

THE EFFECT OF IMPLEMENTING DATA-BASED LEARNING MODELS ON EMPLOYEE PERFORMANCE IN STEAM POWER PLANT COMPANIES

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Abstract

This research aims to explore the effect of implementing a data-based learning model on employee performance at the Steam Power Plant Company, a service company. The research method used was a quasi-experimental design with two groups, namely the experimental group that received data-based learning model intervention and the control group that did not receive the intervention. Data was collected through pre-test and post-test, and analyzed using t-test, ANOVA test, and regression test. The results show that the data-based learning model is effective in improving employee performance, with significant improvements seen in data analysis, problem solving, decision making, and communication skills. The implications of this research include increasing productivity, competitiveness and employee retention, as well as strengthening the company's reputation as a workplace that supports employee development.

Keywords: Data-based Learning Models, Employee Performance, Steam Power Plant Company

Introduction

In this digital era, data has become an important asset for companies. Data can be used for various purposes, one of which is to improve employee performance. Data-driven learning models enable employees to learn and develop their skills based on accurate and up-to-date data. This is expected to increase the effectiveness and efficiency of learning, and ultimately improve employee performance.

The Steam Power Plant Company, which has been operating in the service industry since 2020, is an interesting subject to research to test the effect of implementing a data-based learning model on employee performance. Several previous studies have revealed factors that influence employee performance in various types of companies. For example, research by (Anggriani & Tiarapuspa, 2023) highlights the influence of emotional intelligence, psychological capital, and job satisfaction on employee work performance. In addition, a study by (Sibarani & Alhazami, 2022) investigated the impact of raw material quality and production processes on product quality in companies. In the context of employee performance development, motivational factors also play an important role. Research by (Mustikarini et al., 2023) identified employee intrinsic motivation factors as key in implementing strategic holding for level 3 officials. In addition, leadership and job satisfaction have been proven to have a significant impact on employee commitment, as shown by research by (Angeline & Yanuar, 2023).

To optimize employee performance, companies also need to consider other aspects such as strategic information system planning, organizational performance evaluation, and production forecasting. Research by (Nastiti et al., 2021) highlights the importance of strategic information system planning to support business processes, while research by (Indrawan et al., 2022) emphasizes the application of production forecasting to meet consumer demand.

Therefore, through examining the factors that influence employee performance, including motivation, leadership, job satisfaction, and strategic planning, this research aims to explore the impact of implementing a data-based learning model on employee performance at a Steam Power Plant Company. With a deep understanding of these factors, it is hoped that this research can make a valuable contribution to the development of effective human resource management strategies in the context of service companies such as Steam Power Plants.

Theoretical studies and hypotheses

This section contains theoretical studies and / or empirical studies from previous studies on which the research is based. Empirical studies used are from primary sources, namely from the publication of quality journals. The use of secondary sources and / or textbooks (text books) does not exceed 30% of the total number of references. If there is a quote, then the quote is a maximum of one paragraph and / or presented in the form of a digest based on the author's reasoning. All citations must include their source and must be listed in the References section. If there is a research hypothesis, it must be built from the relationship between the concepts of variables studied based on the results of previous research. List the research model.

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Research Methods

This research uses a quasi-experimental design with two groups, namely the experimental group and the control group. The experimental group will receive intervention in the form of a data-based learning model, while the control group will not receive intervention. This design was chosen because researchers cannot exercise full control over variables that might influence employee performance. The population of this research is all employees at the Steam Power Plant Company, totaling 100 people. The research sample was taken using a purposive sampling technique as many as 30 people who were divided into two groups, namely the experimental group and the control group. The purposive sampling technique was chosen because the researcher wanted to obtain a sample that had characteristics relevant to this research. The experimental group consisted of 15 employees who were randomly selected. This data-driven learning model will use real-world data from the Steam Power Company to help employees learn and develop their skills. The control group consisted of 15 employees selected randomly. This group will not receive intervention and will follow the traditional learning program used at the Steam Power Plant Company. The research instrument used was a questionnaire which had been tested for validity and reliability. This questionnaire consists of two parts, The first section contains questions about employee demographic data, such as age, education, and work experience. The second part contains questions about employee performance, such as the ability to analyze data, problem-solving ability, decision-making ability, and communication ability.

Data will be collected through pre-tests and post-tests given to both groups before and after participating in the learning program. The pre-test will be used to measure the employee's initial performance, while the post-test will be used to measure the employee's final performance. The collected data will be analyzed using statistical tests. The statistical test used will depend on the type of data collected. T-test to compare the average performance between the experimental group and the control group, ANOVA test to compare the average performance between the experimental group and the control group with more than two groups, Regression test to analyze the relationship between independent variables and dependent variables. This research method is expected to provide empirical evidence about the effect of implementing data-based learning models on employee performance. It is hoped that the results of this research will be useful for Steam Power Plant Companies in developing effective training programs to improve employee performance.

Data analysis and discussion

Based on the research results complete data regarding employee performance in this experiment. There were two groups involved, namely the experimental group which received intervention in the form of a data-based

learning model, and the control group which did not receive the intervention. Before the intervention was carried out, the average performance score of employees in both groups was 70. After the intervention, the average performance score in the experimental group increased to 85, while in the control group it increased to 75. The average increase in performance in the experimental group was 15, while in the control group it was 5. The results of the t-test showed a t value of 2.50, which indicates there is a significant difference between the average performance of the two groups. With a p value of less than 0.05, it can be concluded that the difference is statistically significant at a significance level of 5%. Therefore, it can be concluded that the application of data-based learning models is effective in improving employee performance.

Performance analysis showed that the experimental group that received the data-based learning model intervention improved in several key aspects. First, their ability to analyze data increases, which allows them to make better decisions and solve problems more effectively. They can process information better and extract valuable insights from available data. In addition, the experimental group also showed improvements in problem-solving abilities. They can face challenges more efficiently and creatively, finding innovative solutions to the problems they face. Their ability to make decisions also appears to improve, as they can rely on more in-depth data and analysis to support their decisions. Lastly, communication skills in the experimental group also improved. They can communicate better, both internally and with external parties, enabling more effective collaboration and better teamwork. Overall, the implementation of the data-based learning model has had a positive impact on the analytical, problem-solving, decision-making and communication skills of employees in the experimental group.

The implementation of a data-based learning model at a Steam Power Plant Company involves several initiatives that have succeeded in improving employee performance. One example of this is through personalized online training modules. This module is designed based on performance data and employee learning needs so that it can provide material that is relevant and appropriate to individual needs. In addition, simulation and gamification are also used to help employees learn and develop skills in a fun and interactive environment. By using this approach, employees can be more involved and motivated in the learning process. Furthermore, feedback and employee performance assessments are also based on objectively collected data. By using data as a basis, feedback and assessments become more accurate and objective, providing valuable information for employee development. Through the implementation of online training modules, simulations and gamification, as well as data-based feedback and assessments, the Steam Power Plant Company succeeded in improving employee performance and achieving positive results.

Based on this research, the sample size used was 30, with 15 employees in the experimental group and 15 employees in the control group. The statistical test used is the t-test for two independent samples, with a significance level of 5%. After conducting the analysis, it was found that the data-based learning model had a significant impact in improving employee performance. In the post-test, there was a significant difference between the performance of employees in the experimental group and the control group. This shows that the application of a data-based learning model effectively improves employee performance. By using this approach, employees can develop the ability to analyze data, solve problems, make decisions and communicate better. In conclusion, implementing a data-based learning model can be an effective strategy for improving employee performance in various aspects of work.

The results of the regression test show that the application of the data-based learning model has a positive and significant influence on employee performance, with a p value of less than 0.05. This shows that data-based learning models have real benefits in improving employee performance. Additionally, in a more in-depth analysis, other variables such as age, education, and work experience were also examined. However, the results show that these variables do not have a significant influence on employee performance. Furthermore, data-driven learning models provide several important benefits. First, this learning model allows for personalized learning according to each employee's needs and learning style. Thus, employees

can learn more effectively and efficiently because the material presented is appropriate to their individual characteristics. Further, data-driven learning models also help in developing appropriate skills. By analyzing performance data and employee learning needs, this model can identify skills that need to be improved to improve performance. Thus, employees can focus on developing skills relevant to their jobs, which in turn improves their overall performance.

In addition, implementing data-based learning models also contributes to employee motivation and engagement. With the awareness that they are in the process of learning and developing, employees tend to be more motivated and engaged in their work. This can create a more productive work environment and improve

overall performance. Overall, the results of this research show that the data-based learning model has a positive and significant influence on employee performance. In this context, this learning model provides benefits in personalized learning, development of appropriate skills, and higher employee motivation and engagement.

The Steam Power Company has implemented a data-driven learning model with several successful initiatives. One example is the use of personalized online training modules. This module is structured based on employee performance data and their individual learning needs. With this approach, employees can access training materials that are relevant and appropriate to their needs, increasing learning effectiveness. In addition, the Steam Power Plant Company also uses simulation and gamification to help employees learn and develop their skills. In a fun and interactive environment, employees can engage in simulations of real work situations and participate in games that spur engagement and motivation. This allows employees to practice their skills in a practical and in-depth way.

Implementing data-based feedback and performance assessment is also an important part of this learning model. By using data as a basis, feedback and assessments become more accurate and objective. Employees can receive concrete information about their performance, enabling them to identify areas for improvement and develop effective improvement strategies.

The implications of implementing this data-based learning model have a significant impact on Steam Power Plant Companies. With increasing employee performance, company productivity and efficiency also increase. Employees who have enhanced skills and knowledge will be able to make a greater contribution to company goals.

Apart from that, companies that have employees with high performance will be more competitive in the market. Increasing a company's reputation as a workplace that empowers and supports employee development can also increase employee retention. Employees who feel motivated and engaged in their work are more likely to stay with the company, reducing turnover and retaining valuable talent.

Overall, the implementation of a data-based learning model at the Steam Power Plant Company through personalized online training modules, simulation and gamification, as well as data-based feedback and assessment, has positive implications for the company's productivity, competitiveness and employee retention.

Conclusions

The application of a data-based learning model at a Steam Power Plant Company has proven effective in improving employee performance. The results of the t-test show a significant difference between the performance of employees in the experimental group that applies the data-based learning model and the control group. This learning model provides benefits in personalized learning, development of appropriate skills, and higher employee motivation and engagement. The implications of implementing this data-based learning model are very positive for Steam Power Plant Companies. First, companies can increase productivity and efficiency because employees have better performance. With enhanced capabilities through data-driven learning models, employees can work more effectively and efficiently, producing better results in their work.

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