

The Effect of Cybergogy on Students' Learning Motivation and Learning Outcomes

I Wayan Kayun Suwastika¹, I Komang Adisaputra Gita², Nurul Armadari³

¹ Information System ITB STIKOM Bali, Indonesia

² Information Technology ITB STIKOM Bali, Indonesia

³ Informatic management ITB STIKOM Bali, Indonesia

ABSTRACT

Higher education is an integral part in developing students' intellectual abilities and skills to prepare them for a better future. As information and communication technology develops, higher education faces increasing demands to integrate this technology into the learning process. One approach that is emerging and developing rapidly in higher education is cybergogy, which combines pedagogical principles with information and communication technology to create a more interactive and technology-oriented learning experience. One of the important aspects of the learning process in higher education is student learning motivation. Learning motivation plays a key role in student academic success, because motivated students tend to participate more actively in learning, develop deeper understanding, and achieve better learning outcomes. Applying cybergogy, it is important to understand that the use of technology in learning can influence student learning motivation. Apart from learning motivation, student learning outcomes are also an important benchmark in assessing the effectiveness of learning approaches. In the digital era, learning outcomes are no longer only measured through traditional exams, but also through critical thinking skills, the ability to collaborate, and the ability to adapt to technology. Therefore, research on the influence of cybergogy on student learning outcomes is becoming increasingly important. Understanding the relationship between cybergogy, learning motivation, and student learning outcomes, we can develop more effective and relevant learning strategies to meet future demands in the digital world. This research was conducted at ITB STIKOM Bali using a population of students majoring in Information Systems class of 2023 as generation C whose activities cannot be separated from utilizing information technology. Sampling was taken using the Slovin method. The research instrument used a Likert scale questionnaire. The research method uses survey research methods with a quantitative approach. Data analysis techniques use simple linear regression and MANOVA. The results of the research are the results of quantitative statistical calculation analysis to answer the hypothesis of whether or not there is an influence between cybergogy on learning motivation and learning outcomes.

Keywords: cybergogy, motivation and learning outcomes, Slovin method, simple linear regression, MANOVA

INTRODUCTION

Higher education is an integral part in developing students' intellectual abilities and skills to prepare them for a better future. Higher Education (PT) plays an important role in preparing the younger generation to improve their competence. As information and communication technology develops, higher education faces increasing demands to integrate this technology into the learning process. One approach that is emerging and developing rapidly in higher education is cybergogy, which combines pedagogical principles with information and communication technology to create a more interactive and technology-oriented learning experience.

Cybergogy is a learning approach that utilizes digital technology and the internet to support and strengthen the learning experience. Students not only consume information, but are also actively involved in learning, collaborating with fellow students, participating in online discussions, and accessing various learning resources online. The technological capabilities and easy access to information provided by cybergogy can change the dynamics of learning in higher education. The word cybergogy comes from the word pedagogy, derived from the words Paidos (boy) and Agogos (leader). The emphasis of Pedagogy is on the words leading/teaching, so that if it is related to the teaching process in cyber education, the term becomes Cyber Pedagogy/Cybergogy. Literally the meaning of Cyber Pedagogy is the science and art of teaching children virtual learning or online learning. In general, Cyber Pedagogy is interpreted as learning that is based on and uses internet media or takes place virtually (Sukarmin, 2023).

One important aspect of higher education is student learning motivation. Learning motivation plays a key role in student academic success, because motivated students tend to participate more actively in learning, develop deeper understanding, and achieve better learning outcomes. Applying cybergogy, it is important to understand that the use of technology in learning can influence student learning motivation. Learning motivation is the overall driving force within students that causes learning (Winkel, 2004).

Apart from learning motivation, student learning outcomes are also an important benchmark in assessing the effectiveness of learning approaches. In the digital era, learning outcomes are no longer only measured through traditional exams, but also through critical thinking skills, the ability to collaborate, and the ability to adapt to technology. Therefore, research on the influence of cybergogy on student learning outcomes is becoming increasingly important.

Previous research has identified the benefits of using cybergogy in higher education, but there remains a need to better understand how the use of this technology affects students' learning motivation and their learning outcomes. Understanding the relationship between cybergogy, learning motivation, and student learning outcomes, we can develop more effective and relevant learning strategies to meet future demands in the digital world. Several expert opinions regarding the definition of learning, according to Benjamin S. Bloom, state that learning outcomes are changes that can be measured in an individual's behavior, knowledge and skills after participating in a learning experience (Bloom et al., 1956). Learning outcomes are all changes that occur in individual behavior which are the result of a planned educational experience (Tyler, 1974). Learning outcomes are changes in an individual's internal conditions that produce new abilities or changes in individual behavior (Gagne, 1965).

This research was conducted at ITB STIKOM Bali using a population of students majoring in Information Systems class of 2023 as generation C whose activities cannot be separated from utilizing information technology. Sampling was taken using the Slovin method. The research instrument used a Likert scale questionnaire. The research method uses survey research methods with a quantitative approach. Data analysis techniques use simple linear regression and MANOVA. It is hoped that the results of this research will provide deeper insight into how technology and technology-based learning approaches can help improve student learning experiences in the future.

MATERIALS AND METHODS

Cybergogy Concept

The era of the digital revolution and the development of Technology, Information and Communication in all fields have also led to new innovations in the field of education, especially online learning. The concept of cybergogy learning refers to learning practices

involved online or using Information, Communication, Technology (ICT) devices (Wang & Kang, 2008).

The concept of cybergogy is a learning approach with a virtual learning environment for the development of students' cognitive, emotional and social learning. Cybergogy learning encourages students to use computers and the internet to obtain information, modules, reports and various other types of references. Cybergogy combines the basics of pedagogy and andragogy and provides the learning benefits provided by technology for better learning outcomes. The cybergogy approach has currently been implemented in several countries and will become more widespread in the future. Cybergogy education is expected to fulfill Education 4.0, which creates a virtual learning environment that is learner-centered, autonomous and collaborative. Education 4.0 is a phenomenon that responds to the needs of the Industrial Revolution 4.0 where humans and machines are brought together to find solutions, solve problems and of course discover new innovation possibilities. Cybergogy serves the needs of society in the 'innovative era'

Student Learning Motivation

Motivation to learn is important in adult learning, especially the motivation possessed by students in basic literacy programs. The importance of learning motivation for literacy students is because it is difficult for adult students to absorb learning material if they do not have a strong motive, especially students in basic literacy programs who require adults to have the ability to read, write and count (Syah, 2022).

Motivation is one of the factors that influences student success. A person will get the desired results in learning if within him there is a desire to learn. Motivation can function as a driving force for achieving good results. A person will carry out an activity because there is motivation within him. Having high motivation in learning will achieve optimal results (Rahman, 2021).

Learning Outcomes

Learning outcomes are achievements, knowledge, skills, understanding, attitudes and abilities obtained by an individual after participating in the education or learning process. Learning outcomes reflect the extent to which someone has mastered the subject matter or competencies taught. Learning outcomes are the main goal in the education and learning process, and are often measured through evaluations, exams, assignments, or projects. Good learning outcomes show that students have succeeded in understanding, mastering and applying what they have learned during learning. Good learning outcomes can also be the basis for decision making in the field of education, curriculum development, and improving the learning and teaching process.

Learning outcomes are conditions or changes that occur in individuals after they have participated in a learning or educational process. Learning outcomes include increases in knowledge, skills, understanding, or changes in behavior that can be measured or observed as a result of learning experiences. Learning outcomes are an important indicator in evaluating the effectiveness of education, both at the individual level and at the institutional or educational system level. Evaluation of learning outcomes helps assess the extent to which educational goals have been achieved and helps guide improvements in learning methods and curriculum.

Simple Linear Regression Analysis

Linear regression is divided into simple linear regression and multiple linear regression. Simple linear regression analysis is a linear relationship between an independent variable (X) and a dependent variable (Y). Simple linear regression analysis is used to determine the influence of one independent variable on one dependent variable, while multiple regression is

a development of simple linear regression analysis. Multiple linear regression analysis is a statistical method used to understand the relationship between one or more independent (free) variables and one or more dependent (dependent) variables (Padilah & Adam, 2017). Its use is to predict the value of the dependent variable (Y) if there are at least two or more. The regression analysis used in this research is a simple regression analysis to determine the influence of cybergogy on student learning motivation and the influence of cybergogy on student learning outcomes.

Proving whether or not there is an influence of two or more independent variables (X(X3),(Xn) with one dependent (bound) variable used in regression. Linear regression equation of variable Y on variable X, namely

$$Y = a + bX$$

$$a = \frac{(\sum Y)(\sum X^2) - (\sum X)(\sum XY)}{(n)(\sum X^2) - (\sum X)^2}$$

$$b = \frac{n(\sum XY) - (\sum X)(\sum Y)}{(n)(\sum X^2) - (\sum X)^2}$$

Information:

Y : Dependent variable (learning outcomes)

X : Independent variable (learning model)

a : Intercept (Y value, if X=0)

b : Regression coefficient/slop (slope of the regression line)

n : Number of data

MANOVA Analysis

Multivariate Analysis of Variance (MANOVA) is a statistical method used to test overall differences between two or more groups in a combination of two or more interrelated dependent variables. These dependent variables are considered as one group and are analyzed together to assess whether there are significant differences between the groups in the combination of these variables.

The purpose of MANOVA is to test whether there are differences in the pattern of linear relationships between dependent variables between groups, rather than simply testing differences in the means of the dependent variables separately as is done in univariate analysis. Researchers can evaluate the impact of independent variables on the combination of dependent variables as a whole, which allows a more comprehensive analysis of the effects of independent variables on different groups, therefore, MANOVA is often used in various research fields, including social sciences, psychology, and natural sciences, when researchers are interested in differences between groups in various interrelated dependent variables.

Research Method

The research conceptual model is the identification of research variables. The variables identified are the independent variable and the dependent variable. The independent variable is cybergogy and the dependent variable is learning motivation and student learning outcomes as seen in Figure 1.

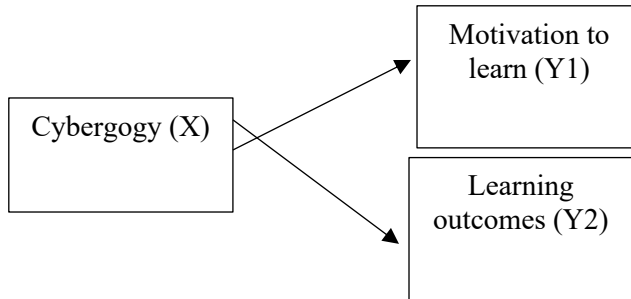


Figure 1. Research Method

RESULTS AND DISCUSSION

The Influence of Cybergogy on Student Learning Motivation

The analysis technique used is a simple linear regression test for 1 independent variable, namely the cybergogy variable, with 1 dependent variable, namely the student learning motivation variable. Data processing to carry out this test process uses SPSS software, the output of the data processing results.

Table 1. Coefficients of Variables X and Y1 in SPSS Software

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	29.614	4.825		6.138	.000
	cybergogy	.291	.118	.258	2.464	.016

a. Dependent Variable: Motivasi belajar

The output is a coefficient table stating that the constant value of a is 29.614 and the value of cybergogy (b) is 0.291 so that the regression equation can be written as follows

$$Y = a + bX$$

$$Y = 29.614 + 0.291X$$

This equation means that the constant value for the cybergogy variable is 29.614 and the regression coefficient. The regression coefficient value is positive, meaning that the direction of the cybergogy variable (X) towards learning motivation (Y1) is positive.

Decision making from simple linear regression between cybergogy variables and learning motivation:

a) Based on the significance value from the coefficients table, a significance value of $0.016 < 0.05$ is obtained, so it can be concluded that the cybergogy variable (X) influences the learning motivation variable (Y1)

b) Comparing the calculated t value with the t table, based on the coefficients table, the t value is 2,464.

Formula for finding t table

$$t \text{ table} = (a/2); n-k-1$$

Formula description

a : confidence level of 0.05

n : number of samples

k : number of independent variables

t table = (a/2); n-k-1
 = (0.05/2) ; 87-1-1
 = 0.025 ; 85

Based on the formula for finding the t table in Appendix 15, the t table value is 1.988. The conclusion is that the t value is 2,464 > the t table value is 1,988, meaning that the cybergogy variable (X) has an effect on the learning motivation variable (Y1)

The Influence of Cybergogy on Student Learning Outcomes

The analysis technique used is a simple linear regression test for 1 independent variable, namely the cybergogy variable, with 1 dependent variable, namely the student learning outcome variable.

Table 2. Coefficients of Variables X and Y1 in SPSS Software
 Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	70.963	8.411		8.437	.000
	X	.467	.206	.239	2.267	.026

a. Dependent Variable: Y2

The output is a coefficient table stating that the constant value of a is 70.963 and the cybergogy X value is 0.467 so that the regression equation can be written as follows

$$Y = a + bX$$

$$Y = 70.963 + 0.467X$$

This equation means that the constant value for the cybergogy variable (X) is 70.963 and the regression coefficient The regression coefficient value is positive, meaning that the direction of the cybergogy variable (X) towards learning outcomes (Y2) is positive.

Decision making from simple linear regression between cybergogy variables and learning outcomes:

a) Based on the significance value from the coefficients table, a significance value of 0.026 < 0.05 is obtained, it can be concluded that the cybergogy variable (X) has an effect on the learning outcome variable (Y2)

b) Comparing the calculated t value with the t table, based on the coefficients table, the t value is 2,267.

Formula for finding t table

t table = (a/2); n-k-1

Formula description

a : confidence level of 0.05

n : number of samples

k : number of independent variables

t table = (a/2); n-k-1

= (0.05/2) ; 87-1-1

= 0.025 ; 85

Based on the formula for finding the t table in Appendix 15, the t table value is 1.988. The conclusion is that the calculated t value is 2,267 > the t table value of 1,988, meaning that the cybergogy variable (X) has an effect on the learning outcome variable (Y2).

The Influence of Cybergogy on Student Learning Motivation and Student Learning Outcomes

The analysis used for 1 independent variable with 2 dependent variables uses MANOVA (Multivariate Analysis of Variance) analysis. The results of data processing using the MANOVA analysis technique assisted by SPSS software to determine the influence of cybergogy on learning motivation and learning outcomes simultaneously, which consists of 1 independent variable cybergogy (X) and 2 dependent variables learning motivation (Y1) and learning outcomes (Y2) are as follows.

Table 3. Multivariate Test

Multivariate Tests^a

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.962	1018.812 ^b	2.000	81.000	.000
	Wilks' Lambda	.038	1018.812 ^b	2.000	81.000	.000
	Hotelling's Trace	25.156	1018.812 ^b	2.000	81.000	.000
	Roy's Largest Root	25.156	1018.812 ^b	2.000	81.000	.000
X	Pillai's Trace	.201	2.292	8.000	164.000	.002
	Wilks' Lambda	.803	2.343 ^b	8.000	162.000	.001
	Hotelling's Trace	.239	2.392	8.000	160.000	.002
	Roy's Largest Root	.213	4.371 ^c	4.000	82.000	.003

Based on Table 3 regarding the cybergogy variable, it can be seen that the Wilks' Lamda value is 0.001 <0.05, so it is significant, meaning that there is an influence on the response between learning motivation and learning outcomes based on groups of students who answered according to category.

CONCLUSSION

Based on the research results, the conclusion is that there is an influence between online learning/cybergogy on learning motivation, there is an influence between online learning/cybergogy on learning outcomes and there is an influence between online learning/cybergogy together with learning motivation and student learning outcomes.

ACKNOWLEDGEMENT

This study has received supported from ITB STIKOM Bali, including the Chairman and the management team, who have extended their support and allocated resources. It is anticipated that the outcomes of this research will prove beneficial to the global community.

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