(RESEARCH ARTICLE)

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Usability, effectiveness, and satisfaction of students in using College of Education Automated Review (CEDAR)

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Abstract

In today's digital era, the success of educational technologies depends on their usability, effectiveness in supporting learning, and the satisfaction they provide to students. This study assessed the usability, effectiveness, and student satisfaction with the College of Education Automated Review (CEDAR) platform. A total of 139 education students from the second to fourth years were selected using stratified sampling. The study was conducted in one higher education institution in Misamis Occidental. Three validated surveys were utilized: the System Usability Scale (SUS), Mayer's Cognitive Theory of Multimedia Learning, and the Student Satisfaction Survey. Data were analyzed using Mean, Standard Deviation, Pearson Product-Moment Correlation Coefficient, and Simple Linear Regression. Results revealed a very high level of usability of CEDAR, and students perceived it to be very effective. Their level of satisfaction was also very high in terms of platform quality, learning experience, academic support, convenience, engagement, and motivation. Effectiveness was strongly observed in knowledge retention, comprehension, and exam preparedness. Significant correlations were found between usability and satisfaction, as well as effectiveness and satisfaction, with exam preparedness emerging as the strongest predictor of overall satisfaction. The study concludes that the CEDAR platform is a highly usable, effective, and satisfying tool that significantly supports students' learning needs. These findings highlight the importance of sustaining CEDAR's strengths while enhancing exam-related features, accessibility, and user-driven updates to further improve students' learning experiences.

Keywords: Automated review; Effectiveness; Exam preparedness; Student satisfaction; Usability

1. Introduction

In today's digital era, educational technologies have become essential tools in enhancing students' learning experiences. The success of these technologies depends largely on their usability, effectiveness, and the satisfaction they bring to learners. With the growing need for accessible and efficient review systems, the College of Education Automated Review (CEDAR) platform was developed to support education students in their academic preparation and review processes. CEDAR serves as a digital learning platform designed to provide organized, user-friendly, and interactive features that promote continuous learning and assessment readiness.

The main purpose of this study is to evaluate the usability, effectiveness, and students' satisfaction with the use of the CEDAR platform. Specifically, the study aims to determine how user-friendly the system is, how effective it is in promoting learning outcomes such as knowledge retention and exam preparedness, and how satisfied students are in using it as a review tool. Furthermore, it examines the relationship between the platform's usability and effectiveness and how these influence the level of student satisfaction.

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The variable CEDAR's Usability includes three indicators: *navigation*, *accessibility*, and *system efficiency*. These describe how students interact with and experience the functionality of the system. The variable CEDAR's Effectiveness consists of *knowledge retention*, *comprehension*, and *exam preparedness*, which determine how well the platform supports learning and examination readiness. The dependent variable, Student Satisfaction, encompasses *platform*, *learning experience and academic support*, *convenience and usability*, *engagement and recommendation*, and *confidence and motivation*. The study assumes that when the platform demonstrates high usability and effectiveness, students will show greater satisfaction in their review and learning experiences.

This study is significant because it provides evidence-based insights into how digital platforms like CEDAR can enhance the academic performance and motivation of education students. The results can serve as a foundation for improving CEDAR's design and functions to better meet learners' needs. Moreover, it emphasizes the role of technology-driven learning environments in promoting active engagement, convenience, and confidence among students. By understanding these relationships, educators and developers can sustain CEDAR's strengths and continuously improve its features to ensure that it remains an effective and satisfying educational tool.

2. Material and methods

2.1. Research Design

This study utilized a quantitative research approach employing a descriptive–correlational design to determine the relationships among the usability, effectiveness, and student satisfaction with the College of Education Automated Review (CEDAR) platform. The descriptive part focused on identifying students' perceptions of the platform's usability and effectiveness, while the correlational aspect examined how these factors influence student satisfaction. This design allowed the researchers to collect quantifiable data, enabling objective and statistical analysis that supports reproducibility by other researchers.

2.2. Setting

The study was conducted in the College of Education of a higher education institution in Ozamiz City, Misamis Occidental, Philippines. The college is known for its commitment to quality teacher education and innovative use of technology to support students' academic development. The CEDAR platform, a digital learning and review system, was developed to improve students' learning experiences and examination preparedness. This setting was chosen because of the college's active implementation of technology-assisted review programs.

2.3. Respondents

The study involved 139 education students enrolled in the second, third, and fourth years of the College of Education. Respondents were selected through stratified sampling to ensure fair representation across year levels—32 second-year, 50 third-year, and 57 fourth-year students.

Inclusion criteria required that participants:

- Be officially enrolled in the College of Education;
- Be active users of the CEDAR platform;
- Voluntarily agree to participate in the study; and
- Have used CEDAR for at least one academic term.

This respondent selection allows for reproducibility and ensures that data represent actual CEDAR users.

2.4. Research Instruments

Three validated survey instruments were used to measure CEDAR's usability, effectiveness, and students' satisfaction. Prior to their full administration, a pilot test with 30 education students was conducted to determine internal consistency using Cronbach's Alpha.

2.4.1. Usability of the CEDAR Platform

This instrument evaluated usability across three indicators—navigation, accessibility, and system efficiency. The 15-item survey was adapted from the System Usability Scale (SUS) by Brooke (1996), using a 5-point Likert scale. The pilot test yielded a Cronbach's Alpha of 0.889, indicating excellent reliability.

Interpretation of Mean Scores for the Usability of the CEDAR Platform

Response	Continuum	Interpretation
5 – Strongly Agree	4.20 – 5.00	Very High
4 – Agree	3.40 – 4.19	High
3 – Neutral	2.60 – 3.39	Moderate
2 – Disagree	1.80 – 2.59	Low
1 – Strongly Disagree	1.00 – 1.79	Very Low

2.4.2. Effectiveness of the CEDAR Platform

This instrument measured effectiveness in terms of knowledge retention, comprehension, and exam preparedness, based on Mayer's Cognitive Theory of Multimedia Learning (2005). The tool consisted of 15 items on a 5-point Likert scale, with a Cronbach's Alpha of 0.877, signifying high reliability.

Interpretation of Mean Scores for the Effectiveness of the CEDAR Platform

Response	Continuum	Interpretation
5 – Strongly Agree	4.20 – 5.00	Very Effective
4 – Agree	3.40 – 4.19	High
3 – Neutral	2.60 – 3.39	Moderate
2 – Disagree	1.80 – 2.59	Low
1 – Strongly Disagree	1.00 – 1.79	Very Low

2.4.3. Student Satisfaction with the CEDAR Platform

This instrument assessed student satisfaction through five indicators: platform, learning experience and academic support, convenience and usability, engagement and recommendation, and confidence and motivation. The 15-item survey used a 5-point Likert scale and produced a Cronbach's Alpha of 0.731, indicating acceptable reliability.

All instruments underwent expert validation by a panel of language education specialists to ensure clarity, relevance, and alignment with the study's objectives. Necessary modifications were made according to expert feedback. Since the questionnaires were adapted from established sources, the researchers properly acknowledged the original frameworks and instruments used.

Interpretation of Mean Scores for Student Satisfaction with the CEDAR Platform

Response	Continuum	Interpretation
5 – Strongly Agree	4.20 – 5.00	Very High
4 – Agree	3.40 – 4.19	High
3 – Neutral	2.60 – 3.39	Moderate
2 – Disagree	1.80 – 2.59	Low
1 – Strongly Disagree	1.00 – 1.79	Very Low

2.5. Data Gathering Procedure

Before data collection, formal permission was obtained from the Office of the Dean of the College of Education. A written letter of request was distributed to potential respondents explaining the purpose of the study and procedures involved.

After approval, the researchers conducted an orientation session to inform participants of their roles, rights, and confidentiality assurances. Respondents voluntarily completed the survey questionnaires, which were retrieved after sufficient time for thoughtful responses.

The data gathered were tallied, encoded, and analyzed systematically using descriptive and inferential statistics. This process ensures that the study can be replicated following the same methodological steps.

2.5.1. Ethical Considerations

This research involved human respondents and complied fully with ethical research standards. The study obtained approval from the College of Education Research Ethics Committee before data collection. Written informed consent was secured from all participants, who were informed about the purpose of the study, the voluntary nature of participation, and their right to withdraw at any time.

All information was treated with strict confidentiality, and participants' names or identifying details were not included in the published data. No animals were used in this research. The study posed no risk of physical, emotional, or psychological harm to participants. The researchers affirm that all ethical requirements were met, ensuring the validity and integrity of the findings.

2.5.2. Data Analysis

Data were analyzed using appropriate statistical tools as follows:

- **Mean** – to determine the overall levels of usability, effectiveness, and satisfaction with CEDAR;
- **Standard Deviation** – to measure the variability or consistency of responses; and
- **Pearson Product-Moment Correlation Coefficient** – to determine the strength and direction of the relationship among the three main variables.

These statistical analyses were conducted to identify significant correlations and provide a clear understanding of how CEDAR's usability and effectiveness influence students' satisfaction.

3. Results and discussion

3.1. Level of Usability of CEDAR

Table 1 presents the respondents' ratings of the CEDAR platform's usability in terms of navigation, accessibility, and system efficiency. The results show that all three areas received a *"Very High"* rating: Ease of Navigation (M = 4.24, SD = 0.33), Accessibility (M = 4.37, SD = 0.38), and System Efficiency (M = 4.42, SD = 0.41). The overall mean usability score was 4.34 (SD = 0.37), also within the *"Very High"* category (4.20–5.00).

These findings indicate that students perceive CEDAR as highly usable across all areas. System efficiency received the highest mean, suggesting that the platform is reliable, loads quickly, and rarely encounters errors. Accessibility followed closely, showing compatibility across devices and strong support for diverse learning needs. Ease of Navigation was also rated very high, confirming that CEDAR's interface is intuitive and user-friendly. The low standard deviation values indicate consistent experiences among respondents.

The findings align with Almahasees et al. (2021), who found that usability factors such as ease of use, quick system response, and cross-device functionality strongly influence student motivation and satisfaction in e-learning. Similarly, Dai et al. (2022) emphasized that clear navigation and intuitive design reduce cognitive load, helping students focus on learning rather than system operation. Thus, CEDAR's strong usability contributes directly to enhanced engagement and learning outcomes.

In summary, the high usability ratings underscore the value of user-centered platform design that prioritizes accessibility, system efficiency, and navigation. Continuous optimization of these areas will sustain high satisfaction and learning success among students.

Table 1 Level of Usability of CEDAR

Indicators	Mean	SD	Remarks
Ease of Navigation	4.24	0.33	Very High
Accessibility	4.37	0.38	Very High
System Efficiency	4.42	0.41	Very High
Overall Usability	4.34	0.37	Very High

Scale: 4.20–5.00 (Very High); 3.40–4.19 (Moderately High); 2.60–3.39 (High); 1.80–2.59 (Low); 1.00–1.79 (Very Low)

3.2. Level of Effectiveness of CEDAR

Table 2 presents students' evaluation of the platform's effectiveness in promoting knowledge retention, comprehension, and exam preparedness. All three indicators received a *"Very Effective"* rating: Knowledge Retention (M = 4.47, SD = 0.33), Comprehension (M = 4.43, SD = 0.38), and Exam Preparedness (M = 4.46, SD = 0.42). The overall effectiveness score was 4.53 (SD = 0.42).

Students view CEDAR as highly effective in enhancing their learning performance. Knowledge retention obtained the highest mean, implying that CEDAR effectively helps learners retain essential concepts. Exam preparedness and comprehension followed closely, showing that students feel confident in understanding content and performing well on tests. The low standard deviations suggest consistency among responses.

Zainuddin et al. (2021) found that interactive e-learning systems with personalized feedback significantly boost knowledge retention and performance, supporting this study's findings. Similarly, Gomez et al. (2023) confirmed that platforms with multimedia materials and progress tracking enhance comprehension and exam preparedness. CEDAR appears to meet these standards, equipping students with tools that support both cognitive and performance-based outcomes.

Overall, the data affirm that CEDAR is a valuable academic resource that contributes meaningfully to students' comprehension, knowledge retention, and readiness for assessments.

Table 2 Level of Effectiveness of CEDAR

Indicators	Mean	SD	Remarks
Knowledge Retention	4.47	0.33	Very Effective
Comprehension	4.43	0.38	Very Effective
Exam Preparedness	4.46	0.42	Very Effective
Overall Effectiveness	4.53	0.42	Very Effective

Scale: 4.20–5.00 (Very Effective); 3.40–4.19 (Moderately Effective); 2.60–3.39 (Effective); 1.80–2.59 (Less Effective); 1.00–1.79 (Least Effective)

3.3. Level of Student Satisfaction in Using CEDAR

Table 3 presents students' satisfaction levels with CEDAR across five key areas: learning experience and academic support, convenience and usability, engagement and recommendation, and confidence and motivation. All indicators received *"Very High"* ratings. Confidence and Motivation scored the highest (M = 4.60, SD = 0.49), followed by Learning Experience and Academic Support (M = 4.58, SD = 0.33), Engagement and Recommendation (M = 4.51, SD = 0.34), and Convenience and Usability (M = 4.47, SD = 0.38). The overall satisfaction rating was 4.34 (SD = 0.38).

The results suggest that students are highly satisfied with CEDAR's performance and learning support. Confidence and motivation were particularly strong, showing that the platform fosters academic enthusiasm and self-efficacy. Similar to Tawafak et al. (2021), system interactivity, usability, and motivation are key drivers of satisfaction in online learning environments. Li and Tsai (2023) also found that personalized feedback and peer engagement increase satisfaction and recommendation rates, supporting the current findings.

Table 3 Level of Satisfaction Among Students in Using CEDAR

Indicators	Mean	SD	Remarks
Learning Experience & Academic Support	4.58	0.33	Very High
Convenience & Usability	4.47	0.38	Very High
Engagement & Recommendation	4.51	0.34	Very High
Confidence & Motivation	4.60	0.49	Very High
Overall Satisfaction	4.34	0.38	Very High

Scale: 4.20–5.00 (Very High); 3.40–4.19 (Moderately High); 2.60–3.39 (High); 1.80–2.59 (Low); 1.00–1.79 (Very Low)

3.4. Relationship Between CEDAR's Usability and Students' Satisfaction

Table 4 shows the correlations between CEDAR's usability components and satisfaction indicators. System efficiency demonstrated significant correlations with both Learning Experience and Academic Support ($r = 0.256$, $p = 0.010$) and Confidence and Motivation ($r = 0.253$, $p = 0.010$). Accessibility also showed a significant relationship with Learning Experience and Academic Support ($r = 0.212$, $p = 0.033$).

These results suggest that system efficiency and accessibility are key determinants of student satisfaction. As Gopal et al. (2021) and Khan & Masrek (2022) noted, reliability and inclusivity through responsive system design enhance learners' motivation and trust in digital platforms. Hence, improving these technical and functional aspects can further increase CEDAR's positive educational impact.

Table 4 Significant Relationship Between CEDAR's Level of Usability and Students' Level of Satisfaction

Variables		Platform	Learning Experience & Academic Support	Convenience & Usability	Engagement & Recommendation	Confidence & Motivation
Ease of Navigation	r	0.046	0.101	0.085	-0.013	0.054
	p	0.648	0.313	0.397	0.895	0.587
Accessibility	r	-0.006	0.212*	0.193	-0.039	0.119
	p	0.951	0.033	0.052	0.700	0.232
System Efficiency	r p	0.125	0.256**	0.143	-0.023	0.253*
		0.211	0.010	0.153	0.818	0.010

Probability Scale: $p < 0.01$ (Highly Significant); $p < 0.05$ (Significant)

3.5. Relationship Between CEDAR's Effectiveness and Students' Satisfaction

Table 5 shows that Exam Preparedness significantly correlates with Platform ($r = 0.308$, $p = 0.002$) and Confidence and Motivation ($r = 0.237$, $p = 0.016$). However, Knowledge Retention and Comprehension did not show significant correlations with any satisfaction dimensions. This suggests that satisfaction is more influenced by practical outcomes, such as exam readiness, than by conceptual understanding alone.

These findings are supported by Xie et al. (2021) and Salas-Pilco et al. (2022), who emphasized that assessment preparedness and performance assurance significantly enhance student satisfaction in online learning environments.

Table 5 Significant Relationship Between CEDAR's Effectiveness and Students' Satisfaction

		Platform	Learning experience & Academic support	Convenience & Usability	Engagement & Recommendation	Confidence & Motivation
Knowledge Retention	Pearson's r	0.136	0.018	-0.019	0.110	0.041
	p-value	0.174	0.855	0.849	0.272	0.682
Comprehension	Pearson's r	0.027	0.083	0.112	-0.020	0.033
	p-value	0.787	0.408	0.260	0.838	0.744
Exam Preparedness	Pearson's r	0.308**	0.145	0.155	0.153	0.237*
	p-value	0.002	0.146	0.119	0.126	0.016

*Probability Scale: **p < 0.01 (Highly Significant); *p < 0.05 (Significant)*

3.6. Predictor of Students' Satisfaction in Using CEDAR

Table 6 presents the simple linear regression results showing that Exam Preparedness significantly predicts satisfaction ($\beta = 0.19$, SE = 0.06, t = 3.01, p = 0.003). The model explains 8% of the variance in satisfaction ($R^2 = 0.08$; F = 9.07, p = 0.003). The regression equation derived is:

Satisfaction = 3.70 + 0.19 × Exam Preparedness

This result means that for every one-point increase in perceived exam preparedness, satisfaction increases by 0.19 points. Although R^2 is modest, the result highlights Exam Preparedness as a significant factor influencing satisfaction. These findings are consistent with Nguyen et al. (2023) and Rahman & Malik (2021), who reported that exam-oriented tools enhance academic confidence and satisfaction in self-directed learning.

Table 6 Predictor of Students' Level of Satisfaction in CEDAR

Predictors	Coef (β)	SE Coef		t- value	p-value
(Constant)	3.70	0.28		13.02	< .001
Exam Preparedness	0.19	0.06		3.01	0.003
r²	0.08				
F value	9.07				
p-value	0.003				

Satisfaction=3.70 +0.19 Exam Preparedness

4. Conclusion

The study concludes that the College of Education Automated Review (CEDAR) platform demonstrates high usability and effectiveness, leading to very high student satisfaction. System efficiency and accessibility are key contributors to positive user experiences, while exam preparedness emerges as the strongest factor influencing satisfaction. These findings highlight the importance of well-designed digital review systems that not only simplify access and navigation but also enhance learners' confidence and readiness for examinations. Overall, CEDAR proves to be a relevant and valuable tool for supporting academic achievement and promoting effective, technology-driven learning in higher education.

Compliance with ethical standards

Disclosure of conflict of interest

The authors declare that they have **no conflicts of interest** related to the publication of this manuscript.

- **Maxene Iligan Lago:** No conflict of interest to declare.
- **Claiza Bongcawil Metillo:** No conflict of interest to declare.
- **Catherine Faith Capoy Dura:** No conflict of interest to declare.
- **Analyn Salvacion Clarin:** No conflict of interest to declare.
- **Beverly Balambao Dionio:** No conflict of interest to declare.

All authors confirm that there are no financial, institutional, or personal relationships that could be perceived to influence the work reported in this paper.

Statement of ethical approval

The present research work was reviewed and approved by the **College of Education Research Ethics Committee of Ozamiz City, Misamis Occidental, Philippines**. All procedures performed in this study involving human participants were in accordance with institutional ethical standards. No studies involving animals were conducted by any of the authors.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study. Participation was voluntary, and all respondents were assured of the confidentiality and anonymity of their responses.

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