



Implementation of Learning Management System (LMS) For Technical Training in the EMS Company

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ARTICLE INFO

Keywords:

Learning Management System
Training Activities
Technical training

ABSTRACT

Purpose - This study was conducted in an electronics manufacturing company that was just starting the implementation of the Learning Management System (LMS) for the technical training subject. The LMS project started in September 2025.

Methodology - This study used a literature review, observation, data collection, and a respondent survey. Several journals were reviewed to gather information from prior studies and research on this topic. Observations were also conducted to support the analysis. To understand employees' perceptions of the impact of LMS, several respondents were selected for a survey.

Findings - 1) Accessibility of employees to the LMS is 98.56%. On average, it takes less than 1 minute for employees to access the LMS. 54.07% of surveyed employees stated that the LMS used by PT. PCBAI is very good and very helpful. 2) The effectiveness of the training activity is indicated by the increment of 18.4% of participants. The average final score on the post-test increased by 7.90%, from 90.39 to 97.53. 3) Participants' feedback on the learning experiences using the LMS Survey result showed that 99.04% respondents agree that the LMS is flexible and easy to access, 99.52% respondents agree that the LMS is practical. 4) The level of participants' satisfaction with the LMS. Survey results also show that 99.22% of respondents are very satisfied with the LMS implementation for their training needs. 5) The Role of Learning Management System (LMS) in Training Activities. 6) Urgency of applying the Learning Management System (LMS) in training activities.

Contribution - This study enhances management's confidence in implementing LMS in the organization and convinces management to support this implementation. It has been proven that the LMS is a suitable application for improving training activities.

Received 29 May 2026; Received in revised form 10 June 2026; Accepted 30 July 2026

Jurnal Eduscience (JES) Volume 13 No. 4 (2026)

Available online 30 August 2026

INTRODUCTION

Information and Communication Technology (ICT) has impacted teaching, learning, training, and educational systems worldwide (V. Nikolić, 2019). Blended learning (b-learning), a combination of in-person and virtual content dissemination, emerged during this period and has been widely adopted in higher education. Earlier, these two learning approaches were distinct and were used by different groups. However, recent technological advances have also been reflected in education, with e-learning becoming a common practice. (Sharpe and Beetham, 2010) presented the b-learning model as an efficient educational format that capitalizes on ICT's ability to facilitate interaction and communication.

Proponents of b-learning recognize the importance of physical interaction but also believe in supplementing the traditional teaching format with e-learning alternatives. This combination can be achieved through a blended learning model (M. Tayebinik & M. Puteh, 2012). When both teaching formats are utilized in a blended learning setting, a broader spectrum of learning opportunities arises (A. Althunibat, 2015). Successful implementation of b-learning requires that primary requirements be met first: the institution's technological readiness, competence with technical resources, a motivated organization and staff, and open communication and feedback channels among users.

A Learning Management System (LMS) is a platform designed to produce, distribute, and organize learning materials online (Ginting et al., 2023). As a platform, an LMS is not only a tool for distributing training materials but also helps improve training execution by providing a more structured and easily monitored learning process. The application of LMS at PT PCBAI can facilitate employees' access to information, documentation of activities, and development of professional skills through more structured monitoring. Furthermore, it can help overcome administrative constraints and provide technology-based solutions that make monitoring and evaluation more efficient, thereby improving employees' competency, skills, and professionalism.

PT. PCBAI is an electronic manufacturing company based in Batam that produces a range of electronic devices. The company employs more than 2,500 personnel, with 4.8% technicians and 2.3% engineers. Technical competencies are important in this organization. Engineers and technicians are expected to solve technical problems in production.

The LMS implementation at PT PCBAI is an interactive, integrated online learning platform for trainers and training participants. It can increase the efficiency and effectiveness of the training activities. LMS provides convenience for monitoring training activities, managing reports, and storing data in a more structured, easier-to-access way. LMS allows them to apply the training material regularly. This is important for supporting improvements in training participants' professionalism. Refer to the survey results from interviews with the employee's superior, which reveal that LMS applications make training activities more attractive, more flexible, and provide better learning experiences.

This study aims to find out the role of LMS in improving the efficiency and effectiveness of training activities. Previous studies in this field examined the impact of LMS on schools and universities. This study also aims to elaborate on the research on the impact of LMS on employee training. The subjects of this research are adults with diverse learning styles. The complexity of the subject's task, with the aim of training, is to improve their competencies, which is the novelty of this study. The focus of this study is the contribution of LMS to the development of employee competencies and professionalism, and how LMS overcomes various obstacles in training activities.

This study was conducted at an electronics manufacturing company (PT PCBAI), which is just beginning the implementation of the Learning Management System (LMS) for the technical training subject. The LMS project started in September 2025. Management needs to understand the impact of LMS implementation on the organization. The LMS is one of the company's digitalization projects. The study is expected to present

results that can convince management of the LMS implementation in the organization. Effectiveness and efficiency are key aspects of management objectives.

Management considers the training program important for closing the gap between employees' competencies and organizational needs. Previously, the training activities in this company were managed conventionally, with poorly structured, disorganized training records and methods. Some engineers and technicians do not get training to upgrade their competencies and knowledge. Employees have difficulty accessing the training program. On the other hand, the training schedule arranged by the training department conflicts with the engineers' or technicians' working activities. Data show that fewer than 55% of engineers were able to attend the training program. In 2022, the training hours per employee in this company were only about 1.1 hours per year. Training is needed to improve employees' competencies and organizational performance. In 2025, management decided to invest in an LMS platform to improve training management. This decision was made to support training activities and improve their effectiveness and efficiency.

The LMS is considered a new platform implemented in this organization. Does the management need to know how effective and efficient this new platform is? How do employees perceive the LMS platform in relation to their training needs?

METHODOLOGY

The study design is to review the literature on Learning Management Systems and to observe the implementation of the LMS at PT PCBAI. Several journals related to this study were reviewed, along with information on LMS implementation. The existing training method prior to LMS implementation was analyzed and compared with the situation after LMS implementation. Data needed in this study include the attendance rate, ease of understanding the training material, flexibility, and the post-test scores.

Data collection will be conducted with support from the Training Department and through surveys of respondents. To collect the data, past training records and documentation will be reviewed and analyzed. The sample will be randomly selected from the population of employees who have used the LMS for technical training. They are employees in the engineering department who have been with the company for 3 to 5 years. The number of respondents will be determined using Slovin's formula with a tolerance 5%. This methodology is selected since the aspect of the study related to the individual perceptions, which is the observation and survey, is a more appropriate approach. There were 437 engineers, and employees used the LMS to access technical training from September 2025 to March 2026. For this study, 209 employees were randomly selected for the survey. The data analysis method used is nonparametric.

FINDINGS

Accessibility of Employees to the LMS

Survey results on employees' access to the LMS are presented in Table 1. It shows respondents' perceptions and agreement with the statement provided in the questionnaires—the implementation of LMS in PT. PCBAI is successful. Employees can easily access the LMS from their laptops or mobile devices. Based on the survey, for the period from September 2025 to March 2026, 98.56% of respondents strongly agree that the LMS is easy to access, while 0.96% agree. Accessibility ends up at 99.52%. Table 1 shows that 208 out of 209 respondents agree or strongly agree that the LMS is easily accessible. 100% respondents testify that it takes less than 1 minute for employees to access the LMS. 209 employees were surveyed to understand their perception of using the LMS. From the survey, 54.07% of respondents stated that the LMS used by PT. PCBAI is very good and very helpful in guiding employees to learn, while 45.93% agreed with the statement in the questionnaires. Clear visualizations, such as photos and videos, make it easier for them to understand the training materials. An increase in the post-test score indicates this.

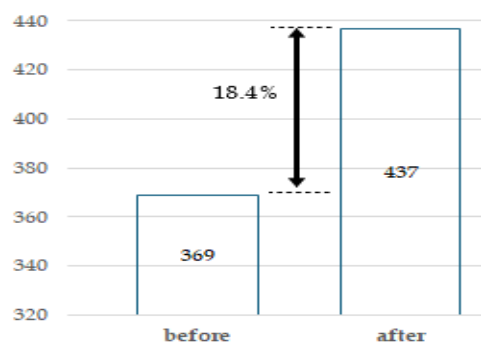
Table 1. Accessibility to LMS

The questionnaires	Strongly Disagree	Disagree	Quiet Agree	Agree	Strongly Agree
Can you access the LMS easily?	0 (0%)	1 (0.48%)	0 (0%)	2 (0.96%)	206 (98.56%)
Can you access the LMS in less than 1 minute?	0 (0%)	0 (0%)	0 (0%)	0 (0%)	209 (100%)
LMS used by PT. PCBAI is very good and very helpful in guiding employees to learn	0 (0%)	0 (0%)	0 (0%)	96 (45.93%)	113 (54.07%)

In terms of accessibility, the company's LMS implementation performs well and meets expectations. This accessibility is one important aspect of the digital platform implementation.

Effectiveness of the Training Activity

Implementation of LMS at PT PCBAI is currently used for technical training, such as Preventive Maintenance, Poka yoke, OEE, and Problem-Solving Techniques. There are 437 technicians and engineers attending the training using the LMS. Compared with the previous period, there is an 18.4% increase in the number of participants. This indicates that LMS is useful for increasing participants' availability to attend the training. Before the LMS implementation, some employees invited to attend the training program had scheduling conflicts.

**Figure 1.** Comparison training attendance impacted by LMS

Respondents stated the reasons they were unable to attend the training previously. They need to prioritize their job due to the task's urgency. In many cases, the employee emails the training admin about their obstacles to attending the training just 2 hours before it starts. The flexible schedule offered by the LMS helps them arrange their own training. This is the main reason testified by the employees who cannot attend the in-class training. The diagram in Figure 2 illustrates why the employees cannot attend the training session.

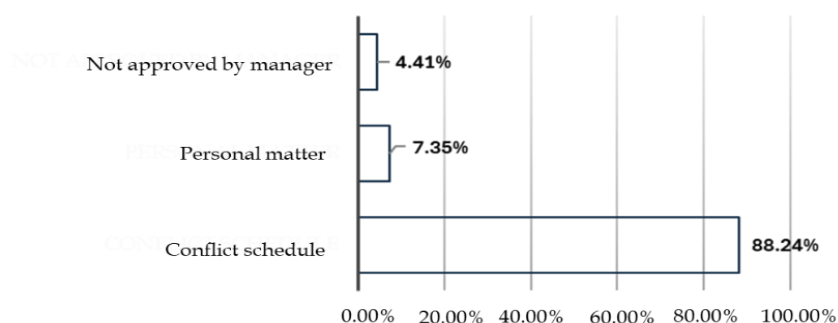
**Figure 2.** The employee's reason for not attending the training

Table 2 shows the average post-test scores. There are 5 training programs in the LMS. It found a significant increase in post-test scores. The overall average post-test score has increased by 7.90%, from 90.39 to 97.53. This increase indicates a better understanding of the training material among the participants. Improvement in understanding of the training material was supported by its clarity, which was enhanced by photos and videos. Employees view the videos and photos to enhance their understanding of the training material. The LMS enables participants to focus on the subject of their concern.

Table 2. Comparison of the Average Post-Test Scores Before and After LMS Implementation

Training Topic	Average Post Test Score		Score increment (%)
	Before	After	
Overall Equipment Effectiveness	91.06	95.71	5.11%
Practical Problem Solving	91.38	97.19	6.36%
Poka Yoke	90.06	97.05	7.76%
Failure Mode and Effect Analysis	89.13	98.24	10.22%
Preventive Maintenance	90.31	99.44	10.11%
Overall Average Post Test Score	90.39	97.53	7.90%

An increase in training participants and in average post-test scores indicates that the LMS has a positive impact on training effectiveness.

Participants' Feedback on the Learning Experiences Using LMS

A survey was conducted among 209 participants to collect data on their perceptions of their learning experiences using the LMS. The number of respondents was determined using Slovin's formula for survey sample size. The main perceptions regarding the survey's focus are participants' flexibility in accessing the training, the training's accessibility, practicality, and clarity of the materials. The survey result is shown in Table 3. It shows that 89.00% of respondents strongly agree that the LMS is flexible, 87.56% strongly agree that it is easy to access, and 89.95% strongly agree that it is practical. Practicality is important when using learning tools. Regarding the clarity of the training material, 93.78% of respondents agree that it is clear and easy to understand. Moreover, 95.22% of respondents strongly agree that they are satisfied with the LMS.

Table 3. Employee's Perception of the LMS Platform

Aspect	Strongly Disagree	Disagree	Quiet Agree	Agree	Strongly Agree
Provide flexibility	0.00%	0.00%	0.96%	10.05%	89.00%
Easy accessibility	0.00%	0.00%	0.96%	11.48%	87.56%
Practicality	0.00%	0.00%	0.48%	9.57%	89.95%
Clarity of the training material	0.00%	0.00%	0.48%	5.74%	93.78%
Satisfied	0.00%	0.00%	0.00%	4.78%	95.22%

Most respondents testify that the LMS provides them with the flexibility to arrange their training schedules. The employee can choose their preferred time for the training session. The employee can avoid scheduling conflicts with their routine job. They can access the LMS anytime they want to take a training course. It is easy to access the LMS platform. They just need to log in to the system, and in less than 1 minute, they can access the training program they want to take. This gives an interesting learning experience for the employees. In addition to its accessibility, employees report that the LMS is practical and not too complicated. The system really helps them fulfill their training needs within their preferred time.

Level of Participants Satisfactory on the LMS.

User satisfaction with the application is important for successful implementation. A survey was conducted to understand employees' perceptions of user satisfaction. The respondents were randomly selected from among employees with experience using the LMS. They need to respond to the questionnaires

distributed to them. Survey results also showed that 95.22% of respondents were very satisfied with the LMS implementation for their training needs, and 4.78% were satisfied with the platform. They can easily access the system and set their own training schedule. In the previous model (non-LMS), employees must follow the training schedule arranged by the training department, which often conflicts with their routine job schedules. Respondents were also surveyed about their satisfaction with the increase from before to after the implementation of the LMS. 4 aspects of satisfaction are being surveyed: flexibility, accessibility, practicality, and clarity of the training material.

Table 4. Average Level of Employee Satisfaction with the Training Program

An aspect of satisfactory	Average Level	
	Before	After
Flexibility	2	5
Accessibility	3	5
Practicality	2	4
Clarity of training material	2	5
Total Average of Satisfactory Level	2.25	4.75

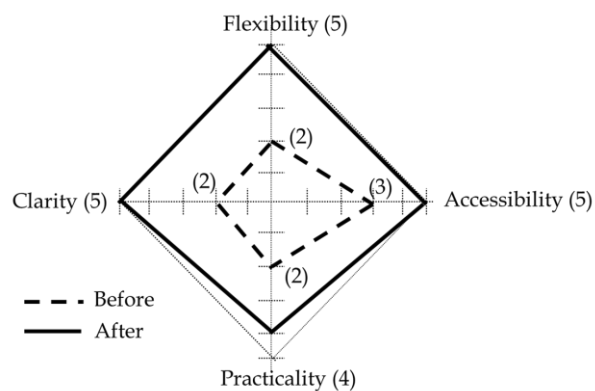


Figure 2. Comparison before and after LMS implementation

A radar chart is used to visualize improvements in employee satisfaction levels during the execution of the training program at PT PCBAI. In total, the satisfactory level increased from 2.25 to 4.75, a 115% increase.

DISCUSSION

The Role of Learning Management System (LMS) in Training Activities. Discussion with the management of PT PCBAI indicates a strong interest in implementing an LMS within the organization. Management views the LMS as crucial to improving training activities in the company. Training is an important activity to support the organization. Training is needed to improve the employees' knowledge and competence. This is required to improve the organization's performance. The research shows that LMS can address challenges in training management, including training record management, coordination difficulties, communication gaps, and administrative issues.

The research findings show that the Learning Management System (LMS) provides highly engaging learning experiences for training participants. The implementation of LMS at PT PCBAI makes the learning process more effective and efficient. In line with this, the employees expressed, "the training participants feel greatly assisted with the presence of LMS. The training participants become very enthusiastic about the training or learning process. They are also enthusiastic and interested in the subject because the learning is not monotonous, unlike the lecture model, where training participants only listen, and it ends with questions. The training participants will not ask questions if the learning is very boring. Consequently, the trainer would also

be reluctant to enter the classroom. That is why the trainer at PT PCBAI feels happy and greatly assisted by the existence of LMS. Additionally, with the features available in the LMS. There is integration of various content such as video, audio, images, and text, also, because there is a discussion forum that can create a dynamic training environment" (Farhah, 2024).

Urgency of applying the Learning Management System (LMS) in training activities. Observations and discussions with the training participants highlighted the urgent need for the LMS to enhance learning experiences. The participants testify that LMS features such as logbooks, documentation, training modules, and evaluation tools are valuable for structuring their training activities. These features facilitate a better understanding of training materials, seamless documentation, and more efficient evaluation processes.

The finding also indicates that LMS contributes to fostering the competency and professionalism among the employees. The implementation of LMS also aligns with the company's objectives on the digitalization program. The finding highlights the significant role of LMS in improving training management, ensuring competency development, and addressing the training operational challenges. LMS serves as an effective tool to address those challenges. However, the development of training needs and the enhancement of training management require management support to ensure the sustainable development of LMS through investment in necessary resources.

The implementation of an LMS at PT PCBAI is a good strategy to enhance employees' competencies and knowledge, supporting the company's growth. It is aligned with the company's strategy for the digitalization of its operations. The study revealed that the LMS successfully improves training effectiveness, as indicated by increases in attendance rates and post-test scores. The attendance rate increased by 18.04%, from 369 participants before the LMS implementation to 437 after its implementation. This is affected by the participants' flexibility in determining the training schedule. The flexibilities offered by the LMS system enable participants to overcome the constraints of the training department's fixed schedules. In other respects, the effectiveness of the LMS is indicated by the increase in post-test scores. The total average of post-test score improvement is 7.90%. The LMS system enables the presentation of training material in multimedia formats, such as photos and videos. This is effective in helping participants get a better understanding of the training material.

The survey results show that the participants are satisfied with the new learning system implemented by the company. This satisfaction covers a few aspects, such as flexibility, accessibility, practicality, and clarity of the training material

CONCLUSION

Based on the findings and discussion, the implementation of the LMS at PT PCBAI is successful and can enhance training activities. The implementation of LMS improves the effectiveness of training activities, as indicated by increased training attendance and higher post-test scores. The survey shows an increase in the employees' satisfaction level with the training activity. LMS can be expected to run more effectively and interactively, and to provide optimal benefits for the organization. However, the sustainable development of the LMS is recommended to help the company derive greater benefits from this platform.

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