



SOEN342

Software Requirements and Specifications

E-Academy

(Phase 1)

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GitHub Link(is included per request of the project coordinator Ahmed Rebei) :

<https://github.com/JamesPartsafas/soen342>

Abstract

CraigsTutors is an e-learning platform that allows elementary students to book tutors on a variety of subjects. With parents' ever-busy schedules, it may be difficult to oversee a child's education day-in and day-out. With CraigsTutors, we provide the child with a tutor to supervise their education on a particular subject/s. This ensures that the child understands the material taught at school and any methods and techniques are reinforced. Moreover, CraigsTutors' key feature is an AI-powered personality-matching algorithm that rates child's compatibility with that of a tutor. This 1-100 scale (100 being the highest compatibility) provides a quick assessment of how well a tutor will be able to teach the child and how receptive the child will be of the teaching. It matches the tutor's skills, capabilities, and overall personality with the child's learning needs, learning style, and overall personality(more details in later sections).Other than that, CraigsTutors showcases tutors specializing in numerous subjects, a built-in video call platform, nano- and adaptive learning systems, shared student-teacher resources, a comprehensive resource bank for tutors, automated tutor background checks, and a state-of-the-art AR/VR learning platform to get students excited for learning.All these features aid in CraigsTutors stand out in an already heavily saturated online teaching market while ensuring the core of teaching: its students.

Part I: Market analysis (Comparative Study)

This section presents three different tutoring sites with their features that exist on the market and will be used for comparative purposes with our site in later sections.

Website Analysis 1: TutorOcean (<https://www.tutorocean.com/>)

TutorOcean is an online tutor booking site built to give people of all ages access to tutoring for all main school subjects (Math, English, Science) as well as learning additional languages, instruments and hobbies. It allows for free sign-ups, however, time with tutors is based on individual hourly payments for the sessions themselves. For any given category a set of tutors, their ratings, qualifications, known languages, number of years spent as a tutor and hourly rate are posted for the user to view and select. Tutors can also be searched by location or by the university in case the sessions must be held in person and not online.

Upon signing in, you're shown a list of recommended tutors along with a set of filters and search bars that can be used to narrow down results. The site also keeps track of future and past sessions, payment history and allows for both the purchase and redemption of gift cards for the service. Also, the site has an integrated messaging system allowing for easy

contact with tutors as well as the customer service team. Sign-ups can also be done automatically using either a Facebook or a Google account, which after the individual accounts verification uses their information to set up the account without asking for any info that is available from that account, with the only other info needed (a mobile phone number) being asked for immediately after.

The user can also make an account as a tutor, allowing them to create a profile to teach. It also allows some info to be transferred from a Google or Facebook account; however more details like location, teaching experience, hourly rate, address, a description and a cover photo are all additionally required. The website takes 10% of all cash made by the tutors as commission for the service. The site also provides a digital classroom to hold the tutorial sessions in allowing tutors to teach across a far wider area and plan sessions from the comfort of their homes.

All tutors can be given a rating out of 5 stars with the average being displayed on when the tutor is viewed, with higher rated tutors being prioritized in searches. Searches can also be filtered by rating, however, you can only filter by 5 stars, 4 stars or 3 stars and doesn't allow you to search for low-rated tutors.

In conclusion, TutorOcean allows for easy access to tutors in a wide variety of sectors beyond just education. Users have a large variety of search filters at their disposal to aid in their search and tutors are given a very fair cut of all payments. By spreading such a wide range of topics, TutorOcean sets itself as the one-stop place for learning and encourages experimenting with its services in multiple subjects as opposed to only using it for the subject the user began using the site for.

Website Analysis 2: Preply (<https://preply.com/>)

Preply is an online tutoring site where users may hire tutors to explain topics to them. Upon reaching the site, the user may choose a general topic, such as math, history, chemistry, or some other course from the drop-down list, and they will be presented with a list of tutors for that subject. These tutors can be further filtered by their hourly rate, country of birth, language spoken, and availability. Each tutor has a profile page, where they write a description about themselves and give their schedule, while the user can see their overall rating as well as user reviews.

Once the user logs in with a student account, more options are available to them. They are able to write reviews about tutors as well as rate them, they can book lessons, send messages to tutors, and ask for trial lessons from tutors. On attempting to book a trial lesson, the user is asked to choose a time within the tutor's available schedule, and a notification is sent to the tutor to confirm. The sign-up process for student accounts involves giving an email address to the site that can be used to log-in, or the user may optionally choose to sign-up with their Google or Facebook account.

In addition to making a student account, the user may also make a tutor account. The user first has to give their email, then they are provided with a lengthy sign-up form where they specify information such as their name, language, origin, phone number, subject taught, certification, price, and availability. Notably, Preply only allows tutors to choose 1 subject they can register to teach. This means that, for example, a tutor with an engineering background may be knowledgeable in both math and physics, but can only be listed as tutoring in one of those subjects, not both.

For payment matters, a student will choose their tutor and a bundle of hours they wish to pay for. For example, they may pay for 5 hours of tutoring with someone that they use progressively over time, with the site tracking how many hours they have left. To pay, the client can either give their credit card information to Preply or use PayPal. From the tutor's perspective, the funds will be deposited into a virtual "Preply wallet" when paid by a client. At any time, the tutor may withdraw money from this virtual account using an external service such as PayPal. As such, the client does not directly pay the tutor. The client pays Preply, and Preply transfers the money to the tutor at the tutor's request. That is all to say that the site has the feature of managing and tracking payments.

Overall, Preply is built to allow tutors from a wide variety of backgrounds to teach to students in private lessons. Users have a large number of ways to filter the tutors they see, to choose whoever best matches their needs. Preply tutors cover a wide range of subjects, but the site seems very focused on language learning and multilingualism. In drop-down menus listing tutoring subjects, languages such as English, French, Japanese, or German are listed near the top. The site homepage advises visitors that tutors on this site will teach them to "speak confidently". All tutors are required to state their spoken languages and their proficiency in each language when they sign up. Tutors must also specify their country of origin on sign-up. These all point to the fact that compared to others, Preply is a tutoring site focused primarily on language learning.

Website Analysis 3: Wyzant(<https://www.wyzant.com/>)

Wyzant is an online tutoring website which provides one-to-one learning services in a variety of subjects like Math, Science, English, and Business, in addition to a variety of languages and instruments.

Users can sign up with their Facebook, Apple ID, or their email. Upon signing in, the student enters their postal code to find tutors located in the same time zone. Tutor profiles can either be browsed through, or if time is short, a booking can be made to allow Wyzant to match the user with a tutor (price range and time must be specified). The tutor profile shows their areas of expertise, their reviews and ratings. Lessons can be in-person or online. The schedule of each tutor is listed on their profile. The student can click on the contact button and select three-time slots that suit their needs.

The website offers a ‘good fit guarantee’, that is, users do not have to pay for the first hour until they find a tutor they like. If unsatisfied, Wyzant provides a refund and helps the student find another tutor at no additional cost.

Upon contacting a tutor, the student tells them their goal (a message box is provided for the same). In addition to the tutor selected by the student, Wyzant shares the request with other qualified tutors and five of them may contact the student, if interested. After chatting with the tutor, if satisfied, the student can book their lesson.

A user can also apply to become a tutor. After entering basic details like name and email, a questionnaire pops up that asks for the user's experience and mode of teaching (online/in-person). Further, the user is asked to specify their subjects, type of degree, and location. The tutor sets their own default hourly rate. Tutors do not receive direct payment from the students. For safety, students/parents can order background checks on tutors for a fee of \$15.99 for which they are responsible themselves. Wyzant partners with Checkr, Inc. to provide this facility.

To conclude, Wyzant allows students to have a one-on-one learning experience with the instructors that best fit their needs. This online community also searches for tutors on behalf of the students, which can be helpful considering the paucity of time. The platform also allows students and parents to conduct background checks on the instructors. Overall, with their pay-as-you-go structure and good-fit guarantee, Wyzant is a reasonable choice for students.

Part II: Elicitation Techniques and Site Presentation

The system as-is is an e-academy online tutoring site that lacks interactive and adaptive learning. The quality of service lacks focused personalized learning adapted to correspond to every single student's needs and level of knowledge. In other words, it does not target each student's requests by providing them a learning experience that will match what exactly they need. In addition to not having the best tools, resources, recent technologies and customer support, the system as-is does not satisfy most clients. The proposed system-to-be therefore offering adaptive learning to both tutors and students in order to ensure constant improvement and adjustment of both sides. In addition to other features of automatic matching and nano learning, the proposed system to bring the online tutoring to a higher level and solves the problems mentioned earlier.

List of Features: What does our site offer?

This section describes the features that our website offers in details. These were created with respect to the two elicitation techniques that we used: an interview with the project coordinator (Ahmed Rebei) and group discussions. In addition to these techniques, background research about the topic was also conducted.

Our site features will be offered to children studying subjects that are covered in elementary school courses. The following four sections present the features that are offered to each user type, covering all the features that exist on the site.

Guest View

Guests have the access to register themselves on the website as a student, parent, or tutor through the welcome homepage. They can access to view the featured courses, ongoing promotions, featured reviews (parent testimonials vouching for our service), and featured tutors in their area (because curriculum may differ from province to province). They have access to the list of all courses and subjects, but cannot book for any of the sessions prior to registration. This gives them an incentive to register on the website. In fact, the courses can be searched and filtered to make it easier for the guests to find the courses they are interested in most. They can access the list of all tutors and can search for specific tutors and view their individual profiles, where they will be able to see their bio, subjects, spoken languages, strengths, experience, and reviews. They will not be able to see any contact information of any tutor unless they already have a registered account and already booked a session with a specific tutor(where after all these steps they can view tutors' contact).

Moreover, they can access the "About Us" page to find more information on the services' goals, staff and background. They can also find the terms and conditions, refund policy, and privacy policy. Additionally, on the homepage they can find contact information, such as email address and phone number, to reach out for general inquiries and questions about the services. Alternatively, they will find a live chat section where an automated Q&A bot or support staff can answer questions live. Furthermore, guests can access the FAQs page to see frequently asked questions and their answers. Finally, there will be "Careers" section for people with managerial experience to apply and join the admin team.

Student/Parent View

Students can register to have an account and book a session with a tutor. While registering students are asked to fill out a timesheet where they can select their weekly availability, filter the subjects they wish to be tutored in, the language they wish to be taught in, and their school grade. In addition to that, they will also be prompted to take a quick personality test to benefit from our site's unique feature of automatic matching that can determine and match students with tutors that best match their personalities, interests,

disabilities, and language options. The user interface will then return a list of recommended tutors with those attributes and the student can view their profiles and book them for lessons. Therefore, our site finds personalized solutions for students and corresponds better to their specific needs by finding tutors that will be the most comfortable to interact with and thus have a better learning environment where students are more encouraged to participate and learn. As previously mentioned, tutoring is offered in various languages to help those who have recently migrated and have trouble understanding the subject in the language taught at school, as well as accessibility for people with disabilities (blind, deaf, autistic and many other). After a student selects a tutor, the student can see the course plan for each session (how each session is divided, what they do in each session, the exercises and quizzes, etc.). In the student's user settings, they can choose to archive their lesson material and documents provided as well as they are able to record their online video call sessions. These sessions will be saved so they may go back to watch them if they need to review certain topics or have a better understanding of the material. Within the online teaching platform, they will also have access to a shared virtual whiteboard, shared documents, textbooks, question banks, and screen sharing. Our service uses a system of improved learning, combining nano-learning and adaptive learning. The former method consists of giving small daily quizzes to the student that take approximately 10 minutes to complete, as small daily tasks are proven to lead to better learning than long lessons; while the latter consists of suggesting supplementary courses or tutors based on the students' performance which will be evaluated on a monthly basis. These evaluations through our unique feature will also enable parents to track the progress of their children. On the other hand, students will also have access to a social network platform where both parents and students can communicate with and help each other by sharing their knowledge or advice. Our platform exceptionally also seeks to expand experiential learning to an online platform. This extraordinary feature in this teaching platform will be accomplished by supporting AR/VR technology. Students and tutors who have this hardware will be able to enter a shared environment where they will have access to a variety of simulation tools to help with the learning process. For example, a student having a tutoring session on a history subject about Paris, while being in the session he/she will be able to see himself/herself and feel like in Paris(similar to the Metaverse concept).

Finally, students will also have an adaptive learning feature, where an automated system based on results of previous evaluations of the students might suggest enrolling into a supplementary another tutorial session (with the same or different tutor) and therefore have an impact on their learning.

Tutor View

Many of the features described in the Students section are also meant to help the tutors do their part more effectively. Thus, those features that are already discussed and offered to tutors as well will not be repeated again here. In addition, tutors will be responsible for setting up meetings with the students, where parents can join as well, using our video call platform. Similar to the students, tutors will also have a timesheet to fill out their availability. Tutors will have a User Interface(UI) displaying which student they will be tutoring at each

time slot. They have the ability to set up their profile page, where they can write down their bio, add their education, experiences, strengths, languages and personality traits. These personality traits are determined by a personality matching test previously discussed which will help match tutors to students. In order to help tutors teach their students, our site offers a massive resource bank, where they can find practice test questions, access or request textbooks, co-op learning games, subject refreshers, and teaching courses. The system will also suggest different teaching styles based on the student's performance in order to help incorporate the adaptive learning aspect of our tutoring service. That is to say, if student evaluations show the poor performance of students, the automatic system will provide some feedback and other teaching styles or methods that tutors can apply for better performance.

Administrator View

Admins will have access to admin-type accounts with their credentials. They have a UI where they will be able to manage many aspects of the service. Administrators will be responsible for selecting tutor candidates and therefore be able to prepare interview tests where they can evaluate candidates and admit only those that will succeed in their roles. Moreover, there will be automated background checks of selected tutors (criminal/sexual offenses, education, identity, etc.). Administrators can also oversee the tutor's behavior during their sessions: if a tutor gets reported by a student or parent, admins will be able to see it and take the proper disciplinary action. This is accomplished through our site feature of a review of a flagged session. Sessions are flagged automatically through an audio and video pattern matching algorithm or manual complaints from users. They can manage complaints, or find quick replacements for when the assigned tutor is sick. They can manage all job applications and select candidates. They are also responsible for keeping the learning and social media environment safe. Lastly, they will manage refund requests in case of a dissatisfied client with the service.

Comparison to our site and How our site is different from others:

Guests

As with the three other websites reviewed (TutorOcean, Preply, Wyzant), guests are able to view most pages of CraigsTutors openly. They are able to view courses available, pertinent information about the company, tutor profiles, frequently asked questions, legalese, and career opportunities. Guests are able to register for an account in order to receive full access to the site either as a student or as a parent. Standard contact options (e-mail and phone) are available to guests, and both automated and live chats are present to assist with

any inquiries. Where CraigsTutors differs from a site like TutorOcean is the fact that guests are allowed to view the complete lists of courses to entice them to join the platform. They are also able to view the full list of tutors to survey ahead of time to see who they may want to employ.

Students

For student access to our website, as well as any parents or guardians, we share some vital components with our competitor sites and those will be discussed first. Logging in and signing up to register for the tutoring sessions are basic elements websites such as these need to be used by the clients so it is logical that this component would be like the ones on other competitor sites. There is also the commonality of hourly pay for each session across similar websites to ours. We also provide the option to rate tutors which in turn allows us to recommend tutors that can be filtered just as other competitors offer.

In terms of the differences, similar tutoring sites have a selection of subjects to pick from, like Preply, our site has a wider range for students to choose from and explore (more variety of topics). On the other hand, we have unique features that improve the customer experience. Such as the message board on TutorOcean does not have any parental control, however, ours allows the parents or guardians to view or interact with the message board for the comfort and protection of their children. The main difference is where sites such as Wyzant ask five tutors to teach a client, our site provides a more personal learning environment through an AI personality matchmaking technique to help the user choose the right tutor for them from the personalized list of tutors that are provided to them via the matching making system. Thus, this eases significantly the process of finding a tutor that is suitable for the student. Our website, unlike Wyzant for example, offers easier use and access to the online lecture sessions by having a built-in solution that allows the users to join and record the session without the need for a 3rd party application. Where other websites, such as TutorOcean, provide only learning from the tutor, our website allows for nano or adaptive learning as well as interactive lessons with the use of whiteboards. Compared to other websites, like Preply who only teach different languages, we offer for users to learn most subjects in their preferred language (limited to certain languages). That is to say, for instance, if a tutor speaks Chinese and the child wants the lessons to be explained in Chinese then the match will happen for these two. As a consequence, this would help new immigrants and minorities to have access to learning without any delays in their success. Not forget to mention that our experiential learning by the addition of Augmented Reality (AR) or Virtual Reality (VR) support crosses boundaries and makes us the **first** to implement it giving to users exceptional experience and unmatched tutoring service. Lastly, unlike other websites, we have tutors that are qualified to teach students with special needs including but not limited to students with autism and the intellectually disabled.

Tutors

For the tutors' side, they will see similarities to other sites regarding their payment through the app, having a set availability, and being responsible for setting up the meetings with the students and either their parents or guardian. However, compared to other sites, our website will help the tutors by providing a large bank of resources free of charge. This will dramatically increase the quality of the session and alleviate some of the stress that tutors face when trying to find teaching material. In addition to that, tutors can receive letters of recommendation after tutoring for a number of hours which will allow them to further continue their career in tutoring or teaching. Unlike in Preply, tutors will be able to teach more than one subject if they wish to and if sufficiently skilled since tutors might have a wide knowledge of different subjects. Compared to other competitors, our tutors will have the access to an automated Adaptive learning feature system will suggest to them an Adaptive learning features where they receive automated feedback or suggestions of different learning styles that they can integrate into their teaching plan and change their teaching methods.

Administrators

Likewise to most websites, users with administrative privileges are able to view all information on the platform, with the exception of sensitive information (i.e. financial records, birthdates, etc.). They are able to screen candidates applying for the role of tutor and are able to run automated background checks during application. They have some financial capacity, as well, such as providing refunds to dissatisfied clients. They are also able to provide replacements for tutors unable to attend sessions.

However, much like in a classroom, administrators are able to “sit in” during a tutor’s session to evaluate their performance. This is done in a discrete manner to avoid disrupting a session and to avoid any bias during evaluations. Administrators are able to resolve complaints made by users or the platform (through audio-video pattern-matching algorithms) and take necessary disciplinary action for errant tutors.

Overall, our features such as personality matching, adaptive learning, nanotechnology, audio-video pattern-matching algorithms and AR/VR support make our site different and unique compared to competitors as well as make it evident that we have taken unique measurements to provide a remarkable learning platform.

Project Value:

Provided the fact that the site has incredible features to have a better online tutoring service and a more interactive experience for both tutors and students, it in fact solves all problems that the current system-as is encountering and outcompetes them due to the value that it has of its constant developing techniques and growing numbers of users.

GitHub Link(is included per request of the project coordinator Ahmed Rebei) :

<https://github.com/JamesPartsafas/soen342>