

Development of a Tutorial Web-based Application System

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Abstract – *The developer aimed to design a web-based application specifically for learner and tutor. The developed web application is capable of helping the learner in locating for a tutor instantly and helping the tutor as well. The developed system sought to meet the following objectives: to identify the current processes of locating for tutors, to determine the hardware and software requirements of the developed system, to describe the features of the developed system, and to test the acceptability of the developed system. Modern Waterfall Model was used in building the project in which it was chosen as the Software Development Life Cycle Model to provide specific steps and activities to be followed such as requirements analysis, design, implementation, testing, deployment, and maintenance. Also, various data gathering techniques were used to define the requirements of the system. These include interview, library research, observation, and internet research. Further, the tools used for data analysis include flowchart, Use Case Diagram, Entity-Relationship diagram, database schema, database instance, and weighted mean. Based from the analysis of findings, it showed that the developed system is an effective tool in finding for a tutor.*

Keywords – *Instatutor, Tutorial Web-based Application, Tutor, Learner*

INTRODUCTION

The traditional education systems used for several centuries have evolved very slowly and might be ineffective for learning styles and preparation levels. This system is characterized by many students interacting with a single teacher who cannot address every student's individual needs. Therefore, some students can become frustrated and fail to reach their educational potential. Besides, the traditional education system creates an environment in which it is difficult to accommodate students' varying levels of background

information about the materials and differences in their ability to learn; the teacher uses the same materials and teaching techniques for the entire class regardless of the students' different levels of understanding. Hence, it can lead to some students becoming frustrated because not all students learn from the same teaching style; some are visual learners, some are auditory learners, etc. Students in these traditional classrooms often concentrate more on taking notes than understanding the materials, making it more difficult for them to master the concepts (Talib, A., 2010).

Relative to the traditional "chalk and talk" method of teaching that's persisted for hundreds of years is now acquiring inferior results compared with the more modern and revolutionary teaching methods available for use in schools today. More significant student interaction is encouraged, the boundaries of authority are being broken down, and a focus on enjoyment over grades is emphasized (Jackson, S., 2013).

Likewise, when kids lack confidence in the classroom, they struggle to keep up with their peers, need help preparing for exams, or deal with a learning difficulty; parents may arrange for them to see a private tutor outside the school. Tutors provide the extra scaffolding that less able students may require and can also encourage gifted children by introducing them to more advanced topics not covered in a school curriculum. By working one-on-one, tutors can go over content at a pace that is right for every child. They can also assist with school assignments and help enforce good study habits, including setting smart targets specific, measurable, achievable, and relevant in a given period (Cicerchia, M., 2016).

There are many reasons parents choose Tutoring for their children. Some parents feel unable to help their children with schoolwork. Others may find their children are more receptive to working through school struggles with another person. Tutoring can help strengthen subject comprehension, boost confidence, and build essential learning skills (GradePower Learning, 2017).

In Dagupan City, there are several tutorial centers such as Brainworks Tutorial and Review Center,

Kidsworld Learning and Tutorial Center, Children's Niche Tutorial Center, and many more. Parents enroll their children in those tutorial centers to keep their children updated with the classroom lessons. There are problems why parents send their child to a tutorial center; one reason is that most parents are busy with their work - the problem is the time consumed. They need to go and look for a tutorial center. What if the tutorial center is located away from the location of the learner? Or are there no tutorial centers at all in their area? With the developed system, the parents don't need to consume or waste time and effort to locate a tutor. Also, the plan was designed to cater and solve those problems, most especially on looking for a qualified tutor for the learner.

METHODS

This study used descriptive-developmental research. Descriptive research is the most effectively applied to studies to gather additional information, learn more about an area of interest, or become more familiar with the topic. Typical methods of descriptive research are the observational method, case study method, survey method. Descriptive research is unique in the number of variables employed. Like other types of research, descriptive research can include multiple variables for analysis, yet

According to Manda (2014), descriptive research describes a population's characteristics or phenomenon being studied. According to Borg (2009), descriptive research can include multiple variables for analysis,

yet it requires only one variable, unlike other methods. Descriptive studies have an important role in educational research.

In this study, the developer used the Modern Waterfall Model as the SDLC to be the guide in the development of the system. It has six (6) phases that include the following: 1) **Requirements gathering and analysis** which aimed to come up with Requirement Specification document or documents. The aim is to define the necessities in as clear and as detailed a manner as possible. Generally, to capture, collect and gather the requirements, a dedicated team is set up to capture the requirements. (Panchal, 2011).

2) **System Design**, in this phase, focus on the looks at how the software will be built and how it will operate, emphasizing hardware, software, network infrastructure, and user interface. This stage's primary purpose is to create a blueprint that will satisfy all documented requirements, then identify all inputs, processes, and outputs needed and help avoid misunderstandings by involving the stakeholders such as managers and users. (WORDPRESS.COM, 2013).

3) **Testing**, the project design, in this stage is tested to ensure that it accomplishes the goals and tasks laid out for the system. Any errors in the previous phases will arise in this stage of the project. (TECH-FAQ, n.d.).

4) **Implementation**, with inputs from system design, the system is first developed in small programs called units integrated into the next phase. Each unit is set and tested for its functionality

which is referred to as Unit Testing. (tutorialspoint.com, n.d.). According to Daniel(2012), this phase is also called the Implementation & Unit Testing. On receiving system design documents, the work is divided into modules unit, and actual coding started. The system is first developed in small programs called units. Each unit is set and tested for its functionality. Each must comply with the needs of the users. 5) **Deployment of the System**, it is in this stage that the product is put into production. After the project team tests, the product and the product pass each testing phase, and the product is ready to go live. This means that the product is ready to be used in a natural environment by all end-users. There are various phases of the deployment process the project team must follow to ensure the code and technology deploy appropriately. The stages include deployment preparation and procedures, product deployment, transferring ownership of the product, and closing the deployment phase (Noel Ransom, 2018). And lastly 6) the **Maintenance and Support** phase, it is where when the customers start using the developed system, then the actual problems come up and need to be solved from time to time. This phase has the common cases, and a dedicated team handles maintenance. Those who did the implementation and testing phase often moved to the next project, leaving the maintenance team to fix bugs in production. In such a situation, knowledge of what was done during the project is based on documents instead of experience, and the team needs more time to debug and solve the problem. (Thomas, 2013).

Sources of Data

The Primary sources of data were derived from an interview conducted from some tutorial centers and schools. Ma'am Kathleen Mendoza teacher in Mary Help Christian Catholic School (MHCCC) in Basista, Pangasinan, was interviewed. The developer gathered the information required for the project, such as the information regarding the existing processes of finding Tutor by having an interview with Mrs. Racquel Repulleza, one of the parents of a learner who is currently letting her child attend tutor class.

Likewise, as the secondary sources of data, the developer used books, unpublished references, and the Internet. The developer used books such as System Analysis and Design and other related books to help her identify the valuable features that are incorporated in the system, and Dictionaries were used to determine the meaning of some unfamiliar terms. The developer had also taken articles from the school of Colegio de Dagupan's library-related research study and Internet sources to gather additional features for the system and existing documents that proved the system's acceptability.

Instrumentation and Data Collection

In the development of the application, the following data gathering instruments were used. 1) Interview. The developer used the Interview for data gathering to get the needed information faster and more reliable in creating the system. The developer had acquired certain relevant information.

The developer conducted an Interview to identify requirements required to develop INSTATUTOR: A Tutorial Web-based Application. The developer interviewed tutors from different tutorial centers and schools. According to Ma'am Kathleen Kaye Mendoza, teacher of MHCCS, which has three learners, she said she had encountered difficulty teaching a learner. She thinks that the developed application is beneficial to Tutor and Tutor to that learner. 2) Library Research. The developer used the library research to gather information. Library Research is conducted in a university, college, municipal, or private library where people can search catalogs, stacks, book or magazines, or microfiche looking for information on all kinds of topics to include in theses. It is a general and traditional technique using the library to collect materials for use in intensive research projects. It is defined as the systematic study and investigation of some library and information science aspect where conclusions are based on the analysis of data collected following pre-established research designs and methodologies (HLWIKI International, 2017). According to Rasmuson (2016), Library research is a term used for secondary analysis where a person uses data that someone else had already collected. It involves the investigation of books, journals, periodicals, databases, and stored records. 3) Observation. Through Observation, the developer knew the real problems needed to solve, especially in finding a tutor on the part of parents /students and finding a learner on the part of tutors. 4) Internet Research. The developer used the

internet research to gather data, searching articles, case studies, etc. This would helped the developer search for more related pieces of literature available from the Internet, such as up-to-date and readily accessible reference materials.

Tools for Data Analysis

The following are the tools that the developer utilized for analyzing the processes in developing the system: 1) Flowchart, the developer used a flowchart in identifying the existing process of finding a tutor – on the part of the learner and vice-versa. It helped the developer understand the current process of looking for a tutor and likewise looking for a learner, thereby assisting the developer in presenting the process in a flowchart. 2) Use Case, the developer used the Use Case Diagram to set possible interaction sequences between systems and users (or actors) in a particular environment and relate it to a specific goal. 3) Entity Relationship Diagram (ERD), the developer used the ERD to create graphical representation of the relationships between entities within the Interactive learning application. It is also used to see and understand the relationship of the entities. The diagram helped the developer produce an exemplary database structure, and it is also servers as future references during tables or data manipulation. 4) Database Schema. The developer had utilized a database schema to illustrate the structure of the developed system's database fully. The developer also used this as a tool for data analysis to show the organized way of presenting the system's database data. It

is also provided developer on making the proper structure of the database. 5) Database Instance. The developer used the database instance to represent the complete database environment. It contains all the records of the sales transaction being processed through the use of the developed system. 6) Weighted Mean. The developer used the weighted mean for the system's acceptability as a part of the system's develop on the deployment of the system and the system's test ability. This will be computed through the Likert Scale and Average Weighted Mean to determine the system's acceptability, and below shows the computation. The developer also used this tool to mean the computed with extra given to one or more sample elements.

RESULTS AND DISCUSSIONS

Existing Process of Locating for Tutor

The existing process of locating a tutor is potentially time-consuming. The parent or the learner needs to talk to a tutor personally by going to the tutorial center. That's why parents exert effort to find a tutor. The Tutor manually gathered the learner's information, and because of that, there were a vast amount of papers in the file room. Most parents prefer home-based Tutoring, but they encounter problems in locating a tutor who wants to teach according to the learner's desire. Parents send their children to the tutorial center every day and paying the Tutor every month, while some parents pay per session. There is also a tutorial center that advertises their center to different schools, and it quite

tricky, and they experience a hard time finding a learner.

Hardware and Software Requirements of the developed System

The requirements of the system include the hardware and software specifications of the system. Fulfilling the given recommendation of conditions

should be attained for the system to work at its full potential.

Hardware Specification. This requirement includes the physical or tangible resources of the computer. The requisites should be followed for the system to be functional. Table 4.1 shows the minimum hardware requirements of the system needed in the deployment of the system.

Table 4.1 *Hardware Requirements*

Hardware Requirements	Specification
Processor	Intel Pentium
RAM	4GB
Storage	1TB hard drive
Mouse	USB Mouse
Keyboard	USB Keyboard Port

The table above shows the hardware specification that can use in installing the system. The processor must be at least Intel Pentium to support the system's execution, 4GB RAM or higher, at least 1TB free space for the system storage, USB mouse, and USB keyboard port. These requirements are needed for the effective and efficient use and access of the system.

Software Specification. For the deployment of the developed system, the developer also made software specifications for the course. The system should run at ease without any problems if the said specifications are met. Table 4.2 shows the software specification of the system.

Table 4.2 *Software Specifications*

General Requirement	Suggested Requirements
Operating System	Windows 10
Cross-platform Web Server/ Database	XAMPP / WAMPP, MySQL

Table 4.2 present the list of minimum software specifications of the system. The operating system must at least be Windows 10. The cross-platform webserver/ database must be XAMPP,

WAMPP, or MySQL. Software requirements support the hardware requirements in running the system. The availability of each condition should be

considered in the implementation of the system.

Features of the Developed System

Through the conducted interviews, Observations, and data made by the developer, the system's features were clearly defined and identified. The developer added some features and, through analysis, developed a more relevant and interactive design.

The overall system's features and functionalities are presented. The developed method is composed of different modules. The quality of the course was delivered via screen-shots. The first page displayed upon launching the system is the Home page, where you can view the main panel or HOME of the system.

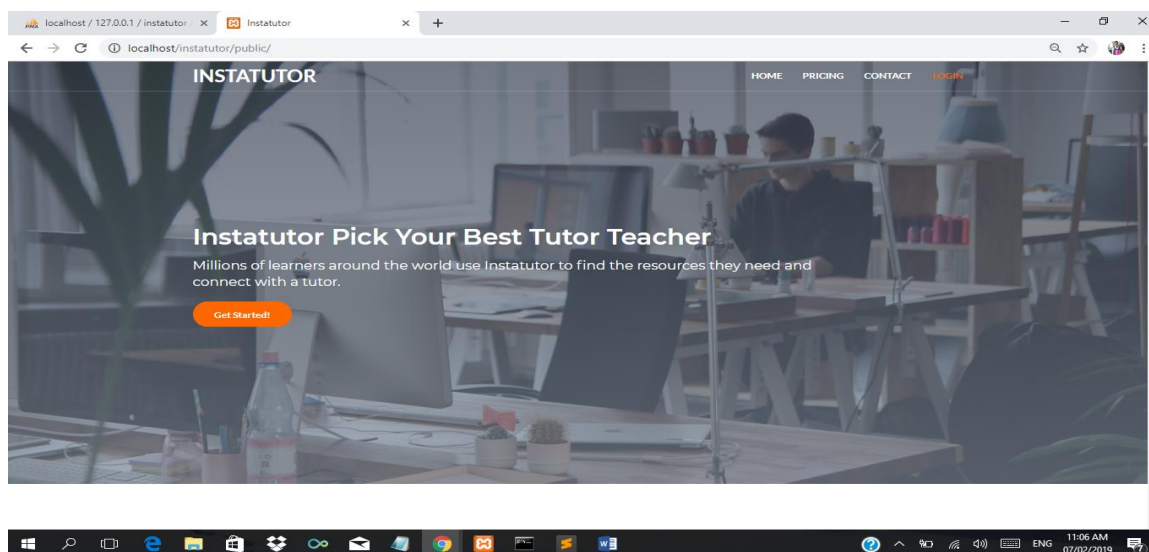


Plate 4.3: Home Module

Plate 4.3 shows the home module and serves as the welcome page of the website. It should be user-friendly for the users to understand the website easily. As you can see on the navigation bar, four (4) tabs will bring you to the

corresponded page of that particular tab, such as the home tab, pricing tab, contact tab, and login tab. Also, a Get Started button brought you to the signup form of the system.

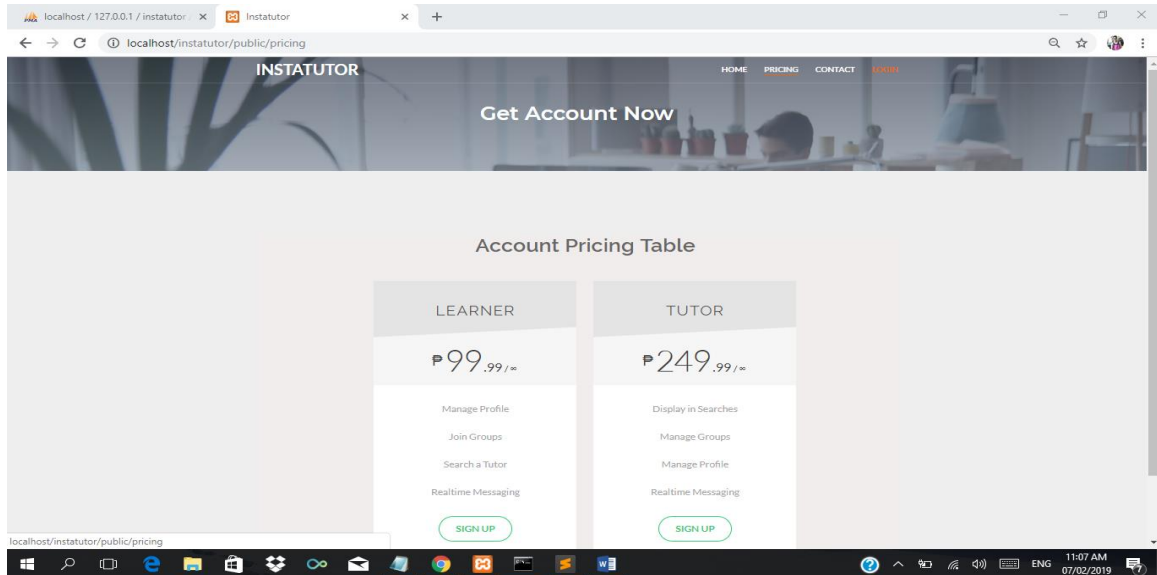


Plate 4.4: Pricing Module

Upon clicking the pricing on the navigation bar, the pricing module will be shown. Plate 4.4 shows the pricing table for the Tutor and learner's

membership fee and the features once they create an account. Upon clicking the signup button, the system will bring you to the signup form.

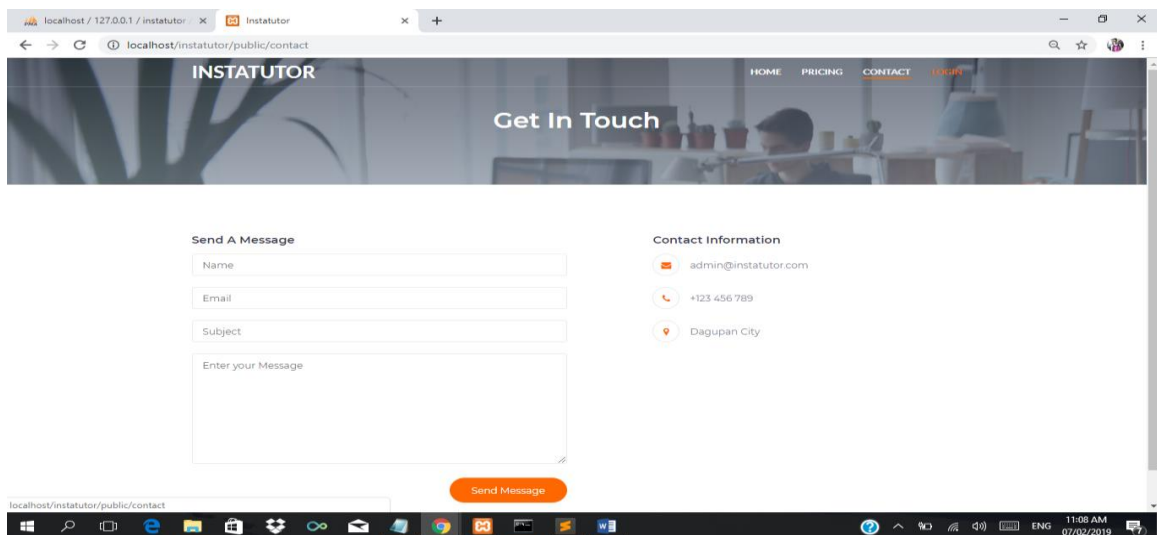


Plate 4.5: Contact Module

This plate shows the developer's contact information, and the users can

send feedback, and basically, it was used for getting in touch with the developer.

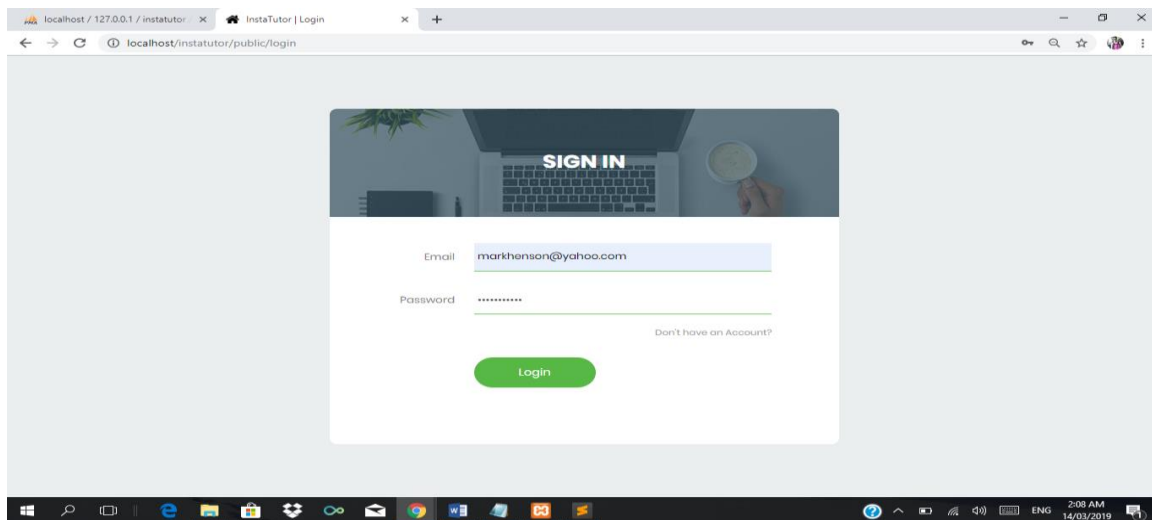


Plate 4.6: Login Interface

Upon clicking the login on the navigation bar, the system will bring you to the login form where the user is

required to input his/her email and password and clicking the login button to access their accounts.

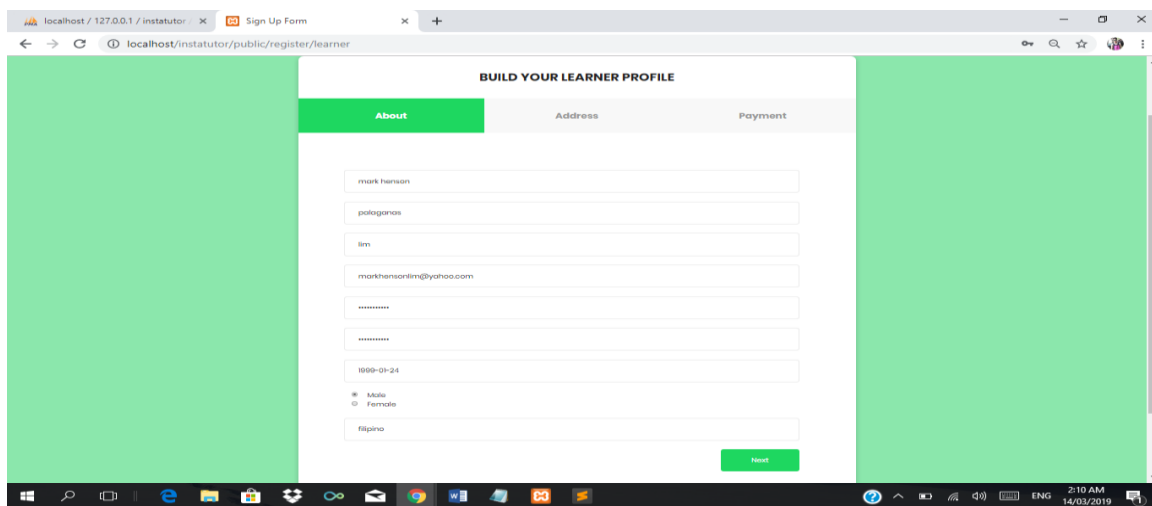


Plate 4.7: Sign up Module for Learner

Plate 4.7 shows the learner module's signup form wherein the learner starts to build his/her profile. The learner is required to fill in all the information needed. The first form is about the

learner's personal information such as first name, middle name, last name, email, password, birthday, gender, and nationality and clicking the following button once they are finished.

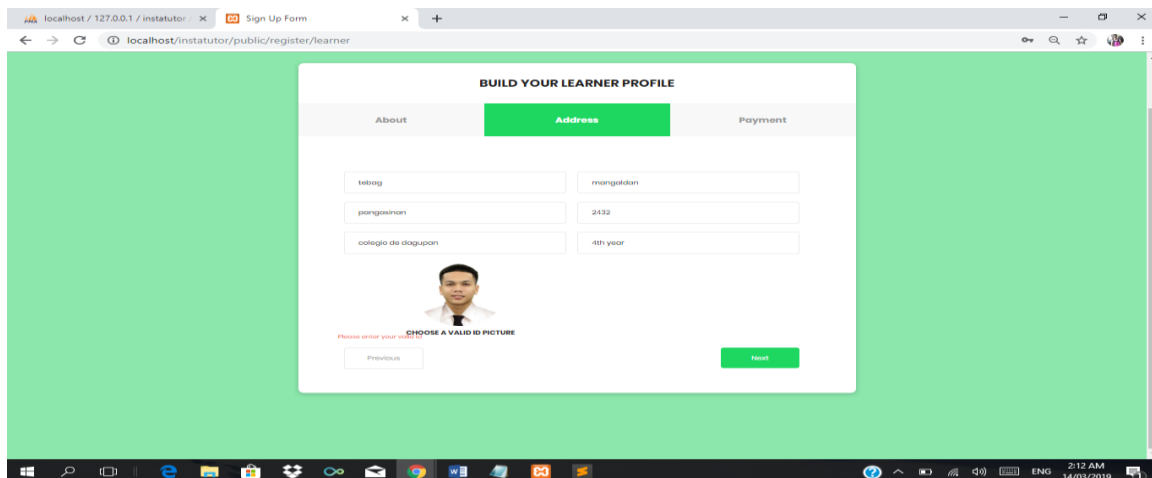


Plate 4.7.1: Sign up Module for Learner

Plate 4.7.1 shows the next steps in creating an account which is the address wherein the learner is required to input his/her complete address, zip code,

school, and grade level. The learners are also required to upload his/her profile picture. After finishing this step, the next plate will be shown.

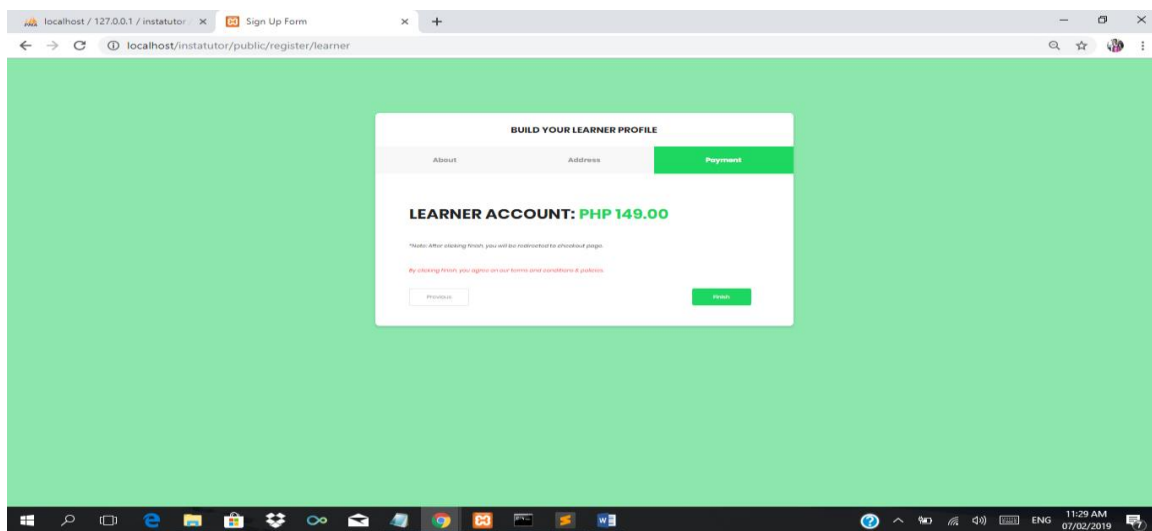


Plate 4.7.2: Sign up Module for Learner

Plate 4.7.2 shows the payment section. It displays the membership fee, and upon

clicking the following button, the next container will be shown.

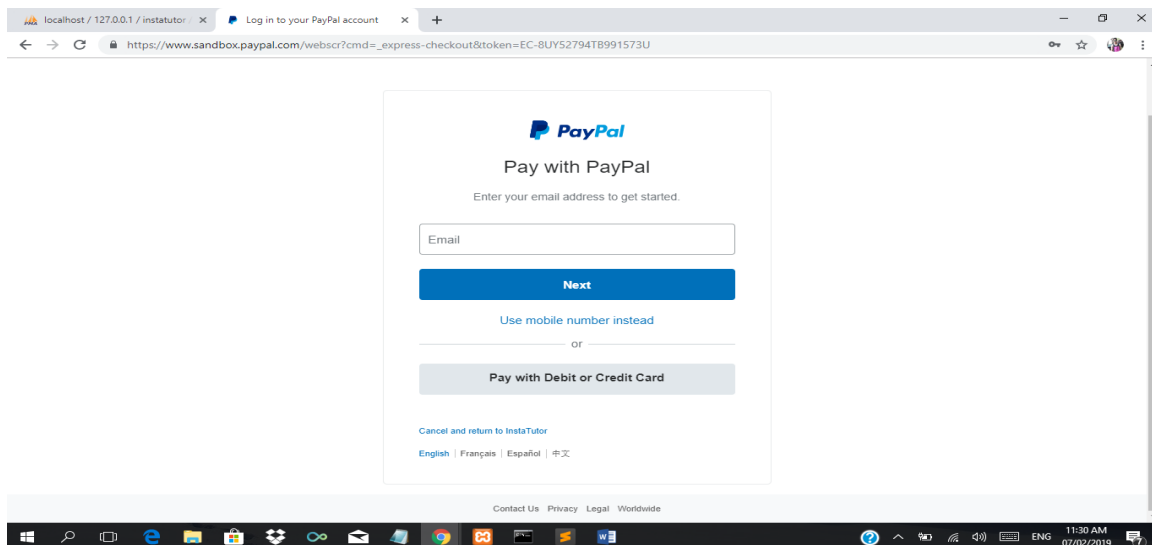


Plate 4.7.3: Sign up Module for Learner

Upon finishing all steps, the system will bring you to the login form of Paypal, which is used for the payment mechanism. After paying the

membership fee, the system will bring you to the website's login form and log in to your account to get started.

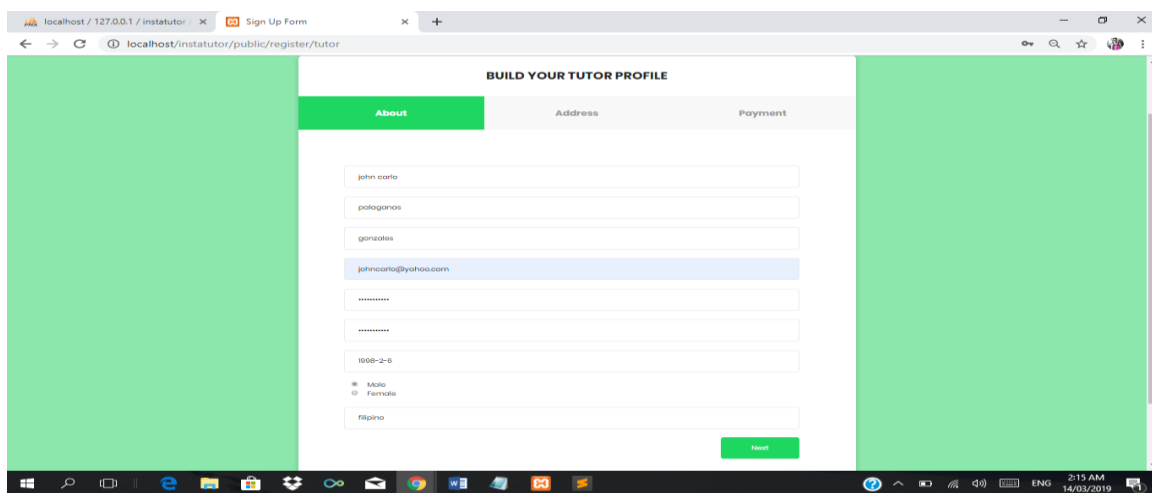


Plate 4.8: Sign up Form for Tutor

Plate 4.8 shows the tutor module's signup form wherein the Tutor starts to build his/her profile. The Tutor is required to fill in all the information needed. The first form is about the

Tutor's personal information such as first name, middle name, last name, email, password, birthday, gender, and nationality and clicking the following button once they are finished.

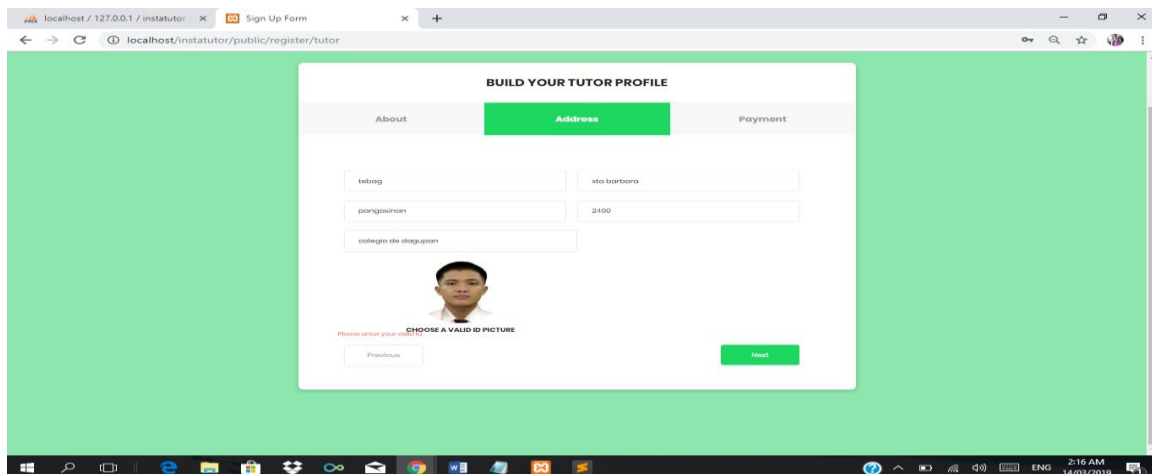


Figure 4.8.1: Sign up Form for Tutor

Plate 4.8.1 shows the next steps in creating an account which is the address wherein the Tutor is required to input his/her complete address, zip code, and

school. The Tutor is also required to upload his/her profile picture. After finishing this step, the next plate will be shown.

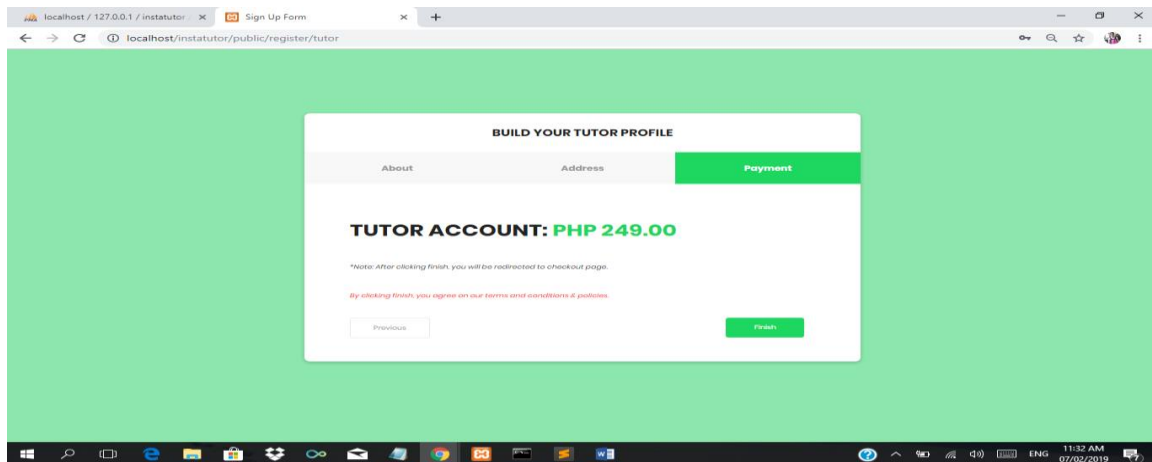


Plate 4.8.2: Sign up Form for Tutor

Plate 4.8.2 shows the payment section. It displays the membership fee,

and upon clicking the following button, the next figure will be shown.

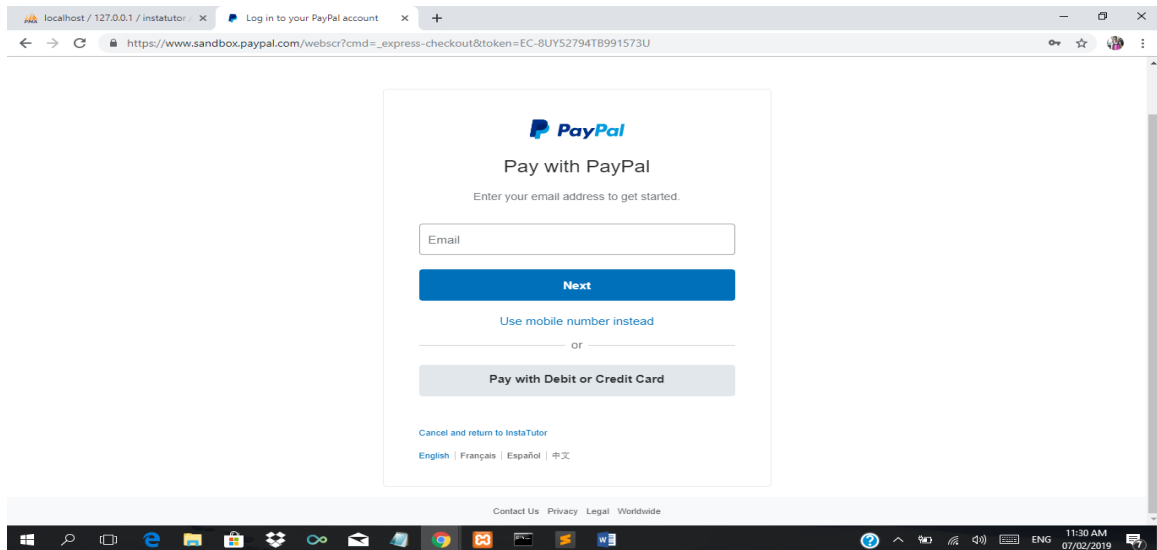


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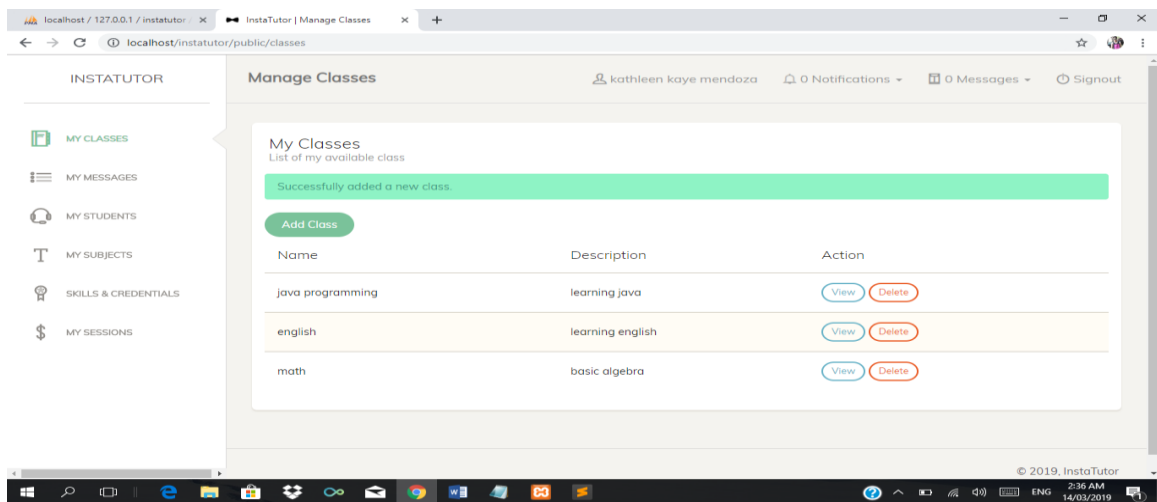


Plate 4.9: My Classes Module for Tutor

Plate 4.9 shows my class dashboard, where it displays the online classes created by the Tutor. Also, the Tutor can add online courses.

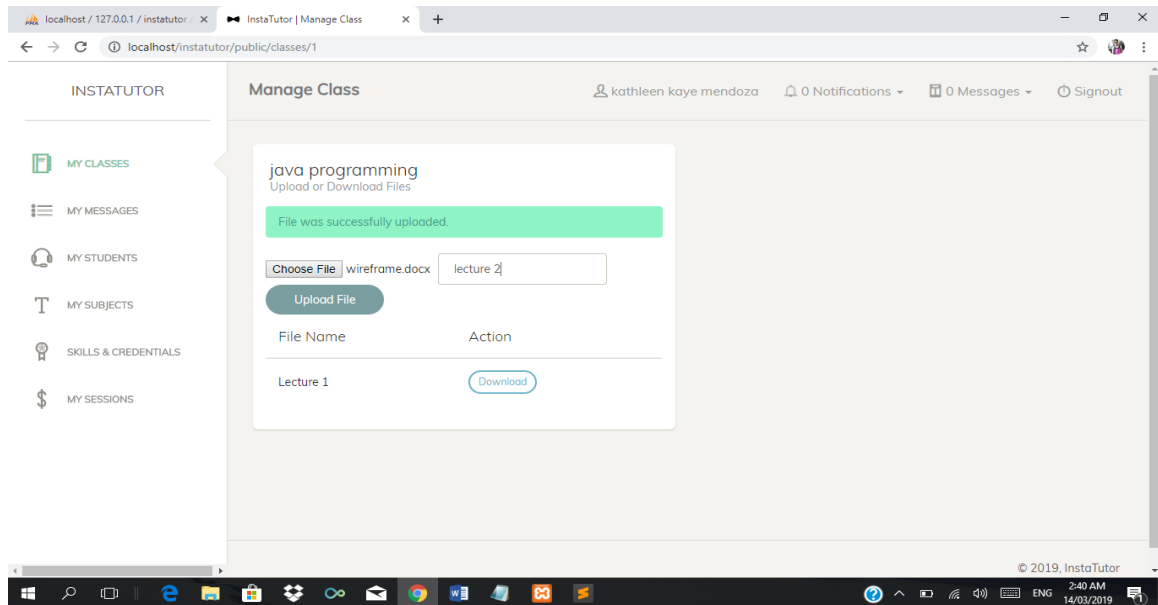


Plate 4.9.1: My Classes Module for Tutor

Upon clicking the view button, plate 4.9.1 will be shown. The Tutor can

manage the class such as uploading a file, download and deleting the category.

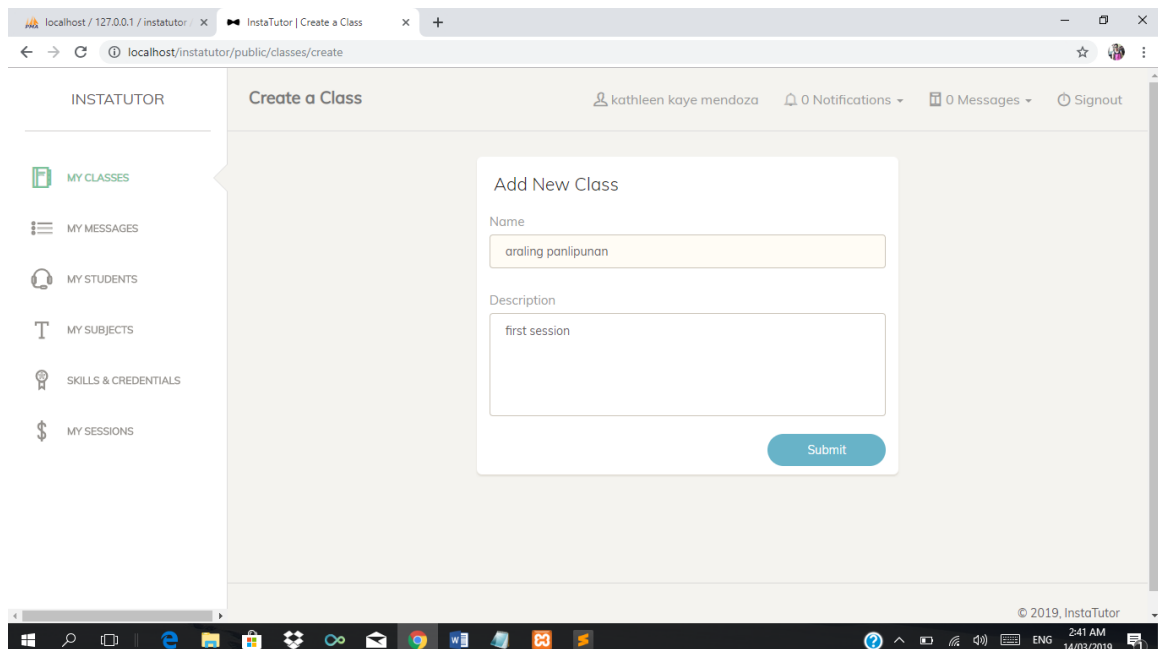


Plate 4.9.2: My Classes Module for Tutor

Upon clicking the add class button, the system will bring you to this plate wherein the tutor input the class

name and the description of the subject and clicking the submit to finish.

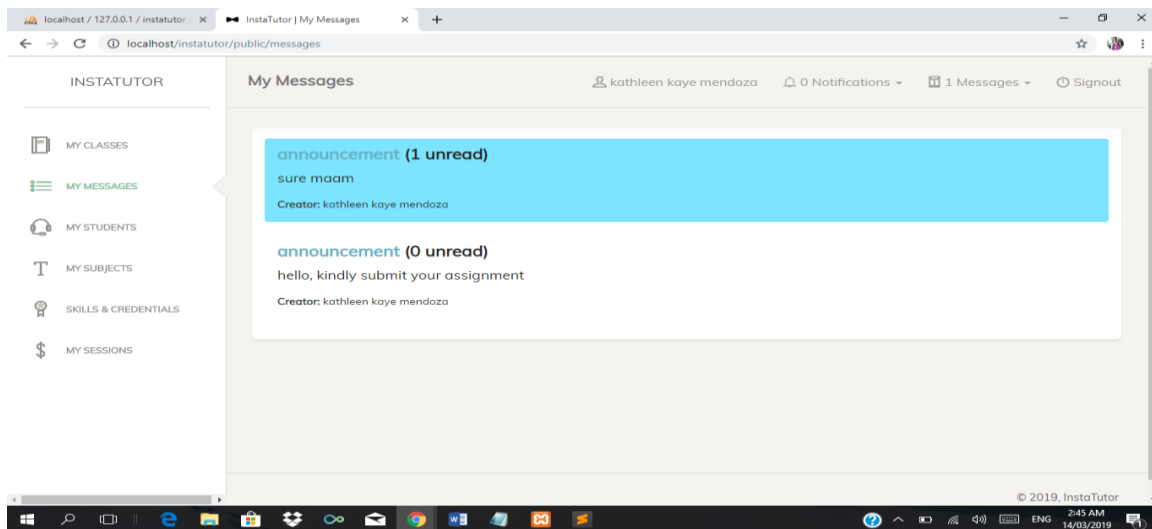


Plate 4.10: My Message Module

Plate 4.10 shows the list of messages composed by the Tutor and viewing his/her learner's conversation.

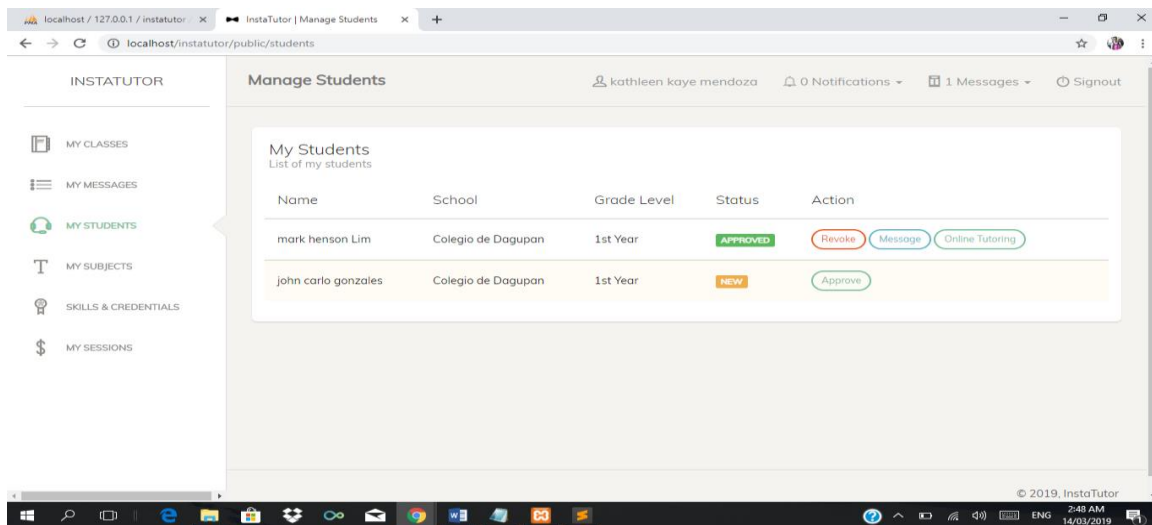


Plate 4.11: My Student Module for Tutor

Plate 4.11 shows my student's dashboard, which displays all the learners approved by the Tutor. Upon

clicking the message button, the system will bring you to the compose message section to create a new message.

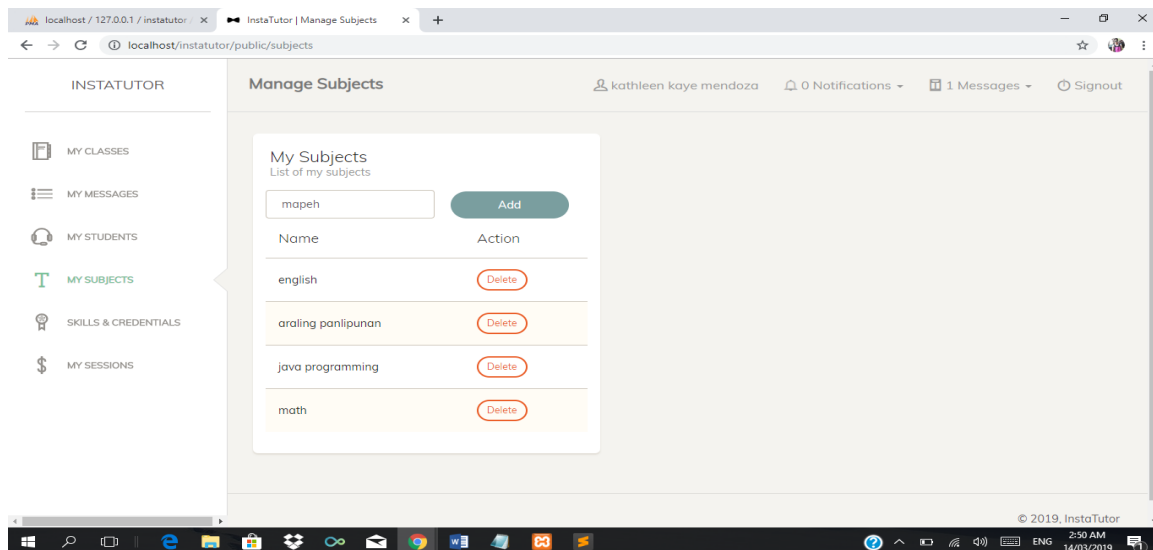


Plate 4.12: My Subject Module for Tutor

Plate 4.12 shows my subject dashboard where the Tutor can add subjects and view the created issues. He/she can also delete the problems started.

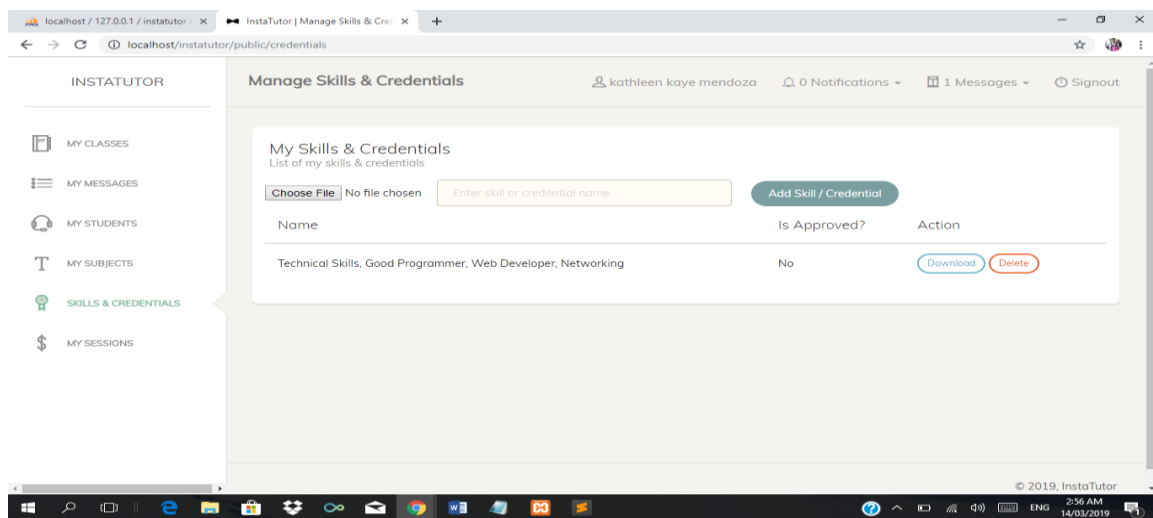


Plate 4.13: My Skill/Credentials Module for Tutor

Plate 4.13 shows my credentials dashboard, where the Tutor can add credentials and qualifications. After adding, the admin will validate the

Tutor's qualifications and certifications, and the admin is the one who approves the request.

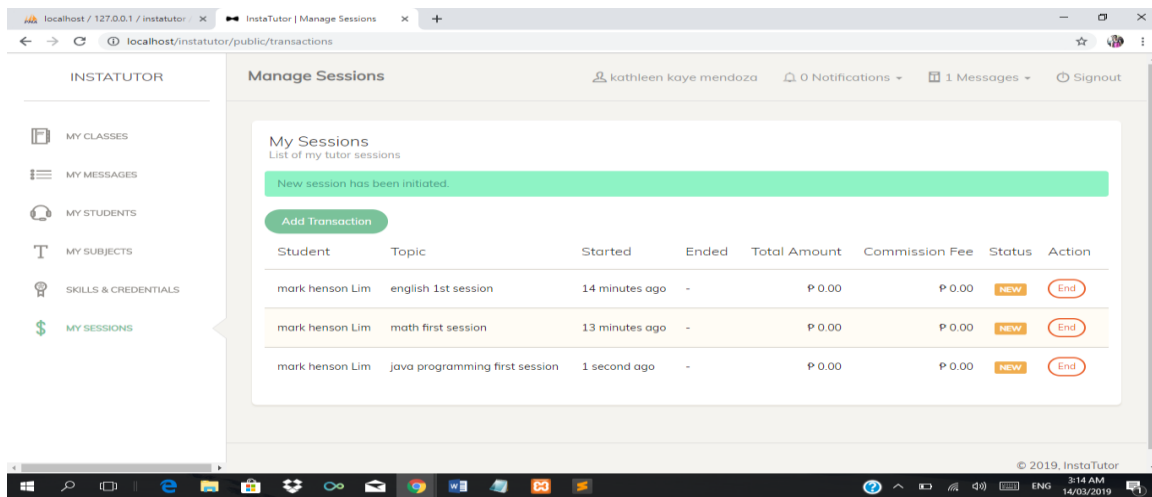


Plate 4.14: My Session Module for Tutor

Plate 4.14 shows my session's dashboard, displaying the list of successful transactions created by the Tutor. It also displays the total amount and the commission fee. Upon clicking the add transaction, the system will bring

the user to the add transaction section, where the Tutor input the transaction's name and the transaction description. The Tutor can also end once they already finished the session.

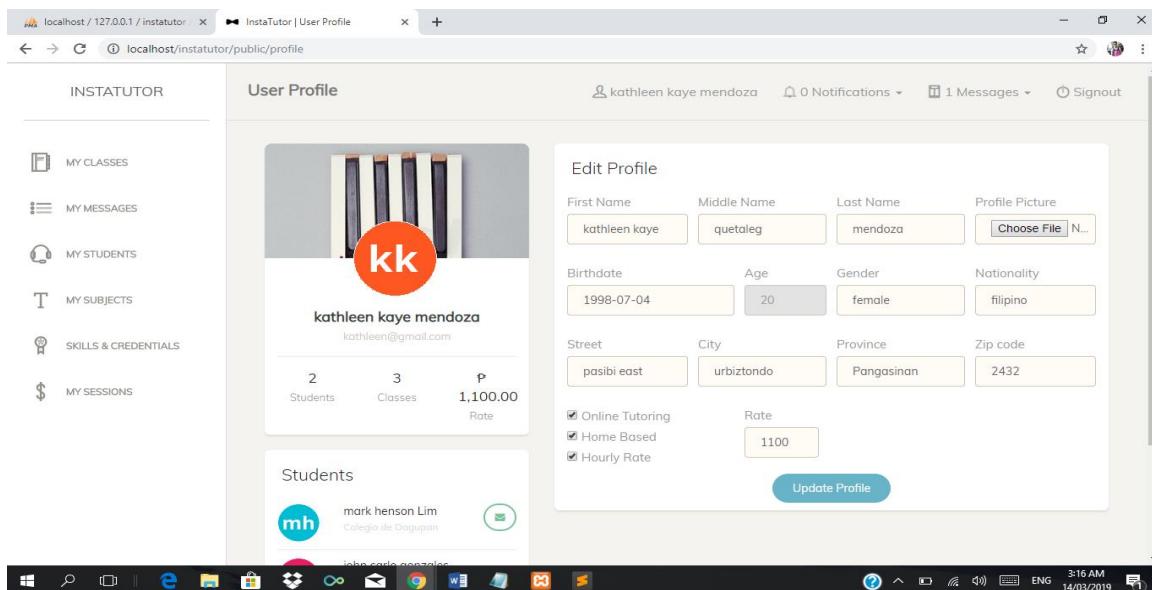


Plate 4.15: Profile Module for Tutor

Upon clicking the profile on the navigation bar, plate 4.15 will be shown. The Tutor can manage his/her face.

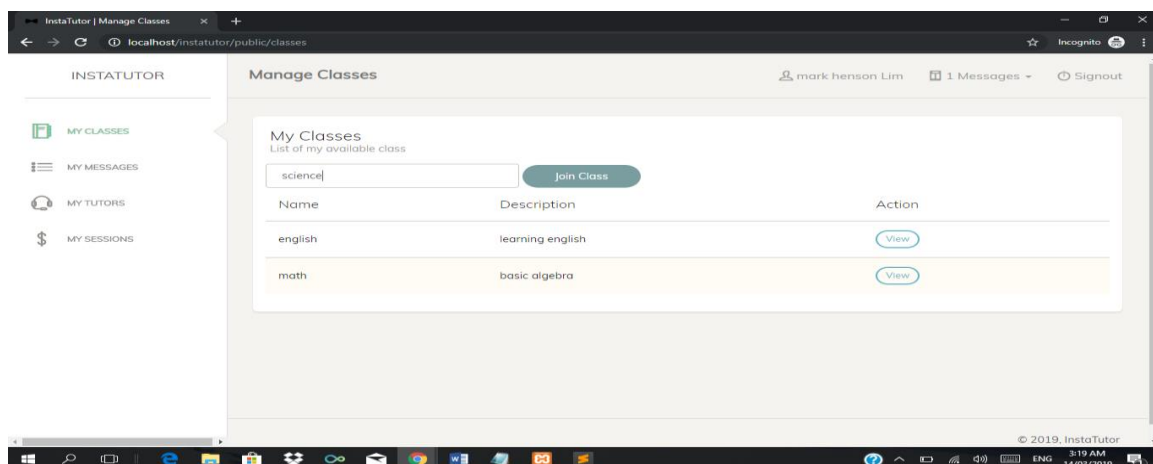


Plate 4.16: My Classes Module for Learner

Plate 4.16 shows my class's dashboard of the learner, displaying the list of online courses joined by the learner. Upon clicking the join class, the system will bring you to the join class

section to search for the study and display the result. Also, the learner can upload, download files by clicking the view button.

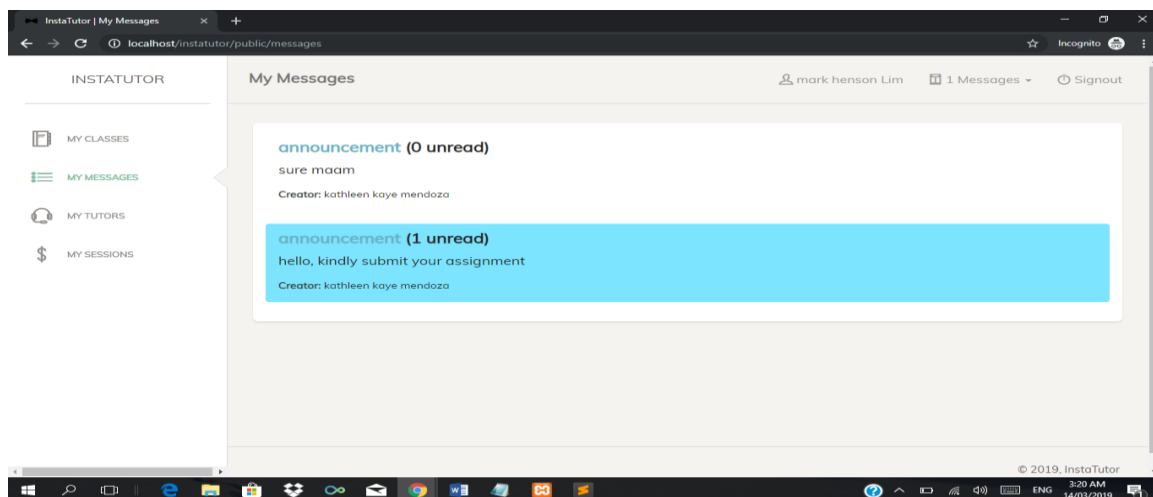


Plate 4.17: My Messages Module for Learner

Plate 4.17 shows my messages dashboard of the learner, which displays the learner's list of messages.

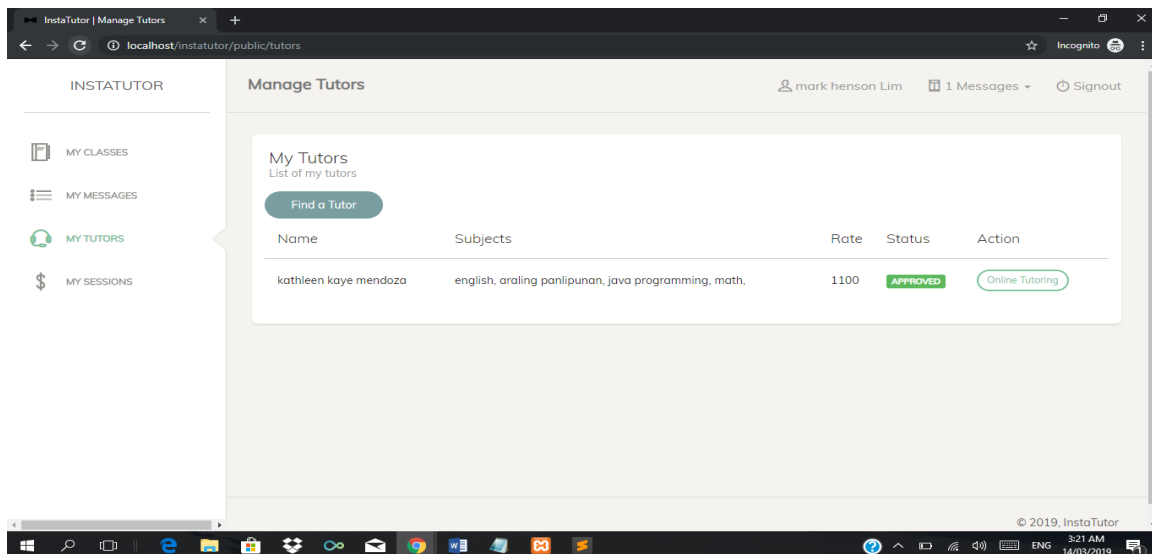


Figure 4.18: My Tutors Module

Plate 4.18 shows my tutor dashboard of the learner, which displays the list of approved tutors.

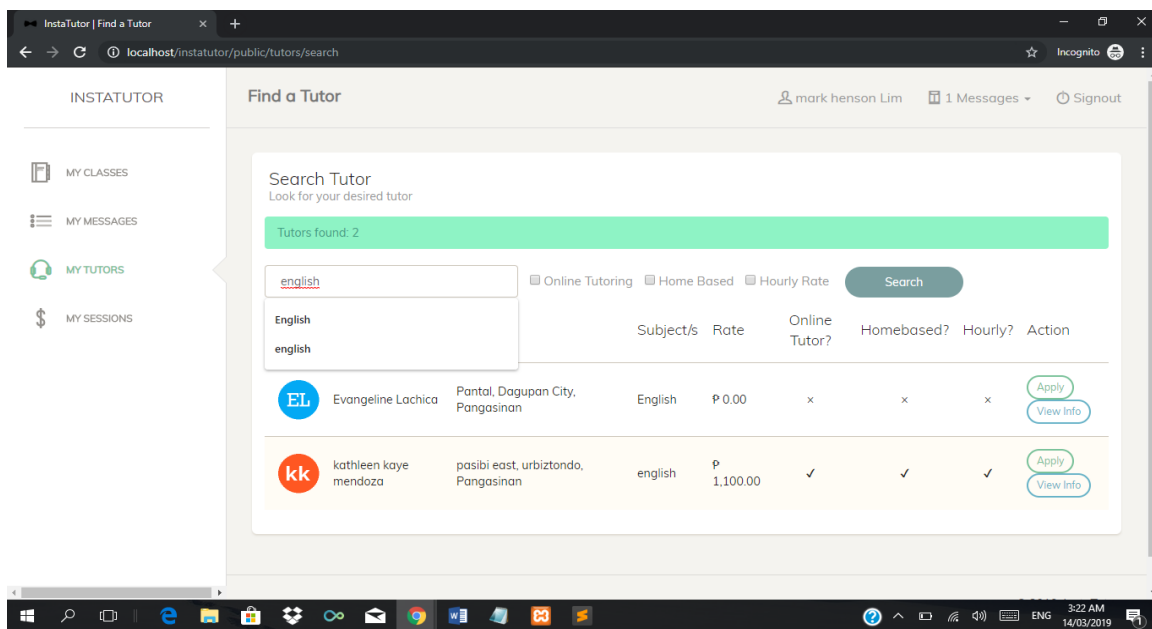


Plate 4.18.1: Find a Tutor Module

Upon clicking the find a tutor, the system will bring the users to this plate wherein the learner can search for a

tutor, and it displays the result. This is the main feature of the developed application.

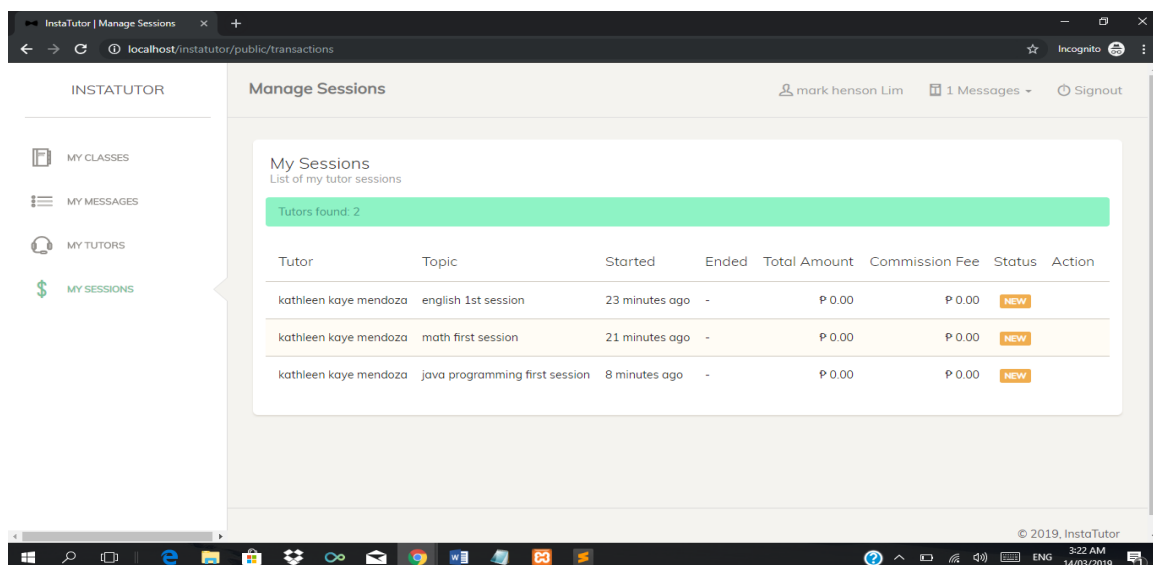


Plate 4.19: My Sessions Interface for Learner

Plate 4.19 shows the learner's successful transaction, started the topic and ended topic, and the total amount of money.

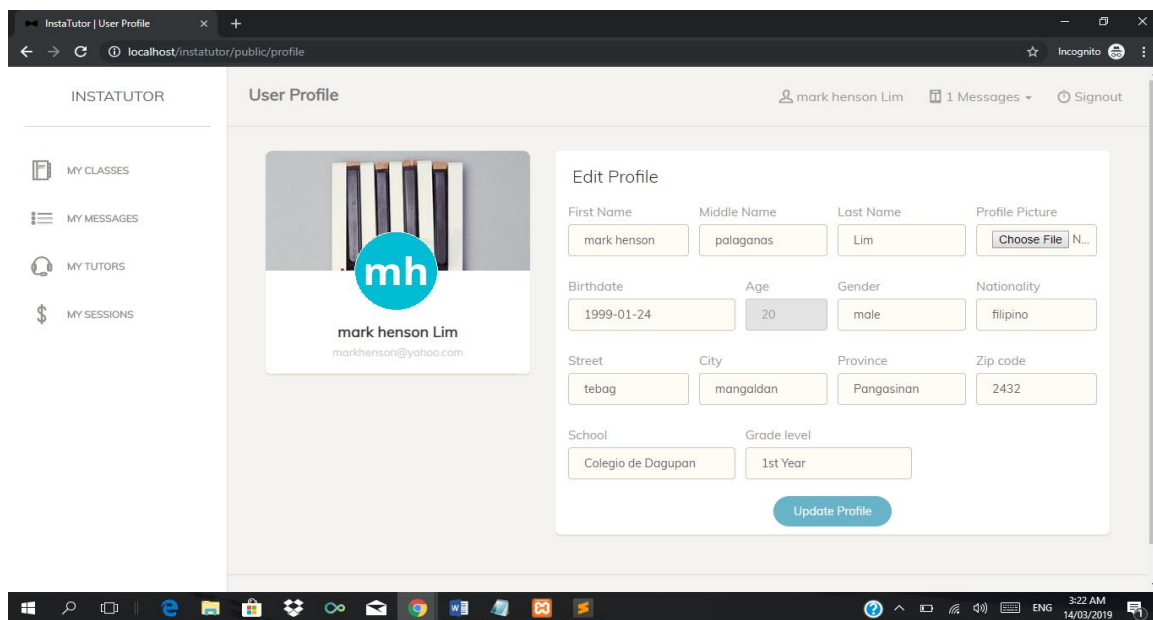


Plate 4.20: Profile Module for Learner

Upon clicking the profile on the navigation bar, plate 4.20 will be shown. The learner can manage his/her face.

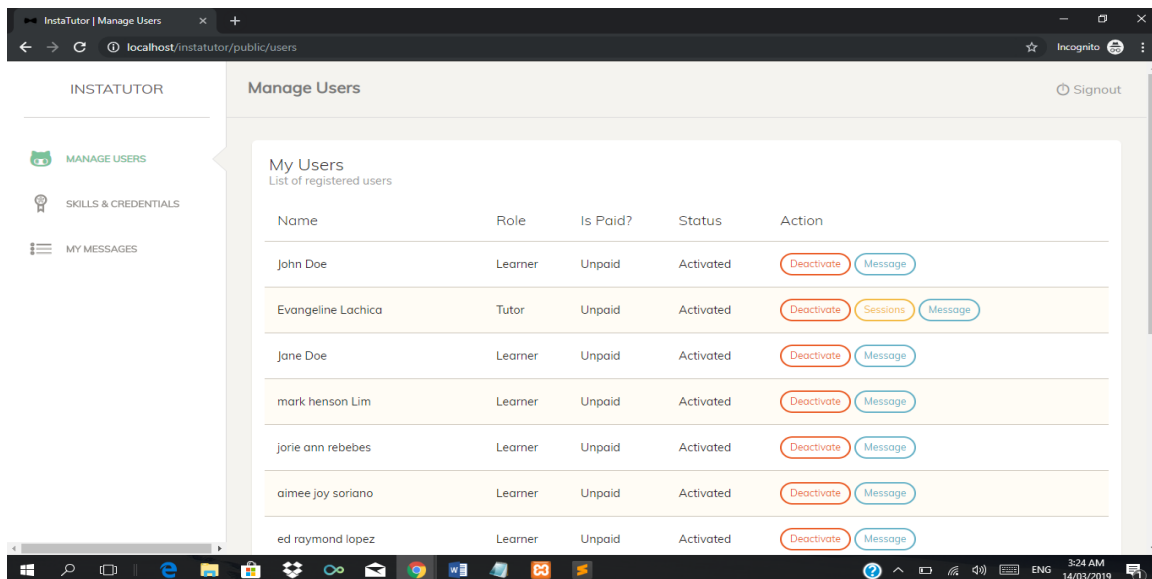


Plate 4.21: Manage users Module for Admin

Plate 4.21 shows the lists of all Tutor and learner accounts wherein the admin can activate the account once the user paid the membership fee and

deactivate if not. The admin can also monitor if the Tutor already paid the membership fee and see all the Tutor sessions.

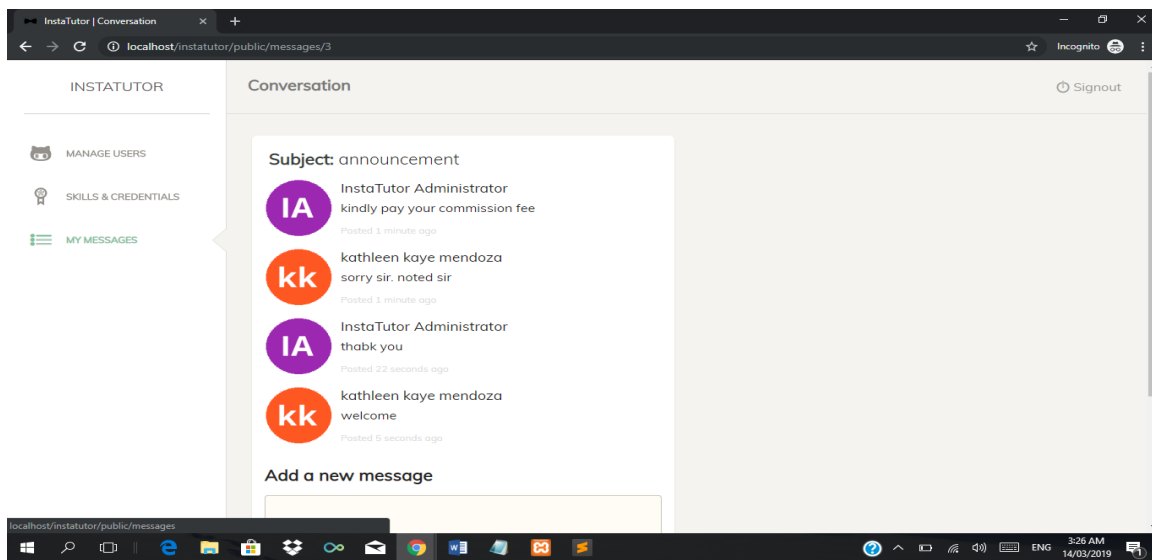


Plate 4.22: My Messages Module for Admin

Plate 4.22 shows the lists of messages created by the admin and sent by the Tutor.

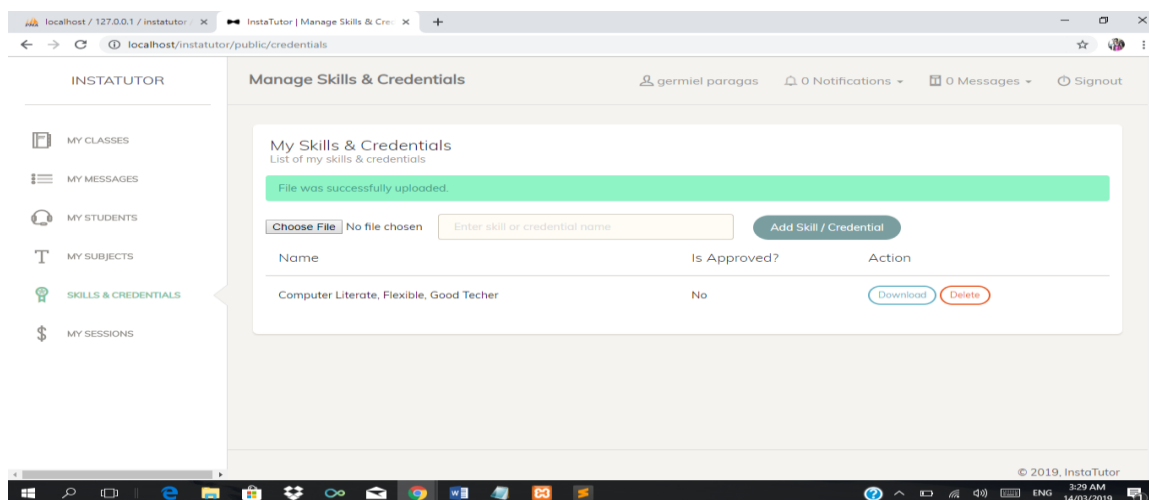


Plate 4.23: My Messages Module for Admin

Plate 4.23 shows the skills and qualifications submitted by tutors. The admin is the one who validates the

credentials of the learner and approves once it is already validated and deleted.

Acceptability Test of the developed System

In testing the developed system's acceptability, a survey was done to assess the system's quality. The following questions were scaled as follows: 5 - Strongly Agree, 4 - Agree, 3 - Neutral, 2 - Disagree, and 1 - Strongly Disagree.

From the general assessment, including the qualitative, usability, and user satisfaction of the system. These three parts of the evaluation were used to test the acceptability if the developed system has met the functional and non-functional requirements that predicated the change. Table 4.7 shows the overall respondent's evaluation.

Table 4.6 Overall Evaluations

Overall Evaluation	Mean	DE
The overall design is pleasing to the eyes	4.8	Agree
I am satisfied with the present functionalities	4.8	Agree
I am happy to use the system	4.7	Agree
Weighted Mean	4.8	Agree

Legend: 5-4.24 Strongly Agree, 3.41-4.20 Agree, 2.61-3.40 Neutral, 1.81-2.60 Disagree, 1-1.80 Strongly Disagree

The overall acceptability test was evaluated with a weighted mean of 4.8 that the agency agreed and is satisfied with the deployed system. The result shows that the agency is willing to

implement the deployed system of the developer.

REFERENCE

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