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PENS TO LENS: A Sequential Explanatory Study Learning Engagement through CSU Learning Environment Network System of Pre-service Elementary Teachers of CSU Lal-lo

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ABTRACT

This research study employed a sequential explanatory approach to investigate the learning engagement of pre-service elementary teachers at CSU Lal-lo using the Cagayan State University Learning Environment Network System (LENS). The primary objective was to assess whether the utilization of LENS had a positive impact on the academic performance of the students. The study utilized an Explanatory Sequential Mixed Method Design, comprising two distinct phases of data collection and analysis. In the first phase, quantitative data was gathered through survey questionnaires distributed among the entire population of BEED students at CSU Lal-lo. This initial phase aimed to provide a comprehensive overview of the research constructs. The quantitative findings served as a foundation for the subsequent qualitative phase. In the qualitative phase, semi-structured interviews were conducted to validate the quantitative results and gain deeper insights into student engagement with LENS. The results of the study revealed that pre-service elementary teachers frequently used the CSU-LENS. Interestingly, male respondents demonstrated higher LENS usage than females, and unmarried individuals utilized LENS more than their married counterparts. Furthermore, the study found that BEED students displayed high levels of engagement in their learning through the use of LENS during online learning. To collect data, the researchers employed both quantitative and qualitative methods. They initiated data collection with a quantitative survey, followed by qualitative interviews with purposefully selected participants among the pre-service elementary teachers. This school-based study was conducted at Cagayan State University Lal-lo Campus, specifically at the College of Teacher Education. It exclusively focused on BEED students, aiming to explore the potential of future elementary teachers as catalysts for integrating technology into elementary education.

Keywords: *pre-service elementary teachers, learning engagement, LENS (Learning Environment Network System), explanatory sequential mixed method design*

INTRODUCTION

Recent technological advancements have significantly enhanced our capacity for long-distance communication and collaboration. As technology continues to evolve, both workplaces and classrooms undergo transformations through the integration of new technologies. The widespread use of computers and smartphones has expanded the boundaries of work and learning, making face-to-face communication no longer the sole option. This shift has given rise to the concept of the virtual workplace, where individuals separated by geographical distances can function as a unified organization through virtual environments, computer-mediated communication, and other long-distance communication methods (Wasko et al., 2011). The impact of technological changes in the workplace extends to educational settings as well. Educational institutions, especially at the post-secondary level, have embraced Information and Communication Technology (ICT) to keep pace with today's technology-driven society. Many universities offer online courses and utilize learning management systems (LMS), which consist of tools and features designed to facilitate coursework and learning (Dahlstrom and Bichsel, 2014). Higher education institutions with internet capabilities have introduced online courses, allowing students who cannot physically attend classes on-site to participate (Klassen & Vogel, 2003).

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According to Young (2006), online learning has revolutionized instructional methods and the role of instructors, particularly through distance learning.

Online learning, as defined by the ITT Technical Institute (2007), enables students to learn at their own pace and access their educational programs flexibly, accommodating other commitments such as work and family responsibilities. Consequently, online learning has become an integral part of the educational system. The Chronicle of Higher Education (2003) reported that approximately 89% of students in U.S. public four-year higher education institutions had access to some form of online learning, while two-year public institutions provided online learning to about 90% of students. Globally, nearly 99% of higher education institutions, including universities and colleges, employ some form of LMS application to deliver their services (Dahlstrom, Brooks, & Bichsel, 2014).

However, the outbreak of COVID-19, initially identified in Wuhan, China, in late December 2019, quickly spread worldwide, affecting the Philippines as well. In response, the government imposed a nationwide lockdown, enforcing social distancing and other health protocols, which resulted in the suspension of face-to-face classes in all Philippine institutions. Teachers and instructors faced the challenge of finding ways to continue teaching and delivering lessons to students. Utilizing online education to maintain interaction and learning engagement among students and remain connected with the school emerged as the most viable option. Consequently, Cagayan State University implemented an online learning management system known as CSU-LENS (Cagayan State University Learning Environment Network System). This system is deployed across all CSU campuses, enabling instructors at CSU Lal-lo to utilize it for simulating and motivating students to maintain their study routines.

CSU-LENS, the University's Learning Management System, employs various components, including online lectures, modules for students without internet access, and limited face-to-face classes for laboratory work, especially in fields like engineering, medicine, and other practical courses, with a maximum of five students per session, subject to approval from the Inter-Agency Task Force Authority. All course materials, modules, and interactive activities must be uploaded to LENS, and students are required to log in or sign up on the platform to engage with the uploaded content and coursework provided by instructors. Improving student performance, enhancing the learning experience, and encouraging active participation in the learning process remain top priorities in education, particularly in the context of the new normal. To address these goals, CSU Lal-lo incorporates the Learning Management System, CSU LENS, with faculty members from the College of Teacher Education actively experimenting and making efforts to use this online learning tool to deliver lessons and engage with students as they would in a traditional classroom setting.

In designing the framework for online learning, practical pedagogical concepts are essential, including facilitating student-to-student and student-to-instructor communication. To achieve this, suggestions include synchronous virtual classroom meetings via video conferencing platforms such as Zoom, Google Meet, and Messenger Room, as well as asynchronous activities that can be organized through teaching platforms like MOODLE, Google Classroom, and Messenger via Chat. These platforms allow for interactive activities such as quizzes, forums for recitation, essays, and concept maps to enhance interaction and engagement in online activities.

While the majority of modifications in delivering lessons and engaging students and teachers in CSU Lal-lo involve the use of LENS, some students face challenges in accessing this learning tool. Poor internet connectivity has made it difficult for some students to participate effectively in online discussions and learning activities using CSU-LENS, which may impact their academic performance and engagement. Although some instructors are considering alternatives like Messenger Room and Messenger chats, the proposed research study focuses specifically on

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the use of LENS as a Learning Management System tool, examining its impact on the academic performance and learning engagement of pre-service elementary teachers at CSU Lal-lo.

Therefore, the primary objective of this research study is to explore the learning engagement of pre-service elementary teachers at CSU Lal-lo, with a particular focus on their level of engagement using LENS. Additionally, the study aims to determine whether the use of LENS improves the academic performance of students.

Objectives of the Study

This study explored the learning engagement of the pre-service elementary teachers in the CSU Lal-lo, whether they are highly engaged using the LENS or not and checked whether using the LENS improves the academic performance of the students. Since face-to-face learning is shift to online learning because of the COVID-19 Pandemic, using the CSU-LENS as Learning Management System is a very new to most of the students of CSU Lal-lo and to the instructors that got the interest of the researchers in this topic along the way of experiencing this change especially for fellow students.

MATERIALS AND METHODS

Research Design

This study employed a Mixed Method Approach, integrating both quantitative and qualitative data to examine and validate the extent of learning engagement and academic performance of pre-service elementary teachers using the CSU Learning Environment Network System (LENS). The study followed an Explanatory Sequential Mixed Method Design, consisting of two distinct phases of data collection and analysis.

Sampling Technique

The study's population comprised students enrolled in the Bachelor of Elementary Education program at Cagayan State University – Lal-lo Campus during the Academic Year 2021-2022. A total of 98 students were purposively selected to participate in the research, with a focus on those residing in rural areas. This selection was made to accommodate both quantitative surveys and qualitative interviews.

Table 1. Total population of Bachelor of Elementary Education students in CSU Lal- lo

Year Level	Number of Students
First Year	45
Second Year	18
Third Year	22
Fourth Year	13
TOTAL	98

Locale of the Study

The research was conducted at Cagayan State University – Lal-lo Campus, specifically within the College of Teacher Education, as it centered on Bachelor of Elementary Education (BEED) students. The choice of this locale aligned with the study's objective to investigate future elementary teachers' experiences with technology utilization.

Research Instruments

The primary research instruments included closed-ended survey questionnaires administered via Google Forms for the quantitative phase and one-to-one semi-structured interviews conducted through messenger chat for the qualitative phase. These instruments were designed to gather both quantitative and qualitative data relevant to the study's objectives.

Data Gathering Procedure

Prior to commencing the study, formal permission was sought and obtained from the Dean of the College of Teacher Education, the CEO of CSU Lal-lo Campus, and the advisers of BEED Students from first year to fourth year through a letter of approval. Subsequently, the researchers administered the questionnaires to the selected respondents, providing clear explanations of the questionnaire's mechanics to ensure the accuracy of the responses. Following the quantitative data collection, the researchers analyzed the data.

Subsequently, the qualitative data collection was conducted through interviews, which served as a follow-up based on the analysis of the quantitative data. These interviews aimed to delve deeper into the experiences, struggles, and

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practices of BEED students using the CSU LENS.

Analysis of the Data/ Statistical treatment

The collected data, both quantitative and qualitative, were meticulously tallied, tabulated, and analyzed. For the quantitative data, descriptive statistics such as frequency counts, percentages, means, weighted means, and standard deviations were employed to analyze profiles, academic performance, LENS usage, and learning engagement. Regarding LENS usage, the extent was assessed using a predefined scale. The subsequent qualitative data from interviews provided additional insights to explain and complement the initial quantitative findings, especially in cases of insignificant results or when examining relationships between variables. This mixed method approach allowed for a comprehensive examination of the research questions and hypotheses, ensuring a well-rounded understanding of the study's objectives. The scale below was used in describing the respondent's extent of using the CSU Learning Environment Network System.

Table 2. Scale used for the extent of using the CSU LENS.

Scale	Weighted Mean	Descriptive Value
4	3.28 – 4.00	Always/ Always Used
3	2.52 – 3.27	Often/ Often Used
2	1.76 – 2.51	Sometimes/ Sometimes Used
1	1.00 – 1.75	Rarely/ Rarely Used

The scale below was used in determining the respondent's level of learning engagement using the CSU Learning Environment Network System.

Table 3. Scale for students level of learning engagement.

Scale	Weighted Mean	Descriptive Value
4	3.28 – 4.00	Always/ Very High Engagement
3	2.52 – 3.27	Often/ High Engagement
2	1.76 – 2.51	Sometimes/ Low Engagement
1	1.00 – 1.75	Rarely/ Very Low Engagement

The Pearson product moment, Kendall's Tau-b and point biserial correlation were used in determining the extent of relationship between the select profile variables and the LENS Usage and Learning engagement of Pre-service Elementary Teachers of Cagayan State University Lal-lo campus.

RESULTS AND DISCUSSION

Extent of Using the CSU – Learning Environment Network System

Presented in Table 4 is the extent of use of the CSU–Learning Environment Network System of the Bachelor of Elementary Education students of Cagayan State University at Lal-lo. It is evident in the table that the BEED students often find that the LENS useful in their online learning with a weighted mean of 2.99. The respondents claim to often check their respective LENS accounts every day to check the lessons and activities given to them ($\bar{x}$ =2.91) while utilizing it often to participate in the online discussion forum using the LENS ($\bar{x}$ = 2.90), to take quizzes and examinations ($\bar{x}$ = 2.81), and to comply or send outputs in learning tasks ($\bar{x}$ = 2.73).

A third-year respondent said during the interviews:

"I used the LENS to check whether there are quizzes, activities and exam that need to be completed, if there are files needed to download for offline reading, to answer forum questions and to pass or upload learning activities."

While the respondents use the LENS often in attending to their learning tasks, the respondents also consider utility of the LENS to be flexible in online learning ($\bar{x}$ = 2.73), allowing them often to accomplish more quickly the activities given by the teachers ($\bar{x}$ = 2.71), improve often their productivity ($\bar{x}$ = 2.63), confidence in learning ($\bar{x}$ = 2.66) and activeness and engagement in group discussion ($\bar{x}$ = 2.56) which they often consider to be helpful in improving their academic performance ($\bar{x}$ = 2.63).

This result is consistent with the claims of the respondents during the interviews that they are

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exerting their effort in their online learning with the LENS because they need to accomplish all the activities and pass all their exams and quizzes for them not to fail their subjects and also learn more knowledge especially in this time of pandemic. According to respondent 2, internet connections are not stable, so she need to looked for a strong signal before opening the LENS for not to cause an error during examinations and doing other features of the LENS.

Table 4. The respondents' extent of using the CSU Learning Environment Network System.

Statement	Weighted Mean (n=98)	Descriptive Value
Usefulness of LENS	2.99	Often found useful in online learning
Frequency of checking LENS accounts	2.91	Often check for lessons and activities
Participation in online discussion forums	2.90	Often used for online discussions
Taking quizzes and examinations	2.81	Often used for quizzes and exams
Compliance with learning tasks	2.73	Often used to complete and submit tasks
Flexibility in online learning	2.73	Considered flexible in online learning
Accomplishing tasks more quickly	2.71	Often helps in completing tasks quickly
Improvement in productivity	2.63	Often leads to improved productivity
Confidence in learning	2.66	Often boosts confidence in learning
Activeness and engagement in group discussions	2.56	Often enhances participation in discussions
Impact on academic performance	2.63	Often seen as helpful in improving performance
Difficulty accessing LENS due to internet issues	1.92	Often face difficulties due to poor internet
Ease of use for online learning	2.51	Not always considered easy for online learning
Challenges in scoring high on LENS exams	2.39	Sometimes a challenge to score high on exams
Comparison with traditional classes	2.39	Considered easier in traditional face-to-face classes
Overall Mean Score	2.64	Indicates frequent use of CSU LENS for classes

***Legend*:**

Weighted Mean		Descriptive Value
3.28 – 4.00	>>	*Always/ Always Used*
2.52 – 3.27	>>	*Often/ Often Used*
1.76 – 2.51	>>	*Sometimes/ Sometimes Used*
1.00 – 1.75	>>	*Rarely/ Rarely Used*

A first-year respondent said verbatim:
"I am motivated to learn using the LENS but at the same time, I was feeling nervous kasi baka biglang humina ang signal. Hindi ako maka move into the next question tapos mayroon pang time limit ang exam; madalas nauubos ang oras ko dahil sa hina ng internet /signal. Pero ginagawan ko parin naman ng paraan."

Despite the positive response of the respondents in terms of how frequent they use the LENS in their classes, the respondents find often difficulty accessing the LENS because of internet connection problems ($\bar{x}$ = 1.92), claiming that it's not easy to use it for online learning ($\bar{x}$ = 2.51). As a result, they feel that gaining high scores in examinations using the LENS is sometimes a challenge ($\bar{x}$ = 2.39) contending that taking examinations and other activities is still easier in traditional face-to-face classes than using the LENS ($\bar{x}$ = 2.39).

A senior participant said:
"I am feeling motivated to take examinations using the LENS however, I was feeling nervous because of internet connection because I experience a frequent crashing back of the LENS while taking the examination.

The overall mean of 2.64 however indicates that the BEED students use the CSULENS often for their classes. This proves that the CSU LENS provides teachers and students with an online classroom that reinforces learning processes during distance learning set-up purporting the claim of Dias and Dinis (2014), Jung and Huh (2019) Oakes (2002) as cited by Bradley (2021) that learning management system provides an inclusive learning environment for academic progress with interceding structures that promote online collaborative-groupings,

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professional training, discussions, and communication among other LMS users.

Level of Learning Engagement Using the CSU Learning Environment Network System

Table 5. The respondents' level of learning engagement using the CSU Learning Environment Network System

Aspect of Engagement	Mean Score
Attendance to Synchronous and Asynchronous Learning	2.86
Eagerness to Improve Academic Performance	2.81
Motivation and Interest	2.79
Review and Learning at Own Pace	2.79
Class Interaction	2.73
Activeness in Discussions and Forums	2.73
Asking Questions in Class	2.47
Engagement in Class Interactions	2.58
Doing Learning Tasks	2.79 to 2.85
Taking Examinations and Quizzes	2.85

***Legend*:**

Weighted Mean		Descriptive Value
3.28 – 4.00	>>	*Always/Always Used*
2.52 – 3.27	>>	*Often/ Often Used*
1.76 – 2.51	>>	*Sometimes/Sometimes Used*
1.00 – 1.75	>>	*Rarely/ Rarely Used*

Table 5 reveals that students have shown high levels of engagement when using LENS for both synchronous and asynchronous learning, with a mean score of 2.86. This high engagement is attributed to LENS's ability to maintain students' focus on the materials and their eagerness to improve academic performance, as indicated by a mean score of 2.81. The LMS also allows students to review and learn at their own pace, fostering motivation and interest ($\bar{x}$=2.79). The study suggests that BEED students actively participate in synchronous and asynchronous learning using LENS ($\bar{x}$=2.77).

This research emphasizes the significance of class interaction facilitated by LENS, with students reporting high engagement, motivation, and interest in online discussions and forums ($\bar{x}$=2.73). The LMS encourages students to interact with classmates and instructors virtually, making them more active and attentive compared to other online learning platforms. Students also feel comfortable asking questions, as reflected in a mean score of 2.47, contributing to their overall engagement in class discussions ($\bar{x}$=2.58).
Students' positive attitudes toward learning tasks and assessments in LENS, with students often finding exercises, learning tasks, and quizzes easy to accomplish and monitor ($\bar{x}$=2.79 to 2.85). They appreciate the ability to manage their time efficiently during examinations and receive immediate feedback from instructors ($\bar{x}$=2.62). Overall, these findings underscore the effectiveness of LENS in enhancing student engagement, motivation, and academic performance, aligning with the broader trends observed in the field of online education.

Relationship between the Profile Variables of the Respondents and their LENS Usage and Learning Engagement

Table 6 presents the relationship between the LENS usage and profile variable as well as their level of engagement across attendance to synchronous and asynchronous learning, class interaction, doing learning tasks, and taking examinations. Pearson product-moment, Kendall's tau-b and point biserial correlation analyses were run and revealed that the LENS usage of the BEED students and general weighted average (r=0.050, p=0.623) have no significant relationship. The current result does not confirm the initial findings of Dulkaman and Ali (2016) and Kim (2017) that using an LMS positively impacts the academic performance of students in class.

However, demographic profiles including age (r=-0.251, p=0.013), and civil status (r=-0.0208, p=0.040) were identified to have high significant association with LENS usage while sex (r=-0.290, p=0.004), year level (r=-0.468, p=0.000) and internet speed (r=0.333, p=0.001) show a significant correlation. The null hypothesis is then rejected which means that LENS usage and these profile variables are either positively or negatively related.

The results suggest that the younger ones use LENS more frequently but such usage declines

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as they get older, and move to higher year level. In terms of sex, males have more frequent LENS usage than females while singles have higher LENS usage than married ones.

The high significant relation of internet speed and LENS usage indicates that when respondents have faster internet speed, their LENS usage gets more frequent. This result recommends that to fully maximize the features and use of the LENS, the students should secure

Table 6. Correlation results between the profile variables of the respondents and their LENS usage and learning engagement

Variables	Correlation Coefficient	Probability	Statistical Inference
LENS Usage and			
Age	-0.251*	0.013	*Significant*
Sex	-0.290**	0.004	*Highly Significant*
Civil Status	-0.208*	0.040	*Significant*
Year Level	-0.468**	0.000	*Highly Significant*
General Weighted Average	0.050	0.623	*Not Significant*
Internet Speed	0.333**	0.001	*Highly Significant*
Level of Learning Engagement: Attendance to synchronous and asynchronous learning			
Age	-0.121	0.237	*Not Significant*
Sex	-0.291**	0.004	*Highly Significant*
Civil Status	-0.025	0.804	*Not Significant*
Year Level	-0.391**	0.000	*Highly Significant*
General Weighted Average	0.076	0.455	*Not Significant*
Internet Speed	0.256*	0.011	*Significant*
Level of Learning Engagement: Class Interaction			
Age	-0.134	0.189	*Not Significant*
Sex	-0.285**	0.005	*Highly Significant*
Civil Status	-0.138	0.176	*Not Significant*
Year Level	-0.342**	0.001	*Highly Significant*
General Weighted Average	0.105	0.302	*Not Significant*
Internet Speed	0.202*	0.046	*Significant*
Level of Learning Engagement: Doing Learning Tasks			
Age	-0.087	0.394	*Not Significant*
Sex	-0.319**	0.001	*Highly Significant*
Civil Status	-0.032	0.752	*Not Significant*
Year Level	-0.382**	0.000	*Highly Significant*
General Weighted Average	0.052	0.610	*Not Significant*
Internet Speed	0.219*	0.030	*Significant*
Level of Learning Engagement: Taking examinations			
Age	-0.325**	0.001	*Highly Significant*
Sex	-0.259**	0.010	*Highly Significant*
Civil Status	-0.218*	0.031	*Significant*
Year Level	-0.466**	0.000	*Highly Significant*
General Weighted Average	0.001	0.994	*Not Significant*
Internet Speed	0.263**	0.009	*Highly Significant*

The results contradict the findings of Basil C. E. Oguguo (2020) which states that students taught using LMS (Moodle) performed better than those exposed to the CAI4ME Package and was equally revealed that female students performed better than the males in both the two approaches although the male students recorded a higher gain score.

a strong and stable internet connection as this guarantees their access to the learning platform. The Table also shows the correlational analyses results on the relationship of the profile variables and the domains of learning engagement in the LENS. It can be gleaned on the table that sex (r=-0.291, p=0.004), year level (-0.391, p=0.000), and internet speed (r=0.256, p=0.011) were found to maintain a

significant relationship with attendance to synchronous and asynchronous learning. This means that male respondents have better attendance to synchronous and asynchronous learning than females while such attendance gets worse as they move to higher year level. This implies that male BEED students are more engaged with online classes than their female counterparts. Comparing in terms of year levels, those in the higher levels are less engaged in the LENS whenever there are synchronous or asynchronous activities uploaded by an instructor in the learning management system.

On the other hand, the positive relationship between the respondents' internet speed and their attendance to synchronous and asynchronous learning means that with faster internet speed, attendance at classes online gets better. In terms of participating into class interactions, only sex and year level are revealed to have significant relationship with learning engagement in the LENS. The result for sex (r=-0.285, p=0.005) means that males have better class interactions in the LENS compared to females. The result (r=-0.342, p=0.001) for year level suggests that class interactions in the LENS of the BEED students get worse as they move to higher year levels. This implies that the first-year students are more interactive in the LENS than those in the higher levels. This result may be attributed to the fact that first year students are more excited to use new platforms in learning while those students in the higher levels would consider using the LENS for class interaction a customary engagement.

While it is expected that doing learning tasks is one of the fundamental features of the LENS and should foster common engagement among students, sex (-0.319, p=0.001), year level (r=-0.082, p=0.000) and internet speed (r=219, p=0.030) correlate to learning engagement. The result means that males can do learning tasks in the LENS better than females while such engagement declines as they move to higher year level. Also, those with faster internet connections have more established engagement than those with slow internet connections.

In terms of taking examination, only GWA is not found to be related with learning engagement. Age (r=-0.325, p=0.001), sex (r=-0.259, p=0.010), civil status (r=-0.218, p= 0.031) year level (r=-0.466, p=0.000) and internet speed (r= 263, p=0.009 were revealed to be significantly related to taking examinations as a factor in ensuring learning engagement. Implications include respondents' engagement in taking examinations gets worse as they get older and move to higher year level. As respondents' internet speed gets faster, their engagement in taking examinations gets better.

CONCLUSIONS

In the light of the findings of the study, it is concluded that the Pre-service elementary teachers are female dominated who have very satisfactory academic performance but with slow internet connections in different learning environment. The pre-service teachers often use the CSU-Learning Environment Network System or LENS and are highly engaged in using the LENS across the domains of learning engagement.

The following are also concluded in the study. The respondents' use of LENS gets less frequent as they get older. Meanwhile, male respondents have higher LENS usage than females and singles have higher LENS usage than married. The respondents' use of LENS gets less frequent as they move to higher year level. Furthermore, as respondents' internet speed gets faster, their LENS usage gets more frequent. Male respondents have better attendance to synchronous and asynchronous learning than females. Meanwhile, the respondents' attendance to synchronous and asynchronous learning gets worse as they move to higher year level.

In addition, as respondents' internet speed gets faster, their attendance to synchronous and asynchronous learning gets better and males have better class interaction than females. The respondents' class interaction gets worse as they move to higher year level. On the other hand, males can do learning tasks better than females. The respondents' completion of learning tasks gets worse as they move to higher year level.

Furthermore, the respondents' engagement in taking examinations gets worse as they get older and males have higher engagement in taking examinations than females. The respondents' engagement in taking examinations gets worse as they move to higher year level. And as respondents' internet speed gets faster, their engagement in taking examination gets better.

RECOMMENDATIONS

Based on the aforementioned findings, it is recommended that the College of Teacher Education take several actions. Firstly, considering the majority of pre-service teachers are females and males tend to exhibit better performance, usage, and engagement with the LENS platform, the college should consider developing and implementing training or capability-building initiatives to familiarize all pre-service teachers, regardless of gender, with the LENS features. This will help bridge the gap in terms of usage and engagement between male and female students, as well as those in their first year of study. Additionally, the college should explore the creation of programs such as an alumni relations program or an adopt-a-student program to provide support for students with slow internet connections, as this issue negatively impacts their ability to effectively use and engage with the LENS platform. Finally, it is advisable to expand the scope of the study beyond BEED students to investigate the relationship between academic performance, LENS usage, and learning engagement in a larger population of education students or those enrolled at CSU Lal-lo.

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