

From Perception to Proficiency: Unveiling the Impact of Cybergogy and Learning Management Systems In Language Education

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Abstract. This study reviews the effectiveness of using a Learning Management System (LMS) in cybergogy-based language learning, focusing on student perceptions of information quality, ease of use, and usability. Conducted in the odd semester of 2023/2024, the research involved 36 tenth-grade students from a high school in Yogyakarta. Data were collected via Google Forms in November 2023 and analyzed using SPSS and SmartPLS4, including descriptive statistics, correlation analysis, and model fit assessments. The findings reveal a positive correlation between information quality, ease of use, and usability in online learning. Ease of use significantly boosts student enthusiasm for online learning, while LMS usability also significantly enhances learning motivation. However, the positive influence of information quality on online learning enthusiasm, although suggested, was not statistically significant.

Keywords: Cybergogy; Learning Management System; Language Learning.

1 Introduction

Learning Indonesian has gained significant attention amidst globalization and technological advancements. Beyond communication, language is a vessel for cultural identity and self-expression [1]. Recognizing Indonesian as an official UN language can spark global interest in learning it, improving educational resources and teaching methods. This highlights the need for a modern learning model suited for the digital generation. Cybergogy, a framework for online learning, expands on traditional pedagogy by incorporating cognitive, social, and emotional domains [2]. In the context of Indonesian learning, cybergogy's emphasis on technology-driven education and social interaction is vital. This study focuses on the effectiveness of using Learning Management Systems (LMS) to enhance students' understanding and skills in high school, reflecting the growing importance of digital communication in education [3].

A key characteristic of online learning is the use of digital platforms that host content, learning resources, and online interactions via the internet. Numerous studies have shown that online learning effectively enhances communication and collaboration between students and teachers [4]. LMS platforms typically offer elements like materials, videos, quizzes, discussion forums, and assignments in an organized way [5]. Integrating tools such as video conferencing, discussion forums, and messaging systems fosters the innovation of interactive virtual classrooms and helps develop digital skills among learners [6].

While the use of Learning Management Systems (LMS) has long been established, especially in higher education [7], its implementation at the high school level remains limited. An initial survey of high schools in Yogyakarta revealed that online learning mainly relies on WhatsApp groups (48%), Zoom (21%), and Google Classroom (31%), indicating suboptimal conditions for effective online education. This study addresses this gap by developing a cybergoth-based Indonesian learning model for senior high school students through a blended learning system using LMS to support integrated online learning.

LMS platforms are crucial to modern digital-based education, transforming how teachers and students interact [8]. Including discussion forums, video conferencing, and chat features fosters innovation and necessitates digital skills from teachers and students. Therefore, this study will consider digital skill levels as a key factor in assessing the effectiveness of cybergoth-based learning through LMS.

2 Result and Discussion

Table 1. Descriptive statistics construct of students' perception of LMS (N = 36)

Factors	Minimum	Maximum	Mean	SD
Quality of information	1.80	5.00	3.78	0.72
Ease of Use	1.40	5.00	2.80	0.49
Usability	1.85	5.00	3.79	0.73
Enthusiasm for online classes	1.60	5.00	3.77	0.80

The table summarizes 36 students' perceptions of the Learning Management System (LMS). For information quality, scores ranged from 1.80 to 5.00, averaging 3.78 (SD 0.72). Ease of use had the same average (3.78) with a smaller standard deviation (0.49), and usability ranged from 1.85 to 5.00 with an average of 3.79 (SD 0.73). Enthusiasm for online classes scored 1.60 to 5.00, averaging 3.77 with a higher standard deviation of 0.80.

Table 2. Pearson correlation of dependent and independent variables

Variable	Measurement	Quality of Information	Ease of Use	Usability	Enthusiasm
Quality of Information	r	1.000			
	p				
Ease of Use	r	.560**	1.000		
	p	.000			
Usability	r	.659**	.496**	1.000	
	p	.000	.000		
Enthusiasm	r	.662**	.645**	.750**	1.000
	p	.000	.000	.000	

Table 2 shows that information quality, ease of use, and usability positively correlate with enthusiasm for online classes. Usability has the strongest correlation ($r = 0.750$, $p = 0.000$), followed by information quality ($r = 0.662$, $p = 0.000$) and ease of use ($r = 0.645$, $p = 0.000$), all significant at $p < 0.05$.

Table 3. Pearson correlation of dependent and independent variables

	Cronbach's alfa	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance contracted (AVE)
Quality of information	0.875	0.878	0.911	0.670
Ease of Use	0.876	0.876	0.913	0.726
Usability	0.930	0.930	0.950	0.822
Enthusiasm	0.937	0.939	0.960	0.889

Cronbach's alpha evaluates how well items in a group are related, with values from 0 to 1. Scores between 0.6 and 0.9, as shown in the table, indicate satisfactory internal consistency. Rho_a and rho_c values above 0.8 also confirm strong consistency among factors. The Average Variance Extracted (AVE), which measures how well items explain variance despite measurement error, ranges from 0.6 to 0.8 in Table 3, exceeding the 0.5 threshold. This demonstrates good convergent validity and strong item correlation within the construct.

Table 4. Outer loadings

Items	Quality of information	Ease of Use	Usability	Enthusiasm	VIF
Learning content and curriculum are well designed, up-to-date, and in accordance with academic standards to improve the quality of online learning		0.855			2.248
The instructional design and delivery of online learning, multimedia, and interactive elements positively influenced my engagement and learning outcomes		0.867			2.288
Infrastructure technology and LMS are reliable and accessible and contribute to the learning experience		0.828			1.973
Flexibility and customization options for online learning according to student preferences and learning needs		0.865			2.235
LMS reliability and performance are consistent and free of technical issues				0.960	6.238
LMS is accessible and available to all students, regardless of the student's technological capabilities and limitations				0.910	2.92
LMS encourages interactivity and engagement through discussion forums, live sessions, and multimedia content				0.855	2.382
LMS integrates well with a wide range of learning tools and resources	0.856				2.384
I get an extension or effective technical instructions when there is a problem with my LMS	0.806				2.090
The LMS was easy to guide and I was able to find learning materials, assignments, and resources quickly	0.790				1.885
The LMS is accessible on a variety of devices and the operating system makes it easy for me to access learning	0.830				2.110
I have reliable access when I encounter problems	0.799				1.990

with my LMS		
I receive timely and constructive feedback on assignments and assessments, improving my perception of online learning	0.877	2.785
The overall quality of the online learning system is on par with the conventional education system	0.920	4.037
The LMS I use provides interesting tools and features that contribute to the effectiveness of my learning experience	0.900	3.525
LMS provides a smooth and engaging learning experience	0.925	4.601

Table 4 shows how items relate to latent factors, with higher factor loadings indicating stronger associations. This helps reveal the data's structure and how items contribute to each factor. The Variance Inflation Factor (VIF) checks for multicollinearity. VIF values below 5 are acceptable, while values over 10 indicate issues. In Table 4, most VIF values are under 5, with one slightly above but still below 10, showing no significant multicollinearity problems.

Table 5. Discriminant validity (heterotrait-monotrait ratio / HTMT - matrix)

Variable	Quality of information	Ease of Use	Usability	Enthusiasm
Quality of information		0.666		0.775
Ease of use				0.753
Usability	0.765			0.835
Enthusiasm		0.652		

The heterotrait-monotrait ratio matrix (HTMT) assesses construct discriminant validity in structural equation modelling. It evaluates whether constructs are distinct or overlap by comparing correlations between different constructs with correlations within the same construct.

An HTMT value below 0.85 indicates good discriminant validity, meaning constructs are more closely related to their own items than to items from other constructs. Values close to or above 0.85 suggest potential overlap and problems with discriminant validity. Table 5 shows that the constructs are more strongly related to their own items than to items from other constructs, with values all below 0.85. This indicates that the constructs have sufficient discriminant validity and that the measured items accurately represent their respective constructs.

Table 6. Fornell-Lacker criteria.

Variable	Ease of use	Enthusiasm	Quality of information	Usability
Ease of use	0.855			
Enthusiasm	0.685	0.940		
Quality of information	0.583	0.702	0.817	
Usability	0.585	0.778	0.690	0.905

The Fornell-Lacker criterion is used to assess discriminant validity in Structural Equation Modeling (SEM) [20]. It involves comparing the square root of the Average Variance Extracted (AVE) for each construct with the correlations between constructs. Constructs are considered to have sufficient discriminant validity if the square root of the AVE is greater than the correlations with other constructs.

Table 6 shows that the Fornell-Lacker criterion is met, as the square root of the AVE for each construct exceeds the correlations with other constructs. Therefore, constructs such as ease of use, enthusiasm, quality of information, and usability exhibit sufficient discriminant validity, indicating clear differentiation between them.

Table 7. R and F values

Relationship	F-square	R-Square	Adjusted R-squared
Ease to use →enthusiasm	0.065	0.753	0.742
Quality of information →enthusiasm	0.026		
Usability → enthusiasm	0.257		

Table 7 presents the F-squared values, which measure the strength of the relationship between variables in statistical tests like ANOVA and regression analysis. The values range from 0.026 to 0.257, indicating that the independent variables (predictors) have a small to moderate impact on the dependent variable. This range suggests that the predictors explain between 2.6% and 25.7% of the variance in the dependent variables. While the effect size is classified as small to medium, the predictors still significantly contribute to explaining the variance of the dependent variables.

Table 8. Path coefficients Mean, STDEV, T value, and p value

Relationships	Original sample (O)	Sample mean (M)	T statistics ((O/STDEV))	P values
Quality of information →enthusiasm	0.124	0.126	1.560	0.112
Ease of use →enthusiasm	0.180	0.193	2.038	0.043
Usability →enthusiasm	0.380	0.369	4.594	0.000

Table 8 highlights the relationships between key factors and online learning enthusiasm. Information quality shows a positive but statistically insignificant effect (O = 0.124, T = 1.560, P = 0.112, $p > 0.05$), suggesting a potential influence requiring further testing. In contrast, ease of use demonstrates a significant positive impact on enthusiasm (O = 0.180, T = 2.038, P = 0.043, $p < 0.05$), with each 1-point increase in ease of use resulting in a 0.180 increase in enthusiasm. Usability exhibits the strongest positive effect (O = 0.380, T = 4.594, P = 0.000, $p < 0.05$), where each 1-point increase in usability corresponds to a 0.380 rise in enthusiasm. These findings emphasize the significant role of ease of use and usability in boosting student enthusiasm for online learning, while the effect of information quality remains inconclusive.

3 Conclusion

The study concludes that students have positive perceptions of LMS use in cybergoth-based online learning, with strong correlations between information quality, ease of use, usability, and their enthusiasm for learning. The constructs showed excellent reliability and validity, with no significant multicollinearity issues. The LMS's ease of use and perceived usefulness significantly boost students' enthusiasm for online learning, though the potential positive impact of information quality on enthusiasm was not statistically confirmed. The model demonstrates that these factors collectively enhance student engagement in online learning.

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