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E-Learning System, Time Management, Learning Motivation, Self-Regulated Learning On Student Learning Success

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ABSTRAK

Tujuan penelitian ini adalah untuk menganalisis pengaruh sistem e-learning, manajemen waktu, motivasi belajar, dan pembelajaran mandiri terhadap keberhasilan belajar mahasiswa Program Studi Dokter Spesialis Radiologi di Rumah Sakit Umum Daerah Dr. Moewardi Surakarta. Bahan dan metode. Penelitian ini menggunakan pendekatan kuantitatif deskriptif, dengan populasi 42 residen program studi Radiologi, dan sampel diperoleh melalui metode sensus. Data dikumpulkan menggunakan kuesioner online dan kemudian dianalisis menggunakan regresi linier berganda untuk menentukan pengaruh masing-masing variabel independen terhadap variabel dependen. Hasil. Hasil penelitian menunjukkan bahwa sistem e-learning, manajemen waktu, motivasi belajar mahasiswa, dan pembelajaran mandiri berpengaruh signifikan terhadap keberhasilan belajar. Kesimpulan. Keberhasilan belajar residen radiologi ditentukan oleh keberadaan sistem pembelajaran berbasis e-learning, di samping kemampuan mahasiswa dalam mengatur waktu antara jadwal belajar dan jadwal praktik, keinginan kuat mahasiswa untuk memotivasi diri dalam belajar, dan kemampuan mahasiswa untuk belajar secara mandiri terkait materi pembelajaran.

Kata kunci: sistem e-learning, manajemen waktu, motivasi belajar, pembelajaran mandiri, keberhasilan belajar.

ABSTRACT

This The study purpose wasanalyzing the influence of e-learning systems, time management, learning motivation, and self-regulated learning on the learning success of Radiology Specialist Doctor Education students at Dr. Moewardi Surakarta Regional General Hospital. Materials and methods.This study used a descriptive quantitative approach, with a population of 42 residents in the Radiology study program, and the sample was obtained through a census method. Data were collected using an online questionnaire and then analyzed using multiple linear regression to determine the effect of each independent variable on the dependent variable. Results.The results of the study show that the e-learning system, time management, student learning motivation and self-regulated learning have a significant influence on learning success. Conclusions.The success of radiology resident learning is determined by the existence of an e-learning based learning system, in addition to the student's ability to manage time between the study schedule and the station schedule, the student's strong desire to motivate themselves in learning, and the student's ability to learn independently regarding learning materials.

Keywords: e-learning system, time management, learning motivation, self-regulated learning, learning success.

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INTRODUCTION

In today's competitive era, every company must be able to develop and improve itself. Advances in information technology have brought about significant transformations in the world of education, including medical education. One important innovation in this field is the implementation of e-learning systems, which enable the teaching and learning process to be flexible, interactive, and adaptive to student

needs. As stated in a study by(Suwarno 2022)The implementation of e-learning in medical education presents various human, organizational, and technological challenges that must be addressed for the system to become an effective learning solution. In the context of specialist medical education, particularly in radiology, e-learning is a practical solution to overcome time and space constraints that are often a challenge due to busy clinical and academic schedules.

Using an e-learning system greatly facilitates access to course materials, allowing them to be accessed anywhere and at any time. However, the implementation of the e-learning system faces challenges: it relies heavily on hardware with internet connectivity. Furthermore, server portal issues also impact the smooth operation of the e-learning software/web portal. Eating disorders can hinder the e-learning learning process, impacting the success of Radiology Resident Doctors (PPDS) students.

In addition to e-learning systems, time management also has the potential to influence various important aspects of the learning process, which can be very helpful if students can manage their time well. However, several problems are currently being encountered, such as students being required to organize their own study schedules amidst busy clinical activities, lack of study time amidst busy station schedules, and on-call duties. Therefore, the role of time management significantly influences the academic success of radiology PPDS students. This role is crucial in organizing and managing the very busy activities in the hospital, as well as teaching and learning activities.

The role of learning motivation is also very important in the success of student learning, generally each student has their own learning motivation, but when the learning system is designed in an interesting, responsive way, and supports active student involvement, this will have a positive impact on student learning success, and this is relevant to the results of the study.(Rosli et al. 2022), which states that primary needs such as autonomy, competence, and relatedness, when met in an effective e-learning design, significantly increase student motivation and participation in the learning environment. However, the reality of the scope of PPDS students, is that they often feel bored, so this reduces the learning motivation of PPDS radiology students, so that in addition to implementing an interesting and interactive learning system, it is also necessary for PPDS radiology students to take a little time to do other activities such as vacations, or doing hobbies they like, so that this can reduce the boredom of PPDS radiology students.

Equally important, the success of radiology PPDS students is also influenced by their ability to self-regulate learning, namely the ability to independently organize learning strategies, from planning, implementation, to evaluating learning outcomes. As stated earlier,(Zimmerman and J 2010) *"Self regulation refers to self-generated thoughts, feelings, and behaviors that are oriented towards achieving goals"*, which emphasizes that students must actively recognize their strengths and weaknesses, set goals, monitor progress, and evaluate the effectiveness of their learning methods. In medical education, the character of learners who are able to manage themselves effectively is essential to support lifelong learning. However, in practice,

these radiology PPDS students have difficulty implementing self-regulated learning, due to the lack of mentoring by medical lecturers or senior doctors, so that even for basic learning, radiology PPDS students must learn independently, or the lack of bedside teaching in learning certain cases. Therefore, the need for mentoring by medical lecturers is considered important before implementing self-regulated learning.

Various studies have shown that systematically designed e-learning integration can have a positive impact on student learning success, both cognitively, affectively, and psychomotorically. This is also confirmed in research.(Tjandra et al. 2023)which shows that e-learning supports the flexibility and effectiveness of clinical learning, especially in overcoming time and access limitations. However, there is still limited research that specifically develops and tests e-learning systems in the context of radiology specialist education, therefore in medical education, the concept of e-learning has become a foundation in learning and has a very important role and a large function for the success of student learning who have been burdened with many shortcomings and weaknesses in education, such as limitations of space and time in the teaching and learning process.(D and Kurniawaty 2021). In addition, other aspects such as time management, student motivation, and self-regulated learning each have their own influence in improving student learning success. If these aspects can be implemented well, this can encourage student learning success. Thus, students can develop competency in the use of information technology, increase creativity, innovation, and independence, and develop a responsible identity.(2021 Musdalipa).

Based on this background, this study aims to determine the influence of each aspect, such as e-learning, time management, student learning motivation, and self-regulated learning, on student learning success. It is hoped that this research will improve the learning success rate of radiology PPDS students. This research is also expected to contribute to improving the quality of specialist medical education through a structured and relevant digital learning approach.

METHOD

This research uses a descriptive quantitative approach, research that is used to analyze data by describing or depicting the data that has been collected as it is without intending to change or make generally applicable conclusions.(Sugiyono 2019 : 35). Data were collected through a Likert-scale-based questionnaire that had been tested for validity and reliability for each variable construct.

The population in this study was all Radiology Specialist Medical Education students at Dr. Moewardi Hospital, Surakarta. Because the population was 40 students, the sampling technique used was total sampling, which included the entire population in the study. This research instrument was designed with reference to indicators for each variable, such as e-learning, time management, motivation, self-regulated learning, and learning success. Each item was compiled based on theories or previous research

to align with the objectives of hypothesis testing. Data processing included statistical techniques such as correlation tests, multiple linear regression, and, if necessary, path analysis to examine direct and indirect relationships between variables.(Sofya et al. 2024)In this study, variables are divided into two types, namely independent variables (free) and dependent variables (bound). The independent variables consist of the E-Learning System (X).1), Time Management (X_2), Learning Motivation (X_3), and Self-Regulated Learning (X_4), while the dependent variable in this study is Student Learning Success (Y).

Data analysis was conducted in stages. First, classical assumption tests (normality, multicollinearity, heteroscedasticity) were performed, followed by a simple correlation test to determine the strength and direction of the relationship between variables. Next, multiple linear regression was used to assess the partial and simultaneous effects of independent variables on learning success. For further analysis, path analysis could be used to explain the direct and indirect contributions between variables.(Sofya et al. 2024)The research stages include identifying problems and variables, developing instruments, collecting data, analyzing statistics, drawing conclusions, and writing up the research.

FINDING AND DISCUSSION

1. Multiple Regression Analysis

$$Y = 3{,}090 + 0.143X1 + 0.231X2 + 0.186\ X3 + 0.544\ X4$$

So this shows that:

a) The constant of 3.090 states that if the independent variable is considered constant, then the average value of Y is 3.090.
b) The regression coefficient for variable X1 is positive at 0.143. This indicates that every one-unit increase in variable X1 will increase the value of Y by 0.143, assuming the other variables remain constant. This positive relationship means that the higher the value of X1, the higher the value of Y, and vice versa.
c) The regression coefficient for variable X2 is positive at 0.231. This means that every one-unit increase in variable X2 will increase the value of Y by 0.231, assuming other variables remain constant. This positive relationship also indicates that the higher X2, the higher Y increases, and vice versa.
d) The regression coefficient for variable X3 is positive at 0.186. This means that every one-unit increase in variable X3 will increase the value of Y by 0.186, assuming other variables remain constant. This positive relationship indicates that the larger X3, the higher the value of Y.
e) The regression coefficient for variable X4 is positive at 0.544. This means that every one-unit increase in variable X4 will increase the value of Y by 0.544, assuming other variables remain constant. This positive relationship indicates that the higher X4, the higher the value of Y, and vice versa.

2. F Test/ Feasibility Test

Table 2 F Test/Feasibility Test

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	104,328	4	26,082	13,375	.000b
	Residual	72,154	37	1,950		
	Total	176,483	41			

a. Dependent Variable: y
b. Predictors: (Constant), x4, x2, x1, x3

From the calculation results using SPSS, if based on the F Test decision making, the regression model is declared FIT if Sig < 0.05, it is concluded that in the table the sig value is 0.000 < 0.05 which means it has a significant effect.

3. t-test

Table 3 t-Test Results

Variable	Thitung	table	Sig	Std	Information
H1	3,600	2,026	0.001	≤ 0.05	Accepted
H2	5,842	2,026	0.000	≤ 0.05	Accepted
H3	3,762	2,026	0.001	≤ 0.05	Accepted
H4	9,656	2,026	0.000	≤ 0.05	Accepted

Based on calculations using SPSS, it was found that the variables had a positive and significant influence, this is in accordance with the following explanation.

a) Because the calculated t value is greater than the t table (3.600 > 2.026) and the significance value is less than 0.05, it can be concluded that X1 has a positive and significant effect on Y.
b) Because the calculated t is greater than the t table (5.842 > 2.026) and Sig. < 0.05, then X2 has a positive and significant effect on Y.
c) Because the calculated t is greater than the t table (3.762 > 2.026) and Sig. < 0.05, then X3 has a positive and significant effect on Y.
d) Because the calculated t is greater than the t table (9.656 > 2.026) and Sig. < 0.05, then X4 has a positive and significant effect on Y.

4. Determination Test (R^2)

Table 4 Determination Test (R^2)

Model Summary

Model	R	R Square	Adjusted R Square	Standard Error of the Estimate
1	.968a	.937	.930	.54998

a. Predictors: (Constant), VAR00004, VAR00003, VAR00001, VAR00002

Based on the calculation results, it was found that. The adjusted R Square value is known to be 0.930, so it is concluded that the contribution of the independent variable to the dependent variable is 93%, where all independent variables such as the e-learning system, time management, learning motivation, self-regulated learning have a significant effect on the dependent variable of learning success.

Interpretation & discussion

1. The Influence of E-Learning Systems on the Learning Success of PPDS Radiology Students

The results of the SPSS calculation show that the calculated t value is greater than the t table (3.600 > 2.026) and the significance value is less than 0.05, so it can be concluded that Ho is rejected and Ha is accepted, which means that the E-learning System has a significant effect on the learning success of PPDS Radiology students. Thus, the hypothesis that states that the E-learning System has a positive and significant effect on employee productivity is true.

This research is in line with research(Nisa, Komariyah, and Syam 2021: 21–30)Regarding the influence of e-learning systems on student learning success, this study demonstrates that implementing e-learning successfully improves students' learning abilities. This improvement in learning outcomes through e-learning is highly relevant because its adaptive and self-contained system allows students to access clinical materials while busy with practice.

2. The Influence of Time Management on the Learning Success of PPDS Radiology Students

The SPSS calculation results show that the calculated t value is greater than the t table (5.842 > 2.026) and Sig. < 0.05, so Ho is rejected and Ha is accepted, which means that time management has a significant effect on student learning success. Thus, the hypothesis that time management has a positive and significant impact on the learning success of PPDS Radiology students is proven true. This can be interpreted as the more skilled we are in managing time well, the more organized and measurable our activities will be.

This research is in line with research(Sari, Lisiswanti, and Oktafany 2017)Regarding the influence of time management on student learning success, students who are able to plan and implement study schedules in a disciplined manner tend to achieve higher academic achievement. Therefore, it is necessary to teach proper time management.

3. The Influence of Motivation on the Learning Success of PPDS Radiology Students

The SPSS calculation results show that the calculated t value is greater than the t table (3.762 > 2.026) and Sig. < 0.05, so it can be concluded that Ho is rejected and Ha is accepted, which means that motivation has a significant effect on student learning success. So the hypothesis that motivation can have a positive influence on student learning success is true. And motivation is an important thing that humans must have.

This research is in line with research(Rosli et al. 2022)This study examines the influence of motivation on student learning success. Intrinsic and extrinsic motivation can be strengthened by fulfilling the three basic psychological needs of autonomy, competence, and relatedness, significantly improving learning effectiveness and academic performance. Therefore, with high motivation, students are able to achieve success in their studies.

4. The Influence of Self-Regulated Learning on the Learning Success of PPDS Radiology Students

The SPSS calculation results show that the calculated t value is greater than the t table (9.656 > 2.026) and Sig. < 0.05, so Ho is rejected and Ha is accepted, which means that Self-Regulated Learning or the ability to learn independently has a significant effect on student learning success. So the hypothesis that states that Self-Regulated Learning has a positive and significant impact on student learning success is true. So it is necessary to know the learning methods of each individual to achieve success in learning.

This research is in line with research(Corazza et al. 2023)related to the influence of self-regulated learning. In the study, final-year medical students most frequently used self-regulated learning strategies, such as searching for information online and seeking assistance from colleagues and physicians when facing clinical challenges. This indicates that self-regulated learning is not only a cognitive strategy but also contextual and highly adaptive to real-life clinical situations. Therefore, self-regulated learning can influence the learning success of radiology students.

CONCLUSIONS

E-learning system, time management, learning motivation, self-regulated learning have a positive and significant effect on the learning ability of Radiology Specialist Doctor Education Students at Dr. Moewardi Regional General Hospital. E-learning system, time management, learning motivation, self-regulated learning, have a simultaneous and significant effect on the learning success of Radiology Specialist Doctor Education Students at Dr. Moewardi Regional General Hospital. Determination of e-learning system variables, time management, learning motivation, self-regulated learning. It is known that the adjusted R Square value is 0.930, so it is concluded that the contribution of the independent variable to the dependent variable is 93%, while the rest is influenced by other variables.

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