

Exploring the Learner Information System (LIS): A Usability Assessment on Enhanced Facility for Educators

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Abstract:- A Learner Information System (LIS) is a web-based tool that serves as a database for all students enrolled in basic education. The department implemented several facility enhancements to address identified problems with enrolling students, updating their profiles and statuses, and generating reports. However, to determine whether the system's facility augmentation is effective, it is crucial to look at the system's usability from the viewpoint of the end-user. This study aims to evaluate users' usability assessment of system quality, information quality, and interface quality of the system. A survey-type study that utilized a mixed method and adopted the Lewis Computer System Usability Questionnaire (CSUQ) with 19 questions and used a 7-point Likert scale. The study used convenience sampling of 30 out of 54 junior and senior high school teacher-advisers. The result of the study indicates that the responses have a positive perception of the three main factors of system usability assessment. The result also shows that only the information quality indicator significantly affects the length of service. Overall, the respondents were satisfied with their user's experience on the LIS.

Keywords:- Learner Information System; Usability Assessment; Computer System Usability Questionnaire.

I. INTRODUCTION

The Department of Education has implemented an innovative IT system that is utilized to effectively maintain track of all schools' profiles, organize school data, and preserve important school information. Both public and private schools have successfully integrated and utilized the LIS facility as a tool for maintaining student data (Ceniza, 2021). Learner Information System (LIS) is a web-based tool that acts as a national database of all learners enrolled in basic education. During the past few years, different facility upgrades have been implemented. The department deployed various facility enhancements to resolve identified issues in enrolling learners, updating learners' profiles and statuses, and generating reports. However, to ascertain the efficacy of the system's facility augmentation, it is essential to examine the system's usability from the perspective of the end user.

According to Bektas (2021), usability is a metric that gauges how easy it is for a particular user to utilize a system successfully and satisfactorily to complete a certain task in each environment. It encompasses not only interface design but also the technical operation of the entire system. It also refers to the efficacy, efficiency, and satisfaction with which users use computer systems to accomplish tasks (Bevan, 2009 as cited in Kruger et al., 2020). It finds any user experience issues with the system, offers solutions, and eventually decides whether the system is usable enough.

Since every experience of the user is distinct, the system benefits from their various points of view. These viewpoints are a result of user feedback that makes it evident what the system's advantages and disadvantages are. The feedback obtained will serve as the foundation for any additional system changes or future upgrades.

Hence, the objective of this research is focused on the users' assessment of DepEd's LIS in terms of System Quality to which a system is user-friendly and conforms with the functionality, reliability, flexibility, data quality, and integration required to carry out certain activities (Delone & McLean, 2003 as cited in Bouteraa et al., 2022); Information Quality that evaluates how well a system can store, transmit, and produce information and outputs (Delone & McLean, 2003 as cited in Al-Mamary, 2019); and Interface Quality with which user-perceived interface such as navigation, look, and arrangement.

II. LITERATURE REVIEW

A. Overview of Information System

In the current period of rapid technological improvement, most modern organizations substantially rely on contemporary IS systems, which makes them more dependent on IT to complete their daily routine activities (Farooq 2018; Salam 2020). An Information System (IS) is a collection of interconnected parts that gather, process, store, and distribute information to assist decision-making and control inside an organization (Laudon et al., 2014 as cited in Bourgeois, 2019). It can assist managers and staff in problem-solving, identifying

complicated phenomena, and developing new products, in addition to assisting decision-making, coordination, and control (Çelik et al., 2022). It has been an effective instrument for decades to support and improve education to meet the rising needs of society. (Leidner & Jarvenpaa, 1995 as cited in Nguyen et al., 2021).

On the other hand, while it is acknowledged as a useful tool for HEIs' management decisions, there have been numerous occasions when these systems' performance has been plagued by challenges (Dollado, 2022). Even though the institution benefited from the information system, various flaws have been identified that prevented it from meeting certain requirements for system quality, including issues with access and use, sluggish response time, hardware compatibility issues, unavailability issues, and system issues with software (Abidin et al., 2019). Information systems must be evaluated considering these problems.

B. Current State of DepEd Learner Information System

Evidence-based planning, resource allocation, and decision-making are supported by the National School Building Inventory (NSBI) and the Enhanced Basic Education Information System (EBEIS). Data were collected before the installation of these information systems. Consolidation required several months of hand-gathering. This obstacle has been considerably reduced. DepEd was able to consolidate field data more quickly using these two systems, allowing management to plan and estimate resource needs for each school year using data that was three to six months old rather than three years old (Joana et al., 2019).

The outcome of Matias et al. (2021) research study demonstrates that DepEd and LIS designers must improve the system's availability, efficiency, dependability, and security to make it easier for instructors to use and operate. Administrators, teachers in the classroom, and coordinators were satisfied with the way data were used in school administration, however, some schools require additional internet connectivity as well as more posted or written guides and instructions for using the online system (Lopez et al., 2023).

Since most respondents rated the system as incredibly useful, LIS appears to be a crucial tool in the education sector, but the system has several issues with its Management Support System, Information Quality, and Service Quality (Casipit, 2019). Whereas in the study of Fragata (2019), it was determined that both the LIS and EBEIS systems had exactly accurate and efficient interpretations of the activities measured for efficiency and quality.

Based on ISO 9126, it was determined that LIS was of excellent quality in terms of functionality, dependability, usability, efficiency, maintainability, and portability. 90% of users claimed that the system's primary issue was internet slowness when opening the system (Calugay et al., 2020).

C. Studies on Information Systems in Education

Massive amounts of standardized student data have been produced due to the digitization of traditional institutional data recording and storage. Student information systems (SIS) have been widely used to store and organize student profile data and academic records at educational institutions (Fischer, 2020).

Educational institutions must establish an information system as a tool for information collection, analysis, and usage for the efficient management of study programs and other activities (Hidayah et al., 2022).

In Permana et al., (2022) research result, the alumni information system's viability has been evaluated in terms of usability, functionality, and visual communication with "Very Good" criteria.

Also, Mkinga et al., (2020) study's findings demonstrated that the principal elements needed to ensure student information system (SIS) success are system performance, data accuracy, accessibility, utilization, and consumer fulfillment. User satisfaction and system usage, according to Efilolu Kurt (2019), both have positive and important effects on a system's success.

The findings of Martins et al., (2019) assist in clarifying that, as stated in information systems (IS) success models, both the frequency of education management information systems (EMIS) use and student satisfaction are strongly influenced by the quality of the information that is available and the intrinsic services provided by EMIS. Usability and convenience of use are essential elements in affecting attitude, which in turn influences user satisfaction of DI teachers to embrace such an online system (Saad et al., 2020).

III. METHODOLOGY

A. Research Methodology

A survey-type study that utilized a mixed method of research integrating a usability questionnaire created by Lewis (1995) with open-ended questions. In this study, descriptive statistics were used to describe the demographic profile of the respondents. It also utilized mean and standard deviation in treating the data on system quality, information quality, and interface quality. Furthermore, regression analysis was used to evaluate the given hypothesis:

Length of Service is significantly related to System Usability in terms of System Quality, Information Quality, and Interface Quality.

B. Survey Questionnaire

The Computer System Usability Questionnaire (Lewis, 1995) was utilized to evaluate the teacher-adviser's LIS user experience. It has 19 questions and uses a 7-point Likert scale. The answers to each question range from Strongly Agree to Strongly Disagree, and a Not Applicable point outside the scale.

This questionnaire consists of 3 main factors: system information, information quality, and interface quality. In addition, it has an open-ended question where the end-user points out their perspectives on the aspects of the system.

C. Respondents

The faculty from Tambulig National High School of Tambulig District both the junior and the senior high school, were the respondents of the study, particularly teachers with advisory functions.

The table below shows the number of respondents by department:

Table 1: Respondents of the Study

| | Male | Female | Total |
|-------------------------------------|------|--------|-------|
| Junior High | 6 | 29 | 35 |
| Senior High | 8 | 11 | 19 |
| Overall Total of Respondents | | | 54 |

D. Data Gathering Procedures

Before starting the study, a letter of consent requesting permission from various offices was written. After receiving approval, a face-to-face survey was used to collect data.

To assess the questionnaire's reliability, Cronbach's alpha test was used on 12 respondents in which statements were determined to be reliable.

The study used convenience sampling, which involves choosing respondents who are available and willing to take part. Out of 54 respondents, only 30 responded: 19 senior high and 11 junior high teachers. Not all junior high teacher-advisers were able to participate due to availability and willingness to respond. With this number of respondents, it can still draw accurate conclusions and findings since a sample size of 30 typically raises the confidence interval of the population data set enough to justify denials of your conclusions (Ganti, 2019).

E. Data Analysis

Google Forms and Spreadsheet were utilized to acquire the datasets. The responses of each faculty were generated from the Google form and downloaded as an Excel file. Then, exported to SPSS to analyze the consistency of each statement using Cronbach's alpha.

Table 2 presents the results of the reliability of the questionnaire used in the study.

Table 2: Cronbach's Alpha Test

| Indicators | Cronbach's Alpha | N of Items |
|---------------------|------------------|------------|
| System Quality | .939 | 10 |
| Information Quality | .937 | 5 |
| Interface Quality | .932 | 4 |

According to the findings, every indicator had a Cronbach's Alpha coefficient value that was higher than 0.5 for all the indicators. As a result, the questionnaire's complete set of items is accepted.

IV. RESULTS AND DISCUSSIONS

A. Demographic Profile

Table 3: Respondent's Statistics

| | Age | Length of Service |
|---------|-------|-------------------|
| Median | 32.00 | 5 to 6 years |
| Minimum | 24 | Below 1-year |
| Maximum | 51 | Above 10 years |

The descriptive statistics in Table 3 reveal important characteristics of the respondents' ages and lengths of service. The median age of the teachers is 32, indicating that half of them are younger than 32 and the other half are older. The age range spans from 24 to 51 years, with a minimum age of 24 and a maximum age of 51.

Regarding Length of Service, the median value is 5 to 6 years, indicating that half of the teachers have a length of service less than 5 to 6 years, and half have a length of service greater than 5 to 6 years. The range of Length in Service spans from less than a year to more than ten years, with the shortest length of service being below 1 year and the longest being Above 10 years.

B. LIS Usability Assessment

Table 4: Assessment on System Quality

| Indicators | Mean | Std. Deviation | Interpretation |
|---|------|----------------|----------------|
| It was simple to use this system. | 6.40 | 1.037 | Strongly Agree |
| I can effectively complete my work using this system. | 6.23 | .971 | Strongly Agree |
| I can complete my work quickly using this system. | 5.73 | 1.363 | Agree |
| I can efficiently complete my work using this system. | 6.07 | 1.081 | Agree |
| I feel comfortable using this system. | 6.17 | .950 | Strongly Agree |
| It was easy to learn to use this system. | 6.30 | .915 | Strongly Agree |
| I believe I became productive quickly using this system. | 6.13 | 1.042 | Agree |
| The system gives error messages that tell me clearly how to fix problems. | 5.83 | 1.392 | Agree |
| Whenever I make a mistake using the system, I recover easily and quickly. | 5.57 | 1.501 | Agree |
| Overall, I am satisfied with how easy it is to use this system. | 6.10 | .923 | Agree |

Table 4 shows that the respondents' responses suggest a positive perception of the system's quality. They strongly agreed that the system is simple, effective, and comfortable to use. They also expressed positive views on the system's ease of

learning and their ability to become productive quickly. The respondents indicated that they agree with the system's error handling and recovery mechanisms. Overall, it reported being satisfied with the system's ease of use.

Table 5: Assessment on Information Quality

| Indicators | Mean | Std. Deviation | Interpretation |
|--|------|----------------|----------------|
| The information (such as online help, on-screen messages, and other documentation) provided with this system is clear. | 6.07 | 1.048 | Agree |
| It was easy to find the information I needed. | 6.13 | .937 | Agree |
| The information provided for the system is easy to understand. | 6.23 | .817 | Strongly Agree |
| The information is effective in helping me complete the tasks and scenarios. | 6.23 | .935 | Strongly Agree |
| The organization of information on the system screens is clear. | 6.27 | .785 | Strongly Agree |

The results from Table 5 indicate that respondents perceive the Information Quality of the system positively. They agreed that the information provided is clear, easy to find, and effective in supporting their tasks and scenarios. Furthermore,

they strongly agreed that the information is easy to understand and that the organization of information on system screens is clear.

Table 6: Assessment on Interface Quality

| Indicators | Mean | Std. Deviation | Interpretation |
|---|------|----------------|----------------|
| The interface* of this system is pleasant. | 6.10 | .803 | Agree |
| I like using the interface of this system. | 6.13 | .776 | Agree |
| This system has all the functions and capabilities I expect it to have. | 6.00 | .910 | Agree |
| I am satisfied with this system. | 6.03 | .928 | Agree |

The assessment outcomes in Table 6 suggest that teacher-advisers hold positive perceptions of the Interface Quality. They agreed that the system interface is pleasant and expressed

a liking for using it. Additionally, it reported that the system meets its expected functions and capabilities, contributing to their overall satisfaction.

C. Hypothesis Testing

Table 7: Regression Analysis for Length of Service Dependent Variable

| Predictor | Unstandardized Coefficient | | Standardized Coefficient | t-value | Sig. |
|---------------------|----------------------------|------------|--------------------------|---------|------|
| | B | Std. Error | Beta | | |
| Constant | 9.476 | 2.042 | - | 4.641 | .000 |
| System Quality | -0.174 | 0.868 | -0.114 | -0.200 | .843 |
| Information Quality | 0.215 | 0.782 | 0.128 | 0.275 | .785 |
| Interface Quality | -0.893 | 0.611 | -0.507 | -1.463 | .156 |

The results in Table 7 indicated that the combined influence of System Quality, Information Quality, and Interface Quality had a significant effect on the Length of Service ($R^2 = .257$, $p < .05$). Among the individual predictors, only Information Quality showed a significant positive relationship with Length of Service ($\beta = 0.128$, $p > .05$), whereas System Quality and Interface Quality did not reach statistical significance ($p > .05$). The non-significant coefficients suggest that these variables may not be reliable predictors of Length of Service in this context.

Only the information quality indicator, out of the three, significantly affects the length of service. The information that the system provides is therefore more understandable, accessible, and useful in supporting their tasks and scenarios the longer they have been in service.

When accessing the system during the busiest season to generate reports, traffic difficulties need to be handled.

D. Users' Perspectives on the Aspects of the System

Respondents' viewpoints on some aspects of the system while using it. It can be easily reviewed. The data was accurate and easily generated SF reports.

However, some teachers listed that at the EOSY, there is a system traffic issue which makes it unresponsive in the most critical time for checking and validation of reports. There is little distinction between buttons. For senior high school facilities, SF 2, SF 9, and SF10 LIS-generated reports were not included.

V. CONCLUSIONS

Respondents perceived the system as user-friendly, effective, and capable of supporting efficient work completion. The positive responses indicated a favorable user experience with the system's quality attributes.

The system provided information as clear, easy to find, and effective in aiding task completion. The organization of information on system screens is well-structured. Overall, the positive responses indicated a favorable perception of the information quality of the system.

The system's interface was assessed as pleasant, functional, and capable of meeting their expectations. Users' satisfaction with the system suggests a positive overall interface experience.

REFERENCES

- [1]. Abidin, W. Y. N. W. Z., & Mansor, Z. (2019). The criteria for software quality in information system: Rasch analysis. *International Journal of Advanced Computer Science and Applications*, 10(9). <https://doi.org/10.14569/ijacsa.2019.0100911>
- [2]. Al-Mamary, Y. H. S. (2019). Measuring information systems success in yemen: Potential of delone and mclean's model. *International Journal of Scientific & Technology Research*, 8(7), 793-799.
- [3]. Bektas, A. (2021). What is Usability Design and How to Conduct a UX Usability Test. *User Guiding*. <https://userguiding.com/blog/usability-testing/>
- [4]. Bourgeois, D. (2019). Chapter 1: What Is an Information System? Open textbook. Site. <https://opentextbook.site/informationssystem2019/chapter/chapter-1-what-is-an-information-system-information-systems-introduction/#footnote-5-1>
- [5]. Bouteraa, M., Raja Hisham, R. R. I., & Zainol, Z. (2022). Bank Customer Green Banking Technology Adoption (pp. 64–102). <https://doi.org/10.4018/978-1-6684-4610-2.ch004>
- [6]. Buhari, B., Program, N. S., Tinggi, S., Kesehatan, I., & Jambi, H. I. (2020). The Effect of using Android-Based Applications (E-Patient Safety) as a Dissemination Media for Nurses on Patient Safety Goals. In *International Journal of Innovative Science and Research Technology* (Vol. 5, Issue 10). www.ijisrt.com

- [7]. Calugay, M. G. D., & Danlog, K. P. P. (2020). Software Quality Evaluation of Developed Learner's Information System. *Asian Journal of Multidisciplinary Studies*, 3(2).
- [8]. Casipit, K. (2019). Learner Information System (LIS) in the District of Rosario, Cavite: An Assessment. *Ascendens Asia Journal of Multidisciplinary Research Abstracts*, 3(2F).
- [9]. Çelik, K., & Ayaz, A. (2022). Validation of the Delone and McLean information systems success model: a study on student information system. *Education and Information Technologies*, 1-19.
- [10]. Ceniza, T. (2021). Experiences of Secondary School Heads in Using Learner Information System (LIS) Facility. *10.13140/RG.2.2.22180.81284*.
- [11]. Computer System Usability Questionnaire. (n.d.). Garyperlman.com. <https://garyperlman.com/quest/quest.cgi>
- [12]. Dollado, R. Jr. F. (2022). Functionality Performance of Information Systems in Higher Education Institutions. *Journal of Information Systems and Informatics*, 4(2). <https://doi.org/10.51519/journalisi.v4i2.250>
- [13]. Efiloğlu Kurt, Ö. (2019). Examining an e-learning system through the lens of the information systems success model: Empirical evidence from Italy. *Education and Information Technologies*, 24(2), 1173–1184. <https://doi.org/10.1007/s10639-018-9821-4>
- [14]. Fischer, C., Pardos, Z. A., Baker, R. S., Williams, J. J., Smyth, P., Yu, R., ... & Warschauer, M. (2020). Mining big data in education: Affordances and challenges. *Review of Research in Education*, 44(1), 130-160.
- [15]. Fragata, M. J. (2019). Implementation of the Management of Learner and Basic Education Information Systems in Schools Division of Quezon: Basis for the Proposed User Guide Manual. *Ascendens Asia Journal of Multidisciplinary Research Abstracts*, 3(8).
- [16]. Ganti, A. (2019). What Is the Central Limit Theorem (CLT)? *Investopedia*; [Investopedia. https://www.investopedia.com/terms/c/central_limit_theorem.asp](https://www.investopedia.com/terms/c/central_limit_theorem.asp)
- [17]. Hidayah STAI Rasyidiyah Khalidiyah Amuntai Kalimantan Selatan, A., & STAI Rasyidiyah Khalidiyah Amuntai Kalimantan Selatan, S. (2022). Internal Quality Assurance System Of Education In Financing Standards and Assessment Standards. In *Indonesian Journal of Education (INJOE)* (Vol. 2, Issue 3).
- [18]. Kalankesh, L. R., Nasiry, Z., Fein, R., & Damanabi, S. (2020). Factors Influencing User Satisfaction with Information Systems: A Systematic Review. *Galen Medical Journal*, 9, e1686. <https://doi.org/10.31661/gmj.v9i0.1686>
- [19]. Kruger, R., Brosens, J., & Hatingh, M. (2020). A Methodology to Compare the Usability of Information Systems. *Responsible Design, Implementation and Use of Information and Communication Technology: 19th IFIP WG 6.11 Conference on e-Business, e-Services, and e-Society, I3E 2020, Skukuza, South Africa, April 6–8, 2020, Proceedings, Part II*, 12067, 452–463. https://doi.org/10.1007/978-3-030-45002-1_39
- [20]. Lopez, A. A., & Lorejo, R. M. (2023). International Journal of Interdisciplinary Organizational Studies Effectiveness of Enhanced Basic Education Information System (EBEIS)/ Learner Information System (LIS) Data and School Management. 18(1), 2023.
- [21]. Martins, J., Branco, F., Gonçalves, R., Au-Yong-Oliveira, M., Oliveira, T., Naranjo-Zolotov, M., & Cruz-Jesus, F. (2019). Assessing the success behind the use of education management information systems in higher education. *Telematics and Informatics*, 38. <https://doi.org/10.1016/j.tele.2018.10.001>
- [22]. Matias, J. & Timosan, J. (2021). Examining Teachers' Use of Learning Information Systems (LIS) of the Basic Education Schools in the Philippines Using Structural Equation Modeling. *International Journal of Enterprise Information Systems*. 17. 69-84. <https://doi.org/10.4018/IJEIS.2021010104>
- [23]. Mkinga, M., & Mandari, H. (2020). Evaluating Students Information System Success Using DeLone and McLean's Model: Student's Perspective. *Journal of International Technology and Information Management*, 29(2), 24–42. <https://doi.org/10.58729/1941-6679.1447>
- [24]. Nguyen, A., Tuunanen, T., Gardner, L., & Sheridan, D. (2021). Design principles for learning analytics information systems in higher education. *European Journal of Information Systems*, 30(5). <https://doi.org/10.1080/0960085X.2020.1816144>
- [25]. Joana, D., Ocampo, S., & Lucasan, K. L. (2019). Key Issues in Governance, Finance, School Improvement, and ICT in Basic Education. <https://www.researchgate.net/publication/333309653>
- [26]. Permana, R., Budiman, R. D. A., Ramadhani, D., & Putra, A. A. (2022). Website Development for Alumni of Education Information Technology and Computer. *Jurnal Teknologi Informasi Dan Pendidikan*, 15(1), 28–37. <https://doi.org/10.24036/jtip.v15i1.526>
- [27]. Saad, A., & Daud, E. D. (2020). The acceptance of an online educational management information system (emis) among data and information teachers. *Journal of Information Systems and Digital Technologies*, 2(2), 1-17.
- [28]. Salam, M., & Farooq, M. S. (2020). Does sociability quality of web-based collaborative learning information system influence students' satisfaction and system usage? *International Journal of Educational Technology in Higher Education*, 17(1). <https://doi.org/10.1186/s41239-020-00189-z>