

# Determinants of Effectiveness Learning of SAP-Based Enterprise Resource Planning Courses

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## Abstract

This study aims to determine the factors that influence learning effectiveness of SAP-based Enterprise Resource Planning Courses at the Islamic University of Indonesia. Based on the theory of embodied learning, this study hypothesizes that activeness, level of suitability, perception of immersion, motivation, and technology support have a positive effect on learning effectiveness of SAP-based ERP courses. A quantitative approach with a survey method was used to collect data from 371 students in 6 study programs who had taken SAP-based ERP courses. The results of multiple regression analysis showed that physical involvement, level of suitability, motivation, and technology support had a significant positive effect on learning effectiveness of SAP-based ERP courses. However, the perception of immersion actually has a significant negative effect on the effectiveness of learning SAP-based ERP courses, which is contrary to the formulated hypothesis. These findings contribute to designing an ERP curriculum by increasing active participation, aligning materials with software features, fostering motivation, and ensuring technology infrastructure to improve learning effectiveness of SAP-based ERP courses.

**Keywords:** Enterprise Resource Planning (ERP), Learning Effectiveness, Level of Suitability, Technology Support

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## INTRODUCTION

The development of information technology has had a significant impact on various aspects of life, including in the world of education (Shelly et al., 2012). One technology that is often implemented in the context of education is Enterprise Resource Planning (ERP) (Helm et al., 2005). ERP is an integrated system designed to manage and integrate various business processes across departments in an organization (Jacobs & Weston, 2007). In academic environments, ERP systems are used to demonstrate and teach cross-functional business concepts such as operations, logistics, accounting, and human resources (Hawking et al, 2001). However, several problems that arise in the implementation of SAP-based ERP learning need attention. One of the main problems is the lack of level of learning effectiveness felt by students (Li & Liang, 2020). This is an important issue considering the large investment required to implement and operate this SAP-based ERP system. Several previous studies have attempted to examine the factors that influence learning effectiveness. For example, research conducted by Li and Liang (2020) found that students' physical involvement such as actively participating in class discussions, the level of suitability of the material with the textbook given, and also the perception of immersion in the teacher's explanation in China. The results of Li and Liang's (2020) study showed that activeness and the level of suitability between body posture and learning materials had a significant effect on learning satisfaction, perception of immersion had a significant effect on learning satisfaction but did not have a direct effect on learning effectiveness in China. Meanwhile, Maheshwari (2021) stated that the availability of technological resources and motivation were the main factors influencing learning outcomes in Vietnam. Maheshwari (2021) also found that institutional support and perceived satisfaction influenced the effectiveness of student learning to use technology in Vietnam.

To analyze the perception and application of Embodied Learning-based learning, this framework can be used. Embodied Learning-based learning prioritizes the use of the body and physical interaction in the learning process. This theory explains how individuals understand and respond to the use of the body and the physical environment in learning. This allows for a better understanding of the impact of technology use in an educational context (Lindgren, 2013). A proper understanding of the causes will have a positive impact on student motivation and learning outcomes (Hariyanto, 2021).

Universitas Islam Indonesia (UII) has implemented the use of SAP-based ERP in the learning process. Therefore, the purpose of this study is to analyze the factors that influence learning effectiveness of SAP-based ERP courses at Universitas Islam Indonesia. Several potential factors in learning have been studied, including activeness factors, immersion perception, level of suitability (Li and Liang, 2020) and motivation and technological support (Maheshwari, 2021). Activeness is the extent to which a person participates in a particular activity through their body movements (Li & Liang, 2020). The level of suitability is the extent to which the structure or characteristics of an element match or harmonize with other elements (El-Zanfaly, 2015). Immersion perception is an event and feeling that a person feels carried away by the atmosphere of a particular activity so that time seems to pass quickly (Csikszentmihalyi, 2008). Motivation is the drive or force that influences a person to act or do something (Graham, 2012). Technological support is a technology that is provided to assist the learning process (Martha et al., 2001). In the context of this study, several issues related to the effectiveness of SAP-based ERP learning need attention as stated by Selim (2017) that students perceive success or failure in the learning process using technology. In addition, it is necessary to understand what obstacles students may face in achieving effectiveness in the SAP-based ERP learning process.

Relevant studies, such as those conducted by Li and Liang (2020) and Maheshwari (2021) have provided initial insights into the factors that influence the effectiveness of ERP learning. However, these studies may have a different context from the Islamic University of Indonesia, so more specific research is needed in the environment of several study programs at the Islamic University of Indonesia that implement SAP-based ERP to understand how these factors apply in this context.

This study is a development of the research by Li & Liang (2020), by adding two independent variables that were not yet in their research, namely motivation and technology support (Maheshwari, 2021). The results of this study are expected to provide deeper insight into the factors that influence the learning effectiveness of SAP-based ERP courses at the Islamic University of Indonesia, so that they can provide practical guidance for curriculum development and teaching at the Islamic University of Indonesia. With a better understanding of information technology, the quality of learning and the benefits obtained can be improved (Dorothy & Sirkka, 1995).

## LITERATURE REVIEW

### Embodied Learning Theory

Since the 1980s, embodied learning has become a learning that is often applied in cognitive science and artificial intelligence (Ziemke, 2016). In the theory of Embodied Learning, learning is seen as an interactive process involving the body and interaction with the physical environment. Students are invited to actively participate, feel, and move, so that they understand the concept more deeply (Rold, 2018). In the context of this study, students' physical involvement and perception of immersion in SAP-based ERP material are key factors analyzed. Learning that involves physical aspects and interaction with technology allows students to feel and understand concepts better (Johnson-Glenberg et al., 2014).

In the theory of Embodied Learning, the emphasis on activeness and participation in learning in the learning process can provide deeper insights (Corcoran, 2018; Weiskopf, 2010). Therefore, the Embodied Learning theory provides a strong basis for understanding how the variables of activeness, motivation, perception of immersion and level of suitability which are internal variables of technology support as external variables can interact with each other and contribute to the learning effectiveness of SAP-based ERP courses in the study program environment at the Islamic University of Indonesia.

### **Learning Effectiveness**

According to Biggs (1996), learning effectiveness depends on students' understanding of the learning process, how they process information, and how they organize and manage learning resources. The role of students in the learning process is highly emphasized, including the learning strategies they use and the management of learning resources. Previous research also shows that students' understanding of how to learn and the use of effective learning strategies can affect their learning outcomes (Pintrich et al., 1991).

### **Research Hypothesis**

Rohmawati (2015) stated that learning effectiveness is the level of success achieved from a particular learning method that is in accordance with the planned learning objectives. While activeness is the level of a person's participation in a particular activity through their body movements (Li & Liang, 2020). In recent years, studies in China and abroad have shown that activeness plays an important role in a person's work, study, and social interactions (Barsalou et al., 2003). Teaching is not only limited to teaching on the blackboard, but should provide more training to students' visual, auditory, tactile, and motor senses in their experiences and learning (Montessori, 1912). Therefore, to improve the effectiveness of learning, it is important to learn with body language and present it (Chao et al., 2013). The educational journey emphasizes learning in the laboratory, and participation in learning has a certain influence on improving the effectiveness of learning. The results of the research by Li & Liang (2020) and Maheshwari (2021) concluded that activeness has been proven to have an effect on the impact of learning outcomes.

**Ha1 :** Activeness has a positive effect on learning effectiveness of SAP-based ERP courses.

Research conducted by El-Zanfaly (2015) highlights the importance of the level of fit between physical movements and learning materials. The level of fit refers to how much the learning materials match or align with the features, activities, and interfaces of the platform/software used in learning (Li & Liang, 2020). In terms of learning, this level of fit can increase learning effectiveness by enabling a better understanding of concepts (Wu et al., 2021). In the context of SAP-based ERP, the fit between lecture materials and SAP software can affect learning effectiveness.

**Ha2 :** The level of suitability has a positive effect on learning effectiveness of SAP-based ERP courses.

A study conducted by Csikszentmihalyi (2008) highlighted the importance of the level of focus in learning. High focus and being carried away by the learning atmosphere can make learning more effective. In the context of SAP-based ERP learning, the level of student focus on learning materials can contribute to increasing learning effectiveness. Students who feel carried away by the learning atmosphere are more likely to achieve better learning outcomes.

**Ha3 :** Immersion perception has a positive effect on learning effectiveness of SAP-based ERP courses

Maheshwari (2017) explained that student motivation plays an important role in determining the effectiveness of learning. Graham (2012) also explained that motivation is an internal factor that plays a major role in determining the effectiveness and success of learning. High motivation encourages students to actively participate, devote greater attention and effort to understanding the material, and diligently work on assignments and solve problems. These factors can ultimately increase the overall effectiveness of learning. The higher the student's motivation to learn, the better the learning outcomes. The higher the student's motivation, the more effective SAP-based ERP learning.

**H4 :** Student motivation has a positive effect on learning effectiveness of SAP-based ERP courses.

Good technology, such as up-to-date SAP software and smooth access can help students to more effectively understand concepts, master the necessary skills, and apply knowledge in real contexts. Appropriate technological support can motivate students to actively participate in learning (Maheshwari, 2021). Likewise, efficient technological support can affect learning effectiveness (Maheshwari, 2021). Jones' (2019) research exploring the role of technology in learning concluded that

efficient technological support is a key element in achieving learning effectiveness. Advanced and well-integrated technology can enrich students' experiences and help them achieve better learning outcomes.

**H5 :** Technology support has a positive effect on learning effectiveness of SAP-based ERP courses.

### Research Framework

The research framework that describes the influence between independent variables consisting of activeness, level of suitability, perception of immersion, motivation, and technology support on learning effectiveness is presented in the following figure:

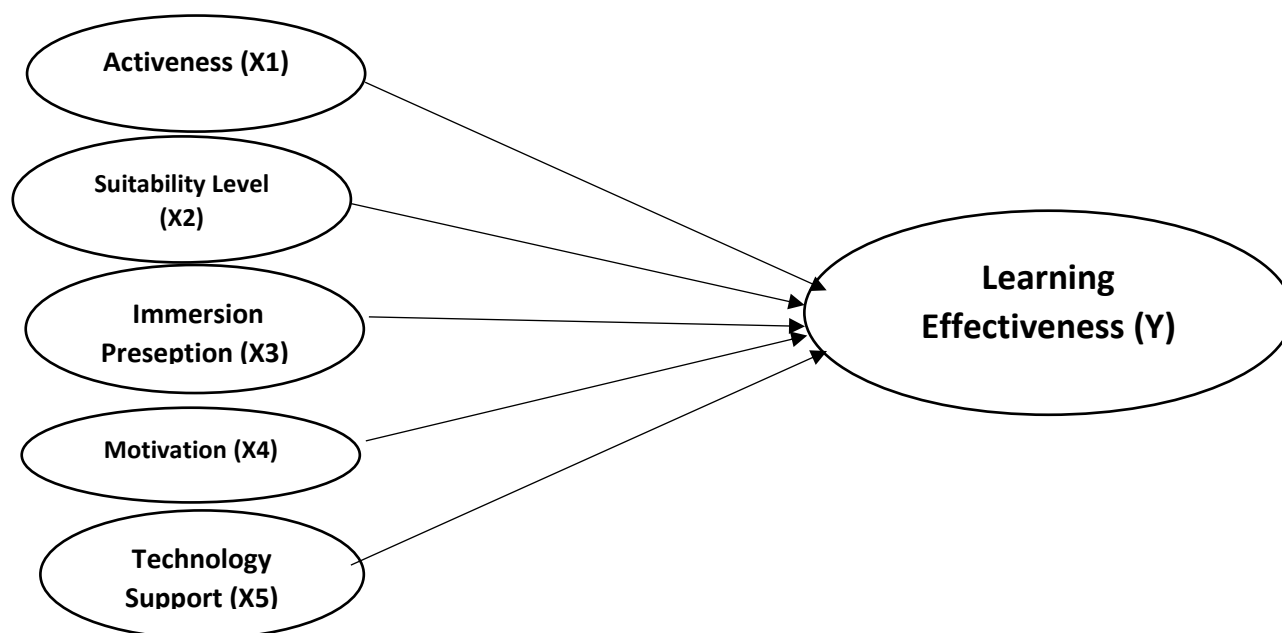


Figure 1. 1 Research Framework

## RESEARCH METHODS

### Research Population and Sample

The population in this study were all students in study programs that implement SAP-based ERP learning at the Islamic University of Indonesia (UII). The sample of this study was selected through a purposive sampling method with the criteria of students from all study programs that implement SAP-based ERP learning. Therefore, the research sample consisted of students of the Accounting, IP Accounting, Management, IP Management, Industrial Engineering, and IP Industrial Engineering Study Programs who had taken or were taking SAP-based ERP courses. Therefore, several students who met these criteria would be part of the research sample. The population of this study were students from the 2020 and 2021 intakes from all study programs that implement SAP-based ERP learning, which was 2,020 students.

The determination of the minimum sample size in this study refers to the Slovin formula as follows.

$$n = \frac{N}{(1 + Ne^2)}$$

$$n = \frac{2040}{1 + 2040(0.05)^2}$$

$$n = \frac{2040}{6.1}$$

$$n = 334.426 = 334$$

The distribution of questionnaires in this study was carried out by giving questionnaires to all students of the Accounting (Regular), Accounting (International Program), Management (Regular),

Management (International Program), Industrial Engineering (Regular), and Industrial Engineering (International Program) study programs who had taken SAP-based ERP courses at the Islamic University of Indonesia via Google Form. The distribution of questionnaires is presented in Table 1 below.

**Table 1 Questionnaire Distribution Process**

<b>Explanations</b>	<b>Totals</b>	<b>Persentase</b>
Questionnaires distributed via Gmail and Whatsapp	2040	100%
Unreturned questionnaires	(1663)	(81,5%)
Returned questionnaires	377	18,5%
Ineligible respondents	(6)	(0,3%)
Eligible respondents	371	18,2%

Source: Primary Data, 2024

Based on the distribution data of the Google Form questionnaire link distributed via email and Whatsapp blast totaling 2040, 377 (18.5%) questionnaires were returned, 1228 (60.2%) questionnaires were not returned, respondents who did not meet the requirements had taken SAP-based ERP courses, namely 6 (0.3%) students and respondents who met the requirements had taken SAP-based ERP courses, namely 371 (18.2%) students.

### **Method of collecting data**

This study uses primary and secondary data. Primary data is obtained through the distribution of questionnaires that will take place in November 2023. The questionnaire is used to measure respondents' perceptions of each variable in the study. Each variable is measured through a series of statements with a rating scale from 1 to 4. A score of 4 indicates "strongly agree," a score of 3 indicates "agree," a score of 2 indicates "disagree," and a score of 1 indicates "strongly disagree." The secondary data in the study is data on the population of students who have taken SAP-based ERP courses obtained from the PDDikti (Higher Education Database) website. The data source was obtained from the official PDDikti website, namely [www.pddikti.kemdikbud.go.id](http://www.pddikti.kemdikbud.go.id).

### **Definition and Measurement of Variables**

The variables in this study consist of dependent variables and independent variables. The dependent variable in this study is learning effectiveness. According to Smith (2010), learning effectiveness can be measured by the extent to which students understand the material taught and are able to apply it in real contexts. The learning effectiveness instrument was developed and adopted from Maheshwari (2020) and Li & Liang (2020). The indicators of learning effectiveness are as follows: (1) Student perception of the success of SAP-based ERP learning, (2) Student ability to apply SAP-based ERP material, and (3) Level of understanding of SAP-based ERP material by students. This learning effectiveness variable is measured by an instrument consisting of 4 (four) question items, which are adopted from the research of Fatimah & Wardani (2017).

The independent variables in this study consist of 5 variables, namely activeness, motivation, immersion perception, level of suitability, and technology support.

#### **1. Activeness (X1)**

Activeness is the level of individual physical involvement in the learning process (Li and Liang, 2020). The Activity Indicators developed and adopted from Li & Liang (2020) consist of (1) Frequency of actively participating in SAP-based ERP learning, and (2) Frequency of submitting assignments on time. This activity variable is measured by an instrument consisting of 4 (four) question items, which are adopted from the research of Fatimah & Wardani (2017).

#### **2. Suitability Level (X2)**

The suitability level is the suitability between the learning material and the material provided in learning (Li & Liang, 2020). The suitability level indicators developed and adopted from Li & Liang (2020) include (1) Suitability of SAP-based ERP lecture material with SAP features and modules, and (2) Suitability of SAP-based ERP material with the level of student understanding. This suitability level variable is measured by an instrument consisting of 4 (four) question items, which are adopted from the research of Fatimah & Wardani (2017).

### 3. Immersion Perception (X3)

Immersion Perception is the extent to which a person feels carried away by the atmosphere of their learning experience (Li and Liang, 2020). Immersion perception indicators developed and adopted from Li & Liang (2020) include: (1) Level of interest when learning ERP using SAP, and (2) Level of focus and challenge when practicing SAP-based ERP. This immersion perception variable is measured by an instrument consisting of 4 (four) question items, which are adopted from the research of Fatimah & Wardani (2017).

### 4. Motivation (X4)

Motivation is an individual's drive to engage in certain activities. High motivation tends to increase satisfaction and learning effectiveness (Maheshwari, 2021). Motivation is an element that influences behavior in each individual to achieve change (Soemanto, 2006). Motivational indicators developed and adopted from Maheshwari (2021) include: (1) Level of motivation to learn SAP-based ERP, and (2) Encouragement to continue learning SAP-based ERP. This motivational variable is measured by an instrument consisting of 4 (four) question items, which are adopted from the research of Fatimah & Wardani (2017).

### 5. Technology Support (X5)

Technology support is the availability of adequate technology infrastructure and internet access (Maheshwari, 2021). Technology support indicators developed and adopted from Maheshwari (2020) include: (1) Perception that technology helps the effectiveness of SAP-based ERP learning, and (2) Technology helps achieve better learning outcomes. This technology support variable is measured by an instrument consisting of 4 (four) question items, which are adopted from the research of Fatimah & Wardani (2017).

## Data Analysis Methods

The analysis method used to test the research hypothesis is multiple linear regression analysis with the following equation:

$$Y = \alpha + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + e$$

**Note:**

$\alpha$  = Constant

$b_1$ - $b_5$  = Regression coefficient

$Y$  = learning effectiveness

$X_1$  = Activeness

$X_2$  = Suitability Level

$X_3$  = Immersion Perception

$X_4$  = Motivation

$X_5$  = Technology Support

$E$  = error term

## RESULTS AND DISCUSSION

### Respondent Data

Tables 2, 3 and 4 below present respondent data respectively based on study program, gender and year of enrollment.

**Table 2. Respondent Study Program Data**

Study Program	Total	Persentase
Accounting (Regular)	142	38,3%
Accounting (IP)	6	1,6%
Management (Regular)	103	27,7%
Management (IP)	39	10,5%
Industrial Engineering (Regular)	71	19,1%
Industrial Engineering (IP)	10	2,7%
Total	371	100%

Source: Data Processing Results, 2024

Based on the table above, it shows that the respondents in this study mostly came from the accounting study program (regular), namely 142 students (38.3%), respondents from the accounting study program (IP) were 6 students (1.6%), respondents from the management study program (regular) were 103 students (27.7%), respondents from the management study program (IP) were 39 students (10.5%), respondents from the industrial engineering study program (regular) were 71 students (19.1%), respondents from the industrial engineering study program (IP) were 10 students (2.7%).

**Table 3. Respondent Gender Data**

Gender	Total	Persentase
Male	204	54,9%
Female	167	45,1%
Total	371	100%

Source: Data Processing Results, 2024

Respondent characteristic data based on gender in the table above shows that the respondents in this study were mostly male, totaling 204 people (54.9%) and female, totaling 167 people (45.1%). The respondent data based on the year of Generation is presented in the following table 4.

**Table 4. Respondents' Generation Year Data**

Generation	Total	Persentase
2018	1	0,3%
2019	8	2,2%
2020	48	12,9%
2021	314	84,6%
Total	371	100%

Source: Data Processing Results, 2024

Respondent characteristics data based on the year of intake in the table above shows that the respondents in this study were mostly from the 2021 intake, namely 314 students (84.6%), respondents from the 2020 intake were 48 students (12.9%), respondents from the 2019 intake were 8 students (2.2%), and respondents from the 2018 intake were 1 student (0.3%).

### Validity and Reliability Test

The results of the validity test with Pearson correlation show that all correlation values between the scores of each statement item and its total score are  $> 0.50$  with a significance value of  $< 0.05$ . This indicates that all statement instrument items for each variable can be used in this study. The results of the reliability test also show that the seven research instruments have met the reliability requirements, because they have a Cronbach alpha value of  $> 0.6$ .

### Descriptive Statistics

Descriptive statistical analysis is used to provide a description or picture of data from all variables including minimum value, maximum value, average and standard deviation. The results of descriptive statistical analysis are presented in the following table 5:

**Table 5. Descriptive Statistical Analysis**

Variable	n	Minimum	Maximum	Mean	Std. Deviation	Category
Activeness (X1)	371	2.25	4.00	3.29	0.406	Mediun
Suitability Level (X2)	371	2.25	4.00	3.33	0.357	Mediun
Immersion Perception (X3)	371	2.25	4.00	3.29	0.388	Mediun
Motivation (X4)	371	2.50	4.00	3.48	0.381	Mediun
Technology Support (X5)	371	2.50	4.00	3.34	0.371	Mediun
Learning Effectiveness (Y)	371	2.50	4.00	3.40	0.361	Mediun

Source: Data Processing Results, 2024

Based on the descriptive analysis data of the variables in table 5 above, all variables are grouped into 3 (three) categories, namely low, medium, and high based on their interval classes. After the length of the interval class is known, the category range per variable is calculated by adding the minimum value to the result of the interval class length and the final result is the maximum value. The results of the calculation of the category range are presented in table 6 below:

**Table 6. Range of Variable Categories**

Variable	Interval Class Length	Category Range		
		Low	Medium	High
Activeness (X1)	0.583	2.25-2.83	2.83-3.42	3.42-4.00
Suitability Level (X2)	0.583	2.25-2.83	2.83-3.42	3.42-4.00
Immersion Perception (X3)	0.583	2.25-2.83	2.83-3.42	3.42-4.00
Motivation (X4)	0.5	2.50-3.00	3.00-3.50	3.50-4.00
Technology Support (X5)	0.5	2.50-3.00	3.00-3.50	3.50-4.00
Learning Effectiveness (Y)	0.5	2.50-3.00	3.00-3.50	3.50-4.00

Source: Data Processing Results, 2024

### Classical Assumption Tests

The classical assumption tests conducted in this study include normality test, multicollinearity test, heteroscedasticity test. The results of the normality test with Kolmogorov Smirnov show that the exact significance value is 0.282. This indicates that the research data has a normal distribution. The results of the multicollinearity test show that all independent variables have a tolerance value of  $> 0.1$  and  $VIF < 10$ . This indicates that there is no correlation between independent variables in the regression model. The results of the heteroscedasticity test with Glejzer show that all independent variables have a sig value of  $> 0.05$ , which indicates that there is no heteroscedasticity.



### Hypothesis Test Results

Hypothesis testing in this study uses multiple regression analysis method. Multiple regression analysis is conducted to determine the effect of independent variables on dependent variables. The results of the hypothesis test are presented in the following table 7:

**Table 7. Hypothesis Test Results**

Model	Prediction	Coefficient	T. statistic	Sig.	Conclusion
(Constant)		2.871	10.918	0.000	
Activeness (X1)	Positive	0.186	3.940	0.000	Ha1 Supported
Suitability Level (X2)	Positive	0.219	4.265	0.000	Ha2 Supported
Immersion Perception (X3)	Positive	-0.176	-3.494	0.001	Ha3 Not Supported
Motivation (X4)	Positive	0.111	2.344	0.020	Ha4 Supported
Technology Support (X5)	Positive	0.183	3.375	0.001	Ha5 Supported
F statistic = 11.396, sig F=0,000, <i>Adjusted R Square</i> =0.123					

Source: Data Processing Results, 2024

Based on the table above, it shows that the F statistic is 11,396 with a significance value of 0.000. This shows that the regression model has passed the model suitability test. The Adjusted R Square value = 0.123 shows that the ability of the five independent variables including activeness, motivation, immersion perception, level of suitability, and technology support has the ability to explain the variation of the learning effectiveness variable of 12.3%. While the remaining 87.7% is influenced by other factors that are not included in this research model

### Discussion of Research Results

#### The Influence of Activeness on Learning Effectiveness of SAP-based ERP Courses

The results of the hypothesis test show that Ha1 is supported, which means that activeness has a significant positive effect on the effectiveness of SAP-based ERP lecture learning. This finding is in line with the research of Li and Liang (2020) which concluded that students' physical involvement in the form of active participation during learning contributes positively to increasing satisfaction and learning effectiveness.

Chao et al. (2013) explained that activeness during learning can increase students' cognitive and sensory involvement, thereby increasing learning effectiveness. When students actively practice skills or apply concepts using certain software and technology, they have the opportunity to truly understand and implement the knowledge they learn. This can ultimately increase learning effectiveness because students gain a deeper understanding and are able to apply it.

In the context of SAP-based ERP learning in higher education, high student activeness such as actively making presentations and participating in discussions related to the ERP system can help them more thoroughly understand the integrated business concepts inherent in the ERP system. Direct interaction to practice SAP ERP features and components allows students to truly understand the application of the ERP system in a real-world context. Thus, activeness plays an important role in increasing the effectiveness of ERP learning because it provides more contextual learning for students.

#### The Influence of Suitability Level on Learning Effectiveness of SAP-based ERP Courses

The results of the hypothesis test show that Ha2 is supported, which means that the level of suitability is proven to have a significant positive effect on the effectiveness of SAP-based ERP lecture learning. This finding is in line with the study of El-Zanfaly (2015) which states the importance of the suitability between physical movements and learning materials. The results of his study showed that a high matching degree between the two can improve students' understanding and retention of knowledge. Keshavarz (2011) also explained that a high level of suitability between learning materials and the features and modules available on the platform, software, or learning aids used can improve learning effectiveness. This is because a good level of suitability allows for a deeper understanding of the

concepts being taught. In the context of SAP-based ERP learning, the suitability between ERP lecture materials and the features and modules contained in SAP software is very important to note. If lecturers are able to align and adjust the material taught with SAP features well, this can improve students' understanding and ability to apply ERP knowledge in the context of using the actual ERP system. Thus, a high degree of conformity between ERP learning materials and SAP-based ERP systems can contribute positively to increasing the effectiveness of SAP-based ERP learning as a whole. The results of this study support the opinion that a high degree of matching or conformity between learning materials and supporting learning infrastructure such as software is very important to consider in order to increase learning effectiveness. The higher the degree of conformity between the two, the greater the potential for increasing understanding and competence obtained by students.

### **The Influence of Immersion Perception on Learning Effectiveness of SAP-based ERP Courses**

The results of the hypothesis test show that Ha3 is not supported, which means that the perception of immersion is not proven to have a significant positive effect on the effectiveness of SAP-based ERP lecture learning. However, the results of the hypothesis test show that the perception of immersion actually has a significant negative effect on the effectiveness of SAP-based ERP learning, contrary to the previously stated hypothesis.

This finding is contrary to the study of Csikszentmihalyi (2008) which highlights the importance of a high level of immersion in learning activities to increase their effectiveness. However, the results of this study can logically be explained that the level of immersion in SAP ERP learning activities can cause students to dislike the learning material itself. The possibility is that students are too busy with computer devices that they lose attention to the core concepts being taught. Thus, although high immersion perceptions can increase student interest in SAP ERP, students are not necessarily focused on the material being taught. It can actually have a negative impact because it causes over-immersion in computer devices so that students are less focused on their learning material.

Therefore, mediation of several factors is needed, such as appropriate learning strategies and activities to change the perception of immersion in order to increase the effectiveness of SAP-based ERP learning itself. For example, by providing interesting case studies, quiz activities for students after learning, and practicing exploring SAP-based ERP systems. Although the level of student immersion perception is high, if it is not followed by learning activities that stimulate the implementation of the concepts that have been learned, the overall effectiveness of learning will not increase significantly. The results of this study indicate that if only relying on immersion perception as an instrument to increase the effectiveness of SAP-based ERP learning, it is likely not to provide significant results. Therefore, it is necessary to design learning activities and appropriate teaching strategies to mediate immersion perception so that it really has an impact on increasing the effectiveness of SAP-based ERP learning in higher education.

### **The Influence of Motivation on Learning Effectiveness of SAP-based ERP Courses**

The results of the hypothesis test show that Ha4 is supported, which means that motivation has a significant positive effect on the effectiveness of SAP-based ERP lecture learning. This finding is in line with Maheshwari's study (2021) which concluded that motivation is one of the important factors influencing the effectiveness of online learning. Graham (2012) also explained that motivation is an internal factor that plays a major role in determining the effectiveness and success of learning. High motivation encourages students to actively participate, devote more attention and effort to understanding the material, and diligently work on assignments and solve problems.

These factors can ultimately increase the overall effectiveness of learning. In the context of SAP-based ERP lectures, students' intrinsic and extrinsic motivation to learn the ERP system plays a significant role in determining how effective their learning will be. Students who are highly motivated tend to be more persistent in learning SAP-based ERP features and modules, actively practice using the system, and put in more effort to solve problems. This can ultimately improve students' understanding and ability to implement ERP systems in real-world scenarios, which is the main goal

of ERP learning effectiveness. Thus, the results of this study consistently support the findings of previous studies that emphasize the vital role of motivation in determining the level of effectiveness of a learning activity. The higher the motivation of students to learn SAP-based ERP systems, the greater the potential for increasing the effectiveness of SAP-based ERP learning in higher education.

### **The Influence of Technology Support on Learning Effectiveness of SAP-based ERP Courses**

The results of the hypothesis test show that Ha5 is supported, which means that technological support has a significant positive effect on the effectiveness of SAP-based ERP learning. This finding is in line with Maheshwari's study (2021) which concluded that the availability of adequate technological resources (technological support) is a key factor influencing the effectiveness of online learning. Jones (2019) also explained that reliable and up-to-date technological support can facilitate a more effective learning process. Well-integrated technology allows for the delivery of more interesting, interactive, and contextual learning materials. This can ultimately improve student understanding and help them achieve more optimal learning outcomes.

In the context of SAP-based ERP learning, the availability of technological support such as stable internet access, up-to-date SAP versions, and qualified hardware is needed so that the learning process can run effectively. Good technological support allows students to more smoothly practice the features and modules in the SAP ERP system so that their understanding and implementation skills of the ERP concept can increase. This ultimately contributes positively to achieving the effectiveness of ERP learning itself. Thus, the results of this study are in line with previous studies which state that the availability of adequate technological support is vital to facilitate effective learning activities in today's digital era.

## **CONCLUSION AND SUGGESTIONS**

### **Conclusion**

The results of the study showed that of the five independent variables, there were four that were proven to have a significant positive effect on learning effectiveness of SAP-based ERP courses, namely activeness, level of suitability, motivation and technology support. Meanwhile, the perception of immersion actually had a significant negative effect on learning effectiveness of SAP-based ERP courses, which showed that the results of the study were contrary to the formulated hypothesis.

### **Implication**

The results of this study have a contribution to developing information technology-based learning systems in the future, especially related to how to design a system that can increase user activity and motivation. Therefore, the results of this study have implications for higher education institutions, especially for study programs that organize SAP-based ERP learning to improve the curriculum design and SAP-based ERP learning activities. For example, by ensuring that the material taught is in line with the features of the ERP software. Study programs also need to ensure the availability of IT infrastructure, internet access, SAP-based ERP system versions, and adequate hardware facilities so that the ERP learning process can take place effectively. In addition, the results of this study also have implications for lecturers involved in SAP-based ERP learning so that they can motivate students to learn SAP-based ERP. Lecturers can apply interactive teaching methods, provide appreciation, and challenging case studies so that students are more interested in learning the ERP concept.

### **Limitations and Suggestions**

The limitations of this study include, data collection only using questionnaires that cannot be analyzed in more depth. Therefore, it is suggested that future research, in addition to data collection conducted through questionnaire distribution, researchers are expected to be able to conduct interviews with several respondents so that a more in-depth study can be conducted regarding the research results, this study also only conducted an analysis of the influence of independent variables on dependent variables, not examining the possibility of mediating variables. Therefore, further researchers are

advised to examine the possibility of mediating variables that influence the relationship between independent variables and dependent variables.

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