Academic Assessment: Usability Evaluation of an Integrated Platform for Students with Disabilities

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Abstract. This paper presents a usability evaluation of a novel educational platform for students and teachers, focusing on exam creation and monitoring. Employing a quasi-experimental design, the study assessed effectiveness, efficiency, and user satisfaction in alignment with ISO-9241-11 standards. Both students and teachers demonstrated 100% task effectiveness, highlighting the platform's adaptability and inclusivity. Task completion times, while generally acceptable, revealed variability, emphasizing the need for optimization. Usability questionnaire results indicated positive perceptions of Ease of Learning and Satisfaction, affirming the platform's user-friendly design. The platform effectively facilitates accessible assessments, demonstrating its potential in fostering inclusive educational environments. Future work aims to optimize task times, enhance accessibility features, and refine the user interface, ensuring continuous improvement and broader applicability across diverse educational institutions.

Keywords: Educational Technology · Usability Evaluation · Inclusive Assessments · Exam Creation

1 Introduction

Equal access to education is a fundamental principle supported by international legal and ethical frameworks [1]. Despite this acknowledgment, the educational landscape does not always ensure equitable conditions for all students [2]. Individuals with visual and physical disabilities encounter significant challenges in their participation in educational assessments. Accessibility limitations, both in physical and virtual environments, have created barriers to their full integration and academic performance [2, 3].

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Human-Computer Interaction (HCI) has become a crucial field in addressing these barriers [4]. This interdisciplinary approach focuses on the interaction between humans and computer systems, aiming to enhance technology's efficiency, ease of use, and adaptability for users [5]. In an educational context, HCI plays a vital role in striving for the creation of accessible and inclusive environments, enabling students with disabilities to effectively interact with educational material and assessment tools.

In response to the increasing need for inclusive educational environments, this research focuses on the development of an integrated assessment platform specifically designed to cater to students with visual and/or physical disabilities in secondary and higher education settings. The primary motivation is to address existing barriers to the equitable participation of students with disabilities in academic assessments, facilitating equitable access and supportive learning tools.

The objectives of this research are centered on creating an accessible environment that allows students with disabilities to effectively undertake assessments. Additionally, the aim is to empower teachers to manage educational material and assess student activities, while ensuring that students themselves have access to this material and can review corrections made by teachers.

A user-centered design approach [6] will be implemented, considering universal accessibility guidelines and feedback from potential users, including both students and teachers. The methodology involves the development and implementation of the platform, followed by practical tests with representative users, including students and teachers with visual and physical disabilities.

Preliminary findings demonstrate that the integrated platform meets expectations for accessibility and ease of use for students and teachers with disabilities. Students were able to access material, conduct assessments, and review corrections effectively, while teachers successfully managed content and assessed activities with ease.

This research showcases the potential of technology to eliminate barriers in education, fostering an inclusive environment for students and teachers with disabilities. The implications go beyond accessibility, impacting equitable participation and the quality of teaching in educational settings. Possible areas for improvement are identified, and suggestions for future research in human-computer interaction, focusing on accessibility and inclusion, are proposed.

2 Proposal

Students with disabilities often encounter significant challenges when attempting to access technologies that facilitate accessible and comprehensive assessments [7, 8]. This situation perpetuates the constant need for students to seek alternatives and adapt to fully participate in the various educational platforms used today [9, 10]. The lack of specific tools designed to address the individual needs of these students complicates their educational experience, highlighting the importance of implementing solutions that promote inclusion and equal opportunities in the educational sphere.

As mentioned earlier, students with special needs may encounter significant obstacles in utilizing mainstream educational technologies, particularly when it comes to participating in assessments, due to a lack of tools that are designed with their unique requirements in mind. Line with this issue, this work aims to improve the assessment process by introducing a new platform at our university. The primary purpose of this initiative is to provide students experiencing difficulties related to literacy, due to disability situations, the opportunity to carry out their assessments easily. To achieve this, various accessibility tools tailored to the specific needs of these students will be implemented, contributing to the creation of an inclusive and equitable educational environment.

The platform's structure delineates three essential roles: administrator, teachers, and students. Administrators play a crucial role in creating profiles for teachers and students, enabling them to access the platform. Admitting these two participants into the system involves a prior analysis of the needs and abilities of students with disabilities. This process is essential to ensure that individual characteristics are compatible with the application.

A concrete example of this approach is the consideration of students' verbal communication skills. The application requires verbal responses in assessments, so students' ability to communicate in this way is assessed. Furthermore, the choice to allow access to the platform is based on the justification that the students' disability situation merits the use of this tool; consequently, certain disabilities or levels of disability are considered exclusionary.

Additionally, it is a requirement that students have previous experience using the internet. This criterion is implemented to ensure that familiarity with technology is not a hindrance when using the application. In summary, the platform's configuration is based on a rigorous approach that seeks compatibility and suitability of participants, ensuring an effective and accessible experience for all involved.

In the platform, teachers play a crucial role in assessing students with disabilities. They initiate the process by adding the necessary courses and assigning students to these courses from an available list. Subsequently, they upload educational material, following instructions to ensure clear presentation to students with disabilities.

When teachers add assessments to the courses, after students respond, they conduct detailed corrections. In addition to indicating the correction, they provide detailed feedback on the correct and incorrect aspects of the answers and assign scores. The system automatically calculates the student's final grade based on these scores.

As for students, their main activity on the platform is to complete assessments. During this process, they have on-screen tools that facilitate their responses. After completing the assessment, they must wait for teachers to make corrections and provide feedback, thus completing the evaluation process. The fundamental purpose of the platform is to make it easier for students with visual and/or physical disabilities to carry out their written assessments.

2.1 Main Functions

The platform has been designed with an intuitive and efficient approach, providing specific tools for each of its key users: administrators, teachers, and students. Below, we

detail the main features that enable an inclusive and effective educational experience for all.

Administrator.

- Create User Profile: Allows the administrator to input users, distinguishing between students and teachers, assigning specific functions to each profile.
- Create Periods: Facilitates organization by enabling the creation of periods indicating the year and semester in which a course will take place.
- Create Majors: Allows the categorization of courses according to the major to which they belong.
- *Teacher:*
- Create Course: Enables the teacher to add a new course to the platform, including the uploading of content accessible to students.
- Add Materials: Facilitates the inclusion of study documents and assessments for students to access.
- Add Students: Allows the teacher to select and add students to the courses they teach.
- Grade Assessments: Provides the ability to provide detailed feedback and grade assessments conducted by students.
- Generate Reports: Allows the teacher to create an Excel report that includes student data and grades.
- *Student:*
- Take Assessments: Enables students to view and respond to assessment questions.
- Use Accessibility Tools: Facilitates access through visual and verbal tools, such as font size enlargement, reading guides, and the ability to respond verbally through a microphone and speaker.
- Access Corrections: Allows students to review feedback and grades provided by teachers for completed assessments.

2.2 User Interfaces

Initially, prototypes were created with the goal of validating and capturing the essential requirements of end users. Throughout this process, usability was prioritized, considering a minimalist design that displays only the essential functions on the screen. This approach focuses on facilitating user navigation, specifically by providing the necessary functions for activities related to taking and completing assessments.

A key aspect in creating the prototypes was to ensure that tasks followed a logical order and required the fewest possible steps. To achieve this, all platform options were integrated into the navigation bar, allowing users to directly access the functionality they desire.

The prototypes prominently incorporate the use of modals, pop-up windows that appear when selecting a specific function. These structures, overlaying other elements on the screen, capture the user's attention, providing precise guidance on the activity they need to perform.

Regarding the color palette chosen for the prototypes, shades ranging from white and purple to sky blue and blues have been selected. This choice aims to convey sensations of honesty, harmony, security, trust, calmness, and intelligence to users. The underlying

purpose is to create an environment in which students feel at ease when facing the process of taking their assessments.

Examples of the final interfaces are presented here, starting with the "Add Material" interface (see Fig. 1). This is displayed on the screen when the teacher selects the corresponding option. In the associated modal, the fields that the teacher must complete are presented: name and type. The type can be material or assessment. In addition to this data, the teacher is required to choose and upload a specific file to the platform. It is worth noting that this particular view is activated when selecting that the material type is an assessment.

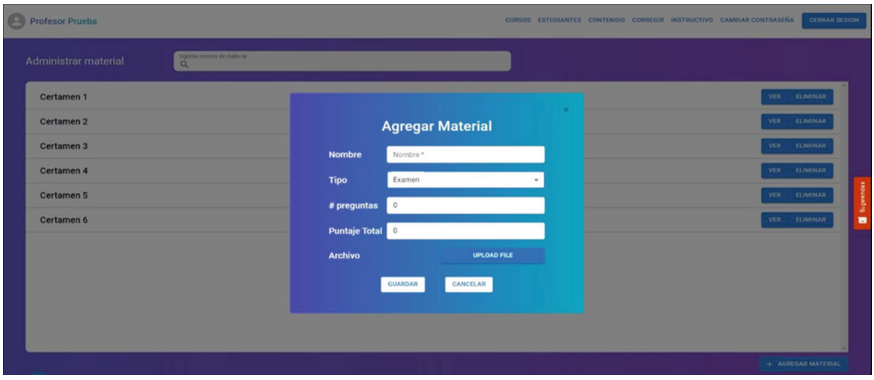

Fig. 1. User Interface for the Addition of New Materials by Professors.

In Fig. 2, the interface designed for teachers to review and correct student responses is presented. The screen includes distinctive buttons to mark answers as correct or incorrect, providing an effective correction tool. Additionally, there is an input field for comments and scoring, allowing detailed and personalized feedback from the teacher.

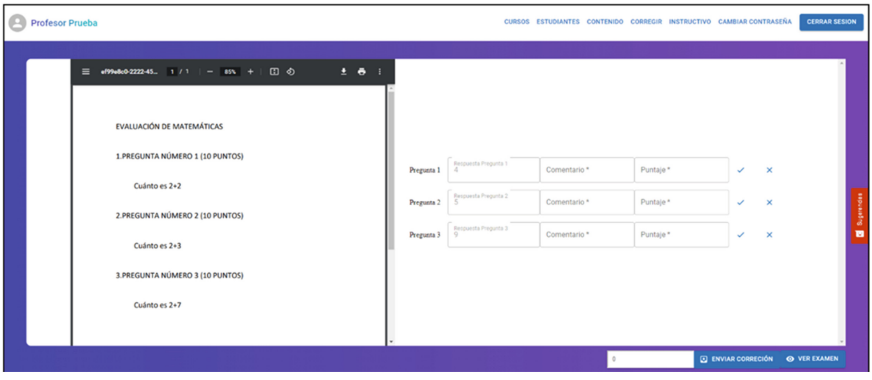

Fig. 2. Correction Interface for Teachers.

In Fig. 3, the "Instructions" interface designed for teachers is presented. This visual section provides detailed guidelines on the required format for the files that will be uploaded to the platform. Its main objective is to guide the teacher in the uploading process, ensuring that the files meet the established requirements. This tool is essential to guarantee the consistency and compatibility of the documents, thus contributing to an efficient and seamless user experience. By accessing this interface, the teacher obtains crucial information that facilitates the correct utilization of the platform and optimizes the process of uploading materials.

Fig. 3. Interface "Instructions" for Teachers.

Figure 4 presents the interface designed for students to carry out evaluations. The primary objective of this interface is to offer students an accessible and functional environment for responding to questions. Specifically designed to support students, including those with visual and/or physical disabilities, the aim of this interface is to streamline the process of completing written assessments. The desired outcome is that students can effectively answer questions using the accessibility tools provided by the platform.

The utility of the interface lies in the clear visualization of the document with questions and the presence of inputs that allow students to respond using various accessibility tools.

The interface offers options to listen to the text of the assessments, providing an auditory reading function that enhances accessibility. Additionally, functionalities are provided for writing and responding through voice, expanding interaction options for those students who can benefit from unconventional methods of text input. In summary, Fig. 4 focuses on improving the assessment experience for all students, regardless of their needs or abilities.

Figure 5 shows the interface designed for students to view the corrections made by the teacher in their evaluations. The main goal of this interface is to furnish detailed and personalized feedback, aiming to enhance the student's comprehension of their performance. Through this interface, students gain insights into their strengths and areas for improvement, fostering a deep understanding of their academic progress. The desired

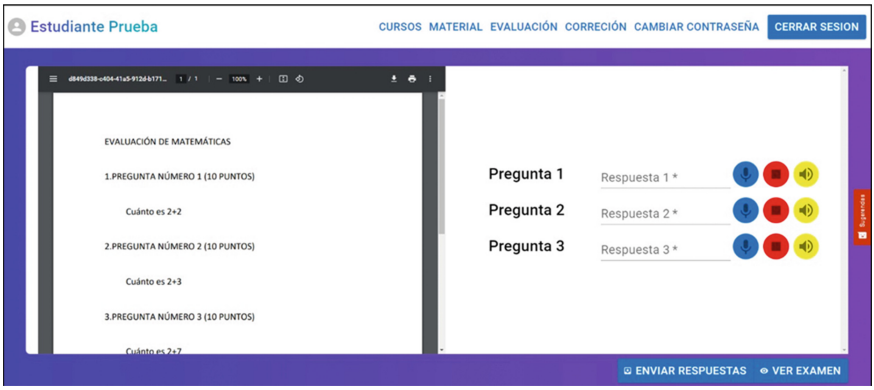

Fig. 4. Interface for Student Evaluation.

outcome is that students, upon viewing this interface, can review and reflect on the provided feedback, facilitating their continuous learning.

The utility of this interface lies in the clear presentation of the corrected evaluation. Each question includes comments from the teacher, the evaluation made, and the score obtained. Additionally, the final grade is included, offering the student a comprehensive view of their performance in the evaluation.

The interface also features an option to view the exam in a complete and detailed manner, giving students the opportunity to review every aspect of the evaluation. In summary, Fig. 5 aims not only to inform about the final grade but also to enrich the educational process by providing constructive and accessible feedback.

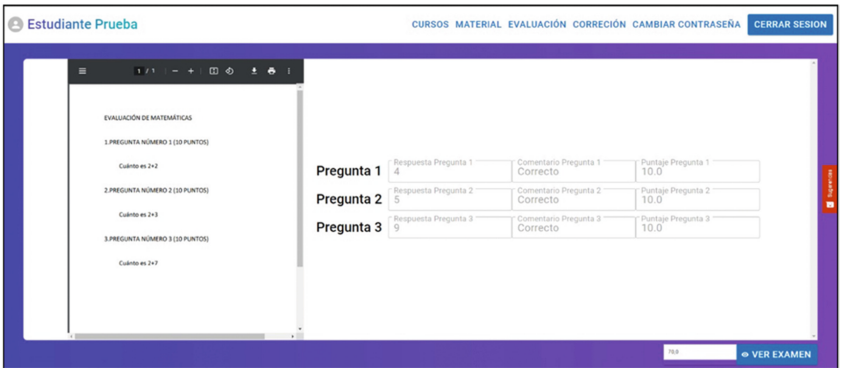

Fig. 5. Interface for Students' Evaluation Correction.

3 Usability Analysis: Evaluations with Students and Teachers

In this section, the comprehensive usability evaluation process conducted with students and teachers actively using the proposed platform is detailed. The applied methodology encompassed both secondary and university-level students as well as educators, delivering a thorough assessment of the user experience in various educational contexts.

3.1 Student Evaluation

The primary aim of the experimental investigation was to examine and assess the usability of the proposed technological platform. To avoid any biases resulting from a random selection of study groups, a quasi-experimental design was implemented, specifically choosing the study group from an environment closely related to the researcher.

This experiment was meticulously crafted to fulfill the three key usability conditions (effectiveness, efficiency, and satisfaction) outlined in the ISO-9241-11 standard [11].

Identification of Variables and Research Questions: In alignment with the principal objective of the experimentation, the study defined both the variables and the research inquiries. Independent variables encompassed the number of tasks performed by users, the total time users expended to complete tasks, participant characteristics (age and gender), and users' responses to the usability questionnaire.

Conversely, dependent variables were aligned with the three usability conditions specified in the ISO-9241-11 standard, namely effectiveness, efficiency, and satisfaction. Effectiveness gauges the level of success users achieve in task execution, measured as the percentage of task accomplishment. Efficiency quantifies the time users require to complete each task, measured in seconds. Lastly, satisfaction denotes the subjective perception of usability with the proposed platform, assessed through the average value of users' responses to the questions in the usability questionnaire. As previously mentioned, the questionnaire utilized is primarily based on the USE questionnaire [12], with some adaptations derived from Davis's Perception of Utility and Ease of Use questionnaire [13], as well as the Purdue Usability Questionnaire [14].

Research questions have been formulated to address the three dependent variables:

- RQ1: What is the effectiveness demonstrated by students in carrying out tasks related to exam creation and monitoring using the proposed platform?
- RQ2: What is the efficiency demonstrated by students in carrying out tasks related to exam creation and monitoring using the proposed platform?
- RQ3: What is students' perception of usability regarding the proposed platform?

Participants. A total of 5 students actively engaged in the evaluation of the proposed platform (see Table 1). The participant group comprised 2 males and 3 females, with ages ranging from 15 to 22 years ($M = 19.6$, $SD = 2.79$).

Tasks. Below is the sequential list of tasks performed by students during the platform evaluation phase. It is important to note that the defined tasks have a direct influence on the evaluation process, so functions that were not relevant at this stage were excluded; an example of this is the password change.

- Log in (T1): Requires the user to access the system using the credentials assigned beforehand.

Table 1. Demographic Profile of Students with Disabilities.

ID	Age	Gender	Disability Type	Educational Level
Student 1	21	Female	Physical	Higher
Student 2	21	Female	Visual	Higher
Student 3	19	Female	Physical	Middle
Student 4	15	Male	Visual	Middle
Student 5	22	Male	Physical	Higher

- Enter the course (T2): Asks the user to access a specific course.
- Access the evaluation (T3): Urges the user to enter the corresponding evaluation section.
- Perform evaluation (T4): Requests the user to complete the evaluation using all available accessibility tools.
- Submit answers (T5): Requires the user to submit the evaluation once finished.
- Access corrections (T6): Asks the user to enter the section housing all corrections for evaluations in a specific course.
- View corrections (T7): Invites the user to review the corrections made in a specific evaluation.

Results Obtained. The results are presented in accordance with the research questions.

- RQ1: What is the effectiveness demonstrated by students in carrying out tasks related to exam creation and monitoring using the proposed platform?

Effectiveness is measured through the task completion percentage. A 100% effectiveness is achieved, indicating that students successfully completed all seven tasks related to exam creation and monitoring. This underscores a consistent and successful performance across various platform functions.

- RQ2: What is the efficiency demonstrated by students in carrying out tasks related to exam creation and monitoring using the proposed platform?

Efficiency is gauged by the time students take to perform the seven tasks. Table 2 presents descriptive statistics for seven tasks undertaken by users during the usability experimentation with the technological platform. Each task is identified from T1 to T7, corresponding to specific platform functionalities.

The task that took the most time was “Perform evaluation” (T4), with an average of 1 min and 14 s. The variability in times suggests potential challenges for some users, emphasizing the importance of investigating the reasons behind these discrepancies to enhance overall efficiency.

In contrast, “Access the evaluation” (T3) was the task that took the least time, with an average of 2 s. The consistency in times indicates notable efficiency in this function.

The completion times fall within the accepted usability standards, according to the guidelines of ISO-9241-11. However, the variability in the completion times for the

Table 2. Students: Task Completion Times (in seconds) on the Technological Platform.

Descriptive Statistics	Tasks						
	1	2	3	4	5	6	7
Average	22	4	2	74	2	14	2
Standard Deviation	4	1	1	22	1	6	1
Minimum	17	2	2	44	2	8	2
Maximum	27	5	4	104	3	24	4

"Perform evaluation" task suggests that it might be beneficial to explore ways to reduce this variability and enhance performance consistency.

- RQ3: What is students' perception of usability regarding the proposed platform?

Figure 6 presents the results of the platform's usability assessment through a questionnaire, measuring four key variables: Utility, Ease of Use, Ease of Learning, and Satisfaction. These metrics are crucial to understanding the user experience and their overall perception of the platform.

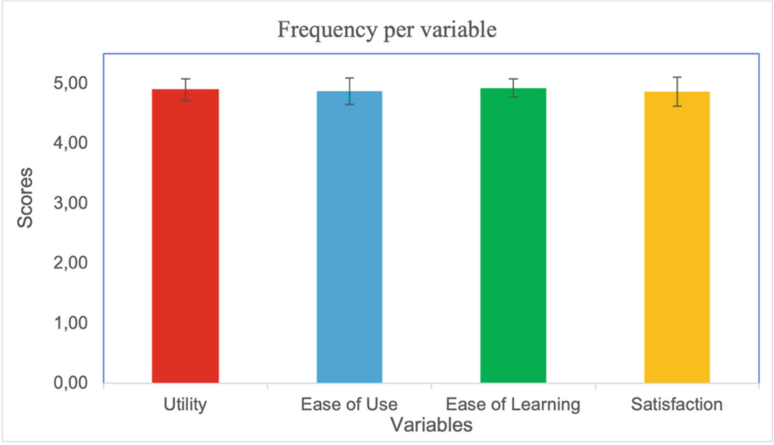

Fig. 6. Students: Results of Usability Assessment through Questionnaire.

Each variable was assessed on a scale of 1 to 5, with 5 being the highest rating. The total score is the average of the four variables, providing a comprehensive view of the platform's usability. Additionally, the usability questionnaire included two open-ended questions aimed at capturing users' perspectives on both positive and negative aspects of the platform.

Ease of Learning leads with an outstanding score of 4.93, indicating the platform's ability to be quickly adopted by users. Although Satisfaction has the lowest score at 4.87, it remains a notable rating, highlighting the overall quality of the user experience.

The results reflect a highly efficient and satisfactory platform for users. The high score in Ease of Learning emphasizes its accessibility, while ratings in Utility and Ease of Use solidify the platform as a valuable and user-friendly tool. Continued attention to user satisfaction could further enhance the experience, but overall, the results support the quality and usefulness of the evaluated platform.

Regarding the open-ended questions in the usability questionnaire, it is noteworthy that users expressed an overall positive perception of the platform. One of the most prominent aspects is the comfort and intuitiveness in using the interface, reflecting a successful design in terms of accessibility and user-friendliness.

A relevant point identified in the positive responses is the platform's utility in academic contexts, with users noting its ease of learning and the value it brings to those with physical or visual disabilities. This recognition underscores the positive impact the platform has on inclusion and diversity.

Concerning the negative aspects, most users did not find significant drawbacks, describing the platform as "providing exactly what is needed and nothing more". However, some suggestions hint at the possibility of expanding accessibility for individuals with different disabilities, indicating an opportunity for increased inclusion.

3.2 Teacher Evaluation

Following the methodology applied in the usability assessment of students, a parallel investigation was conducted focusing on educators from secondary and university levels. The quasi-experimental design, which avoided random selection of study groups, ensured contextual relevance for the researcher. The overall objective remained consistent: a meticulous examination of the usability of the proposed technological platform. Adhering to ISO-9241-11 standards, the experiment addressed effectiveness, efficiency, and satisfaction as primary usability conditions.

Identification of Variables and Research Questions: The replication of variables and investigations from the student usability study speaks to the methodological coherence of the research. Independent variables, including the number of tasks performed, total time investment, and participant characteristics, remained constant. Similarly, dependent variables, linked to effectiveness, efficiency, and satisfaction, continued to be the foundation of the investigation.

It is noteworthy that the same usability questionnaire used in the student evaluation was employed. Based on the USE questionnaire with adaptations from Davis's Perception of Utility and Ease of Use questionnaire, as well as the Purdue Usability Questionnaire.

Adapting the research to the teacher group, the research questions were adjusted:

- RQ4: What effectiveness do teachers demonstrate in performing tasks related to exam creation and monitoring using the proposed platform?
- RQ5: What efficiency do teachers demonstrate in performing tasks related to exam creation and monitoring using the proposed platform?
- RQ6: What is the usability perception of teachers regarding the proposed platform?

Participants. A total of 5 teachers participated in the usability evaluation of the proposed platform (see to Table 1). The group consisted of two males and three females,

with ages spanning from 25 to 58 years ($M = 40.8$, $SD = 12.26$). They work across different levels of education, with two teachers engaged in middle education and three in higher education (Table 3).

Table 3. Participants' Profile: Teachers in Usability Evaluation.

ID	Age	Gender	Level of Education They Work With
Teacher 1	25	Female	Middle
Teacher 2	43	Male	Higher
Teacher 3	40	Female	Higher
Teacher 4	58	Female	Higher
Teacher 5	38	Male	Middle

Tasks. Following is the sequential list of the twelve tasks performed by teachers during the platform evaluation phase. It is worth noting that the tasks outlined have a direct impact on the students' evaluation process; therefore, functions that were not relevant to this stage were excluded, such as changing the password or uploading non-evaluated material.

- Log in (T1): User is required to log in to the system with previously assigned credentials.
- Read instructions (T2): User is prompted to access the Instructions section to read guidelines on how to use the system and create exams.
- Add course (T3): User is prompted to create a new course using default data.
- Enter the course (T4): User is prompted to enter the course created in the previous task.
- Add exam-type material (T5): User is prompted to add an exam to the course using default data and files.
- Review material (T6): User is prompted to verify if the material has been uploaded correctly.
- Search for a student (T7): User is prompted to search for users in a specific course.
- Add student (T8): User is prompted to add a student to a specific course.
- Access corrections (T9): User is prompted to look for pending corrections in a specific course.
- View answers (T10): User is prompted to access the answers given by a specific student.
- Correct answers (T11): User is prompted to provide feedback and a score for each answer in the evaluation.
- Generate report (T12): User is prompted to generate a report for a specific student.

Results Obtained. Similar to the student results, these findings are presented in alignment with the research questions.

- RQ4: What effectiveness do teachers demonstrate in performing tasks related to exam creation and monitoring using the proposed platform?

Effectiveness is gauged by the task completion percentage, and a remarkable 100% effectiveness is attained. This indicates that teachers adeptly executed all twelve tasks associated with exam creation and monitoring, showcasing a uniform and proficient performance across diverse platform functions.

It is noteworthy that assistance was required for two tasks, T9 and T11. T9 records a 15.2% assistance time, attributed to its time-constrained nature. On the other hand, T11 exhibits a higher assistance percentage, reaching 34%, as correcting responses demanded more time.

Despite the need for assistance in these specific tasks, it is crucial to emphasize the overall exceptional results achieved. Nevertheless, a comprehensive 100% effectiveness underscores the teachers' commendable mastery of the platform's functionalities.

- RQ5: What efficiency do teachers demonstrate in performing tasks related to exam creation and monitoring using the proposed platform?

Efficiency is measured based on the time it takes for teachers to complete the twelve tasks. Table 4 presents task completion times for teachers on the proposed technological platform, providing insights into their efficiency in performing tasks related to exam creation and monitoring.

The average completion times vary across tasks, reflecting the efficiency of teachers in navigating and utilizing the platform. Notably, tasks T6 and T10 demonstrate the shortest completion times, with averages of 4 s and 3 s, respectively. These tasks involve relatively simple actions, such as reading instructions and accessing student responses.

On the other hand, tasks T11 and T3 have the longest average completion times, standing at 43 s and 32 s, respectively. Task T11, involving correcting responses, understandably requires more time due to its complexity and the detailed nature of the evaluation process. Task T3, related to adding a new course, also demands a substantial investment of time.

The tasks with the least variability in completion times are T10 and T6, with minimum and maximum times consistent with the averages. Conversely, tasks T4 and T11 exhibit higher standard deviations, indicating greater variability in the time teachers spent on these activities.

- RQ6: What is the usability perception of teachers regarding the proposed platform?

Figure 7 presents the crucial findings derived from the usability evaluation conducted with teachers who participated in the use of the proposed platform. This analysis focused meticulously on four fundamental variables: Utility, Ease of Use, Ease of Learning, and Satisfaction, providing a comprehensive view of the user experience.

Particularly, the Ease of Learning variable achieved the highest score, reaching an impressive 4.63. This result clearly and strongly indicates that teachers perceive the platform as highly accessible and easy to learn.

Despite this success, the Satisfaction variable obtained the lowest score, registering a 3.83. However, the standard deviation of 0.87 reveals variability in the responses, indicating that specific aspects influence user satisfaction and deserve closer attention.

Table 4. Teachers: Task Completion Times on the Technological Platform.

Tasks	Average	Standard Deviation	Minimum	Maximum
T1	17	9	11	33
T2	33	11	20	45
T3	32	18	20	62
T4	28	8	4	25
T5	46	6	39	53
T6	4	2	2	8
T7	12	6	7	22
T8	14	12	4	35
T9	11	4	8	17
T10	3	2	2	6
T11	43	19	20	72
T12	19	5	13	26

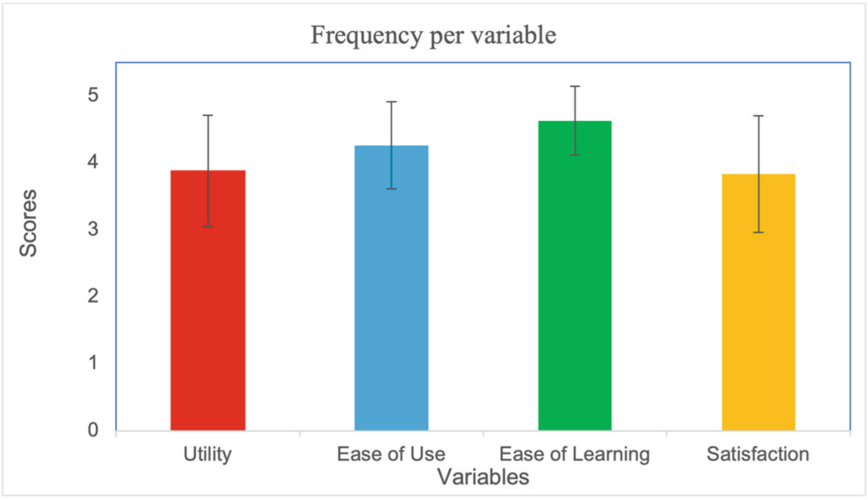

Fig. 7. Teachers: Results of Usability Assessment through Questionnaire.

In summary, teachers assess the platform as highly user-friendly, emphasizing its effectiveness for efficient adoption. Although variations in satisfaction have been identified, this specific aspect requires more detailed attention to enhance the overall user experience. Overall, these results support the overall effectiveness of the platform while providing valuable insights into specific areas that can be continuously improved.

Regarding the open-ended questions, most users highlight the ease of understanding and using the application. Simplicity is repeatedly mentioned as a positive aspect, and

some users praise its intuitiveness, allowing them to use it without additional instructions. On the other hand, one user mentions the difficulty in immediately confirming or corroborating actions, pointing out the lack of quick access previews as an area for improvement.

Overall, the responses suggest a positive experience, emphasizing simplicity and ease of use as key strengths. Improvement suggestions focus on action confirmation and the implementation of additional features, indicating specific areas for the development team's attention.

4 Discussion

The comprehensive usability evaluation conducted with students and teachers using the proposed platform yielded significant insights into the user experience in diverse educational contexts.

Both students and teachers demonstrated 100% effectiveness in performing tasks related to exam creation and monitoring, showcasing the platform's adaptability to diverse user needs and fostering an inclusive and accessible environment.

Efficiency, measured by task completion times, was generally acceptable for both groups, with some observed variability in certain tasks. Specifically, the "Perform evaluation" task for students exhibited variability, indicating potential areas for improvement. Further investigation is warranted to uncover the reasons behind these discrepancies and refine overall efficiency.

Usability perception, assessed through questionnaires, revealed positive ratings in variables such as Utility, Ease of Use, Ease of Learning, and Satisfaction for both students and teachers. While Satisfaction scores were generally positive, some variability was noted among teachers. Open-ended responses provided insights into positive aspects, such as ease of understanding and use, along with suggestions for improvement, including the need for quick access previews and more effective confirmation mechanisms.

Overall, the results support the platform's general effectiveness for both students and teachers, with specific areas identified for continuous improvement. Consistent feedback from both groups emphasizes the importance of addressing identified areas to achieve an optimal user experience.

Implications and future directions focus on improving user guidance, addressing variability in task completion times, and enhancing confirmation mechanisms. Additionally, the importance of continuing to expand accessibility features for even greater inclusion is emphasized. The findings provide valuable patterns and directions for the ongoing development and improvement of the platform.

5 Conclusions and Future Work

The comprehensive evaluation of the proposed technological platform for conducting accessible assessments reveals promising results and key areas for ongoing development. The findings suggest that the platform achieves its primary goal of facilitating the participation of students with disabilities in educational settings while providing teachers with effective tools for assessment creation and review.

The demonstrated effectiveness by both students and teachers, reaching 100% in the completion of specific tasks, underscores the adaptability and overall usability of the platform. Users have shown a strong ability to leverage the provided features, supporting the vision of an inclusive environment.

Task completion times, although mostly acceptable, suggest potential areas for optimization. Variability in the times of some tasks, especially the "Perform evaluation," highlights the importance of further research to address potential challenges that may arise for certain users.

Usability assessments through the questionnaire reveal high scores in Ease of Learning and Satisfaction from both students and teachers. These results support the notion that the platform meets accessibility and simplicity requirements, promoting an inclusive and user-friendly educational environment.

Based on the results obtained and the identified areas for improvement, several directions for future work are outlined:

Optimization of Specific Task Times: A detailed investigation will be conducted on variabilities in task completion times, especially in the "Perform evaluation" task. This will help identify potential obstacles and optimize the workflow for overall efficiency.

Expansion of Accessibility Features: Efforts will continue to expand accessibility features to address diverse needs. The implementation of additional tools, such as enhanced screen readers and simplified navigation options, will contribute to even greater inclusion.

Integration of Formal Methods for User Prioritization in Proposal Design: An additional avenue for future work involves integrating formal methods to prioritize user preferences systematically [15, 16]. This enhancement aims to formally capture end-users' priorities during the design phase, ensuring that the proposed platform aligns closely with their needs and expectations.

Refinement of User Interface: Based on user feedback, improvements to the user interface will address the need for quick access previews and clearer confirmation mechanisms. This will ensure a smoother and more satisfying experience for all users.

Expansion of Testing with Multiple Institutions: To further validate the effectiveness and adaptability of the platform, pilot tests are planned with multiple educational institutions. Feedback from a variety of educational environments will contribute to the continuous evolution of the platform.

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