Impact of Learning Management System on Student's Academic Achievement: A Comparative Study of Kashmir and Indore

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ABSTRACT

The study examines the effect of a MOODLE-based Learning Management System (LMS) on the academic performance of higher secondary school students in Kashmir and university level B.Ed. students in Indore. Data was gathered by using purposive sampling technique. There were total 121 students taken from both the groups. Academic achievement tests, *t*-test and Cohen's *d* effect size were used as the methods of analysis, which employed a quasi-experimental pre-test post-test research design. The academic achievement test was prepared by researcher and face validity was established. The results indicated that there was a statistically significant difference in the academic performance of the two groups ($t = 18.94$, $p < .001$). In particular, the mean score ($M = 30.98$) of secondary school students in Kashmir was significantly higher than the university students in Indore ($M = 15.47$). The findings indicate that, although the MOODLE-based LMS is a powerful resource in achieving academic success, its functionality is greatly dependent on the level of education and curriculum design. The better performance of the school-level group would suggest that the designed settings and extensive supervising that is usually inherent in secondary education would be more conducive to LMS implementation than the freedom of learning that is expected by the university level. Such results point to the importance of having strong learner support systems in the context of higher education to prevent the gap in the self-sufficiency of students in digital transitions.

Keywords: academic achievement, learning management system, Moodle

INTRODUCTION

Technology is the modern pen and paper, the essential lens for understanding our world.

— David Warlick,2006

A Learning Management System (LMS) is an online software platform that assists teachers and schools with course delivery, organization, and monitoring. Examples include MOODLE, Canvas, and Blackboard. In other words, LMS is an online classroom, where students can study the course materials, submit assignments, complete quizzes and communicate with the instructor 24/7 at any location, which has been shown to surpass the traditional classroom approach to teaching and learning, especially when accompanied by properly designed content and a stable internet connection (Dari et al., 2024). The effectiveness of an LMS depends on its flexibility and user-friendliness which allow students to learn at their own pace without being constrained by time and place. This makes the learning process more effective and accessible, particularly where digital access varies extensively (Shah et al., 2025). When properly executed, LMS-based learning improves academic achievement and student satisfaction compared to traditional classroom teaching (Shah et al., 2025),

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Students who were actively engaged in LMS activities achieved higher scores in their academic performance, which demonstrated that the application of Learning Management Systems has a positive influence on academic performance (Ningsih et al., 2025). The studies further indicate that the design, pedagogical integration, and usability of LMS are associated with its effectiveness, as the lack of effectiveness is caused by ineffective implementation, lack of familiarity with LMS, or technical problems with its usage. Poor use of LMS functionalities is usually associated with poor academic performance (Broadbent, 2016).

REVIEW OF RELATED LITERATURE

The following nine research studies are briefly described. They contributed to the same area but in different contexts.

Acar and Kayaoglu (2020) carried out a study titled as: MOODLE as a Potential Tool in Language Education during the Shadow of COVID-19. This study aims at analyzing the process of integrating MOODLE in classroom and finding out the factors that impact the process of integrating MOODLE. Findings of the study revealed that MOODLE platform proved to be highly supportive for university students in English language.

Dulkaman and Ali (2016) carried out a research on this issue: The determinants of the success of learning management system (LMS) on academic performance of students. The research was to find and establish a correlation between the academic performance and motivation of the students using LMS when applied commendably. The researcher concluded that the outcomes of using a Learning Management System (LMS) and the motivation of students as far as their academic performance is concerned are closely linked.

Firat (2016) carried out a research on the subject matter: Establishing the Impact of LMS on Academic Achievement in Learning Analytic Perspective. This study aimed to examine the effects of the activities of Learning Management System (LMS) on the academic performance of the undergraduate students. It was revealed that the academic growth of the student and the number of hours spent on LMS have positive relationship.

Koneru (2017) carried out a research on the subject: Exploring the usability of MOODLE to manage open distance learning E-Assessment. The objective of the research was to explore the role of MOODLE in assisting ODL (Open Distance Learning) institutions to execute and administer electronic tests at an efficient and cost-effective manner. The result of the study indicated that feedback is critical for better learning opportunities.

Kuruppu and Halwatura (2013) conducted a research on the title: Effectiveness of MOODLE application on technical tertiary education in Sri Lanka. The researchers sought to identify the preferences of the students between the traditional and e-learning culture of learning as well as to establish how MOODLE assisted in enhancing the learning abilities of the students. The finding of the study showed that the learners preferred online learning atmosphere to the traditional classroom set up due to the extended time and flexibility

Pandey (2020) conducted a study on the topic: Effectiveness of Developed MOODLE Based on Psychological Perspectives of Learners in terms of Achievement, Attention, and Reaction to Teacher Trainees. The study aimed to establish the effectiveness of the developed MOODLE platform. The sample of the study was B.Ed students of School of Education, DAVV Indore. The results of the study indicated that MOODLE was more efficient than the conventional teaching techniques.

Rani (2024) conducted a study on the topic: Effectiveness of Developed Learning Management System on Education Subject among Higher Secondary School Students in Terms of Attitude Towards E-Learning, Study habits, academic achievement and reaction. After testing the null hypothesis, the researcher discovered that post-scores of students taught by developed MOODLE is better than traditional ways of teaching.

Salhab (2019) conducted a study on the topic: Faculty Members Attitudes towards Using MOODLE at Palestine Technical university Khadoorie (PTUK). The main aim was to find out the attitude of the faculty members towards MOODLE in Teaching and learning. Convenient sampling technique was used and the total participants consisting of 41 faculty members. Demographic variables were also used like gender, age, year

of experience, academic degree. The finding of the study revealed that faculty members have positive attitude towards MOODLE usage in teaching and learning.

Sinaga and Pustika (2021) conducted a study on the topic: To explore the students' attitude towards English online learning using MOODLE during COVID-19 pandemic. In this study both qualitative and quantitative methods were used to identify the attitude of students as individual and in group. The results of the study were positive towards MOODLE.

The above studies had also been done on the MOODLE but these studies vary in location, subject, and age etc. It resulted in Gaps in the field of MOODLE treatment. Therefore, the researcher chooses to answer the following research inquiries:

1 Whether the location of the learner influences learning using MOODLE?

2 Whether the maturity of the students impacts the learning through MOODLE?

3 Whether there is any difference in the academic achievement of students belonging to the school level and the university level?

To answer these research questions, the main objective of the paper was framed with null hypothesis.

OBJECTIVE

To compare the mean scores of academic achievement of MOODLE-based LMS teaching of higher secondary school students in Kashmir and university-level students in Indore.

HYPOTHESIS

There is no significant difference in the mean scores of academic achievement of MOODLE-based LMS teaching of higher secondary school students in Kashmir and university-level students in Indore.

METHODOLOGY

This study was quasi-experimental in nature. Quasi-experimental pre-test, post-test research design was used. There was no control group as the two groups from different states were treatmented with same method that is through MOODLE. Basically the research try to find out the effect of same treatment but in different geographical conditions. The population, sample, tool and procedures are given as under:

Population

The population of the present study covered all higher secondary School students of Kashmir having Education as a subject and all teacher trainees (B.Ed.) students in Indore.

Sample

The study included 60 students from Govt. Girls Higher Secondary School Ranibagh and Govt. Boys Higher Secondary School Bijbehara Kashmir and 61 students from School of Education, DAVV, Indore. Thus the total sample was 121, and it was selected purposively.

Tool

The researchers developed the MOODLE course for the treatment of higher secondary school students having Education as a subject and of B.Ed. students. The academic achievement tests was prepared by the researcher itself, only face validity was established by taking the expert suggestions.

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PROCEDURE OF DATA COLLECTION

The following phases were followed to collect the data.

1. Permission was obtained from the head or principal of the sample institutions.

2. Taking and spacing lectures with the subject teacher.

3. Establishing understanding with the sample and providing an orientation regarding the teaching method before the pre-test.

Table 1 Procedure for data collection

Activities	**Kashmir**	**Indore**
Pre-testing the dependent Variable	Administration of the Achievement Test	
Treatment	Implementation of the developed MOODLE	Implementation of the developed MOODLE
Post-testing of the dependent variable	Administration of the Achievement Test	

ANALYSIS OF THE DATA

To test the null hypothesis, a *t*-test was applied to calculate the difference in the mean scores of sample. The following Table no. 2, Table no. 3 and Table no. 4, represents the descriptive statistics and *t*-test.

Table 2 Table represents the N, Mean, and Standard deviation of the Kashmir and Indore located students

Group	***N***	***M***	***Sd***
Kashmir	60	30.98	5.09
Indore	61	15.47	6.69

Table 3 The table represents the Levene's Test for Equality of Variances

	F	**Sig.**
Postscores	3.23	.075

The above table represents Levene's Test for Equality of Variances with *F* value 3.23 and sig. value .075 which is greater than the 0.05 level of significance. Hence, it is not significant at the 0.05 level of significance. This specifies that the sample distribution is homogeneous.

Table 4 The table represents the t-test of the achievement scores

Post scores	T	Df	*Sig.(2-tailed)*
	18.94	119	.001

From the above table it can be said that the significance value is .001 which is smaller than 0.05 level of significance, hence, the *t*-value of 18.94 was significant at 0.05 level of significance. Therefore, it is clear that there is significant difference in the mean scores of achievement of Kashmir and Indore students.

To clarify this difference in the mean scores, Cohen's *d* size effect is used to measure the standardized difference in academic scores between higher secondary school students having Education as a subject in Kashmir and university-level B.Ed students in Indore.

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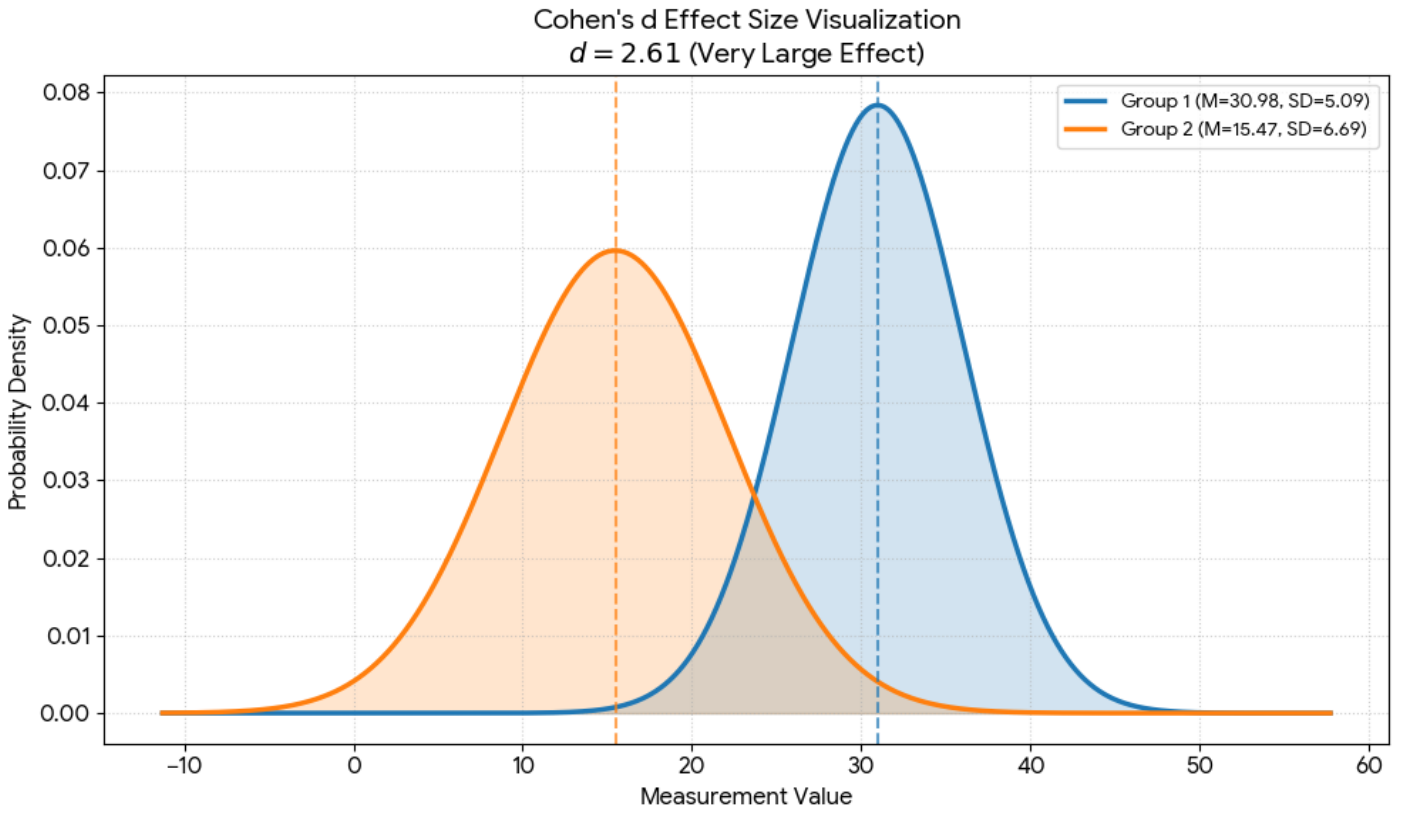

Step 1: Pooled standard Calculation (*SD* p)

The pooled standard deviation was calculated using the following formula

$$SD_{pooled} = \sqrt{\frac{sd^2_1 + sd^2_2}{2}}$$

Calculation steps:

Calculate the variance of both groups :5.09^2 = 25.91 and 6.69^2 = 44.76

Find the average of the variance = (25.91 +44.76) / 2 = 35.34

Compute the square root= √ 35.34= 5.94

SD p) = 5.94

Step 2: Cohen's *d* Calculation

The effect size was calculated to determine the practical significance of the difference between the Kashmir and Indore groups:

d= *M*1 –*M*2 / *sd* pooled

Calculation steps:

Mean difference: 30.98 -15.47 = 15.51

Standard difference: 15.51 ÷ 5.94= 2.61

d = 2.61

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Interpretation

As the calculated value of Cohen's *d* was found to be 2.61 which very high and shows the large size effect. This means the difference between two groups is greater than 2.61 standard deviations. This reflects that the first group's mean scores are 99.6% greater than the second group.

Interpretation of Graph

The above graph represents the two slope, in which orange color graph with mean value 15.47 and blue color slope with mean value 30.98. The difference between their centers defines the relative spread of 2.6 effect size.

RESULT

The main aim of the present study was to compare the mean scores of academic achievement following a Moodle-based LMS teaching intervention in students of higher secondary schools in Kashmir and students of B.Ed. course in universities in Indore. The null hypothesis presupposed that there would be no significant difference in the means of the scores of academic achievement in these two groups. To check that the assumption of homogeneity of variance was met, prior to the primary parametric analysis the data were tested. As shown in Table 3, Levene's test yielded an *F*-value of 3.23 (p = .075$). Since the significance level exceeds the traditional alpha =0.05 level, it was established that the assumption of equal variances is maintained, and the sample distribution is homogeneous and highly appropriate to test the independent parameters. To test the null hypothesis, an independent samples t-test was conducted on the scores of the post-test achievement scores. According to the analysis in Table 4, it is revealed that the difference in academic performance between the two cohorts is highly significant, t (119) = 18.94, p = .001. As a result, the null hypothesis was rejected. As seen in the descriptive statistics in Table 2, the higher secondary school students in Kashmir had a significantly higher means post-test results (M = 30.98, SD = 5.09) as compared to the university-level B.Ed. teacher trainees in Indore (M = 15.47, SD = 6.69). To determine the practical significance of this statistical rejection, the value of the effect size was calculated using a pooled standard deviation (pooled SD), which is equal to 5.94, giving a value of 2.61. Based on the conventional scales of behavioral research, the Cohen value of 2.61 is an extremely large effect size. This implies that the average performance of the Kashmir group is more than two and a half standard deviations higher than that of the Indore group. This statistical magnitude, as represented in the Cohens *d* Effect Size Graph, shows that the average student in the Kashmir group has a larger statistical magnitude than 99.6 percent of the students in the Indore group.

DISCUSSION

The study revealed that secondary school students in Kashmir achieved significantly higher academic scores (M = 30.98) compared to university-level B.Ed. students in Indore (M = 15.47). While it was initially hypothesized that greater maturity would lead to higher LMS engagement, these findings suggest the opposite. Several factors may explain this disparity. First, secondary students often benefit from highly structured environments and guided instructions, which align well with the organized nature of MOODLE resources. Additionally, the higher performance in Kashmir may be attributed to the frequent monitoring and systematic assessments typical of school-level pedagogy. In contrast, university students may have struggled with the high degree of self-sufficiency and autonomy required for successful online learning. Finally, it is important to note that because geographic location and education level were not isolated variables, regional differences in infrastructure or pedagogical integration may also have influenced the outcomes

CONCLUSION

The study comes to the conclusion that MOODLE-based LMS is a powerful educational tool that can be used to achieve academic success, but its effectiveness depends on the education level and the teaching atmosphere to a considerable degree. The fact that the school-level students in Kashmir perform better than other online learners implies that effective online learning must be well integrated in pedagogy and closely monitored. The results suggest that educational establishments, especially in such areas as Indore, might have to support the tech-savvy university learners with more effective frameworks, which would assist them in adjusting to the

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self-reliance demanded of digital studies. It is suggested that in the future longitudinal studies should be conducted to establish whether these achievement gains persist over time and in other areas of study.

The main aim of the research was to compare and contrast the academic performance of higher secondary school students in Kashmir and university level B. Ed. teacher trainees in Indore in the aftermath of the introduction of a Moodle-based Learning Management System (LMS). Although the traditional assumptions in online education are usually that the higher the educational level and the higher the student maturity, the better self-regulation and engagement with online learning platforms, the results of this study proved that there is a sharp and statistically significant opposite. The independent samples t -test showed that there was a tremendous difference in the post-treatment academic performance (t (119) = 18.94, p <.001). In particular, the higher secondary school students in Kashmir scored significantly higher in terms of mean score (M = 30.98, SD = 5.09) than the students of the university level in Indore (M = 15.47, SD = 6.69). To determine the practical meaning of this result, the d of Cohen was computed, showing an unusually large effect size of 2.61. This implies that the academic performance of the school-level group is more than two and a half standard deviations above the university group, indicating that the choice of educational level and associated pedagogical framework have a critical role in determining the success of an LMS intervention. This colossal achievement gap could be attributed to several interrelated pedagogical, institutional, and psychological factors.

Structural Paradigms and Pedagogical Monitoring: An essential reason behind the high performance of the school-level cohort in Kashmir is the differences in the operational environment between the secondary and higher education. The systems of secondary schools are fundamentally organized in terms of strict schedules, definite learning courses, and high degree of direct control by teachers.

Systematic Oversight: The implementation at the school level had the advantage of systematic assessments, frequent follow ups and mandatory engagement. This is a very controlled space which fits well into the linear design of a developed Moodle course.

The Autonomy Paradox: In its turn, university education focuses on independent study and academic freedom. It is plausible that the B.Ed. students in Indore were subjected to a less directive model. In the absence of strong reinforcement of behavior and continuous extrinsic monitoring, these university students might not have made good use of the resources available on the platform. This is in line with Broadbent (2016), who observed that the absence of active engagement and poor use of LMS functionalities are directly correlated with poor academic performance.

The Role of Learner Self-Efficacy and Digital Transitions: The results demonstrate that a critical vulnerability in the digital transition of higher education is the assumption of student self-sufficiency. Although university teacher trainees are supposed to have developed high level of cognitive skills, effective navigation of an online repository effectively requires specialized digital literacy and high academic self-efficacy. This underperformance of the Indore cohort indicates that they might have found themselves mismatched between the expectations of the platform of self-directed performance and their own preparedness to operate in a digital realm of self-directed performance. As emphasized in the literature, when students have to face technical friction or lack familiarity with structured LMS workflows, their motivation and consequent performance plummet quickly. The Kashmir group, which moved through a coordinated, teacher directed orientation and patterned lecture delivery, avoided this friction and the learning curves were optimized.

Confounding Regional and Contextual Variables: It is important to note that the level of education was not only the distinguishing variable in this study, the geographical location is another important factor. The students of the higher secondary school were in Kashmir with the trainees of the university being in Indore. In turn, the results might have been altered by latent variables, including the stability of infrastructures in the region, a different degree of institutional tech-readiness, and a different attitude toward e-learning in the culture. As an example, in case the Moodle application had been implemented as a new, highly valued intervention in the Kashmir schools, it might have created greater situational interest and engagement among the students, as was observed in the positive experimental results in individual local contexts such as Rani (2024) and Pandey (2020).

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