance students’ creative thinking ability. Journal of Technology and Science Education, 10(1), 32-46. https://doi.org/10.3926/jotse.588// Haenilah, E. Y., Yanzi, H., & Drupadi, R. (2021). The Effect of the Scientific ApproachBased Learning on Problem Solving Skills in Early Childhood: Preliminary Study. International Journal of Instruction, 14(2), 289-304. https://doi.org/10.29333/iji.2021.14217a//).

The first half of their course titled …. Was taught in physical mode and an internal examination was conducted on it. The second half was delivered fully online on the Moodle-based LMS.

For the first phase of the study, one group pre and post test quasi experiment was used.

The study adopted the following methods

Measuring the Academic performance of the pre-service teachers were of data collect for the study were collected in the following three major means:

Comparison of marks obtained for the students in the internal examinations conducted for the course during pre and post-intervention stages. (Empirical data sets in the form of student performance scores in their internal examinations).

Adopting the one-group pre-and posttest design, two internal

Direct feedback from the participant students through a 20-item questionnaire.

Reflections of the course teacher who is also a co-investigator of the current research project and second author of this paper

Performance assessment of marks obtained during the pre and post intervention

Administering a survey questionnaire to pre-service teachers of the second year Bachelor of Special Education (B.S.Ed.) programme offered by the Institute.

The questionnaire was developed to assess the special education teacher trainees’ experience in using the moodle-based LMS. It consists of three sections and 28 items. The first section contained five demographic items. In the second section had 20 ‘Yes’ or ‘No’ questions on LMS experience in the form of: (a) facilitation of effective instructional transaction and augmentation (5 items), (b) active student-engagement (2 items), (c) efficient evaluation (2 items), (d) extended learning resources (3 items), (e) learning networks (2 items), (f) student convenience (4 items), and (g) prerequisites to employ Moodle (2 items).

Data Analysis and Results

The study collected three sets of data, namely, internal marks of pre-intervention and post-intervention stages, perception and opinion of the students regarding Moodle LMS based learning and teachers perception on online learning. Of these, the first two sets were analyzed using MS Excel spreadsheet software and the third set directly as it is from a single respondent.

The mean value of the internal marks obtained during the post-test period was higher than the marks obtained during the pre-test.

Table 2 Pre-test-Post-test Result

|  |  |  |  |
| --- | --- | --- | --- |
| Student | Pre-test score | Post-test score | Difference |
| Student1 |  |  |  |
| Student2 |  |  |  |
| Student3 |  |  |  |
| Student4 |  |  |  |
| Student5 |  |  |  |
| Student6 |  |  |  |
| Student7 |  |  |  |
| Student8 |  |  |  |
| Student9 |  |  |  |
| Student10 |  |  |  |
| Student11 |  |  |  |
| Student12 |  |  |  |
| Student13 |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| S.N. | Category/ Statement | M | SD |
| A | Facilitation of effective instructional transaction and augmentation |  |  |
| 1 | It allowed me to take my own time to go through the information and understand the instruction (Q1) |  |  |
| 2 | It cannot replace conventional instruction, but can add to it as an enriching supplement (Q3) |  |  |
| 3 | It involved tedious work that added to the burden of my workload (Q9) |  |  |
| 4 | It is a comprehensive instructional mode that can completely replace traditional classroom-based instruction (Q10) |  |  |
| 5 | It made learning an individualized and personal experience (Q11) |  |  |
| B | Active Student-Engagement |  |  |
| 1 | It boosted my interest and motivation for learning (Q2) |  |  |
| 2 | It was an impersonal process that lacked the advantage of human interaction available in classrooms (Q20) |  |  |
| C | Efficient evaluation |  |  |
| 1 | It helped me receive prompt corrective, but confidential feedback on my performance (Q8) |  |  |
| 2 | It made possible regular ongoing, but stress-free evaluation (Q14) |  |  |
| D | Extended Learning Resources |  |  |
| 1 | It enriched the learning experience by adding to a variety of instructional activities (Q6) |  |  |
| 2 | It provided access to additional in-depth information that enriched my learning (Q16) |  |  |
| 3 | It provided too much of supplementary information that confused me. (Q17) |  |  |
| V | Learning Networks (Out-of-bound interactions) |  |  |
| 1 | It enabled continual interaction with teacher outside classroom bounds for clarifications, progressive guidance, etc. (Q4) |  |  |
| 2 | It facilitated constructive scholastic engagement with peers on the subject matter and related issues (Q7) |  |  |
| VI | Student Convenience |  |  |
| 1 | It enabled me to make up for occasional inability to attend classes in real time.(Q5) |  |  |
| 2 | It made learning easy anytime or anywhere that made me lethargic and laid back in my studies. (Q12) |  |  |
| 3 | It made possible anytime, anywhere learning according to my convenience(Q13) |  |  |
| VII | Prerequisites to employ Moodle |  |  |
|  | It was a constrained process due to the limitations in ICT facilities available to me (Q18) |  |  |
|  | It was a frustrating process due to my limited skills for e-learning (Q19) |  |  |

**Discussion**

The findings from this study shed light on the influence of LMS on the academic performance of the student teachers. Also, it reveals their opinion and attitude towards online learning from their experience in using LMS. The study also elicite the teachers opinion also.

One notable finding of the current study is the improvement in academic performance of the students due to the use of LMS. This supports related research carried out by ….

Contrary to our findings, many studies reported that the teacher trainees, as well as their teachers, lack digital skills and there should be pedagogical support to address the issue.

A similar conclusion was drawn by …. who claimed that

Education can be more fruitful with an LMS integration like moodle as revealed in the current study

Another dimension of the study is

Regarding limitations, the current study is only concerned with one batch students … and data were elicited solely from …

In a further study, all the students and faculty could be involved and different data collection tolls could be utilized.

The results of this study may fill part of the gap that previous researchers (-----) have noted regarding the ….

These results are in line with …..

In a review of literature,

-Technolgy-related resistance and fear of teachers would have influences not only in benefitting from the IT but also their conditions of transferring the technology literacy skills to the students. [[MP6]]

Conclusion

The current study which aims to …. revealed that

It is dafely concluded that ….

According to the findings, …. Were valuable.

However, this is only a pilot study

It may be more revealing with the ….

The study has some limitations. First, the participants were only pre-service teachers. A similar study could be done with teachers.

Due to some and other restrictions, the study is limited in its sampled population.

In this context, it became essential to explore and evolve the probabilities and prospects involved in adopting moodle as means of blended learning in the human resource programmes at AIISH.

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We conclude that the Moodle-based LMS that we have developed at the All India Institute of Speech and Hearing has the potential to effectively enhance the …. The participants’ enhanced academic performance, their positive attitude towards LMS-based learning and the positive experience of the teacher in the context of this study are valuable indicators and are beneficial for the final implementation of the system. Also, the study will serve as a model pilot study for implementing a Moodle-based LMS in other educational institutions in the country.

The current study will provide an evidence for on the potential of the Moodle-based LMS for delivering special education programmes. Also, it will help in further modification and development of a full-fledged moodle-based LMS for all academic programmes offered at the All India Institute of Speech and Hearing, Mysuru, India.

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 I.         Introduction

Tertiary education after secondary schooling and intermediate transition is a higher realm of education that expects learners to not just to accrue knowledge, acquire skills or absorb values, but enter into a self-stimulated and motivated, progressive process of learning to learn, and appropriating the learning for useful purposes. And e-learning (OECD, 2005; Keller, & Cernerud, 2002) endeavours to use information and communication technology to broaden the scope and advance the range of purpose in higher education. Moodle is a all-inclusive open source learning management system that provides a versatile platform for enrolling, instructing, evaluating learners, as well as in accumulating and analysing data related to the learning process (Costello, 2013; Jordan, 2013). With AIISH, a pioneering and proactive institute in the field of communication disorders adopts several e-learning ventures to enhance the quality and quantity of human resources generated. In this context, it became essential to explore and evolve the probabilities and prospects involved in adopting moodle as means of blended learning in the human resource programmes at AIISH.

2.       As a preliminary measure of the ARF project to development a custom-made e-learning platform for use in the human resource development programmes at the institute, a pilot study on trial basis was undertaken. This trial effort focused on two major HRD disciplines at the institute–speech and hearing, and special education, and at two key levels of higher education– under graduate and post-graduate.

3.       This report concerns the trial instruction over Moodle platform carried out in the discipline of special education for the hard-core theory course on ‘Introduction of Cerebral Palsy, Locomotor and Multiple Disabilities’ imparted in the first semester of the B.Ed.Spl.Ed. (HI) programme.

II.            Objectives

1.       Carry out a trial instruction with Moodle, in order to –

i.         Identify viable means for effective transaction knowledge to students.

ii.       Ascertain objective, ail-safe methods for carrying out evaluation.

iii.     Discern channels for extended learning activities

iv.     Recognise technical hitches and procedural snags in using Moodle for instruction and trouble-shooting possibilities.

v.       Devise a an workable prototype for blended(synchronous and asynchronous) instruction.

III.            Participants

1.       Participants were selected through purposive sampling to include 13 students of first-year B.Ed.Spl.Ed. (HI) students in the first semester of the programme.

2.       All student-participants including 11 females and 2 males were young adults in the age range of 20 to 35 years.

3.       All 13 came with a minimum prior qualification of graduation, and six of them graduated in science subjects while seven in humanities.

IV.            Tools and Materials

1.       Three major means were employed for data collection

i.         Pre and post intervention of performance scores of the students in the form of component one and component two marks of the credit-based system.

ii.       Proforma for collecting student feedback on the Moodle experience of learning, which in turn involved –

a.       A 20-item questionnaire drawing information –

-       About the facilitation of effective instructional transaction and augmentation (5 items), active student-engagement (2 items), efficient evaluation (2 items), extended learning resources (3 items), learning networks (2 items), student convenience (4 items), as well as prerequisites to employ Moodle (2 items).

-       Through items drew binary responses of ‘yes’ or ‘no’.

-       In case of 12 statements related to the positive attributes of Moodle the ‘yes’ responses were awarded a score of ‘1’ while the ‘no’ responses were awarded a score of ‘0’. Whereas in eight other statements dealing with the adverse outcomes of the experience the scoring was vice-versa.

b.       The second part of the questionnaire comprised of three open-ended queries to draw qualitative feedback from the participants – on the merits, demerits and recommendations for further improvements.

2.       Instructional materials prepared for blended instruction in the course of investigation included –

i.         The first unit of lesson presented through Moodle was in the form of illustrated web-page content with annexed assessment, hyperlink to further learning resources and ongoing, objective assessment as well as descriptive assignments for embedding the learning.

ii.       The second unit of presentation took form of a slide show, again accompanied with assessment, resource and extended assignments.

iii.     These materials were intended to provide supplementary learning exposure besides conventional classroom teaching.

V.            Research Design and Process

1.       A simple pre and post-test experimental research design had been adopted for the investigation.

i.         A pure or true experimental design with a control group had not been attempted as the experiment involved real time instruction. Because denying the control group of students from a constructive learning experience through Moodle platform may not be ethically reasonable.

ii.       Instead a factorial design where the exposed to conventional learning in the first part of the semester in component-one and then with the assistance of Moodle learning management system in the second part of component-two with comparable instructional content and learning tasks.

iii.     The effect of the independent variable of Moodle learning experience on the dependent outcomes of learning performance and student disposition were investigated by comparing the learning outcomes in the component-one and two.

2.       The pilot study undertook the following course:

i.         Choice of the special educational theory course for experimentation.

ii.       Preparation of learning content.

iii.     Laying out the scheme and schedule and ongoing evaluation of learning outcomes.

iv.     Drafting proforma for recording learning outcomes as well as student feedback.

v.       Implementation two units of the course in the first-half of the semester for eight weeks in the conventional mode without Moodle interface.

vi.     Consequent execution further two units in the second-half of the semester for another eight weeks with the assistance of Moodle interface.

vii.   Compilation and analysis of data to decide influence on teacher-student dispositions and learning outcomes.

VI. Data Analysis and Results

1.       To commence with the empirical data sets in the form of students’ performance scores were subjected to test for normality. As both the pre and post-intervention scores were found to be normally distributed, parametric statistical measures such as t-test for paired samples for measuring variances and Pearson product-moment correlation for determining correlation were made use of.

2.       Influence of Moodle Learning Platform on Learning Outcomes:

i.         The academic performances evinced 12% advancement in the scores from the first stage of conventional instruction (77%) following facilitating learning with Moodle learning management (89%). Following subjection to statistical measure of t-test for paired samples, the advantage was also found to be statistically significant (t = 3.22; p < 0.001).

ii.       The ongoing supplementation of learning through Moodle platform also seemed to sustain a credible and consistent learning pattern among the students with strong trends of correlation between formative and summative performances (r = 0.98; p < 0.001).

3.       Student-Teacher Disposition about Moodle Learning Experience:

i.         From teacher’s perspective the Moodle platform was advantageous in –

a.       Making learning and reference materials available to students.

b.       Timely conduct of ongoing assessment with immediate feedback.

c.       Diversifying assignments according to varied ability level and interests of students.

d.       Providing extended scope for application of learning outside classroom.

e.       Conservation of active instructional time, while also facilitating supplementary time for learning outside bounds of class.

ii.       From students’ perspective as gathered from their responses to the questionnaire –

a.       From the perspective of instructional transaction, the major advantage (89%) was the access to comprehensive learning material and individualised learning exposure enabled with the aid of Moodle platform.

b.       However moderate affirmation (50%) of the interest created and increase in workload indicates need for further exploration of diverse prospects multimedia forays that effectively engage the learner without taxing them.

c.       Students’ satisfaction on evaluation is also not optimal with only 58% assent for prompt and confidential assessment. The reasons being spelt out that assessment accessed out of bounds of classroom permitted misconduct on part of students. Future measures have to be directed to make assessment processes fool and tamper-proof.

d.       Students were appreciative (79%) of the student-centred features facilitating anytime anywhere learning as well as the possibility for making up for missed classes.

e.       They also highly commended (94%) the extended access to additional information resources and variety of teaching-learning material.

f.        This pilot trial did not seem to stimulate sufficient interaction with teacher and among students outside the classroom bounds as implied by the lukewarm responses (38%).

g.       Deficient technical expertise in students or under provided technological facilities were not deterrents in this experiments with Moodle as 83% of the students were satisfactorily provided with both.

h.       Considerable numbers of students (58%) opined that Moodle could best supplement conventional classroom instruction rather than substitute, especially because of its impersonal nature.

i.         Through their descriptive remarks students had recommended for fool-proofing assessment exercises, include more active assignments in the form of projects, and provision of printed handouts for students who do not have 24X7 access to ICT facilities.

 VII.            References:

OECD (2005). E-learning in tertiary education. Available at [http://www.cumex.org](http://www.cumex.org/). (Accessed 27 /02/ 2014).

Keller, C. & Cernerud, L. (2002). Students’ perception of e-learning in university education. Learning, Media and Technology, 27(1), 55-67.

Jordan, S. (2013). E-assessment: Past, present and future. New Directions, 9(1), 87–106. doi:10.11120/ndir.2013.00009.

Costello, E. (2013). Opening up to open source: Looking at how Moodle was adopted in higher education. Open Learning: The Journal of Open, Distance and E-Learning, 28(3), 187–200. doi:10.1080/02680513.2013.856289