Perceived Algorithmic Autonomy-Support and Computer Attitude on Learning Management Systems in Higher Education Institutions in Davao Region

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ABSTRACT

This quantitative research study adopts a non-experimental, descriptive, and correlational design to investigate the influences of perceived algorithmic autonomy-support and computer attitude on Learning Management Systems (LMS) among higher education institutions. The study involves a 100 sample of participants from diverse educational settings, employing adapted questionnaires and statistical measures such as mean, Pearson correlation coefficient (Pearson r), standard deviation, and regression analysis. The research reveals positive perceptions of algorithmic autonomy-support and computer attitudes among participants, covering affective components, perceived usefulness, perceived control, and behavioral intention. Additionally, the study highlights the significance of these factors in optimizing engagement with LMS. While a strong motivation to embrace LMS is evident, the impact of computer attitude on motivated learning strategies is statistically significant. Conversely, perceived algorithmic autonomy-support exhibits a notable influence on instructors' engagement with LMS. These findings emphasize the need to recognize the pivotal roles of perceived algorithmic autonomy-support and computer attitude in the successful implementation of LMS in higher education institutions. Recommendations include prioritizing strategies that enhance algorithmic autonomy-support and computer attitudes among instructors, ultimately contributing to the optimization of educational management practices.

Keywords: Algorithmic Autonomy-Support, Computer Attitude, Learning Management Systems, Higher Education Institutions, Davao Region

INTRODUCTION

Web-based tools called Learning Management Systems (LMS) are used in higher education institutions to improve teaching and learning. However, there are 90% faculty members are still unwilling to use learning management systems (LMS) as a teaching tool, even in spite of the apparent advantages. Actually, for the previous five years, there has been an issue with LMS implementation in higher education institutions (Fearnley & Amora 2020). As supported by Esawe et al (2023), another pressing issue lies in the prerequisite for both faculty and students to possess the technological proficiency essential for effective LMS utilization. Instructors, already occupied with pedagogical concerns, find themselves allocating substantial time to navigate electronic intricacies, leaving less room for subject matter immersion. The convergence of technologies within widely-used LMSs, seamlessly incorporating video, voice, and data communications, introduces new dimensions but also raises usability concerns.

In the Thailand, the requirement that instructors and students possess the technological know-how necessary to operate the LMS efficiently is another significant problem. Specifically, less time is available for students to concentrate on the subject matter since instructors frequently spend more time on pedagogical concerns than in-person, such as instructional design, reviewing electronic resources, and content delivery challenges (Alfalah, 2023). In the Philippines, choosing the best LMS technology for a given institution's needs might be challenging due to the continuous growth of accessible options. The recent health emergency (COVID-19) has brought attention to the importance of digital higher education delivery. This could have a dual effect of influencing the transition to a hybrid model of traditional and digital higher education delivery and strengthening digital higher education partnerships within ASEAN and its dialogue partners (Malbas, 2023).

In the Muncipality of Santo Tomas, Davao del Norte, Philippines, As stated by Somosot (2022), the rapid expansion of available LMS technologies has led to difficulties in choosing the most appropriate system for a particular institution's needs. The increased focus on digital delivery of higher education caused by the recent health emergency (COVID-19) may not only influence the shift to a hybrid of traditional and digital delivery of higher education, but also enhance digital higher education partnerships within ASEAN and its dialogue partners. Moreover, there are further issues found in students' motivated learning strategies, including peer and group socialization, poor class interest, negative belief in the effectiveness of learning mathematics online, and low motivation in mathematics (Almagro, 2021).

The relationship between perceived Algorithmic Autonomy-Support, computer attitude, and learning management systems (LMS) and educational management has not been thoroughly covered in the literature, despite the fact that LMS has been studied extensively in this context (Hu, Shan, & Jiao, 2023; Jabagi et al., 2021). More specifically, there isn't ample discussion on how LMS use and efficacy in higher education institutions are affected by the perception of Algorithmic Autonomy-Support. Furthermore, not much research has been done on how computer attitudes affect this relationship. This disparity is especially noteworthy in light of the growing dependence on algorithmic decision-making in learning environments and the possible effects these algorithms may have on teachers' and students' autonomy and attitudes (Waldman & Martin, 2022). Therefore, there is an urgency to conduct the research entitled optimizing Learning Management Systems in Higher Education Institutions: A Quantitative Analysis of the Impact of Perceived Algorithmic Autonomy.

This study aims to optimize the use of Learning Management Systems (LMS) in higher education institutions by conducting a quantitative analysis of the impact of perceived Algorithmic Autonomy-Support and Computer Attitude on Educational Management. The results of this study are crucial for instructors who are navigating the new typical learning environment, as understanding their computer attitudes and engagement with algorithmic systems may play a significant role in their work performance. Moreover, this study could provide valuable insights for educators and administrators in developing innovative strategies that encourage instructors to improve their work approaches, particularly in their field. By understanding the role of perceived Algorithmic Autonomy-Support and Computer Attitude, educators can better utilize LMS to address the needs and challenges of the modern teaching-learning environment. Through this study, the researchers hope to contribute to the ongoing efforts to enhance the effectiveness of LMS in higher education institutions, ultimately leading to improved student outcomes and a more engaging and supportive learning environment. The researcher's commitment to disseminating the study's findings to its immediate beneficiaries underscores the potential impact of this research on educational practices.

Statement of the Problem

The study aims to determine the level of algorithmic autonomy support, cognitive flexibility and team collaboration skills of Instructors as predicted by Problem solving performance. Specifically, it seeks to answer the following questions:

1. What is the level of Instructors' Perceived Algorithmic Autonomy-Support in terms of;
    - Acknowledging Perspectives;
    - Offering Choices;

- Providing Rationale; and
- Presence of Pressure?

2. What is the level of Instructors' Computer Attitude in terms of;

- affective component;
- perceived usefulness;
- perceived control; and
- behavioral intention?

3. What is the level of Instructors' Learning Management Systems used?

- Performance Expectancy;
- Effort Expectancy;
- Social Influence; and
- Facilitating Conditions?

4. Is there a significant relationship between:

- Learning Management Systems and Perceived Algorithmic Autonomy-Support of instructors?
- Learning Management Systems and Computer Attitude of instructors?

5. Do Perceived Algorithmic Autonomy-Support and Computer Attitude significantly influence the Learning Management System?

Theoretical Framework

The theoretical framework for this study is based on the concept of Perceived Algorithmic Autonomy Support (PAAS) and its connection to Learning Management Systems (LMS). PAAS is a new construct introduced to measure workers' perceptions of algorithmic autonomy-support. In the context of education, this can be applied to understand how students and educators perceive the autonomy provided by LMS. The theory of Self-Determination is used to reconceptualize the notion of autonomy-support for the techno-organizational phenomenon of algorithmically managed platform work.

On the other hand, the attitude towards computer or technology, often measured as Computer Attitude, plays a significant role in the acceptance and effective utilization of LMS. The Technology Acceptance Model (TAM) is a useful theoretical framework in this context, which posits that perceived usefulness and perceived ease of use determine an individual's intention to use a system. Therefore, it can be proposed that both PAAS and Computer Attitude significantly influence the acceptance and effectiveness of LMS in higher education institutions. Further empirical research is needed to test these propositions and to explore the potential moderating or mediating effects of other variables.

On the other hand, the study's conceptual paradigm is shown in figure 1. the first independent variable of this study is perceived algorithmic autonomy-support, it involves acknowledging perspectives, offering choices, providing rationale, presence of pressure. the second independent variable is computer attitude with its indicators; affective component, perceived usefulness, perceived control, behavioral intention the dependent variable of the study is learning management system with performance expectancy, effort expectancy, social influence and facilitating conditions.

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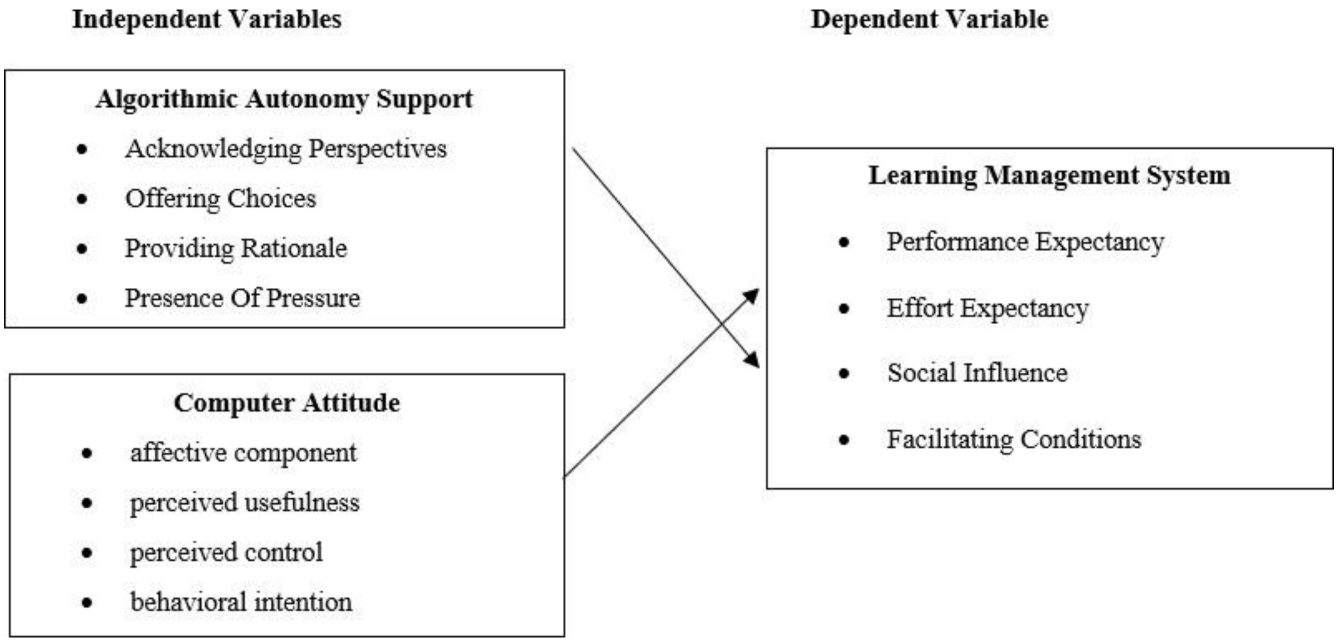

Figure 1. The Conceptual Framework of the Study

Definition of Terms

For more comprehensive understanding, the following terms were defined conceptually and operationally:

Perceived Algorithmic Autonomy-Support. Refers to a construct that measures an individual's perceptions of the autonomy provided by algorithmic systems (Jabagi, 2021). In the context of this study, PAAS can be defined by developing and validating a theoretically-based measure for PAAS. This could involve survey items that assess the extent to which students and educators feel that the LMS supports their autonomy in the learning process.

Learning Management Systems (LMS). Refers to a Learning Management System (LMS) is a software application or web-based technology used for the administration, documentation, tracking, reporting, automation, and delivery of educational courses, training programs, materials, or learning and development programs (Turnbull, 2020). In this study, the LMS could be any specific platform used by the higher education institution for delivering course content and managing the learning process. Its effectiveness can be assessed by tracking usage data, student performance metrics, and feedback from students and educators.

Computer Attitude. Refers to an individual's level of Information and Communication Technology (ICT) use preference and their perceptions about using ICT (Garland & Noyes, 2008). In this study, computer attitude can be measured using a survey or scale that assesses students' and educators' attitudes towards the use of the LMS and other related technologies in the learning process. This could include items that assess their comfort level, perceived usefulness, and willingness to use the technology for learning.

METHODOLOGY

This section covered the study's numerous methodologies, which include the research design, respondents, research instrument, data gathering procedures, statistical treatment of data, and ethical considerations.

Research Design

A quantitative non-experimental applying descriptive and correlational approach design was used in this study. A quantitative research method includes the collection and analysis of numerical data. Additionally, the descriptive approach aims to investigate language learning and instruction in its natural environments, without any intervention or modification of factors. In this study, this was used by the researcher to explore, determine, and describe instructors Perceived Algorithmic Autonomy-Support and Computer Attitude on Learning Management Systems in Higher Education Institutions.

The above-mentioned design was used by the researcher to address the main interests and objectives of the study. Specifically, for the descriptive approach, this was used by the researcher to explore, determine, and describe instructors Perceived Algorithmic Autonomy-Support and Computer Attitude on Learning Management Systems in Higher Education Institutions as variables of the study.

Research Respondents

The study focuses on the instructors currently employed at the local college of Sto. Tomas Davao del Norte with 5 years experience in teaching. The total population size of this study is 100 instructors, all of whom were included in the research. This approach is known as a census sampling method, which involves collecting data from every individual within the population. This method provides a comprehensive view of the population, capturing the perspectives of all instructors without exception. It ensures that every voice is heard, and no perspective is left unexplored.

Research Instrument

Three adopted research instruments were used in this study, as well as one researcher-made survey questionnaire. These were selected and modified to match the overall objectives of the study. The three research instruments were validated by a panel of experts. Moreover, the Cronbach alpha value was determined in order to test the internal consistency of the items.

Perceived Algorithmic Autonomy-Support Scale (PAAS) Questionnaire. The PAAS has been found to be a reliable instrument to measure Perceived Algorithmic Autonomy-Support (Jabagi, Croteau, Audebrand, & Marsan, 2021). For reliability, the following are the Cronbach alpha values of each variable of the questionnaire: Acknowledging Perspectives =0.85, Offering Choices=0.86, Providing Rationale = 0.80 and Presence Of Pressure = 0.81 which indicated strong reliability.The PAAS consisted of 31 items anchored on a 5-point scale ranging from: Strongly agree – 4, Agree – 3, Neither Agree nor Disagree – 2, Disagree – 1. Strongly Disagree.

Parameter Limits	**Descriptive Equivalent**	**Interpretation**
4.20 – 5.00	Very High	This indicates that instructors perceived algorithmic autonomy-support is very much observed.
3.40 – 4.19	High	This indicates instructors perceived algorithmic autonomy-support is much observed.
2.60 – 3.39	Moderate	This indicates instructors perceived algorithmic autonomy-support is moderately observed.
1.80 – 2.59	Low	This indicates instructors perceived algorithmic autonomy-support is less observed.
1.00 – 1.79	Very Low	This indicates instructors perceived algorithmic autonomy-support is least observed.

Attitudes Towards Computer Scale (ATCS) Questionnaire. The ATCS has been found to be a reliable instrument to measure attitude towards computers (Sexton, King, Aldridge and Goodstadt-Killoran,1999). For reliability, the following are the Cronbach alpha values of each variable of the questionnaire: Adoption

Intention (AI)= 0.714, Perceived Usefulness (PU)= 0.855, and Perceived Ease of Use (PEU)= 0.853, which indicated strong reliability. The ATCS consisted of 21 items anchored on a 5-point scale ranging from: Strongly agree – 4, Agree – 3, Neither Agree nor Disagree – 2, Disagree – 1. Strongly Disagree.

Parameter Limits	**Descriptive Equivalent**	**Interpretation**
4.20 – 5.00	Very High	This indicates that instructor's computer attitude is very much evident.
3.40 – 4.19	High	This indicates that instructor's computer attitude is much evident.
2.60 – 3.39	Moderate	This indicates that instructor's computer attitude is moderately evident.
1.80 – 2.59	Low	This indicates that instructor's computer attitude is less evident.
1.00 – 1.79	Very Low	This indicates that instructor's computer attitude ;is least evident.

Learning management system acceptance scale (LMSAS) Questionnaire. This questionnaire in its original form consists of four factors comprising 21 items in total. The factors are Performance Expectancy (9 items), Effort Expectancy (5 items), Social Influence (5 items) and Facilitating Conditions (3 items). For reliability, the following are the Cronbach alpha values of each variable of the questionnaire: Performance Expectancy = 0.75, Effort Expectancy =0.76, Social Influence =0.72 and Facilitating Conditions =0.83 which indicated strong reliability. The LMSAS consisted of 21 items anchored on a 5-point scale ranging from: Strongly agree – 4, Agree – 3, Neither Agree nor Disagree – 2, Disagree – 1. Strongly Disagree.

Parameter Limits	**Descriptive Equivalent**	**Interpretation**
4.20 – 5.00	Very High	This means that instructors learning management used are very much manifested.
3.40 – 4.19	High	This means that instructors learning management used are much manifested.
2.60 – 3.39	Moderate	This means that instructors learning management used are are is moderately evident.
1.80 – 2.59	Low	This means that instructors learning management used are are less manifested.
1.00 – 1.79	Very Low	This means that instructors learning management used are are least manifested

Data Gathering Procedure

The necessary data was gathered in a systematic procedure, which involved the following.

In gathering the data, the researcher will follow the steps.

Seeking Permission to conduct the study. The researchers asked permission to the College President of Sto. Tomas Davao del Norte to allow the researchers to conduct the study. Permission was asked for access to a specific population for the study from someone who was in charge of that population. For example, if you want to perform research in a school district, you would need to ask for permission from the superintendent (Liberty University, 2023).

Collection of Data. The researcher requested validation from the assigned evaluator to check and validate the questionnaire to ensure its validity and reliability. Then, the researchers personally coordinated with the students to collect the data.Data collection was systematic process of gathering observations or measurements. Whether you are performing research for business, governmental or academic purposes, data collection allows you to gain first-hand knowledge and original insights into your research problem (Bhandari, 2022).

Distribution and retrieval of the Questionnaire. The researchers distributed the questionnaire to the respondents in their vacant time. Upon the completion of the forms the researchers gathered the questionnaires.

Tabulation of Data. After collecting the questionnaires, the researchers retrieved and tabulated data with the guidance from statistician to analyze and interpret the data.

Statistical Treatment of Data

The findings of this study were examined and comprehended appropriately using the following statistical tools such as Mean, Standard Deviation, Pearson r, and Multiple Regression Analysis.

Mean. This is sometimes referred to as arithmetic mean, which is a value that summarizes a group of integers. In this study, this tool was utilized to address research questions 1, 2, and 3 in particular.

Standard Deviation. A standard deviation is a measure that expresses the dispersion of a dataset from its mean. This statistical tool was used to determine the degree to which the scores were spread out or close to the mean. This information was needed to respond to questions 1, 2 and 3

Pearson r. Pearson product-moment correlation, sometimes known as Pearson r, is the most extensively used correlation metric. This was used to respond to the research questions in 4.1, and 4.2.

Multiple Regression Analysis. Regression analysis is a collection of statistical procedures on evaluating those connections among one or more independent variables and a dependent variable. Moreover, in this quantitative study, this tool was used to answer 5 research question.

RESULTS AND DISCUSSION

This chapter presents the results and discussions of the study. In particular, this shows the data in tables and its corresponding descriptive interpretations.

Summary on the level of Perceived Algorithmic Autonomy Support

The table presents a summary of the level of Perceived Algorithmic Autonomy Support of Instructors. The indicators, namely, Acknowledging Perspectives, Offering Choices, Providing Rationale, and Presence of Pressure, all received a descriptive equivalent of “Very High”. The mean scores range from 4.23 to 4.35, indicating a high level of perceived autonomy support. The standard deviation values, ranging from 0.70 to 0.82, suggest a relatively low variability in the responses. This implies that the instructors are perceived to be highly supportive of algorithmic autonomy, consistently acknowledging perspectives, offering choices, providing rationale, and maintaining a low presence of pressure. The overall mean score of 4.29 this mean that the level of perceived algorithmic autonomy support of instructos is very much observed.

Table 1. Summary on the level of Perceived Algorithmic Autonomy Support of Instructors.

Indicators	SD	Mean	Descriptive Equivalent
1. Acknowledge Perspectives	.76	4.29	Very High
2. Offering Choices	.70	4.35	Very High

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3. Providing Rationale	.74	4.29	Very High
4. Presence of Pressire	.82	4.23	Very High
Overall	**.76**	**4.29**	**Very High**

The results are corroborated by the research of Martin and Dowson (2009) and Geitz et al. (2016), who discovered that when teachers offer a laid-back, unstructured, and independent learning environment, students demonstrate increased academic confidence in their ability to meet objectives and overcome obstacles. Additionally, Jingxian Zhao and Yue Qin's (2016) study discovered that instructor autonomy support is crucial for encouraging students to engage in deep learning. They discovered a partial relationship between college students' deep learning and their perception of their teachers' support for their autonomy. This shows that students may learn deeply if they experience high levels of perceived algorithmic autonomy-support.

Summary on the level of Computer Attitude of Instructors.

The table provides a summary of the level of Computer Attitude of Instructors. The indicators, namely, Affective Component, Perceived Usefulness, Perceived Control, and Behavioral Intention, all received a descriptive equivalent of "High" or "Very High". The mean scores range from 3.60 to 4.40, indicating a high level of positive computer attitude. The standard deviation values, ranging from 0.82 to 1.30, suggest a moderate variability in the responses. This implies that the instructors have a high affective component towards computers, perceive them as very useful, feel a high level of control when using them, and have a high behavioral intention to use them. The overall mean score of 3.98 this mean that the level of Computer attitude of instructors is much evident.

Table 2. Summary on the level of Computer Attitude of Instructors.

Indicators	**SD**	**Mean**	**Descriptive Equivalent**
1. Affective Component	1.09	3.82	High
2. Perceived Usefulness	.82	4.40	Very High
3. Perceived Control	.91	4.11	High
4. Behavioral Intention	1.30	3.60	High
Overall	**1.03**	**3.98**	**High**

Several authors, like Hemalatha and Devi (2013), who did a critical literature review on the use of information and communication technology (ICT) in education, support the high degree of computer attitude among instructors, as shown by your results. The significance of in-service and teachers' attitudes, views, and confidence in using ICT is highlighted by their research findings. The influence of computer attitude on learner-instructor interaction in online learning was brought to light by Seo et al. (2021), they discovered that attitudes toward computers provide useful assistance for online teaching and learning, including automating mundane chores for instructors, customizing learning for students, and enabling adaptive evaluations. This implies that instructors with a high degree of computer attitude may be able to improve the efficacy of these AI systems in online learning settings. Furthermore, Almagro et al (2019), it is also highlighted that students have a modest level of confidence and feelings in their capacity to use a computer in a classroom setting.

Summary on the level of Learning Management System of Instructors.

The table provides a summary of the level of Learning Management System (LMS) use by instructors. The indicators, namely, Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions, all received a descriptive equivalent of "High" or "Very High". The mean scores range from

4.12 to 4.26, indicating a high level of positive attitude towards LMS use. The standard deviation values, ranging from 0.78 to 0.84, suggest a moderate variability in the responses. This implies that the instructors have a high-performance expectancy from the LMS, perceive the effort expectancy as high, are influenced by social factors, and perceive the facilitating conditions as high. The overall mean score of 4.17 this indicate that the learning management system of instructors is much manifested.

Table 3. Summary on the level of Learning Management System of Instructors.

Indicators	**SD**	**Mean**	**Descriptive Equivalent**
1. Performance Expectancy	.78	4.26	Very High
2. Effort Expectancy	.84	4.14	High
3. Social Influence	.79	4.17	High
4. Facilitating Conditions	.83	4.12	High
Overall	**0.81**	**4.17**	**High**

Significance of the Relationship between Perceived Algorithmic Autonomy-Support and Computer Attitude on Learning Management Systems

The table presents the correlation between Perceived Algorithmic Autonomy-Support and Computer Attitude on Learning Management Systems. The correlation coefficient (r) for Perceived Algorithmic Autonomy-Support to Learning Management Systems is 0.814, indicating a strong positive correlation. This suggests that as the level of Perceived Algorithmic Autonomy-Support increases, the use of Learning Management Systems also increases. The p-value for this correlation is 0.000, which is less than the commonly used significance level of 0.05. This leads to the rejection of the null hypothesis (Ho), suggesting that the correlation is statistically significant.

Table 4. Shows the relationship between Perceived Algorithmic Autonomy-Support and Computer Attitude on Learning Management Systems

Variables Correlated	**r**	**p-value**	**Decision on H_o**	**Decision on Relationship**
Perceived Algorithmic Autonomy-Support to Learning Management Systems	0.814	0.000	Reject	Significant
Computer Attitude on Learning Management Systems	0788	0.000	Reject	Significant

In the case of Computer Attitude on Learning Management Systems, the correlation coefficient (r) is 0.788, also indicating a strong positive correlation. This implies that as the Computer Attitude improves, the use of Learning Management Systems increases. Similar to the previous case, the p-value for this correlation is 0.000, leading to the rejection of the null hypothesis (Ho). This indicates that the correlation is statistically significant. Therefore, both Perceived Algorithmic Autonomy-Support and Computer Attitude have a significant relationship with Learning Management Systems. These results underscore the importance of both Perceived Algorithmic Autonomy-Support and Computer Attitude in the effective use of Learning Management Systems.

A study on the links between perceived teacher autonomy support and learning management systems was undertaken by Hu, Shan, and Jiao (2023), which supports the high positive correlation between perceived algorithmic autonomy-support and the adoption of LMSs. They discovered that by improving the learning management system, perceived support for teacher autonomy may either directly or indirectly increase learning engagement. This is consistent with the strong association shown in the table, which indicates that learning management system utilization rises with perceived algorithmic autonomy-support.

Additionally, Bradley (2021) found a high positive link between computer attitude and the use of learning management systems (LMS) in online training. The research conducted by the authors highlights the significance of teachers striking a balance between implementing recommendations from the authorized curriculum and utilizing LMS technical resources in order to facilitate active learning. Similarly, Maslov (2021) investigated how learning management system users interact with them. They discovered that online classroom environments provided by Learning Management Systems (LMS) boost the learning process. This implies that instructors who have a positive computer attitude may be able to increase the efficacy of learning management systems in online learning settings.

Regression Analysis on the Perceived Algorithmic Autonomy-Support and Computer Attitude on Learning Management Systems in Higher Education Institutions

Regression analysis was performed to determine the significant influence of Learning Management Systems towards Perceived Algorithmic Autonomy-Support and Computer Attitude of Instructors.

The regression analysis on the Perceived Algorithmic Autonomy-Support and Computer Attitude on Learning Management Systems in Higher Education Institutions reveals significant findings. The unstandardized coefficient (B) for Perceived Algorithmic Autonomy-Support is 0.550, with a standard error of 0.078. The standardized coefficient (Beta) is 0.486. The t-statistic is 7.056, and the p-value is 0.000, which is less than the significance level of 0.05. This leads to the rejection of the null hypothesis, indicating that Perceived Algorithmic Autonomy-Support has a significant positive effect on the use of Learning Management Systems.

Similarly, for Computer Attitude, the unstandardized coefficient (B) is 0.426, with a standard error of 0.070. The standardized coefficient (Beta) is 0.420. The t-statistic is 6.102, and the p-value is 0.000, leading to the rejection of the null hypothesis. This suggests that Computer Attitude also has a significant positive effect on the use of Learning Management Systems. The F-ratio of the model is 177.702, indicating a good fit, and the Adjusted R Square is 0.850, suggesting that approximately 85% of the variance in the use of Learning Management Systems can be explained by Perceived Algorithmic Autonomy-Support and Computer Attitude. These results underscore the importance of both Perceived Algorithmic Autonomy-Support and Computer Attitude in the effective use of Learning Management Systems in Higher Education Institutions.

Table 5. Regression Analysis on the Perceived Algorithmic Autonomy-Support and Computer Attitude on Learning Management Systems in Higher Education Institutions

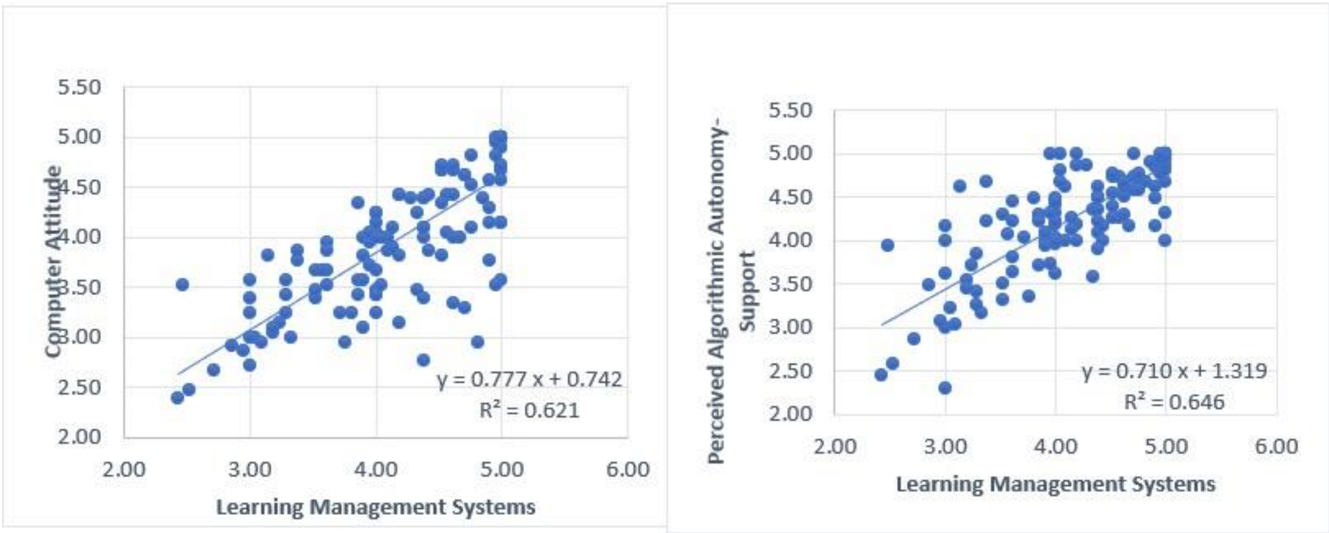
Independent Variable	**Unstandardized Coefficients**		**Standardized Coefficients**	**t-stat**	**p-value**	**Decision@ α = 0.05**
	B	**Standard Error**	**Beta**			
(Constant)	0.126	0.223		.568		
Perceived Algorithmic Autonomy-Support	0.550	0.078	0.486	7.056	0.000	Rejected
Computer Attitude	0.426	0.070	0.420	6.102	0.000	Rejected

Dependent Variable: Learning Management Systems

F-ratio: 177.702

Adjusted R Square: 0.850

Figure 2. Graph of the Regression Analysis on the Perceived Algorithmic Autonomy-Support and Computer Attitude on Learning Management Systems in Higher Education Institutions



This result is consistent with the research of Jiang and Men (2013), who discovered that learning management systems have a major impact on college instructors' perceptions of support for their autonomy as lecturers. Additionally, they discovered that the relationship between students' self-efficacy and perceived teacher autonomy support is mediated by perceived peer support. This implies that students may learn deeply if they experience a high degree of perceived algorithmic autonomy-support, which may be enabled via learning management systems. The results of Kinowska and Sienkiewicz's (2022) study, which indicated that teachers balanced active learning with the use of technical resources from Learning Management Systems and directions from the qualified curriculum, corroborate this finding. Additionally, a study by Ilia Kim and Kim (2022) emphasized how learner-instructor interaction in online learning is affected by computer attitude. They discovered that learning management systems provide efficient assistance for virtual instruction and learning, enabling personalized learning for learners, streamlining regular work for teachers, and facilitating adaptive evaluations. This implies that teachers who have a positive computer attitude may be able to increase the efficacy of these learning modules in online learning settings.

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter presents the summary of the major findings of the study, the conclusions, and proposed recommendations for possible implementations.

Summary of Findings

1. The study assessed the perceived algorithmic autonomy support of instructors based on four indicators: Acknowledge Perspectives, Offering Choices, Providing Rationale, and Presence of Pressure. The participants, on average, rated each indicator very high, with mean scores ranging from 4.23 to 4.35 and an overall mean of 4.29. The standard deviation across all indicators was 0.76. This

suggests that instructors are perceived to strongly support algorithmic autonomy, as evidenced by their high ratings in acknowledging perspectives, offering choices, providing rationale, and maintaining a low presence of pressure. Overall, the instructors' perceived level of algorithmic autonomy support is characterized as very high according to the descriptive equivalents assigned to the mean scores.

2. The investigation into the computer attitude of instructors encompassed four key indicators: Affective Component, Perceived Usefulness, Perceived Control, and Behavioral Intention. The mean scores for these indicators ranged from 3.60 to 4.40, resulting in an overall mean of 3.98. The standard deviation across all indicators was 1.03. Notably, the instructors demonstrated a high level of perceived usefulness, with a mean score characterized as very high. The Affective Component and Perceived Control indicators also garnered high mean scores, indicative of a positive attitude, although slightly lower than perceived usefulness. Behavioral Intention, while rated high, exhibited a slightly lower mean score. Overall, the instructors' computer attitude is deemed high, with a positive disposition towards computer use and a particularly strong perception of its usefulness.
3. The evaluation of the Learning Management System (LMS) by instructors focused on four key indicators: Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions. Across these indicators, mean scores ranged from 4.12 to 4.26, resulting in an overall mean of 4.17. The standard deviation across all indicators was 0.81. Instructors expressed very high expectations in terms of Performance Expectancy, signifying a strong belief in the effectiveness of the LMS. Additionally, Effort Expectancy, Social Influence, and Facilitating Conditions received high mean scores, indicating positive perceptions regarding the ease of use, social support, and the availability of necessary resources for LMS utilization. Overall, the instructors' evaluation of the Learning Management System reflects a high level of satisfaction and positive perceptions, with an overall descriptive equivalent of "High."
4. The correlation analysis reveals a strong positive relationship between Perceived Algorithmic Autonomy-Support and Computer Attitude toward Learning Management Systems (LMS). The correlation coefficient (r) for Perceived Algorithmic Autonomy-Support to LMS is 0.814, and for Computer Attitude on LMS, it is 0.788. Both correlation coefficients are highly significant with p-values of 0.000, leading to the rejection of the null hypothesis (Ho). Therefore, it can be concluded that there is a significant positive relationship between instructors' perceived algorithmic autonomy-support and their computer attitude toward Learning Management Systems. This suggests that as instructors perceive higher levels of algorithmic autonomy-support, their overall attitude towards using LMS becomes more positive.
5. The regression analysis investigated the relationship between the perceived algorithmic autonomy-support, computer attitude, and their impact on the dependent variable, Learning Management Systems (LMS) in Higher Education Institutions. The results indicate that both Perceived Algorithmic Autonomy-Support and Computer Attitude have a significant impact on LMS. For the Perceived Algorithmic Autonomy-Support, the unstandardized coefficient (B) is 0.550 with a standard error of 0.078. The standardized coefficient (Beta) is 0.486. The t-statistic is 7.056, and the p-value is 0.000, leading to the rejection of the null hypothesis. Similarly, for Computer Attitude, the unstandardized coefficient is 0.426 with a standard error of 0.070, and the standardized coefficient is 0.420. The t-statistic is 6.102, and the p-value is 0.000, also resulting in the rejection of the null hypothesis. The overall model is significant, as indicated by the F-ratio of 177.702 with an associated p-value of 0.000. The adjusted R Square is 0.850, suggesting that the model explains 85% of the variance in the dependent variable. In summary, both perceived algorithmic autonomy-support and computer attitude significantly contribute to the prediction of instructors' attitudes towards Learning Management Systems in Higher Education Institutions.

Conclusion

The findings from the study led the researcher to draw the following conclusions:

1. Perceived Algorithmic Autonomy-Support is very high.
2. Computer Attitude is High.
3. Learning Management System is High.
4. There is a significant relationship between Perceived Algorithmic Autonomy-Support has a significant relationship with learning management system. Similarly, computer attitude has a significant relationship with learning management system.
5. Perceived Algorithmic Autonomy-Support significantly influence Learning management. Similarly, computer attitude significantly influences with instructors' learning management system.

Recommendations

Based on the findings, analysis, and conclusion drawn in this study, the following recommendations were summarized:

1. Based on the findings, analysis, and conclusions drawn in this study, several recommendations are proposed for instructors, school administrators, and CHED officials. Firstly, instructors are encouraged to enhance their perceived algorithmic autonomy-support to foster a positive attitude towards Learning Management Systems (LMS). This could involve implementing strategies such as acknowledging diverse perspectives, providing choices, and explaining the rationale behind algorithmic decisions. School administrators should prioritize the facilitation of a supportive environment for instructors, including the provision of resources and training to improve computer attitudes. Additionally, CHED officials are advised to consider policies that promote algorithmic autonomy-support in the context of LMS usage, recognizing its impact on overall instructor satisfaction. Collaborative efforts among these stakeholders can contribute to a more effective integration of technology in higher education, ultimately benefiting both instructors and students.
2. The entire study emphasized the pivotal role of perceived algorithmic autonomy-support and positive computer attitudes in influencing instructors' engagement with Learning Management Systems (LMS) in higher education institutions. The findings underscore the significance of acknowledging diverse perspectives, offering choices, and providing clear rationales in fostering instructors' perceived autonomy in algorithmic decision-making. The study highlights the positive correlation between perceived algorithmic autonomy-support and computer attitudes, suggesting that interventions targeting increased autonomy-support can contribute to a more favorable attitude toward LMS. This emphasis serves as a valuable guide for instructors, school administrators, and CHED officials in crafting policies and implementing initiatives that prioritize algorithmic autonomy-support, thereby enhancing the successful integration of LMS into higher education settings.
3. Future researchers must conduct further research that will focus on delving deeper into the nuanced dynamics between perceived algorithmic autonomy-support, computer attitudes, and their impact on Learning Management Systems (LMS) in higher education. It is recommended to explore specific instructional contexts and diverse academic disciplines to discern potential variations in the relationships identified. Additionally, investigating the role of individual differences, such as technological proficiency and teaching experience, could provide valuable insights. Further research should also consider longitudinal studies to examine the sustainability and evolution of instructors' attitudes over time. Qualitative research methods, including interviews and observations, could offer a richer understanding of the intricate factors influencing instructors' perceptions and behaviors in the realm of algorithmic autonomy-support and LMS utilization. This comprehensive approach will contribute to a more robust knowledge base, informing evidence-based interventions and policies in the ever-evolving landscape of educational technology.

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Optimizing Educational Management: A Quantitative Exploration of the Influences of Perceived Algorithmic Autonomy-Support and Computer Attitude on Learning Management Systems in Higher Education Institutions

Perceived Algorithmic Autonomy-Support Scale (PAAS) Questionnaire

The PAAS has been found to be a reliable instrument to measure Perceived Algorithmic Autonomy-Support (Jabagi, Croteau, Audebrand, & Marsan, 2021). The PAAS consisted of 31 items anchored on a 5-point scale ranging from: *Strongly agree – 4, Agree – 3, Neither Agree nor Disagree – 2, Disagree – 1. Strongly Disagree.*

ACKNOWLEDGING PERSPECTIVES *As a user, my observation is that…*	**Strongly Agree (5)**	**Agree (4)**	**Neither Agree nor Disagree (3)**	**Disagree (2)**	**Strongly Disagree (1)**
1. The platform gathers relevant information to understand my personalized needs.					
2. The platform allows me to specify my work preferences using filters and other advanced settings.					
3. The platform gathers relevant personal performance data before suggesting a new way to do things via app notifications or email.					
4. The platform allows me to accurately rate clients.					
5. When a client rates me, the platform does not include unfair or abusive clients' feedback in my overall performance rating.					
6. The platform provides me with a way to effectively contest unfair or abusive clients' feedback.					
7. The platform sets realistic expectations for me based on my personal situation and performance.					
8. When I contact customer service through the app, I feel that my thoughts and feelings are understood.					

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9. When I contact customer service through the app, I feel that my opinion and point of view are considered.					
OFFERING CHOICES *As a user, my observation is that…*					
10. The platform allows me to choose more desirable option.					
11. The platform allows me to control my work performance.					
12. I am free to choose the way I carry out my work.					
13. I have control over the scheduling of my work.					
14. I have control over what I am supposed to accomplish when working on the platform.					
15. I set my own goals while working on the platform.					
16. The platform provides me with the information I need to take adequate decisions concerning my work.					
17. The platform's tools and features enable me take adequate decisions concerning my work.					
18. The platform provides sufficient tools and features for me to do my job the way I want.					
PROVIDING RATIONALE *As a user, my observation is that…*					
19. When the platform sends me performance advice (via app notifications or email), it explained why they wanted me to do it.					
20. The platform provides information about how it matches to my needs.					
21. When the platform does not allow me to do something, it explains why.					
22. When the platform offers me a reward or promotion, it explains why.					
23. I understand why the platform has not offered me a reward or promotion yet.					
24. Platform penalties (e.g., deactivations,) are clearly explained.					
25. The platform provides me with constructive feedback to improve my performance.					

Presence Of Pressure *As a user, my observation is that…*					
26. When the platform provides feedback on my performance, I must follow their advice.					
27. I feel obligated to accept all rides.					
28. When conducting my work, I feel constantly monitored by the platform.					
29. The platform rating system prevents me from doing my job the way I want.					
30. When working on the platform, I often feel like I have to follow the platform's commands.					
31. When working on the platform, I feel forced to do things I do not want to do.					

Attitudes Towards Computer Scale (ATCS) Questionnaire

The ATCS has been found to be a reliable instrument to measure attitude towards computers (Sexton, King, Aldridge and Goodstadt-Killoran,1999). The ATCS consisted of 21 items anchored on a 5-point scale ranging from: *Strongly agree – 4, Agree – 3, Neither Agree nor Disagree – 2, Disagree – 1. Strongly Disagree.*

A. Affective Component	**Strongly Agree (5)**	**Agree (4)**	**Neither Agree nor Disagree (3)**	**Disagree (2)**	**Strongly Disagree (1)**
1. If given the opportunity to use a computer, I am afraid that I might damage it in some way					
2. I hesitate to use a computer for fear of making mistakes I can't correct					
3. I don't feel apprehensive about using a computer					
4. Computers make me feel uncomfortable					
5. Using a computer does not scare me at all					
6. I hesitate to use a computer in case I look stupid					
B. Perceived Usefulness (PU)					
7. Computers help me improve my work better					

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8. Computers make it possible to work more Productively					
9. Computers can allow me to do more interesting and imaginative work					
10. Most things that a computer can be used for I can do just as well myself					
11. Computers can enhance the presentation of my work to a degree which justifies the extra work					
C. Perceived Control Component					
12. I could probably teach myself most of the things I need to know about computers					
13. I can make the computer do what I want it to					
14. If I get problems using the computer, I can usually solve them one way or the other					
15. I am not in complete control when I use a computer					
16. I need an experienced person nearby when I use a computer					
17. I do not need someone to tell me the best way to use a computer					
D. Behavioural Intention Component					
18. I would avoid taking a job if I knew it involved working with computers					
19. I avoid coming into contact with computers in school					
20. I only use computers at school when I am told to					
21. I will use computers regularly throughout school.					

Learning management system acceptance scale (LMSAS) Questionnaire

This questionnaire in its original form consists of four factors comprising 21 items in total. The factors are Performance Expectancy (9 items), Effort Expectancy (5 items), Social Influence (5 items) and Facilitating Conditions (3 items) .

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A. Acknowledging Perspectives	**Strongly Agree (5)**	**Agree (4)**	**Neither Agree nor Disagree (3)**	**Disagree (2)**	**Strongly Disagree (1)**
1. Using an LMS in my courses enables me to accomplish.					
2. Using an LMS in my courses improves my performance.					
3. Using an LMS in my courses improves my productivity.					
4. Using an LMS in my courses improves my motivation.					
5. Using an LMS in my courses makes it easier to do my work assignment.					
6. Using an LMS in my courses improves the quality of the work I do					
7. I find using an LMS in my courses useful.					
8. Using an LMS in my courses enhances the effectiveness of the learning process					
B. Offering Choices					
9. I find learning how to use an LMS is easy.					
10. I can easily use an LMS.					
11. I can accomplish tasks more quickly when I use an LMS.					
12. I feel comfortable when using an LMS.					
13. I can do anything I want using an LMS.					
C. Providing Rationale					
14. I have the required information to make effective use of an LMS.					

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13. I can do anything I want using an LMS.					
C. Providing Rationale					
14. I have the required information to make effective use of an LMS.					
15. There are people I can turn to for support when I have difficulty using an LMS.					
16. Using an LMS is similar to using other computer systems.					
17. When using an LMS I know who to ask for help to solve problems I encounter.					
18. The help function of an LMS is sufficient to solve the problems I encounter.					
D. Behavioural Intention Component					
19. People around me think that it is important for me to make effective use of an LMS. computers					
20. My effective use of an LMS increases my prestige among fellow instructors.					
21. Friends of mine who make effective use of an LMS have more prestige.					