# Effectiveness of Developed Learning Management System on Education Subject for Higher Secondary School Students in terms of Attitude Towards E-Learning, Study Habits, Academic Achievement and Reaction

**Pre-Submission Presentation**

**for the degree of**

**Doctor of Philosophy in Education**


Supervisor
Dr. Laxman Shinde

Research Scholar
Rohi Rani

RESEARCH CENTRE

SCHOOL OF EDUCATION

DEVI AHILYA VISHWAVIDYALAYA, INDORE

Institute of Advanced Studies in Education (IASE)

(Accredited with Grade A+ by NAAC)

## SUMMARY

### 1.0.0 Introduction

The 21st century's illiteracy is not confined to those lacking basic reading and writing skills but extends to those unable to learn, unlearn, and relearn in the face of constant change, as noted by Alvin Toffler. This observation is particularly relevant in the context of our rapidly evolving world, shaped by technology, globalization, and the continual evolution of knowledge. In an arena of education, technology has played a pivotal role in reshaping teaching and learning methodologies, with Moodle, a widely adopted Learning Management System (LMS), emerging as a transformative tool in diverse educational settings.

This research intends to address a central question: What is the extent of Moodle's impact on the academic achievement of Higher Secondary School students in Education Subject and reactions of students towards technological integration with measurable effects on their academics. This study also involved a thorough analysis of student performance data and compared the outcomes before and after the integration of Moodle. Also, the research focuses on identifying the effect of attitude towards e-learning and study habit on academic achievement of the experimental group.

Recognizing that the integration of technology goes beyond a mere shift in tools, it signifies a transformation in pedagogical approaches. The study aims to contribute valuable insights to the broader fields of educational technology and subject development. The findings have the potential to inform educators, institutions, and policymakers, offering them valuable information to make informed decisions regarding the integration of Moodle in Higher Secondary School for the Subjects of Education and its implications for student learning outcomes.

### 1.1.0 RATIONALE

The integration of Learning Management Systems (LMS) into the Indian education system, in alignment with the National Education Policy (NEP) of 2020, holds the promise of delivering a multitude of advantages. These include the facilitation of personalized learning experiences, enhanced accessibility, skill development opportunities, and increased operational efficiency. However, the successful implementation of LMS necessitates a

proactive approach in addressing associated challenges. Issues such as limited digital literacy and restricted access to technology must be effectively tackled to ensure the optimal functioning and success of LMS in the educational landscape. A collaborative effort involving the government, schools, and colleges is crucial to achieve widespread adoption of LMS and to effectively realize the goals outlined in NEP 2020. (Entab.in.)

The prosperity of a nation is intricately linked to the quality of its citizens, and their education, in turn, is significantly influenced by the integration of technology. In this digital age, teachers, who have long been regarded as the pillars of society, are now empowered by technology to enhance the learning experience. Throughout history, educators have been esteemed for their pivotal role in shaping minds and imparting knowledge. With the infusion of technology in education, teachers now have powerful tools to enrich the learning process and prepare the next generation with the digital skills necessary for personal and societal advancement. The synergy between the noble role of teachers and the transformative impact of technology is instrumental in steering societies towards prosperity and progress Varthana (2023).

All these reasons make the researcher in deep study of the present research on MOODLE as the research topic.

On reviewing the above studies **twenty two** number of researches were found by the researcher on the effectiveness of learning management system that were done by **Costa et al. (2012)** on the Use of Moodle e-Learning Platform: A Study in a Portuguese University; **Kuruppu et al. (2013)** on Effectiveness of Moodle Application on Technical Tertiary Education in Sri Lanka;**Mijatovic et al. (2013)** on How the Usage of Learning Management Systems influences Student Achievement;**Damnjanovic et al. (2015)** on factors Affecting the Effectiveness and Use of Moodle: Students' Perception;**Dulkaman at el. (2016)** on Factors Influencing the Success of Learning Management System (LMS) on Students' Academic Performance;**Firat (2016)** on Determining the Effects of LMS Learning Behaviors on Academic Achievement in a Learning Analytic Perspective;**Han and Shin (2016)** on The Use of a Mobile Learning Management System and Academic Achievement of Online Students;**Umek et al. (2017)** on Assessment of the Effectiveness of Moodle E-Learning System for Undergraduate Public Administration Education;**Abuhassna et al. (2020)** on

Development of a New Model on Utilizing Online Learning Platforms to Improve Students' Academic Achievements and Satisfaction;**Tinmaz and Lee (2020)** on an Analysis of Users' Preferences on Learning Management Systems: a Case on German versus Spanish Students;**Yawisah et al. (2020)** on the Implications of Learning Management System on Education Quality in the New Normal Era: Evidence from Islamic Higher Education;**Gudkova et al. (2021)** on Effectiveness of Moodle in Student's Independent Work;**Kauts and kaur (2021)** on Effectiveness of Moodle-LMS on the Academic Achievement and Student Satisfaction among IX Grade Mathematics Learners;**Oguguo et al. (2021)** on Effect of Learning Management System on Student's Performance in Educational Measurement and Evaluation;**Rosyadi et al. (2021)** on Self-Regulation using Moodle Virtual Learning Environment (VLE) in Solar System Practice;**Gamage et al. (2022)** on a Systematic Review on Trends in Using Moodle for Teaching and Learning;**Rahayu et al. (2022)** on Effect of Employing Moodle on students' Attitude in English class;**Sibgatullina et al. (2022)** on Moodle Learning System as an Effective Tool for Implementing the Innovation Policy of the University;**Yüksel (2022)** on The Effect of Moodle-Integrated Learning Platform on ELT Pre-Service Teachers' General Pedagogical Knowledge;**Furqon et al.(2023)** on the Impact of Learning Management System (LMS) Usage on Students;**Karishma et al. (2023)** on The Correlation between the Demographic Factors and Students' Moodle Logs and their Academic Achievements in a Pre-degree Course;**Rani et al. (2023)** on Adoption of Learning Management System Among Students in Higher Educational Institutions - A Case on Moodle LMS.

For the another variable of the study i.e, attitude towards e-learning **fifteen** researches were found by the researcher conducted by **Ercan and Bilen (2014)** on Effect of Web Assisted Education Supported by Six Thinking Hats on Students' Academic Achievement in Science and Technology Classes;**Mothibi (2015)** on A Meta-Analysis of the Relationship between E-Learning and Students Academic Achievement in Higher Education;**Jović et al. (2017)** on Factors Affecting Students' Attitudes towards E-Learning. To Identify the Factors that Influence Students;**Konwar (2017)** on Attitude of College Students towards E-learning with Special Reference to North Lakhimpur of Lakhimpur District, Assam;**Thakkar and joshi (2017)** on Students' Attitude towards E-learning;**Jan and Mattoo (2018)** on Comparing Research Scholars' Attitudes towards E-Learning;**Ogbonna and et al.(2019)** on Synchronous

versus Asynchronous E-learning in Teaching Word Processing: An experimental approach;**Sert and Ağır (2019)** on Students Attitudes Towards Learning, A Study on Their Academic Achievement and Internet Addiction;**Wu et al. (2021)** on Shift Towards Visualization in E-Learning: A Study on Recent Graduates' Perspectives;**Bismala et al. (2022)** on The Impact of E-Learning Quality and Students' Self-Efficacy Toward the Satisfaction in the Using of E-Learning;**Cao et al. (2022)** on Students Relative Attitudes and Relative Intentions to use E-Learning Systems;**Koyuncuoglu et al. (2022)** on Analysis of Digital and Technological Competencies of University Students;**Ninsiana et al. (2022)** on High School Students' Attitudes towards E-Learning and Impacts of Online Instruction on Their General English Learning: Challenges and Issues;**Nuryatin et al. (2022)** on Effectiveness of Online Learning at Universities: Do Sociocultural Differences Matter;**Reddy and Madhumathi (2023)** on Attitude towards e-learning among b.ed. Students with respect to Gender, Methodology and Computer / Laptop Facility at Home.

Moreover for the another variable of the study i.e, study habits **ten** studies were found by the researcher that was conducted by **Riaz et al. (2002)** on Relationship of Study Habits with Educational Achievements; **Julius and Evans (2015)** on Study of the Relationship between Study Habits and Academic Achievement of Students: A case of Spicer Higher Secondary School, India;**Ebele and Olofu (2017)** on Study habit and its impact on Secondary School Students' Academic Performance in Biology in the Federal Capital Territory, Abuja;**Jafari et al. ( 2019)** on Relationship between Study Habits and Academic Achievement in Students of Medical Sciences in Kermanshah-Iran;**Rafaqi and Musheer (2019)** on Effect of Emotional Maturity on the Study Habit and Academic Achievement of Secondary School Students;**Unwalla (2020)** on Comparative Analysis of Study Habits Between Males and Females;**Kaur and singh (2021)** on Study Habits And Academic Performance: A Comparative Analysis;**Gahir et al. (2022)** on Relationship between Study Habits and Academic Achievement of Secondary School Students;**Castillo et al. (2023)** on The Impact of Study Habits on the Academic Performance of Senior High School Students Amidst Blended Learning;**Lalhruaitluangi and Fanai(2020)** on Study Habits and Academic Achievement of High School Students in Lunglei District.

On the basis of above-mentioned reviews, the following observations were made:

The researcher has identified only seven studies in India exploring the effectiveness of Moodle, e-learning attitudes, and study habits, prompting further investigation across various states and cities.

Despite significant research had taken place on the effectiveness of MOODLE but a critical gap exists in exploring subjects like science and social sciences, emphasizing the need for more in-depth investigation.

Researcher has found the lack of comprehensive research at the higher secondary level to determine the effectiveness of MOODLE, presenting an opportunity for researchers to conduct in-depth studies in this educational tier.

Capitalizing on these insights, the researcher proposes a study focusing on higher secondary students in Anantnag district of, Jammu and Kashmir. The study aims to develop MOODLE specifically tailored for education subject in this context.

Therefore, this research aims to address these gaps by investigating the effectiveness of the MOODLE in the Indian context. The study also considers the influence of factors such as locality, gender, and academic achievement, while taking pre-achievement into account as a covariate. By filling these research gaps, the study aims to contribute to the understanding of the effectiveness of Learning Management System and its implications for academic achievement and attitude towards e learning and study habits in the Indian educational landscape.

### 1.2.0 STATEMENT OF THE PROBLEM

Effectiveness of Developed Learning Management System on Education Subject for Higher Secondary School Students in terms of Attitude towards E-Learning, Study Habits, Academic Achievement and Reaction

### 1.3.0 VARIABLES OF THE STUDY

1) **Independent variable:** An independent variable is a factor or condition in an experiment that is intentionally manipulated or varied by the researcher. It is the variable believed to have a causal effect on the dependent variable, which is the outcome or result being measured. In

other words, the independent variable is the input or stimulus that is changed to observe its effect on the dependent variable. The independent variables of the study are :

a. Moodle.
b. Attitude towards e-learning.
c. Study habits.

2) **Dependent variable:** A dependent variable is the variable in an experiment that is observed or measured to determine the effects of the independent variable. It is the outcome or response that is influenced by changes in the independent variable. In simpler terms, the dependent variable is what you measure in the experiment and what is expected to change as a result of the manipulation of the independent variable. The relationship between the independent and dependent variables is a key aspect of experimental research, as it helps to understand cause-and-effect relationships. The dependent variable of the study are:

a. Academic achievement.
b. Reaction towards moodle.

**3) Covariate variable**: A covariate variable is a variable that is potentially predictive of the outcome under study. In a research or statistical analysis context, a covariate is often used to control for its effects in order to better understand the relationship between the independent and dependent variables. In the present study pre-achievement is the covariate of the study.

### 1.4.0 OPERATIONAL DEFINITION

**Learning Management System**: In the present research study, the Learning Management System (LMS) used is moodle, which is software application specifically designed for 12th class board of school education students having education as one of their subject.

**Education Subject**: "Education" as a subject involves teaching theoretical and practical aspects of pedagogy, educational psychology, and curriculum development etc .It prepares students for careers in education or related fields. In the present study it means the subject of Education for $12^{th}$ class students of JKBOSE ( Jammu and Kashmir Board of School Education ).

**Higher Secondary School Students**: Higher Secondary School Students refer to learners typically between the ages of 15 to 18 years. They are also known as 11th and 12th grade

students. In the present study it means the 12th class students of Government Girls Higher Secondary School Rani Bagh, Government Girls Higher Secondary School Bijbheria, Government Boys Higher Secondary School Bijbheria, and Government Higher Secondary School Wanpoh having Education as one subject.

**Attitude towards E-Learning**: In the present study it means the scores obtained by secondary school students on Attitude towards E-Learning scale developed by Dimpal Rani in 2008.

**Study Habits:** In the present study it means the scores obtained by secondary school students on the scale of study habit developed by Dimple Rani and M. L. Jaidka in 2015.

**Academic Achievement**: In the present study it means a composite measurable outcome of selected three units within the Learning and Teaching subject. The outcome is assessed through researcher-developed Achievement Tests, divided into Pre and Post test.

**Reaction**: It includes the thoughts on the difficulty level, surprises or challenges one encounter, and one's overall feelings about the test-taking experience. It's an opportunity to share one's impressions and reflections on the test in questions. It examines the experimental group student's responses towards the effectiveness of developed LMS (MOODLE).

### 1.5.0 OBJECTIVES

The objectives of the study are:

1. To compare adjusted mean scores of achievement in education subject of the experimental group and control group by taking pre-achievement as a covariate.
2. To compare the adjusted mean scores of achievement in education subject of high, average and low level of attitude towards e-learning of students in experimental group by taking pre-achievement as a covariate.
3. To compare adjusted mean scores of achievement in education subject of high and low level of study habit of students in experimental group by taking pre-achievement as a covariate.
4. To study the effect of treatment, Residential Background, and their interaction on achievement in education subject of students by considering their pre-achievement as a covariate.

5. To study the effect of treatment, Gender and their interaction on achievement in education subject of students by considering their pre-achievement as a covariate.
6. To study the reaction of the experimental group towards Learning Management System (MOODLE).

### 1.6.0 HYPOTHESES

The following hypotheses will be formed based on the objectives as follows:

1. There is no significant difference on adjusted mean scores of achievement in education subject of the experimental group and control group by taking pre-achievement as a covariate.
2. There is no significant difference on adjusted mean scores of achievement in education subject of high, average and low level of attitude towards e-learning of students in experimental group by taking pre-achievement as a covariate.
3. There is no significant difference on adjusted mean scores of achievement in education subject of high and low level of study habit of students in experimental group by taking pre-achievement as a covariate.
4. There is no significant difference on the effect of treatment, Residential Background, and their interaction on achievement in education subject of students by considering their pre-achievement as a covariate.
5. There is no significant difference on the effect of treatment, Gender and their interaction on achievement in education subject of students by considering their pre-achievement as a covariate.

### 1.7.0 RESEARCH DESIGN

The present study will be experimental in nature. The study was designed on the lines of Non-Equivalent Control Group Design as per Campbell and Stanley 1963, the layout of the design is given under.

O X O

---

O O

Here, O represents the pre-test and post-test

X represents treatment given to the experimental group,

and The ----- dotted line represents the non-equivalent nature of the design There were two groups one group designed as Experimental group (above the dotted line) and the other group as Control group (below the dotted line). Experimental group was given treatment of developed MOODLE by the researcher whereas Control group was given treatment with traditional method. Before applying treatment to both the groups a pre-test was administered and after treatment post-test was taken.

1.8.**0 SAMPLE**

| **s.no** | **Institutions** | **Groups** | **Gender** | **Number** | **Total** |
|---|---|---|---|---|---|
| **1** | Govt. girls higher secondary school ranibagh | Experimental group | Female | 31 | |
| **2** | Govt. boys higher secondary school bijhberia | | Male | 29 | =60 |
| **3** | Government girls higher secondary school bijbheria | Control group | Female | 30 | |
| **4** | Government boys higher secondary school boys wanpoh | | Male | 20 | =50 |
| | | | | | 110 |

**1.9.0 TOOLS**

Three tools were used in this study for assessing the student's attitude towards e-learning, study habits and their reaction towards the developed MOODLE course.

1. To assess the attitude towards e-learning the scale of e-learning constructed by Dimpal Rani in 2008 was used. The reliability of the scale was 0.87 also the content and construct validity was established.
2. To assess the study habit of students' the scale of study habit constructed by Dimple Rani and M. L. Jaidka in 2015 was used. The reliability of the scale was .872 also the content and construct validity was established.
3. Reaction Scale was developed by researcher to assess the responses of students after studied through Moodle course.

### 1.10.0 Constructing a Moodle Course on Gnomio Moodle

This guide covers the step-by-step process of developing a course on the Gnomio Moodle platform (https://gnomio.com), a free Moodle hosting site. Basic computer skills, including Microsoft Office operations (Word, Excel, PowerPoint), and the ability to download content from websites, are essential for adding content to Moodle.

**Step 1: Create Your Site on Gnomio Moodle**

1. Visit the site administrator of Gnomio Moodle at https://gnomio.com.
2. Register by providing necessary details

**Step 2: Add a New Course**

1. Sign in to your Gnomio Moodle account.
2. Click on the relevant link to add a new course.
3. Enter general details about the course and click "Save and Display."
4. The new course will appear on the home page, initially organized with default weekly sections.

**Step 3: Enrollment**

1. Enroll yourself in the course to make it accessible in the list of courses.
2. Enroll users by entering their names in the pop-up window, providing necessary details like name and email.

**Step 4: Add Lesson Plan**

1. Select units from the course for lesson development.
2. Click "+Add an activity or resource" and choose "Lesson" from the Moodle toolbar.
3. Add lessons and click "Save and Next" to progress.

**Step 5: Create Question Page**

1. Select "Add a question page" from the Actions menu.
2. Choose the question type (e.g., Multi choice).
3. Write the question in the page title, add answers, responses, and click "Save."

**Step 6: Create More Content and Question Pages**

1. Add more content and question pages to enhance the lessons.
2. Save the content and structure your course as needed.

Following these steps systematically on Gnomio Moodle will help you construct a Moodle course for effective online teaching and learning.

### 1.11.0 Procedure of data collection:

The data collection procedure is a critical component of research, involving systematic methods for gathering, recording, and managing data to ensure its integrity, validity, and reliability. For the present study before collecting the data an electronic mail was forwarded from the chair of the Head of Department of Education DAVV Indore to Chief Education Officer in Anantnag for initiating the formal process of data collection. The investigator was granted authorization to proceed, and the identified schools - Government Girls Higher Secondary School Rani Bagh, Government Girls Higher Secondary School Bijbheria, Government Boys Higher Secondary School Bijbheria, and Government Higher Secondary School Wanpoh - were notified. The study targeted 12th-grade students with education as one of their subject.

**PRE TESTING:**

Prior to the initiation of the study, a pre-test was administered to both groups. This involved a two-day assessment covering three distinct study units within the education subject, with each test spanning approximately 45 minutes.

**TREATMENT:**

After the initial assessment, an interesting occurrence took place for the experimental group. Before starting the Moodle course, students were given a special advanced orientation. Similar to an introduction before the exciting journey, the researcher acted as a guide, demonstrating how the platform works through an engaging presentation and outlining the topics to be covered. On the other hand, the control group went through the typical instructional procedures led by their teacher, receiving general guidance in the traditional manner. As a result, the study involved two different groups – one using innovative technology (Moodle) and the other following traditional teaching methods. Both groups embarked on distinct educational paths within the field of learning.

**POST TESTING**

After the completion of three units, both the experimental and control groups underwent a post-test, utilizing the same achievement test that was administered as the pretest, and were allocated 45 minutes for its completion. Furthermore, the experimental group engaged in two additional tests focusing on attitudes towards e-learning and study habits. These measures were thoughtfully designed to maintain sustained student engagement without inducing unnecessary pressure. Prior to each test, clear instructions were provided to ensure uniformity and understanding across all students.

**SCHEMATIC REPRESENTATION OF THE TREATMENT IS GIVEN BELOW:**

**TABLE 2:**

| Activities | Experimental group | Control group | Time |
|---|---|---|---|
| **Pre testing of dependent variable** | Administration of Achievement test on education subject | | 45 minutes |
| **Treatment** | Execution of the refined MOODLE platform. | Conventional practices and traditional instructional methods. | 24x7 for 50 days |
| **Testing of moderate variables** | Conducting the assessment by using: *Attitude towards E-learning scale. | | 40 minutes |
| | *study habit scale. | | 40 minutes |
| **Post testing of dependent variable** | Administration of Achievement test on education subject | | 45 minutes |
| **Reaction scale** | Administration of reaction Scale | | 30 minutes |

### 1.12.0 STATISTICAL ANALYSIS

1. The first objective of the study was "To compare adjusted mean scores of achievement in education subject of the experimental group and control group by taking pre-achievement as a covariate, the data were analyzed with the help of one-way ANCOVA.
2. The second objective of the study was "To compare the adjusted mean scores of achievement in education subject of high, average and low level of attitude towards e-learning of students in experimental group by taking pre-achievement as a covariate, the data were analyzed with the help of one- way ANCOVA.

3. The third objective of the study was "To compare adjusted mean scores of achievement in education subject of high and low level of study habits of students in experimental group by taking pre-achievement as a covariate, the data were analyzed with the help of one-way ANCOVA.
4. The fourth objective of the study was "To study the effect of treatment, Residential Background, and their interaction on achievement in education subject of students by considering their pre-achievement as a covariate, the data were analyzed with the help of 2x2 ANCOVA.
5. The fifth objective of the study was "To study the effect of treatment, Gender and their interaction on achievement in education subject of students by considering their pre-achievement as a covariate, the data were analyzed with the help of 2x2 ANCOVA.
6. The sixth objective of the study was "To study the reaction of the experimental group towards Learning Management System (MOODLE) data related to this objective was analyzed by calculating mean ,standard deviation and Coefficient of variation.

### 1.13.0 FINDINGS OF THE STUDY

The following were the findings according to the framed objectives:

1. The post scores of the experimental group exhibited a significant disparity compared to those of the control group, owing to the influence of moodle (Quade's F = 237.06, p=00<0.05), indicating a substantial difference in the absence of a covariate. Further examination of the mean post score of 23.66 for the experimental group in contrast to -28.40 for the control group provides clear evidence of the efficacy of the treatment.
2. The post scores of the experimental group showed no significant change attributable to the attitude towards e-learning (F=.366, p=.695 >0.05), indicating no notable difference in Achievement scores in the absence of a covariate.

3. The post scores of the experimental group demonstrated no significant change attributed to the study habits (Quade's F=.077, p=.782>0.05), signifying an absence of notable difference in Achievement scores in the absence of a covariate
4. The post scores of the experimental group and control group demonstrated no significant change attributed to the residence (Quade's F= .209, p= .649 >0.05), signifying an absence of notable difference in Achievement scores in the absence of a covariate.
5. The post scores of the experimental group and control group demonstrated no significant changes attributed to the Gender (Quade's F= .910, p= .979 >0.05), signifying an absence of notable difference in Achievement scores in the absence of a covariate
6. The mean score of 244.80 exceeded the average score of 150 (with a maximum of 300 and minimum of 60), indicating a clear preference for using Moodle among the students. Moreover, the small coefficient of variation at 2.89% suggests minimal variability in the students' responses, supporting the conclusion that the students overwhelmingly favored the effectiveness of the Moodle course.

### 1.14.0 DELIMITATIONS

The present study will be delimited to:

**1.** The selection of Govt. Girls Higher Secondary School Ranibagh, Govt. Boys Higher Secondary School Bijhberia, Government Girls Higher Secondary School Bijbheria, and Government Boys Higher Secondary School Wanpoh for the study may limit the generalizability of the findings to the Kashmir region of Jammu and Kashmir, particularly the Anantnag district, and may reduce the applicability of the findings to other locations.

**2.** The selection of English as the medium of instruction may limit the generalizability of the findings to other mediums of instruction.

**3.** The research is solely centered on the curriculum of the Jammu and Kashmir State Board of School Education.

4. Specific LMS: The study utilizes MOODLE (Modular Object-Oriented Dynamic Learning Environment) as the Learning Management System, potentially excluding the effects of other platforms.

### 1.14.0 EDUCATIONAL IMPLICATIONS

**The findings of the study offer several educational implications for students:**

The research indicates a significant disparity in post scores between the experimental group using MOODLE and the control group, demonstrating the efficacy of the treatment. This suggests that the utilization of MOODLE can have a positive impact on academic achievement at the higher secondary level.

The study reveals that attitude towards e-learning had no discernible effect on students' post scores. This suggests that success with MOODLE may not be strongly influenced by students' initial attitudes towards e-learning, indicating that the platform's effectiveness is relatively independent of students' preconceived opinions.

The findings also suggest that study habits, residence (urban or rural), and gender did not have a notable impact on students' post scores when using MOODLE. This implies that MOODLE may offer a consistent level of benefit regardless of students' study habits, geographic location, or gender.

The study found that the mean score exceeding the average score indicates a clear preference for using MOODLE among students. The associated low coefficient of variation suggests minimal variability in students' responses, further supporting the conclusion that students overwhelmingly favored the effectiveness of the MOODLE course.

In conclusion, the educational implications of these findings suggest that MOODLE can be an effective tool for enhancing academic achievement at the higher secondary level, regardless of students' attitudes towards e-learning, study habits, residence, or gender. The study's results emphasize the potential benefits of implementing MOODLE as a valuable educational resource for students at this level.

**The findings of the study offer important implications for teachers at the higher secondary level:**

MOODLE: Teachers can consider implementing MOODLE as a tool to enhance academic achievement among students. The significant disparity in post scores between the experimental group using MOODLE and the control group suggests that integrating this platform into the teaching process may lead to positive results.

Addressing Attitudes Towards E-Learning: Teachers may need to focus less on students' initial attitudes towards e-learning when utilizing MOODLE. The study shows that attitudes towards e-learning had no discernible effect on students' post scores, indicating that the platform's effectiveness may not be strongly influenced by students' preconceived opinions.

Recognizing Student Diversity: The findings suggest that study habits, residence (urban or rural), and gender did not significantly impact students' post scores when using MOODLE. This implies that MOODLE can potentially offer consistent benefits across a diverse student population, irrespective of these factors.

Encouraging MOODLE Adoption: Given the clear preference for using MOODLE among students and the minimal variability in their responses, teachers may be encouraged to promote the adoption of MOODLE as an effective educational resource.

Professional Development: Teachers may also benefit from professional development opportunities focused on effectively utilizing MOODLE in the classroom to optimize its impact on student achievement.

In summary, the study's findings provide valuable insights for teachers, indicating the potential benefits of integrating MOODLE into their teaching practices to enhance student learning outcomes at the higher secondary level.

**The study's findings offer important implications for curriculum developers at the secondary level:**

Integration of MOODLE: The significant disparity in post scores between students using MOODLE and the control group suggests that curriculum developers may consider

integrating MOODLE into the educational framework at the higher secondary level. This could potentially enhance the effectiveness of the curriculum and contribute to improved academic achievement.

Inclusive Approach: Given that the study found no discernible effect of attitudes towards e-learning, as well as minimal impact from student study habits, residence, and gender, curriculum developers should consider designing a curriculum that accommodates diverse student characteristics without relying heavily on these factors to determine the success of educational interventions like MOODLE.

Emphasis on Technology-Enhanced Learning: The clear preference for using MOODLE and minimal variability in students' responses suggests that curriculum developers should consider emphasizing technology-enhanced learning within the curriculum. This may involve integrating other effective digital learning platforms and resources to complement MOODLE and further support student achievement.

Professional Development and Training: Curriculum developers may want to consider incorporating training and professional development opportunities for teachers to effectively implement and utilize MOODLE within the curriculum. This could ensure that educators are well-equipped to leverage the platform's potential for enhancing student learning outcomes.

In summary, the study's findings provide valuable insights for curriculum developers, suggesting the potential for MOODLE integration to enhance the educational experience at the higher secondary level with a focus on inclusive, technology-enhanced, and effective teaching strategies.

## 1.15.0 SUGGESTIONS FOR FURTHER RESEARCHS

**Alternate Platforms for Study**: While this study was conducted on the Moodle platform, it is worthwhile to explore the impact of similar interventions using alternative online platforms such as Canvas, edX, Coursera, Skillshare, Udemy, and others. Comparative research across these platforms can offer valuable insight into their effectiveness in different educational contexts.

**Expansion to Other Subjects and Educational Levels**: Given that this study focused on developing a Moodle course for the 12th-grade education subject, there is potential to extend this approach to other subjects and educational levels. Developing similar interventions for diverse academic disciplines and different educational stages could promote a comprehensive understanding of the impact of online platforms on student learning outcomes.

**Consideration of Additional Variables:** While the current study focused on attitude towards e-learning and study habits, it is important to acknowledge the significance of additional variables such as intelligence, personality, creativity, and others in shaping student academic achievement. Future research can benefit from examining the interplay of these variables within the context of online learning environments.

**Expansion of Sample Coverage:** The study's sample was delimited to a specific location. Future investigations should aim to broaden the sample coverage to include multiple states or regions, allowing for a more comprehensive understanding of the generalizability of the findings across diverse geographic and cultural contexts.

**Incorporation of other Demographic Variables**: To provide a more holistic analysis, future research should consider the inclusion of demographic variables such as age, socio-economic status, and educational streams. Understanding how these demographic factors intersect with the impact of online platforms on student achievement can offer valuable insights for educators and policymakers.

**Longitudinal Studies:** Conducting longitudinal studies to assess the sustained impact of online learning platforms on student academic performance over an extended period can provide deeper insights into the long-term efficacy of these interventions.

**Comparative Effectiveness:** Comparative studies across different online platforms and traditional classroom settings can offer valuable insights into the relative effectiveness of online learning in comparison to conventional educational approaches.

**Teacher and Instructor Perspectives:** Future research could explore the perspectives of teachers and instructors in integrating and utilizing online platforms in their teaching practices, shedding light on the facilitators and barriers to successful implementation.

Expanding the scope of research to encompass these additional considerations can contribute to a more thorough understanding of the potential impact of online platforms on student achievement and inform the development of effective educational interventions

**REFRENCES**


Abuhassna, H., Al-Rahmi, W. M., Yahya, N., Zakaria, M. A. Z. M., Kosnin, A. B. M., & Darwish, M. (2020). Development of a new model on utilizing online learning platforms to improve students' academic achievements and satisfaction. *International Journal of Educational Technology in Higher Education*, *17*, 1-23

Alameri, J., Masadeh, R., Hamadallah, E., Bani, H., & Fakhouri, H. (2020). *Students' Perceptions of E-learning platforms (Moodle, Microsoft Teams and Zoom platforms) in The University of Jordan Education and its Relation to self-study and Academic Achievement During COVID-19 pandemic*. *11*, 13.

Amdur, E. (n.d.). *'The Illiterate Of The 21st Century...'* Forbes. Retrieved January 25, 2024, from https://www.forbes.com/sites/eliamdur/2022/10/04/the-illiterate-of-the-21st-century/

ISACA. (n.d.). An ethical approach to data privacy protection. ISACA Journal. https://www.isaca.org/resources/isaca-journal/issues/2016/volume-6/an-ethicalapproach-to-data-privacy-protection

Arbeiter, J., & Bucar, M. (2020). Transformative Education: Bridging Education for Change. *Victoria University Library.*

Bismala, L. (2022). The Impact of E-Learning Quality and Students' Self-Efficacy toward the Satisfaction in the Using of E-Learning. *Malaysian Online Journal of Educational Technology*, *10*(2), Article 2. https://doi.org/10.52380/mojet.2022.10.2.362

Cao, G., Shaya, N., Enyinda, C., Abukhait, R., & Naboush, E. (2022). Students' Relative Attitudes and Relative Intentions to Use E-Learning Systems. *Journal of Information Technology Education: Research*, *21*, 115–136. https://doi.org/10.28945/4928

Cavus, N., Uzunboylu, H., & Ibrahim, D. (2006). The Effectiveness of Using Learning Management Systems and Collaborative Tool in Web-Based Teaching of Programming Languages. *Online Submission*.

Costa, C., Alvelos, H., & Teixeira, L. (2012). The Use of Moodle e-learning Platform: A Study in a Portuguese University. *Procedia Technology*, *5*, 334–343. https://doi.org/10.1016/j.protcy.2012.09.037

Damnjanovic, V., Jednak, S., & Mijatovic, I. (2015). Factors affecting the effectiveness and use of Moodle: Students' perception. *Interactive Learning Environments*, *23*(4), 496–514. https://doi.org/10.1080/10494820.2013.789062

Dulkaman, N. S. B. S. M. J., & Ali, A. M. (2016). Factors influencing the success of learning management system (LMS) on students' academic performance. *International Young Scholars Journal of Languages*, *1*(1), 36-49.

Ebele, U. F., & Olofu, P. A. (2017). Study Habit and Its Impact on Secondary School Students' Academic Performance in Biology in the Federal Capital Territory, Abuja. *Educational Research and Reviews*, *12*(10), 583–588.

Entab. (n.d.). Benefits & challenges: Implementing learning management system in education. Retrieved January 25, 2024, from https://www.entab.in/implementing-learning-management-system-in-indian-education.html

Firat, M. (2016). Determining the Effects of LMS Learning Behaviors on Academic Achievement in a Learning Analytic Perspective. *Journal of Information Technology Education: Research*, *15*, 075–087. https://doi.org/10.28945/3405

Furqon, M., Sinaga, P., Liliasari, L., & Riza, L. (2023). The Impact of Learning Management System (LMS) Usage on Students. *TEM Journal*, *12*, 1082–1089. https://doi.org/10.18421/TEM122-54

Gahir, S., Sahu, S., & Sahoo, S. (2022). Relationship between Study Habits and Academic Achievement of Secondary School Students. *Contemporary Research in Education and English Language Teaching*, *4*, 1–9. https://doi.org/10.55214/26410230.v4i1.187

Gamage, S. H., Ayres, J. R., & Behrend, M. B. (2022). A systematic review on trends in using Moodle for teaching and learning. *International Journal of STEM Education*, *9*(1), 1-24.

Gudkova, Y., Reznikova, S., Samoletova, M., & Sytnikova, E. (2021). Effectiveness of Moodle in student's independent work. *E3S Web of Conferences*, *273*, 12084. https://doi.org/10.1051/e3sconf/202127312084

Gunasekaran, A., McNeil, R. D., & Shaul, D. (2002). E-learning: research and applications. *Industrial and commercial training*, *34*(2), 44-53.

Haleem, A., Javaid, M., Qadri, M. A., & Suman, R. (2022). Understanding the role of digital technologies in education: A review. *Sustainable Operations and Computers*, *3*, 275–285. https://doi.org/10.1016/j.susoc.2022.05.004

Hamutoglu, N., Savaşçı, M., & Sezen-Gultekin, G. (2019). Digital Literacy Skills and Attitudes towards E-Learning. *Journal of Education and Future*, 93–107. https://doi.org/10.30786/jef.509293

Han, I., & Shin, W. S. (2016). The use of a mobile learning management system and academic achievement of online students. *Computers & Education*, *102*, 79–89.

India to have 900 million active internet users by 2025, says report. (2021, June 3). *The Economic Times*. https://economictimes.indiatimes.com/tech/technology/india-to-have-900-million-active-internet-users-by-2025-says-report/articleshow/83200683.cms

India Today .(2020,August 21). Remote learning unlikely to replace classroom-based learning, physical textbooks. https://www.indiatoday.in/education-today/featurephilia/story/

India's e-learning market second largest after US, says report | IBEF. (n.d.). India Brand Equity Foundation. Retrieved July 10, 2023, from https://www.ibef.org/news/india-e-learning-market-second-largest-after-us

Jafari, H., Aghaei, A., & Khatony, A. (2019). Relationship between study habits and academic achievement in students of medical sciences in Kermanshah-Iran. *Advances in Medical Education and Practice*, *10*, 637–643. https://doi.org/10.2147/AMEP.S208874

Jan, H., & Mattoo, M. I. (2018). Various dimensions of attitude towards e- learning among research scholars of different fields of research: a comparative study. *Journal of Languages*, *1*(1), 36-49.

Jović, M., Stankovic, M. K., & Neskovic, E. (2017). Factors Affecting Students' Attitudes towards E-Learning. *Management:Journal of Sustainable Business and Management Solutions in Emerging Economies*, *22*(2), Article 2. https://doi.org/10.7595/management.fon.2017.0016

Julius, M., & Evans, A. S. (2015). Study of the relationship between study habits and academic achievement of students: A case of Spicer Higher Secondary School, India. *International Journal of Educational Administration and Policy Studies*, *7*(7), 134–141. https://doi.org/10.5897/IJEAPS2015.0404

Karishma, K., Raghuwaiya, K., & Chand, R. (2023). The Correlation between the Demographic Factors and Students' Moodle Logs and their Academic Achievements in a Pre-degree Course. 2023. https://doi.org/10.5281/zenodo.10161331

Kaur, J. & singh,p.(2021). Study Habits And Academic Performance: A Comparative Analysis. *European Journal of Molecular & Clinical Medicine, 7 ( 7),*

Kauts, D. S., & Kaur, N. (2021, March 1). *Effectiveness of Moodle-LMS on the Academic Achievement and Student Satisfaction among IX grade Mathematics Learners. | Turkish Online Journal of Qualitative Inquiry , 12*(3).| *EBSCOhost*. https://openurl.ebsco.com/contentitem/gcd:160413556?sid=ebsco:plink:crawler&id=ebsco:gcd:160413556

Konwar, D. I. H. (2017). A Study on Attitude of College Students towards E-learning with Special Reference to North Lakhimpur of Lakhimpur District, Assam.

Koyuncuoglu, D. (2022). Analysis of Digital and Technological Competencies of University Students. *International Journal of Education in Mathematics, Science and Technology*, *10*(4), 971–988. https://doi.org/10.46328/ijemst.2583

Kuruppu, G., & Halwatura, R. U. (2013). Effectiveness of Moodle application on technical tertiary education in Sri Lanka. In 2013 IEEE International Conference in MOOC, Innovation and Technology in Education (MITE) (pp. 362–365). https://doi.org/10.1109/MITE.2013.6756368

MasterSoft. (n.d.). NCF 2020 (National Curriculum Framework—2020)—A Complete Guide.

Meena, O. P., & Pareek, R. B. (2020).Impact study of e-content on teaching Learning of science.

Mijatovic, I., Cudanov, M., Jednak, S., & Kadijevich, D. M. (2013). How the usage of learning management systems influences student achievement. *Teaching in Higher Education*, *18*(5), 506–517. https://doi.org/10.1080/13562517.2012.753049

Mohammed, O., Rida, N., & Chafiq, T. (2021). Overview of E-Learning Platforms for Teaching and Learning. *International Journal of Recent Contributions from Engineering Science & IT (IJES)*, *9*, 21. https://doi.org/10.3991/ijes.v9i1.21111

Mothibi, G. (2015). A Meta-Analysis of the Relationship between E-Learning and Students' Academic Achievement in Higher Education. *Journal of Education and Practice*.

Nguyen, H. T., Warren, W., & Fehring, H. (2014). Factors Affecting English Language Teaching and Learning in Higher Education. *English Language Teaching*, *7*(8), 94-105.

Ninsiana, W., Gabidullina, F. I., Widodo, M., Patra, I., Pallathadka, H., Alkhateeb, D. A. A. M.,Zainal, A. G., & Gheisari, A. (2022). High School Students' Attitudes towards E-Learning and Impacts of Online Instruction on Their General English Learning: Challenges and Issues. *Education Research International, 2022*, e9103862. https://doi.org/10.1155/2022/9103862

Nuryatin, A., Mukhibad, H., & Tusyanah, T. (2022). Effectiveness of Online Learning at Universities: Do Sociocultural Differences Matter? *European Journal of Educational Research*, *11*, 2153–2166. https://doi.org/10.12973/eu-jer.11.4.2153

Ogbonna, C. G., Ibezim, N. E., & Obi, C. A. (2019). Synchronous versus asynchronous e-learning in teaching word processing: An experimental approach. *South African Journal of Education*, *39*(2), 1–15. https://doi.org/10.15700/saje.v39n2a1383

Oguguo, B., Fadip, N., Agah, J., Christian, S., Ene, C., & Nzeadibe, A. (2021). Effect of learning management system on Student's performance in educational measurement and evaluation. *Education and Information Technologies*, *26*, 1–13. https://doi.org/10.1007/s10639-020-10318-w

Panda, S. (2020). Analyzing Effectiveness Of Learning Management System In Present Scenario: Conceptual Background And Practical Implementation. *International Journal of Innovative Research and Advanced Studies*, *7*(9), 40-50.

Paris, P. G. (2004). E-Learning: A Study on Secondary Students' Attitudes towards Online Web Assisted Learning. *International Education Journal*.

Park, J.-H., & Wentling, T. (2007). Factors associated with transfer of training in workplace e-learning. *Journal of Workplace Learning*. https://doi.org/10.1108/13665620710757860

Polhun, K., Kramarenko, T., Maloivan, M., & Tomilina, A. (2021, March). Shift from blended learning to distance one during the lockdown period using Moodle: test control of students' academic achievement and analysis of its results. In *Journal of physics: Conference series* (Vol. 1840, No. 1, p. 012053). IOP Publishing.

Rafaqi, M. Z. H., & Musheer, Z. (2019). Effect of emotional maturity on the study habit and academic achievement of secondary school students. *Asia Pacific Journal of Multidisciplinary Research*, *7*(4), 7-12.

Rahayu, P., Rahman, D. A., & Mustofa, M. (2022). The Effectiveness of Using Moodle To The Students Attitude In Efl Classroom. *Premise: Journal of English Education*, *11*(2), 316. https://doi.org/10.24127/pj.v11i2.4540

Rani, J. U., Kumar, J. P. S., & Raj, D. B. C. (2023). Adoption of Learning Management System Among Students in Higher Educational Institutions—A Case on Moodle LMS. In

Reddy, A. K., & Madhumathi, C. (2023). Attitude towards e-learning among b.ed. Students with respect to gender, methodology and computer / laptop facility at home. *11*(7).

Seferoglu, S. S., & Celen, F. (2020). Improving the use of ICT through online professional development platform based on metacognitive strategies. *Global Journal of Information Technology: Emerging Technologies*, *10*, 45–59. https://doi.org/10.18844/gjit.v10i1.4747

Sibgatullina, A., Ivanova, R., & Yushchik, E. (2022). Moodle Learning System as an Effective Tool for Implementing the Innovation Policy of the University. *International Journal of Web-Based Learning and Teaching Technologies*, *17*, 1–12. https://doi.org/10.4018/IJWLTT.298683

Taylor, D., Yeung, M., & Bashet, A. (2021). *Personalized and Adaptive Learning* (pp. 17–34). https://doi.org/10.1007/978-3-030-58948-6_2

Technology is shaping learning in higher education | *McKinsey*. (n.d.). Retrieved July 8, 2023, from https://www.mckinsey.com/industries/education/our-insights/how-technology-is-shaping-learning-in-higher-education

Thakkar, S., & Joshi, H. (2017). Students Attitude Towards E-Learning. *International Journal of Advance Engineering and Research Development*, *4*, 209–213. https://doi.org/10.21090/IJAERD.15380

The India Today.(2021).How e-learning is transforming the education sector. https://www.indiatoday.in/education-today/featurephilia/story/how-e-learning-is-transforming-the-education-sector-1759690-2021-01-16

The Role of Information and Communication Technology in realizing Sustainable Education by 2030 | *UNICEF Global Development Commons*. (n.d.). Retrieved July 8, 2023, from https://gdc.unicef.org/resource/role-information-and-communication-technology-realizing-sustainable-education-2030

The Times of India. (2022). Government initiatives for Digital Education in India. http://timesofindia.indiatimes.com/articleshow/94526223.cms

The-impact-of-learning-management-system-lms-usage-on-students_Content%20File-PDF.pdf. (n.d.). Retrieved January 21, 2024, from https://www.ceeol.com/search/viewpdf?id=1169722

Tinmaz, H., & Lee, J. H. (2020). An analysis of users' preferences on learning management systems: A case on German versus Spanish students. *Smart Learning Environments*, *7*(1), 30. https://doi.org/10.1186/s40561-020-00141-8

Umek, L., Keržič, D., Aristovnik, A., & Tomaževič, N. (2017). An assessment of the effectiveness of Moodle e-learning system for undergraduate public administration education. *International Journal of Innovation and Learning*, *21*(2), 165. https://doi.org/10.1504/IJIL.2017.081939

Unwalla, N. (2020). Comparative Analysis of Study Habits Between Males and Females. *International Journal of Innovative Science and Research Technology*, *5*(7), 182–187. https://doi.org/10.38124/IJISRT20JUL062

Varthana. (2023, April 18). The crucial role: Unveiling the importance of teachers in our society. Retrieved January 25, 2024, from https://varthana.com/school/why-are-teachers-important-in-our-society/

Walpita Gamage, S., Ayres, J., & Behrend, M. (2022). A systematic review on trends in using Moodle for teaching and learning. *International Journal of STEM Education*, *9*. https://doi.org/10.1186/s40594-021-00323-x

Wu, W., Bakirova, G., & Trifonov, I. (2021). A Shift Towards Visualization in eLearning: *International Journal of Web-Based Learning and Teaching Technologies*, *16*(6), 1–12. https://doi.org/10.4018/IJWLTT.20211101.oa11

Yawisah, U., Akla, A., Umam, A., Asad, M., & Wahyudin, W. (2022). The implications of learning management system on education quality in the new normal era: Evidence from Islamic higher education. *Journal of Social Studies Education Research*, *13*(2), 147–169.

Yuksel, I. (2022). The Effect of Moodle-Integrated Learning Platform on ELT Pre-service Teachers' General Pedagogical Knowledge. *International Journal of Technology in Education*, *5*(2), 235–248. https://doi.org/10.46328/ijte.283