

Efficient Tutoring Services: Enhancing Communication and Scheduling with a Cross-Matching Platform for PSU-ACC

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Abstract – The escalating demand for tutoring services in educational institutions, driven by the growing complexity of academic subjects and the need for personalized attention to address learning gaps, is hindered by the disorganized nature of traditional tutoring systems in most universities and colleges. This issue is particularly relevant to Pangasinan State University-Alaminos City Campus, the youngest campus of the province-wide state university system. Despite offering various courses and essential services, the campus faces challenges in managing scheduling conflicts for tutoring services, potentially leading to students missing valuable sessions and tutors struggling to optimize their time and resources. In response, this study proposes the development of an efficient tutoring service, leveraging a cross-matching platform at PSU-ACC to enhance communication and scheduling. The goal is to create a centralized system connecting students with the most suitable and preferred courses created by tutors who possess expertise in their specific areas of need, ultimately improving the overall tutoring experience and enhancing the quality of education at the university, thereby increasing student success rates.

Keywords – Cross-Matching, Enhancing Communication, Platform, Scheduling, Tutoring Services

INTRODUCTION

The demand for tutoring services in educational institutions has been on the rise due to the increasing complexity of academic subjects and the need for individualized attention to address learning gaps. However, the traditional tutoring systems in most universities and colleges are often characterized by disorganized communication and scheduling processes, leading to an inefficient use of resources and a suboptimal learning experience for students.

In the study conducted by Mavrikis et al. (2021)^[1], it presents an innovative online tutoring platform that caters to the individual learning styles of students. This

platform uses a cross-matching algorithm that matches students with tutors who share a similar learning style. In addition to this, the platform includes a communication system that enables students and tutors to interact through text, audio, and video, as well as a scheduling system that generates personalized timetables for each student automatically. The study evaluates the effectiveness of this platform through a series of experiments, and the results indicate that it can enhance the learning outcomes and satisfaction levels of students. This study, therefore, highlights the importance of personalized and adaptive approaches in online tutoring and their potential impact on students' academic performance.

The Journal of Educational Technology & Society published a study in 2020^[2] by Kim and Lee entitled "The Effects of a Mobile Tutoring App on College Students' Academic Performance and Satisfaction" that aimed to explore the impact of a mobile tutoring app on college students' academic performance and satisfaction with tutoring services. The app utilized a cross-matching platform that identified appropriate courses for students based on their academic needs and preferences. To test its efficacy, the proponents conducted a randomized controlled trial involving a group of college students. The study findings revealed that the mobile tutoring app was effective in improving students' academic performance and satisfaction with tutoring services compared to the control group who did not use the app.

The study of M. B. Magturo and J. A. Oliva (2021)^[3] focused on the development of a web-based tutoring platform for language learning that uses a cross-matching algorithm to match students with suitable tutors based on their language proficiency and learning needs. The researchers conducted usability testing and evaluated the system's effectiveness through surveys and interviews with students and tutors. The results showed that the platform was effective in facilitating online language tutoring sessions, and both students and tutors found it helpful in improving their language skills.

Pangasinan State University, also known as PSU, is a province-wide state university system established in 1979 that provides quality education. PSU has nine campuses located in the City of Alaminos, San Carlos, Urdaneta, Infanta, Bayambang, Binmaley, Sta. Maria, Asingan, and Lingayen.

Pangasinan State University-Alaminos City Campus, known as PSU-ACC, is the youngest campus of PSU. It is located in Barangay Bolaney, City of Alaminos, Pangasinan. It started its operation in June 2009 with a population of 100 students. At present, PSU-ACC offers nine courses, such as the Bachelor of Science in Information Technology, Bachelor of Science in Hospitality Management, Bachelor of Science in Business Administration (major in Financial Management and Operations Management), Bachelor of Science in Tourism Management, Bachelor of Science in Elementary Education (major in Enhanced General Education), and Bachelor of Secondary Education (major in English, Filipino, and Mathematics). PSU Alaminos provides guidance and counseling, registrar, library, medical, and student affairs services. The campus has offices such as Admission Guidance and Testing, Accountant Office, Registrar, College of Teacher Education, College of Business and Technology, College of Hospitality Management, Management Information System, Cashier, Student Services, Campus Executive Director Office, Administrative, Planning and Quality Assurance, and Library.

Without an existing system, it can be challenging to manage scheduling conflicts and ensure that tutors are available to meet the needs of all students. This could lead to students missing out on valuable tutoring sessions, and tutors may not be able to maximize their time and resources since there is no proper scheduling mechanism.

To address these issues, this study proposes the development of an efficient tutoring services enhancing communication and scheduling with a cross-matching platform for Pangasinan State University-Alaminos City Campus. The platform serves

as an efficient and centralized system that connects college students with tutors who have expertise in their areas of need and are available to provide assistance.

The ultimate goal of this study is to provide a solution to the current challenges faced by students and tutors in tutoring services and improve the overall tutoring experience for both parties involved. By implementing a cross-matching platform, the study can enhance the quality of education at the university and increase student success rates.

METHODOLOGY

The primary sources of data in this study are the information gathered from the unstructured interview with the Student Services Coordinator, Mrs. Shella Marie I. Diocares, the Dean of the College of Teacher Education (CTE), Mrs. Ellen Grace B. Ugalde, and the ICTMO Coordinator, Mr. Marino B. Bartolome Jr. Aside from conducting an interview, the proponents also conducted a survey among college students coming from different schools located in the City of Alaminos to identify the difficulties and in-demand subjects for the cross-matching platform. The proponents conducted an interview and survey to collect the necessary data and information for the cross-matching platform, as well as to determine the necessary system specifications and features for the developed system.

The proponents used a purposive sampling method to identify other respondents that could help in the completion of the study. These were the faculty members of the Information Technology Department of the campus. The identified respondents helped the proponents do the system validation for acceptability.

The proponents utilized different methods to gather information for the study. The proponents conducted unstructured interviews, which served as the basis for the development of the system. The proponents visited different websites to gather and collect information that was connected to and relevant to the development of the system.

The proponents employed various visualization tools to enhance the clarity of system dynamics. A data flow diagram (DFD) was utilized for a graphical representation, illustrating the seamless movement of data between inputs, outputs, and internal processes. The database schema played a crucial role in delineating relationships between objects and information stored in the database. The data dictionary was employed to showcase the structured data implemented in constructing database tables. Furthermore, an entity relationship diagram (ERD) was employed to elucidate the interconnections among entities, such as individuals or objects, within the developed system. To capture user interactions and system requirements, a use-case diagram was employed, providing insights into how users engage with the platform.

The proponents used the Rapid Application Development model for the software methodology of the system. Rapid Application Development (RAD) is a software development methodology that emphasizes rapid prototyping and iterative development. It is designed to enable developers to quickly create software applications by using pre-built components, reusable code, and automated tools. RAD is a collaborative approach that involves close interaction between developers, customers, and end-users, with an emphasis on delivering working software in a short

period of time. The goal of RAD is to accelerate the development process and reduce the time to market while ensuring that the final product meets the needs of its users.

The following are the phases of the Rapid Application Development model: (1) requirements planning; the requirements planning phase combines elements of the system planning and systems analysis phases of the System Development Life Cycle (SDLC). Users, managers, and IT staff members discuss and agree on business needs, project scope, constraints, and system requirements. It ends when the team agrees on the issues and other management authorizations to continue. (2) user design: during this phase, users interact with system analysts and develop models and prototypes that present all system processes, inputs, and outputs. User design is a continuous interactive process that allows users to understand, modify, and eventually approve a working model of the system that meets their needs. (3) construction: the construction phase focuses on program application development tasks similar to those in the SDLC. In RAD, however, users continue to participate and can still change or improve as actual screens or reports are developed. (4) cutover: the cutover phase resembles the final tasks in the SDLC implementation phase, including data conversion, testing, the changeover to the new system, and user training. The new system is built, delivered, and placed into operation much sooner.

A survey questionnaire was conducted, and forty (40) responses were collected from college students residing in the City of Alaminos, nine (9) of whom are PSU-ACC instructors and one (1) is the PSU-ACC ICTMO coordinator, as shown in Table 1:

Table 1: Respondents of the Project

Respondents	Number of Respondents
College Students	40
PSU-ACC Instructors / IT Faculty Members	9
ICTMO Coordinator	1
Total	50

The proponents used a scale of measurement to measure the acceptability level of the developed system. The table below shows the scale of measurement of the proposed system.

Table 2. Scale of Measurement

Point Score	Statistical Range	Descriptive Equivalent
5	4.21 – 5.00	Excellent
4	3.41 – 4.20	Very Good
3	2.61 – 3.40	Good
2	1.81 – 2.60	Fair
1	1.00 – 1.80	Poor

RESULTS AND DISCUSSION

Based on the conducted interview with the Student Services Coordinator, Mrs. Shella Marie I. Diocares, the proponents have learned that there have been no tutoring sessions held on campus before. Moreover, the coordinator acknowledges that all students experienced difficulties in their subjects, making a case for the necessity of academic support. Additionally, the coordinator emphasized the importance of focusing on subjects that are in demand for tutoring. Furthermore, the Student Services Coordinator expresses support for the introduction of the cross-matching platform, highlighting its potential benefits for academic support and encouraging a collaboration among students and tutors.

With the gathered information from the Student Services Coordinator, the proponents also conducted a survey among college students residing in the City of Alaminos to identify the difficulties and in-demand subjects for the cross-matching platform.

Using a purposive sampling method, the proponents gathered insights from 70 college students. The respondents spanned various academic years, with the 1st year comprising 26 responses, the 2nd year with 10, the 3rd year with 16, and the 4th year with 18. Additionally, diverse academic programs were represented, with BSIT having the highest response count at 27. Subjects perceived as the top three challenging/difficult and highly recommended by the students include calculus with analytics 1, capstone project 1 and 2, and foreign language 1 and 2. Respondents cited struggles with understanding concepts, research and information gathering, and grasping advanced topics.

The CHED sets all the program outcomes outlined in the CHED Memorandum Order series of 2015. These outcomes must be attained at the end of the semester, which the teachers must indicate in their syllabus. However, there are students who can't grasp these outcomes. As per the conducted interviews with students, Calculus with Analytic 1 is difficult because it demands students to exhibit proficiency in mathematical concepts and apply them across various fields, emphasizing pedagogical content knowledge, diverse assessments, and mastery of problem-solving skills.

Similarly, Foreign Language 1 and 2 pose challenges because students need to understand global language and literature,

which requires a lot of reading, good communication skills, and creative teaching methods.

Finally, Capstone Project 1 and 2 also present difficulties and challenges due to its comprehensive nature, requiring students to integrate knowledge across various disciplines and demonstrate originality, innovation, advanced research, critical thinking, and problem-solving skills.

Amidst the various difficulties and challenges encountered by students across different subjects, this study, "Efficient Tutoring Services: Enhancing Communication and Scheduling with a Cross-Matching Platform for PSU-ACC," seeks to address these issues. The proposed platform serves as a comprehensive solution to alleviate academic struggles by providing efficient tutoring services. Additionally, the platform offers an efficient scheduling system, allowing students to easily book tutoring sessions tailored to their needs. This innovative approach aims to enhance the overall learning experience for students and provide a supportive framework to overcome academic challenges.

Developed Processes of the Cross-Matching Platform

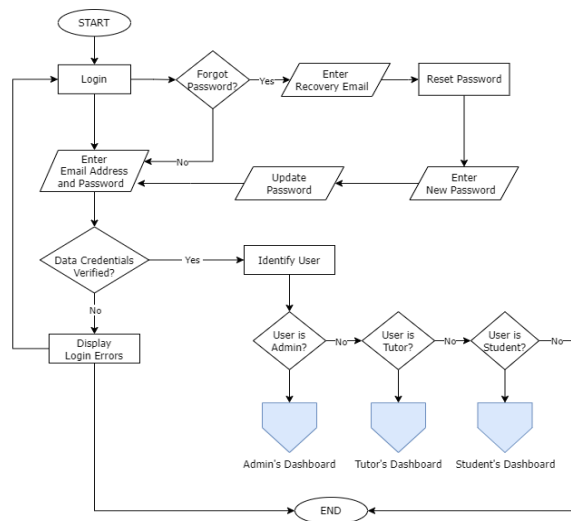
This section delves into the processes developed for the cross-matching platform designed specifically for PSU- ACC. The primary goal of this study is to evaluate the effectiveness and functionality of the platform in addressing the challenges faced by both students and tutors in accessing tutoring services.

The cross-matching platform provides a wide range of well-crafted tutorial courses that are meant to empower students in a variety of tough disciplines that

are frequently hard to work through on their own. These classes are priceless resources that provide students with a thorough comprehension of the subject matter and practical methods for mastering it. Each course includes lectures that explore the nuances of the subject, providing a thorough and interesting learning environment. Through direct interaction with course developers, this interactive approach guarantees that students not only understand the subject but also have a more dynamic and effective learning experience.

The following figures show the developed processes of the cross-matching platform:

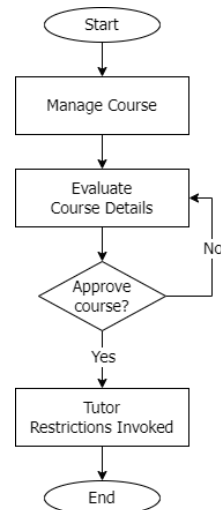
Figure 1: Login



In Figure 1, users can access the website's login page by providing their email address and password. The system will then verify the entered credentials, granting access if valid. Otherwise, error messages will prompt the users to re-enter their credentials. The system has three access levels: admin, student, and tutor. After identifying the access level, users will be redirected to their corresponding dashboard. If a user, including the admin, forgets the password, users can use the

recovery email option to receive a password reset link for recovery. After clicking the link, users can update their login credentials, with the new password securely stored in the database.

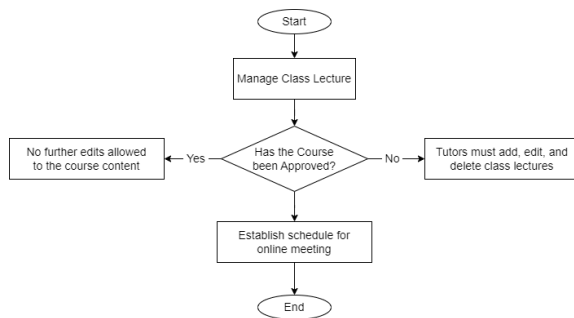
Figure 2: Admin: Managing Courses



The administrator takes charge of course management, thoroughly examining and understanding the details associated with each course. Following this, the administrator undertakes a basic evaluation of the course details that can be easily viewed alongside the course. This includes viewing basic course information like the course name, overview, requirements, list of expected lectures, Google meeting schedules together with the overall lecture count, course image, course tutor name, and course introduction video if the tutor provided that for the course. After viewing the course details, the administrator can then approve or disapprove of the course.

Upon approval, a crucial transition occurs, limiting the tutor's ability to make further edits to both the course and class lecture details. This step ensures the preservation of the approved course content, maintaining consistency and reliability in the learning materials provided to students.

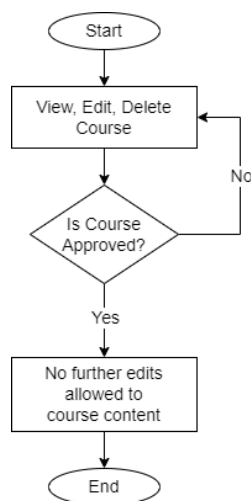
Figure 3: Admin: Managing Class and Class Schedule



In Figure 3, the administrator can only view classes and assess its contents. Once a course is approved, the tutor cannot edit the connected class lecture schedules. The exclusive capability to edit the tutor's class lecture schedule relies on the administrator.

Private Messaging. The administrator can engage in one-on-one conversations directly within the chatting system of the website. This functionality allows the administrator to send messages to any user, facilitating direct and personalized communication through the platform's messaging system.

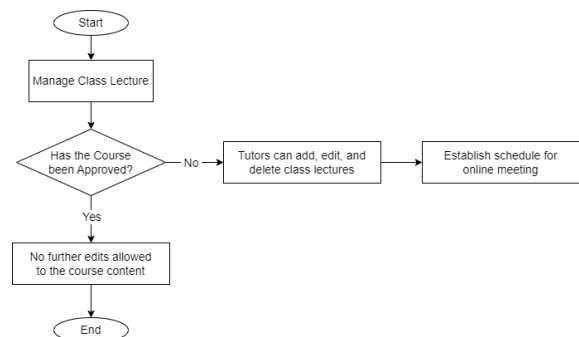
Figure 4: Tutor: Managing Courses



Tutors have the ability to view, edit, and delete courses. However, it's crucial to

note that once a course is approved, a significant transition occurs. At this point, the tutor loses the capability to make any further edits to the details and schedules associated with the approved course. This ensures that the approved course maintains its integrity and consistency without any subsequent modifications by the tutor.

Figure 5: Tutor: Managing Class and Class Schedule

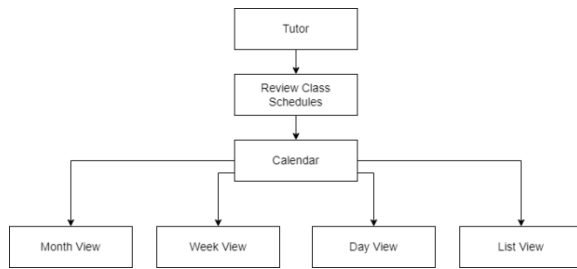


Tutors have the capability to adjust class lectures by adding, editing, and deleting them. Additionally, tutors can establish the schedule for the online meetings associated with the class. However, it is important to note that once the course pertaining to the class is approved, a significant restriction is imposed. The tutor loses the ability to make further edits to any details previously set for the course. This ensures the stability and consistency of the approved course content.

Tutor: Viewing of Enrolled Students.

Tutors have the ability to view enrolled students in the course. This involves accessing the list of enrolled students, allowing tutors to view both the names and information of the students currently enrolled in the specific course. Through this process, tutors can gain insights into the composition of the student and can review individual student details, contributing to effective course management.

Figure 6: Tutor: Viewing of Calendar

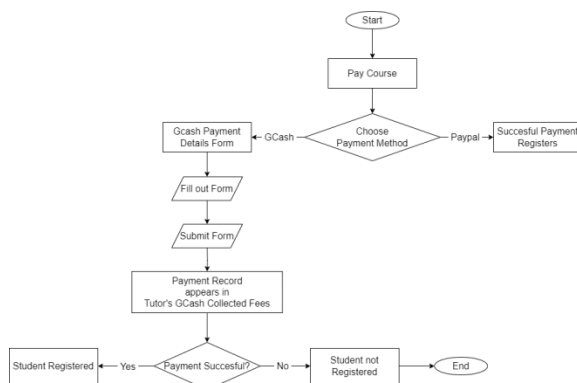


Tutors can access and review the class schedules they have created on the calendar. The calendar provides flexibility, allowing tutors to display schedules in month, week, day, or list view. This functionality enhances the tutor's ability to efficiently manage and track class schedules based on their preferred time frame, contributing to effective organization and planning.

Student: Viewing List of Courses.

Students have the ability to explore the list of approved courses registered on the website. By selecting a specific course, the student can delve into its details by clicking on it, prompting the display of course information. This process empowers students to easily navigate through the available courses and make decisions about their educational pursuits on the platform.

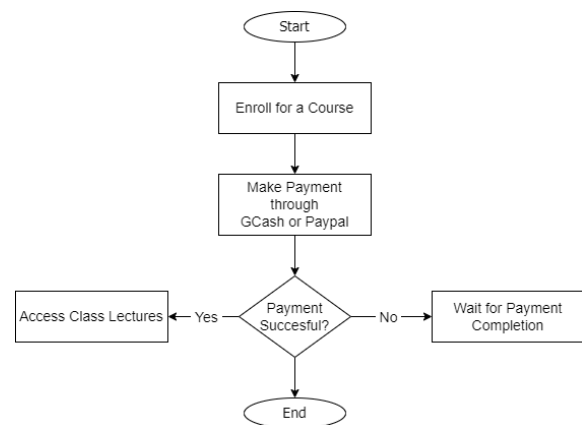
Figure 7: Student: Process of Paying Course



The student's enrollment begins with the prerequisite of paying the course fee,

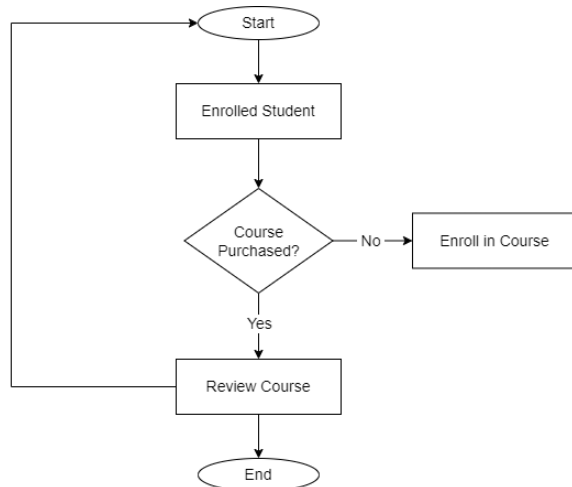
after which they are officially registered as a course student. The payment process takes place on the payment details platform, where students can choose between two payment methods: GCash and Paypal. For Paypal transactions, a successful payment automatically registers the payment. For GCash transactions, the student completes a payment form with GCash details. After submission, the payment records appear in the tutor's GCash collected fees, providing the tutor with the option to either confirm or decline the payment.

Figure 8: Student: Accessing Class Lectures



In Figure 8, students can gain access to class lectures upon successful payment of the full course fee. The sequence involves the student making the required payment, and upon completion of the transaction, the course's class lectures become available for viewing. This process ensures that students who have fulfilled the necessary financial obligations promptly receive access to the educational content associated with the course they have enrolled in.

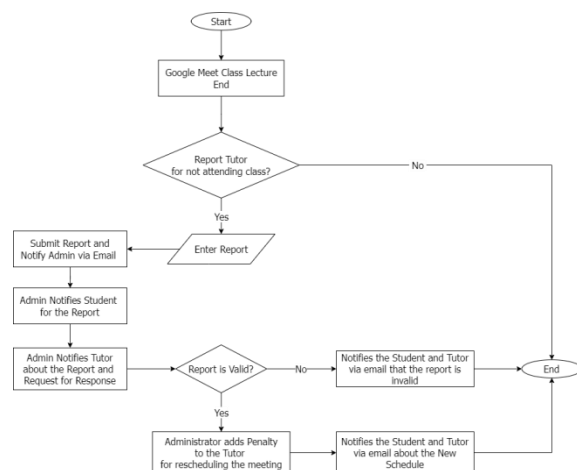
Figure 9: Student: Viewing of Enrolled Courses



Students have the capability to review the courses in which they are currently enrolled. This status is achieved once the student successfully completes the purchase of the course. Through this, students can conveniently access information about the courses they have acquired, facilitating a clear overview of their enrolled educational offerings.

Student: Accessing the Tutor Calendar. Students can access the class lecture schedule created by the tutor for a particular course. This schedule is presented and synchronized with the student's calendar, allowing for seamless integration and easy reference.

Figure 10: Student: Reporting of Tutor



As shown in Figure 10, after the Google meeting schedule, the student can report the tutor for not attending the scheduled online class lecture. The student is required to fill out a form and submit it, notifying the administrator about the incident. The administrator then reviews the report and responds to the student, confirming that the report has been received and is under verification.

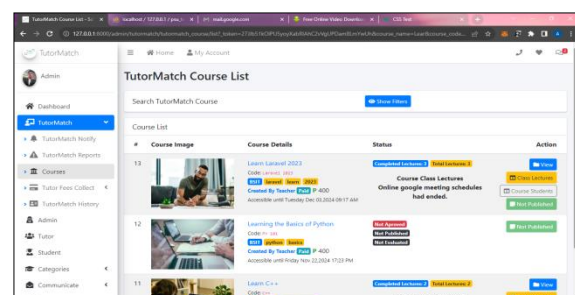
Upon verification, the administrator notifies the tutor mentioned in the report and requests a response. If the report is deemed valid, the administrator imposes a penalty on the tutor and reschedules the Google meeting class lecture schedule. If the report is invalid, both the tutor and the student receive notification of the report's invalidity.

Features Integrated into the Proposed Cross-Matching Platform

The developed cross-matching platform for Pangasinan State University-Alaminos City Campus was designed to provide the following features:

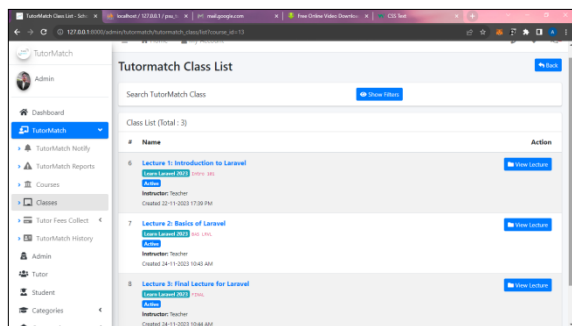
Match the Student with the Preferred Course. The cross-matching algorithm relies on user preferences determined by chosen interests and categories. The system analyzes the data, matching it with courses aligned with the user's preferences. Historical user actions and search queries are given importance in the matchmaking process, with this information recorded and utilized in subsequent logins. The courses recommended are tailored based on the user preferences stored in the database.

Figure 11: Admin: View Course List



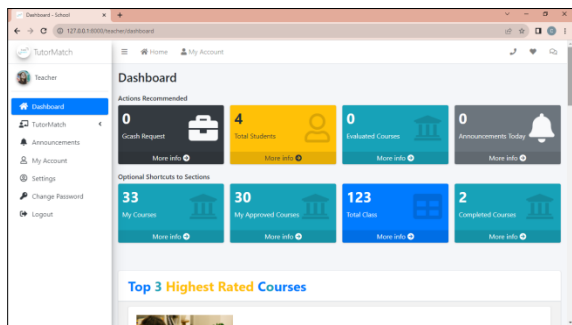
As shown in Figure 11, this is the designated area for the administrator to view and approve TutorMatch courses. Within this section, administrators have the capability to manage the full spectrum of actions related to these courses.

Figure 12: Admin: View Class List



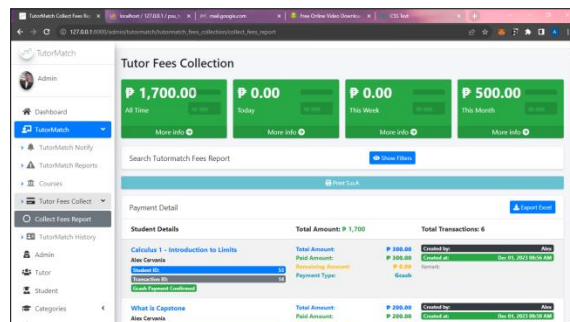
Within this section, the administrator can comprehensively review the TutorMatch classes created by the tutor. The admin can also access and inspect class lectures and content. This interface grants the administrator the ability to view and check the classes along with their associated learning materials.

Figure 13: Admin: View Course Student List



This page allows the administrator to monitor enrolled students in TutorMatch courses. The administrator can review the students currently registered in a course, providing a comprehensive toolset for student enrollment management within the TutorMatch website.

Figure 14: Admin: View Tutor Fees Collection Report



Within this page, the administrator can view the aggregated transactions of tutors' collected fees, serving as a central location for comprehensive financial record analysis. The feature offers valuable insights into the financial aspects of the tutoring platform. Administrator can easily view and check the details of these transactions for efficient financial management.

Figure 15: Tutor's Dashboard

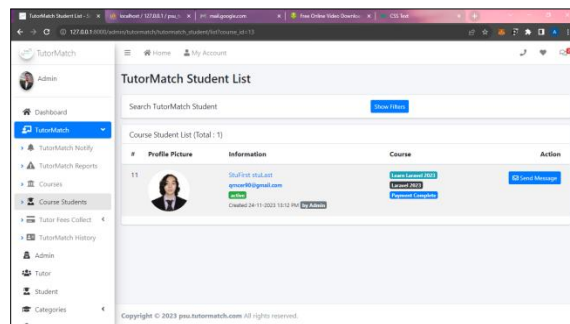
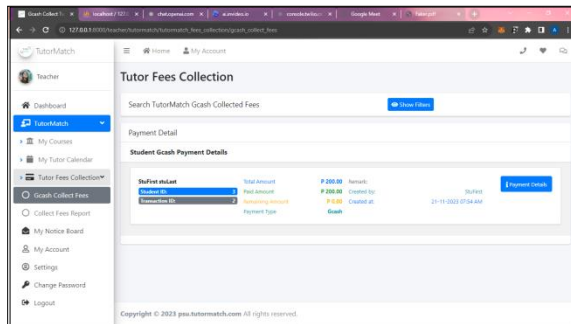


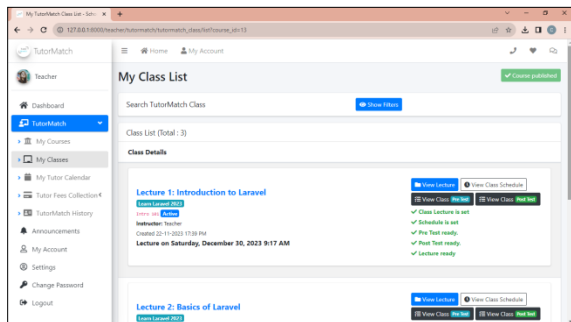
Figure 15 serves as the initial dashboard for tutors. From this page, tutors can seamlessly navigate to various activities and tasks within the website, enhancing their user experience and facilitating their responsibilities.

Figure 16: Tutor's Course List



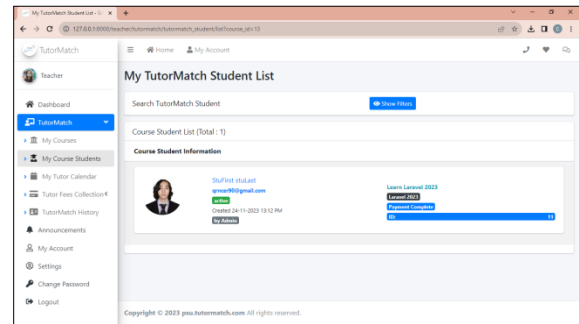
In this area, tutors have the ability to view, create, modify, and delete TutorMatch courses. It's a versatile platform that empowers tutors to manage their course-related actions comprehensively. Tutors can view, add, edit, and delete courses as needed, optimizing the process of course administration.

Figure 17: Tutor's Classes



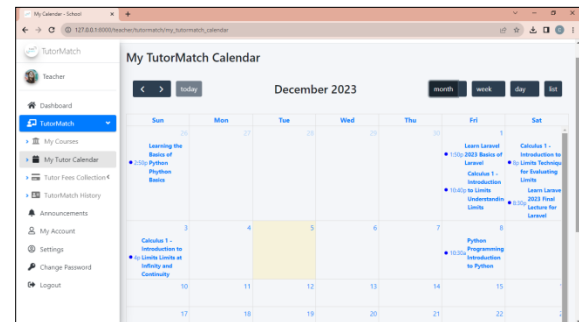
As shown in Figure 17, tutors can review, edit, and delete TutorMatch classes. It provides a user-friendly interface for managing course class details efficiently. Tutors have the ability to modify class information as necessary to ensure the smooth operation of TutorMatch classes.

Figure 18: Tutor's Course Student List



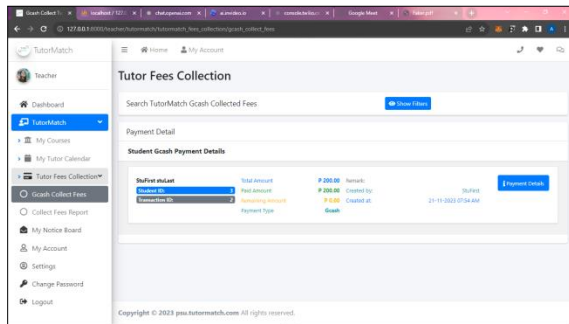
Within this page, tutors can access a list of students currently enrolled in a course. It provides a consolidated view of the enrolled students, making it easier for tutors to manage and interact with their student roster. This feature optimizes the process of tracking student participation across various courses.

Figure 19: Tutor's Calendar



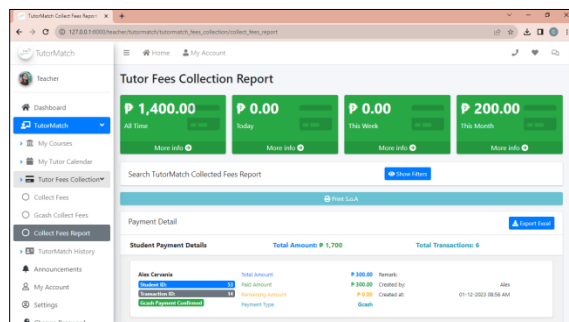
This designated area provides tutors with a calendar display that showcases the synchronized values of the course class time schedules. It offers a clear and organized view of the timetable, making it convenient for tutors to plan and manage their class sessions effectively. The calendar harmonizes the course class time schedules for seamless coordination.

Figure 20: Tutor's Fees Collection



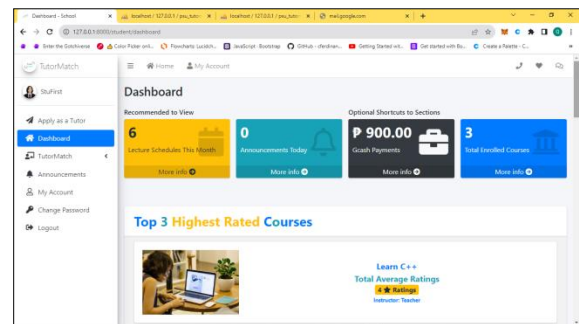
On this page, tutors have the capability to observe, approve, or reject fee requests. It offers a convenient process for managing financial transactions related to the payment method. Tutors can efficiently review and take action on fee requests within this interface.

Figure 21: Tutor's Fees Collection Report



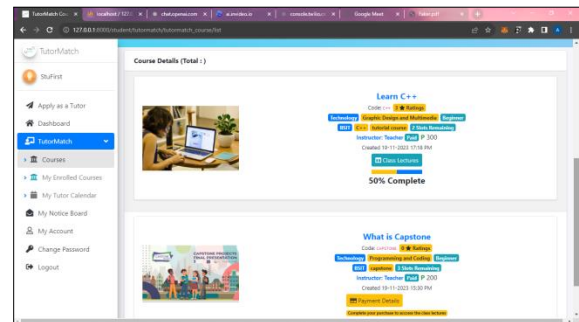
As shown in Figure 21, tutors can access an overview of the fees collected from students currently enrolled in their paid courses. It provides a comprehensive snapshot of the financial transactions related to the tutor's courses. Tutors can conveniently review the total fees collected from their enrolled students, aiding in financial management.

Figure 22: Student's Dashboard



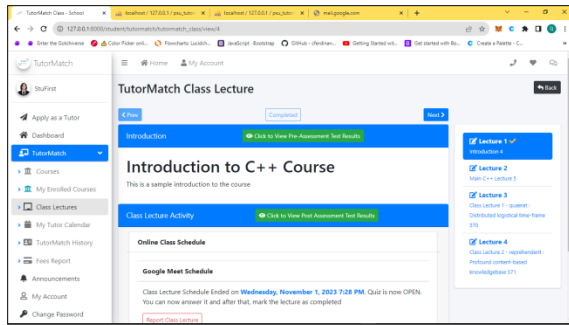
This serves as the student's dashboard page, serving as the starting point for their user experience. From here, students can effortlessly explore the platform and engage in various activities. It acts as the gateway to a range of educational opportunities and interactive features.

Figure 23: Student's Course List



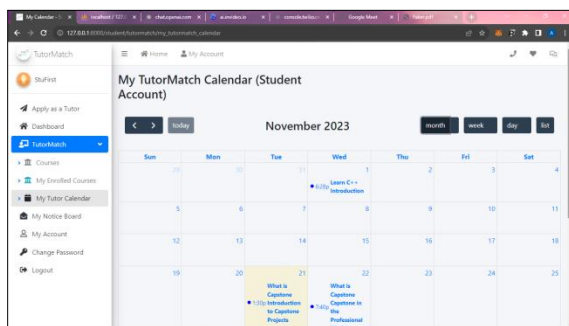
As shown in Figure 23, students can access and manage their course-related tasks, including viewing course details and course tutors. It provides a user-friendly platform for students to explore courses and view the qualifications of course tutors, optimizing their educational journey. This page empowers students to make decisions about their course enrollment and payment activities.

Figure 24: Student's Class Lectures



Within the student's class lectures, students can access and review the class lectures for the course they have selected and enrolled in. It offers a user-friendly interface for students to explore their course materials and enhance their learning experience. Students can conveniently view and engage with the class lectures, supporting their academic journey.

Figure 25: Student's Calendar



Within this page, students can access a calendar displaying synchronized time schedules from the course class timetables of all their enrolled courses. This feature offers a consolidated and organized view of their class schedules, facilitating effective time management. The calendar helps the students systematize their class timetables, helping them to plan and coordinate course activities efficiently.

Acceptability Test of the Cross-Matching Platform

In fulfillment of the developed cross-matching platform for PSU-ACC, the proponents conducted a survey to evaluate the acceptability of the developed system. Purposive sampling was used by the proponents to determine the respondents who were purposefully located and had the willingness to participate in assessing the acceptance of the developed system. The college students residing in the City of Alaminos, PSU-ACC instructors/IT faculty members, and the ICTMO coordinator evaluated the developed system.

The system testing was adapted from ISO 9126-1 by McCall in terms of functionality, reliability, usability, efficiency, maintainability, and portability.

Table 3. Functionality

Functionality	WM	Description
Suitability	4.4	Excellent
Accuracy	4.4	Excellent
Security	4.4	Excellent
OWM	4.4	Excellent

Functionality. Table 3 shows the perception of evaluators of the system for its functionality. The respondents rated the functionality of the system with an overall mean of 4.4, which is interpreted as excellent. The functions of the system are appropriate. A total average weighted mean of 4.4 translated to excellent in terms of suitability. Regarding accuracy, cross-matching platform for PSU-ACC has a total average weighted mean of 4.4, which is excellent. The platform adheres to existing standards and policies. For security, the system prevented unauthorized access with an average weighted mean of 4.4, which was considered excellent. The developed system

can provide security to authorized personnel, such as usernames and passwords, when accessing the system.

Table 4: Reliability

Reliability	WM	Description
Maturity	4	Very Good
Fault Tolerance	4	Very Good
Recoverability	4.24	Excellent
OWM	4.08	Very Good

Reliability. Table 4 shows the perception of evaluators of the system's reliability. The respondents rated the systems as very good, with an average weighted mean of 4.08 indicating that the system performs consistently. In maturity, there was a minimum frequency of fault or failures in the system with an average weighted mean of 4, which translated as very good; the system was capable of handling changes in its environment. In terms of fault tolerance, the system can handle system errors with an average weighted mean of 4, which adheres to the fact that the system could continue its normal operation. In recoverability, the developed system performance is re-establishing from failure with an average weighted mean of 4.24, which is excellent. The system continuously receives data from the internet.

Table 5: Usability

Usability	WM	Description
Understandability	4.7	Excellent
Learnability	4.7	Excellent
Operability	4.6	Excellent
OWM	4.66	Excellent

Usability. Table 5 shows the perception of evaluators of the system for its usability. The respondents rated the system's usability with an average weighted mean of 4.66, which was excellent; thus, the system

was ready and usable. In terms of understandability, the cross-matching platform for PSU-ACC concepts is easily recognized, with an average weighted mean of 4.7 interpreted as excellent. The respondents clearly understood the concept of the system. In learnability, effort in learning the system was reduced with an average weighted mean of 4.7, which translated excellently. This reflected that the system was easy to learn. And in terms of inoperability, the system in the computer device was easy to use or operate with an average weighted mean of 4.6, which was interpreted as excellent. This showed that the system can be operated on a computer.

Table 6: Efficiency

Efficiency	WM	Description
Time Behavior	4.24	Excellent
Resource Behavior	4.6	Excellent
OWM	4.42	Excellent

Efficiency. Table 6 shows the perception of evaluators of the system with respect to its efficiency. The respondents rated the efficiency of the application as reflected with an overall weighted mean of 4.42, which was interpreted as excellent. The efficiency of the system was great. In time behavior, there was a fast response time of the system with an average weighted mean of 4.24, which translated as excellent; thus, the system's response was relatable good. And in resource behavior, resources used for system performance are accessible, with an average weighted mean of 4.6, which was interpreted as excellent; the system's resources are accessible.

Table 7: Maintainability

Maintainability	WM	Description
Analyzability	4	Very Good
Changeability	4.76	Excellent
Stability	4.76	Excellent
OWM	4.5	Excellent

Maintainability. Table 7 shows the perception of evaluators of the system with respect to its maintainability. The respondents rated the application's maintainability with an overall weighted mean of 4.5, which was excellent. The system was capable of being maintained. There was less effort in the identifying system in analyzability, and device failure was caused by an average weighted mean of 4, which was interpreted as very good, which means that the system is easy to analyze for what was wrong. In terms of changeability, effort in modifying the system was reflected with an average weighted mean of 4.76, which translated as excellent; thus, the system has provided resistance to change. In terms of stability, the system's sensitivity to modification was reflected with an average weighted mean of 4.76, which was interpreted as excellent; thus, the system was easily modified by others.

Table 8: Portability

Portability	WM	Description
Adaptability	4.8	Very Good
Installability	4.6	Excellent
Conformance	4.6	Excellent
OWM	4.66	Excellent

Portability. Table 8 shows the perception of evaluators of the application with respect to portability. The respondents portability rate of the system is reflected with an overall weighted mean of 4.66, which was interpreted as excellent. Therefore, the system was easily carried and

moved. In adaptability, specification changes in the system were done quickly with an average weighted mean of 4.8, which was interpreted as excellent; thus, the plan was great at adapting. In terms of installability, there was an effortless process of installing the application on the computer with an average weighted mean of 4.6, which is interpreted as an excellent. In accordance with the result, the system is ready to be implemented. In conformance, the device is compliant with portability standards with an average weighted mean of 4.6, which was interpreted as excellent and was compatible with the computer.

Overall Acceptability Test

Table 9 shows the results of the overall acceptability test of the cross-matching platform that was evaluated by the respondents in different aspects of the test, ranging from functionality to portability.

Acceptability	WM	Description
Functionality	4.4	Excellent
Reliability	4.08	Very Good
Usability	4.66	Excellent
Efficiency	4.42	Excellent
Maintainability	4.5	Excellent
Portability	4.66	Excellent
OWM	4.45	Excellent

The overall acceptability test evaluation of the respondents on the system gained an overall weighted mean of 4.45. Its parts, including functionality, reliability, usability, efficiency, maintainability, and portability, all achieved a very good rating.

CONCLUSIONS AND RECOMMENDATIONS

Based on the findings, it is evident that the system under consideration excels in user-friendliness and security, catering to

both students and tutors. Students experience a seamless process from logging in to exploring courses and conducting transactions. Tutors efficiently manage courses and payments, benefiting from convenient access to essential features like the student-tutor calendar and announcements. Account management is straightforward for students, while administrators can easily edit accounts. The administrative role is crucial in ensuring the system's effective operation, with the ability to smoothly handle tasks and change passwords, emphasizing the system's simplicity, security, and overall functionality.

Furthermore, the system facilitates easy navigation for students and tutors, offering features such as course viewing, lecture attendance, and participation in Google meetings. Account verification emerges as a vital step for accessing all TutorMatch features, ensuring a secure and reliable user experience. Tutors benefit from the system's versatility, enabling them to create courses, schedule meetings, and generate tests. Administrators play a pivotal role in course verification, account management, and communication facilitation. They also have control over significant account actions, such as banning and adjusting settings, contributing to a well-rounded and efficient system.

An overall improvement in the developed system is observed across various dimensions, including functionality, reliability, usability, efficiency, maintainability, and portability. The impressive overall weighted mean of 4.45667 categorizes the system within the excellent category. This denotes a significant enhancement in key aspects, ensuring a robust and effective platform for both students and tutors.

Based on the proposed system, the following recommendations for the Cross-Matching Platform were enumerated: future researchers should enhance the system by allowing the upload of diverse learning materials, including PDFs, Excel, Word, and PowerPoint, to broaden educational resources. Adherence to government rules is recommended for tutors, ensuring compliance with regulations on earning extra income beyond regular working hours during brief consultation sessions limited to answering student inquiries. It is advised to establish a transparent pricing structure for courses, allocating percentages to the school and tutor to create a mutually beneficial model that may potentially generate income for the school, with approval from the administration or through a memorandum of agreement. Enhancements for the mobile version should focus on implementing robust encryption, integrating a stand-alone Learning Management System (LMS), and incorporating video conferencing capabilities to enhance data protection, resource management, and virtual collaboration. Lastly, future researchers are encouraged to improve the user interface and add features based on user preferences to enhance the system's functionality, reliability, usability, efficiency, maintainability, and portability.

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