

Tutor +
A Website That Connects Students With Private Tutors

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Abstract

The goal of this project is to create an online platform, where students can easily find and hire private tutors. Students from different levels as well as majors will be able to find the tutors that best suit their needs, as many tutors with a variety of different skills, qualifications, and rates are available in one place. The focus of this project is on the student interface and experience. Several topics are discussed in the literature review, including designing the search user interface, presenting availability schedules, creating lists, messaging, and progress bars. A prototype of the website is created to examine and measure the usability of the proposed design. Usability testing sessions were conducted with eight participants, who were asked to perform a list of five critical tasks in the form of realistic scenarios. The usability test helped to point out some flaws and usability issues. Several modifications to the initial design were recommended to solve those problems.

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Chapter 1: Introduction

Students of all ages often encounter difficulties in learning certain subjects. School classes may not be enough for them to learn the required material; as a result, they or their parents end up looking for additional assistance by hiring private tutors. In Saudi Arabia, the task of finding tutors is extremely difficult, because there is no complete technical platform offered to facilitate the process.

Currently, one way to find tutors is to check weekly advertising papers, which dedicate a small section to private tutors looking for jobs. It lists 20 to 30 tutors who are specialized in various subjects, with their respective contact details. Tutors in some subjects are more difficult to find than others. For example, if a student is looking for a tutor in computer science, he/she might find only one or two among the 30 listed. These potential two might be busy with other students, disagree about the price, or not have enough knowledge about the respective subject.

Another method is to search the Internet, where some tutors promote themselves either by posting their information on general web forums, or posting on websites specializing in all types of ads. Advertising websites present information on private tutors in a very similar way to weekly advertising papers. All private tutors for all subjects are listed on one page, with no effective filtering options to facilitate the search process.

Creating a website solely for this purpose will benefit students in many ways. It will save them much valuable time and effort by listing a large number of tutors in various subjects in one place. It will help them find qualified tutors at affordable prices. In addition, ratings, reviews, and other portfolio information will help them make informed decisions about whom to hire. Moreover, it will enable them to contact several potential tutors at once by using the messaging feature, to see who is the most capable of teaching the particular material, who is available for teaching, and who is not.

After searching for possible existing websites or mobile applications that provide similar services, only one website was found. However, it fails to fulfill several needs of users. The website does not follow the recommended design guidelines and principles, it neglects key features, and it also significantly lacks user engagement. As a result, the

website is not as effective and efficient as it could be, and does not promote a positive user experience. A general evaluation is conducted on this site to determine which user needs have been neglected. In addition to the evaluation, a literature review is also needed to address the best design approaches that can fulfill user needs and create a satisfying user experience. It covers a variety of topics, including best practices for designing the search user interface, presenting availability schedules, incorporating progress bars, creating lists, and messaging.

Based on the literature review, I designed a website prototype that connects students and tutors with one another. It allows the students to search for the best tutors, contact them, schedule tutoring sessions, manage their tutors' list, and submit reviews and ratings. Next, I conducted a usability test on the prototype with eight participants to examine and measure the usability of the proposed design. The usability test helped to point out some flaws and usability issues. Several modifications to the initial design are recommended to solve those issues.

Chapter 2: Literature Review

The prototype of the private tutoring website will include several features and functionalities, namely a search function, tutors' availability schedule, progress bars, instant messaging, and adding tutors to a list. These features are either not successfully implemented or not provided on the current tutoring website (myprivatetutor.sa.com), and it is important to know how to design these features according to the principles of interaction design and best practices. Based on that, the literature review covers the following topics: designing the search user interface, displaying availability, progress bars, instant messaging, and adding items to lists.

The most significant functionality of the website I am creating is the search functionality. The main reason for the users to visit the website is to search for and find a tutor who meets their personal requirements in a particular subject and is based in a suitable location. Therefore, in order to create a positive search experience, "designing the search user interface" topic is covered in the literature review.

Sharing availability schedules is important, especially in areas that require scheduling many meetings; either with a group of people or one-on-one. It saves time by eliminating the need for each member to communicate his/her availability verbally by exchanging messages until they find a suitable meeting time. To successfully design such a feature, it is essential to understand the users, how they perceive time, and the cognitive task at hand.

Progress bars are designed to show the user's progress when filling out forms to create a user profile or to show progress toward completion when performing a set of tasks. Users are more likely to complete tasks and forms if there is an indicator of their progress toward completion (Callahan, 2009). This is because people are driven to set and accomplish goals, and achieving those goals releases endorphins in the brain, which increases user satisfaction and engagement (Liu, 2010).

Instant messaging is a very important feature, especially for e-commerce websites. When users encounter problems while interacting with the website, using instant messaging (IM) to communicate with a technical support agent provides a timely solution to the problem, rather than a slower form of communication such as email (Hirsh

2002). Implementing a messaging feature on the private tutoring website will allow students to discuss their tutoring needs with their tutors in a timely manner, and to make sure that the tutors are qualified and capable of fulfilling those needs. This will ensure both parties have a satisfying and successful experience.

While browsing the web, people tend to be in hurry, and skim through content in order to rapidly achieve and accomplish their goals. In many cases users find interesting articles, web pages, products, and other forms of web content; however, they do not have the time to read them immediately and hope to read them later. Implementing mechanisms to export content, such as enabling users to save the profile of a potential tutor from the search results, will satisfy the need for re-finding.

Designing the Search User Interface

Information needs. It is critical for designers to determine the information needs of their site users. A difference in information needs provokes different information-seeking behaviors, and these behaviors require specific design decisions. The search user interface should be designed in a way that supports those behaviors and fulfills those needs, in order to create a strong search experience (Morville & Rosenfeld, 2007). Below is a list of the four types of information needs.

- **Known-item seeking:** This means there is only one right answer to the search query. In this case, the user knows exactly what to type in the search field, what he/she is looking for, and where to find it. When users are looking for facts and figures, there are right answers to their questions. This approach is also known as database searching (Morville & Rosenfeld, 2007).
- **Exploratory seeking:** In exploratory seeking there is no right answer. The user is hoping to find a few useful results through searching and browsing, and then to carry on those results to the next search iteration. Users do not know exactly what they are looking for, but they learn while they search. It is an “open-ended” search (Morville & Rosenfeld, 2007).
- **Exhaustive research:** In some cases, the users want to collect everything about a particular subject. This is known as exhaustive research. They try all the different

terms that express it, and are patient in examining all the retrieved results (Morville & Rosenfeld, 2007).

- **Re-finding:** Sometimes users find an interesting web page or piece of information, but do not have the time or the attention to read it at the moment, so they bookmark it to be able to easily return to it at a later time. This type of information need is called re-finding (Morville & Rosenfeld, 2007).

Information-seeking behaviors. It is necessary to understand the cognitive process users go through while searching for information in order to design a successful search user interface that facilitates this process (Hearst, 2009).

Standard model. The standard model describes the information-seeking process as an interactive cycle consisting of four main actions:

- Recognizing the problem;
- Verbalizing the information needed;
- Formulating a query;
- Evaluating the results (Hearst, 2009).

After evaluating the results, the user might want to reformulate the query. These two final steps are repeated several times until the retrieved results are satisfactory (Hearst, 2009).

Cognitive model. The cognitive model is considered to be the cognitive basis for the standard model discussed in the previous section. The cognitive model describes how people perform tasks in general. It suggests that a person first determines the goal he/she wants to achieve. Then, based on his understanding of how a particular situation works, in other words, the individual's mental model of the situation, the person specifies and performs the required actions necessary to achieve that goal. The execution is then followed by the evaluation of any changes that occurred to the person's external world. If the results are not satisfactory, the person reformulates his goal until he obtains the desired results (Hearst, 2009).

Dynamic (berry-picking) model. The berry-picking model represents the way the human brain works. At first, the information need drives the user to search for the information by composing an information request or a query. After browsing the retrieved information, the user's information needs will change, therefore, he/she will

reformulate the initial query to suit the new information needs. These steps will be repeated several times until the user is satisfied with the information he/she acquired along the way (Morville & Rosenfeld, 2007, pp. 36).

Information foraging theory & information scent. Peter Pirolli and Stuart Card, researchers at the Palo Alto Research Center (PARC), established the information foraging theory by applying the concepts of the optimal foraging theory to the information-seeking process. The way users search for information is similar to the way animals search for food by moving from one place to another. Typically, users move from one web page to the next relying on “trigger words” to extract relevant information from blocks of content. The more trigger words they find, the stronger the information scent (Russell-Rose & Tate, 2013, pp. 29).

Designing with information scent. In the information-seeking process, information scent is vital for guiding the user through the page, and for helping the user analyze whether or not the retrieved result matches the information needs. There are three ways to utilize information scent in the design of the search user interface; these are: descriptive titles, hit highlighting, and clear labeling (Russell-Rose & Tate, 2013, pp. 29).

The titles of search results are the first things that a user looks for on a page. Therefore, a clear and accurate descriptive title is the most important technique to ensure a strong presence of information scent. In addition, it is better to avoid jargon and marketing terms, and to link the titles so that they are clickable. Reasonably long titles, ranging from 7 to 12 words, have a greater chance of encompassing trigger words and thus providing a stronger information scent (Russell-Rose & Tate, 2013, pp. 30).

Another method to increase the information scent is to highlight the query terms wherever they appear on the screen. Several search engines use a bold font weight to make the query terms more prominent (Russell-Rose & Tate, 2013, pp. 30).

Categorizing the search results and providing clear labeling is also a good approach to increase information scent. Usually the information a user is looking for belongs to a limited number of categories, thus categorizing allows the user to skip large amounts of unnecessary results (Russell-Rose & Tate, 2013, pp. 30-31).

Designing for sense-making. The concept of sense-making defines the users' attempts to understand the new information they are finding along the way of the search process, and adding it to their existing knowledge. Understanding how users go about comprehending, analyzing, and gaining insights into new contents helps designers create interfaces that facilitate these cognitive functions (Russell-Rose & Tate, 2013, pp. 32).

There are three methods that are mostly used by intelligence analysts in running large-scale sense-making: the shoebox, the evidence file, and the schema. At the beginning of any task, the analyst focuses on filling the shoe box with any document that is potentially relevant, rather than paying close attention to every single document. A user interface should include features such as a star, checkbox, or a linked text next to a search result, thus enabling the users to save and easily find a certain result later (Russell-Rose & Tate, 2013, pp. 34). When the shoebox has been filled with as many documents as possible, the evidence file comes into play. The analyst starts to carefully read the collected documents, extracts any striking sentence or image, and adds it to the evidence file, which results in having a more coherent collection (Russell-Rose & Tate, 2013, pp. 34). The third common practice, which is the schema, helps the analyst organize, connect, and interpret the information placed in the evidence file (Russell-Rose & Tate, 2013, pp. 34).

Designing the search user interface.

Keep the search interface simple. A diverse population of users with different technical expertise and backgrounds surf the web and search. Therefore, designers should design a search interface that is usable for a wide range of users, basically consisting of a search box and a "search" button (Morville & Rosenfeld, 2007). MacDonald (2012) recommends that the search box should be prominently displayed (e.g. a large box covering the entire top portion of the page) to instantly get the users' attention.

Allow for sorting and filtering. The ability to sort search results significantly facilitates the decision-making process (Morville & Rosenfeld, 2007, pp. 168). Sorting is a mechanism that allows the users to manipulate the retrieval content in order to easily explore it and find the particular outcome that successfully meets their information needs (Nudelman, 2011, pp. 161). Sorting controls are commonly integrated in the search

interface as a drop-down list. Most sites provide sort options that are applicable to all categories, such as: price, highest rated, or delivery date. In other cases, sort options are offered that are related to a given category. These options may include a release date for audio content or a publication date for books (Russell-Rose & Tate, 2013, pp. 152). The sorting control is usually placed at the far-right on the search result page, in an attempt to avoid the users confusing it with other filters. However, this placement might convey the wrong message to the users, namely that sorting is not helpful or not important (Nudelman, 2011, pp. 158).

Best practices for faceted filtering. In addition to sorting, faceted filtering is an essential part of the search interface. It significantly assists users in finding what they want, thus leading to a successful search experience (Nelson & Turney, 2015). Users can either select a single value or several values within a particular facet. This depends on the underlying programming of the facet interface. There are two commonly implemented formats to show the difference between the single-select and the multi-select facets. The single-select format is usually represented by textual hyperlinks, where the users are restricted to selecting only one hyperlink from different facets at a given time. In contrast, the multi-select format is displayed as checkboxes, where the users are enabled to choose more than one option for a given facet. It is strongly advised that designers stick to these format conventions to avoid creating a confusing interface and a negative user experience (Nudelman, 2011; Russell-Rose & Tate, 2013). Another important design decision to make is where to position the faceted filtering menu. The most common placement is vertically on the left-hand side. Next is the horizontal placement, where the filtering menu is placed across the top of the page. A vertically arranged menu better accommodates the various numbers of faceted options, and supports the visual association between the selected facets and the result set, since the two elements are placed side by side. However, as a result of the prominent position it occupies, the horizontally placed menu encourages manipulation and interaction with the offered filters (Russell-Rose & Tate, 2013). Moreover, the search interface should support query revision. After going through the search results, users might want to expand or narrow

their search. Filters should be consistently available for further selections, and also be easily removable (Nudelman, 2011).

Displaying search results: between detail and screen space. When displaying search results, designers need to balance two essential usability aspects: the need to show crucial information about each result, and the need to expose the user to as many results as possible (Nudelman, 2011; Russell-Rose & Tate, 2013). Certain result information components are necessary to assist users in evaluating and making informed decisions about the various retrieved items, without the need to go back and forth between items' detailed pages and the search results. This kind of behavior is referred to as "pogo-sticking" (Nudelman, 2011; Russell-Rose & Tate, 2013). However, designers need to carefully consider what information components to display in each result. Overly detailed results occupy a large area of the screen, therefore pushing many useful results below the fold or even onto the following pages. Consequently, the overall relevance of the page is minimized (Morville & Rosenfeld, 2007; Nudelman, 2011; Russell-Rose & Tate, 2013).

Communicating the search navigational context. Preferably, while navigating a website, users should know their current location relative to the site's hierarchy, in order to have a better understanding of their virtual space (Hearst, 2009). This design feature is referred to as "hierarchal breadcrumbs." However, in search interfaces, another type of breadcrumbs is used to communicate the navigational context. These are called "historical breadcrumbs." Historical breadcrumbs indicate the search path, or the sequence of actions a user has taken to get to the current result set. One deficiency of this type of breadcrumbs is that they display hierarchal categories and facet selections all mixed together in a single line, based on the order of selection (Nudelman, 2011). A better approach to communicate the search navigational context is to display the currently applied facet values in a separate container called "breadbox" (Hearst, 2009; Nudelman, 2011). However, if the breadbox is utilized in the search interface, Endeca Design Pattern Library recommends that it is more effective to omit the hierarchal breadcrumbs. This is to avoid the confusion a user is most likely to face regarding these two different, but similar features employed to support search and browse (as cited in Nudelman, 2011).

Displaying Availability

From a psychological point of view, the human brain perceives time as periods and chunks rather than specific dates. The brain divides time into portions such as tonight, this weekend, next week, next month, and this year. When designing an event calendar, the user interface pattern library recommends designers to display events within chunks of time (e.g. tonight's events, next week's, or next month's), so that the users can easily get an overview ("Event Calendar design pattern", n.d.).

Users usually browse event calendars through a list, a table, or a combination of both. The list format is useful for providing them with enough information and details about events within a certain period of time. However, if the calendar is crowded, the list presentation makes it difficult to get an overall view of the events. In contrast, the table format, or calendar box, promotes a quick scan of the events ("Event Calendar design pattern", n.d.). In a monthly view, users can easily identify the days on which events will take place, and in a weekly view they can easily see the time of the events. However, merely relying on the calendar box will not be effective if the users are interested in detailed information about specific events. In addition, in cases where there are typically one to two events per month, presenting events in a calendar box rather than the text list is deemed worthless. One way to overcome these deficiencies is to combine both formats ("Event Calendar design pattern", n.d.).

People primarily receive information about the outside world through their sight sense. Therefore, they tend to grasp ideas and concepts much faster and easier if they are represented and communicated visually (Nagy, 2012). Users will clearly understand a state, setting, or a behavior of a system, if it is conveyed with illustrations or diagrams in addition to words. However, if the legends corresponding to the diagram are presented separately, this will consume additional cognitive energy and require additional functioning. The user will have to navigate back and forth between the diagram and the legends section to be able to decode the displayed information. Cooper, Reimann, and Cronin (2007) suggest in their book "About Face 3" that combining text, graphics, and data all together is much more effective, e.g. by presenting textual information in a visually structured manner with icons placed right next to labels wherever possible. They also recommend keeping numerical data in their numerical form, and supporting them

with other visual techniques (Cooper et al., 2007). Moreover, Edward Tufte, an information designer, suggests that understanding the users, and the “cognitive task” they attempt to perform, is critical for designing successful visual information displays (as cited in Cooper et al., 2007).

Google calendar is a good example of a way to allow users to communicate their availability without the need to communicate it verbally through email or instant messaging. Google calendar offers a “find a time” feature, where the event creator can find a suitable time for all participants according to their schedules. Another feature that eliminates verbal communication and message exchanges, thus saving time, is “setting working hours.” That is, the daily work hours in which participants can attend meetings and events while in the office; meetings outside this time frame are not preferred. As a result, if the event creator schedules a meeting outside this time frame, a pop-up message indicates that this is not a convenient time for this particular group member. Then the event creator can either continue with this action, or try to find another time. So, instead of the group member notifying the scheduling manager that it is not a convenient time, the system does it for him (“How People Communicate Everyday Using Google Apps”, 2012).

Progress Bars

The profile completeness bar. The profile completeness bar is an important subset, or offshoot, of the traditional progress bar. Rather than demonstrating for example how near a download is to completion, a profile completeness bar shows how close a user is to the end of the process when filling out a series of forms, such as that used to generate an online user profile (Kissmetrics, 2013). This is important, because having a way to measure progress toward completion greatly reduces the chances of a user prematurely exiting before completing the full profile, and ultimately escaping the marketing funnel for the page. It serves as a reminder of the “next step” and follows the psychology of “progressive engagement”, which lures users deeper and deeper into the process of engaging with a company, brand, or webpage (Callahan, 2009). While it measures completion of different features, it follows the same psychological conventions and design rules as other progress bars.

Nine functions of progress/ completeness bar psychology. Researchers at Carnegie Mellon University tested nine methods, or functions, to visually display progress along with patterns for filling the completeness bar (Harrison, Amento, Kuznetsov, & Bell, 2008). They hoped to determine the effect of the progress bar, as it related to the way users feel about the completeness of functions they are using, and the time it takes for them to reach completion. The nine functions were: linear with constant progression, early pause at 25% completion, late pause at 75% completion, slow wavy with three long periods of progression divided by pauses, fast wavy that occurs in frequent quick small bursts, power that accelerates in progression from start to finish, inverse power that decelerates from start to finish, fast power that rapidly accelerates then remains constant, and inverse fast power that rapidly decelerates, then remains constant. The study found that these animations directly impacted on how users feel about the time they spend waiting. Progression with pausing is always perceived as slower than linear progression with variable speed. In addition, progression that visually demonstrates acceleration is perceived as faster, even if the actual time for the download is exactly the same (Harrison et al., 2008). As such, a linear progress bar with visual acceleration is recommended for all downloads or processing time on the page.

Duration. The work of Harrison and his peers (2008) restates, on some levels, the findings of Frederickson and Kahneman (1993), which determined that duration has little to do with user satisfaction. Rather, these studies found that users' willingness to experience any waiting time is improved by the presence of a progress bar to mark their movement toward completion. However, the perception of duration and satisfaction is heavily influenced by the presence of certain salient features (Fredrickeson & Kahneman, 1993). This means that the design is as important in user perception as the simple implementation of the completeness monitor feature, especially as it relates to duration neglect and peak-and-end effect (Fredrickeson & Kahneman, 1993).

Color and design. Color and design of the progress bar also affect the way they are perceived by site users. More specifically, pulsating colors were perceived as moving faster than bars of a solid color. Furthermore, both ribbed and pulsating bars were significantly preferred over generic single-colored bars. Generally, the most popular

design is a progress bar with animated ribbing (Alkhalifa, 2012). Using a solid colored bar instead of an animated ribbed or pulsating bar generally makes every five seconds of waiting time feel .61 seconds longer (Alkhalifa, 2012). This is because of the cognitive perception of the animation included in the movement of the ribs or pulsations in the preferred bar design (Alkhalifa, 2012).

The significance of the progress bar on user experience. Generally, users want to see progress, or movement toward completion, when waiting. This is the basis of progress bar implementation; however, it is not the only benefit. Researchers have consistently demonstrated that the use of completeness indicators increases consumer satisfaction and engagement (Myers, 1985; Sherwin, 2014). This is because setting and completing goals releases endorphins, and the progress bar nearing completion fills that need (Liu, 2010). Moreover, users are impatient and are less likely to escape or terminate a task before its completion if they feel they are progressing toward the goal (Zhang & Galletta, 2006).

Instant Messaging

Instant messaging interaction and interface design. Instant Messaging is a real-time communication application that allows for a private conversation between two individuals. According to Li, Chau, and Lu (2005), it is made up of five distinct design features: presence awareness, popup recipient notification, the ability to simultaneously involve in multiple one-on-one conversations, silent interactivity, and ephemeral transcription. It is this combination of features that distinguishes IM platforms from other similar online communication technologies, in that they make computer based communication more like a phone conversation or face-to-face communication than other applications such as email. The online presence manager provides the ability to know if the person that the user wishes to communicate with is online and active at the time. Furthermore, the real-time feature allows for rapid communication in the form of a conversation, rather than with a delay like email (Li, Chau, & Lu, 2005). Moreover, the use of an easy to access contact list not only allows for ease of communication with multiple parties on a single platform, but also raises user exposure, allowing for

networking through the contact lists of mutual contacts. This lends itself well to both business communication and e-commerce (Li, Chau & Lu, 2005).

Adoption of instant messaging. Generally, instant messaging has been adopted in both personal and professional arenas out of a need for greater communication. Ironically, the rise of technology has made people more isolated, less communicative, and less engaged in interpersonal relationships. However, the development of IM that allows for interaction that is similar to face-to-face engagement runs counter to this trend and meets the growing need for relationship-oriented conversation (Kraut et al., 1999). The individual has an innate desire for human contact, and IM as an interactive and rapid communication technique allows for greater interpersonal connection. It allows people to have greater interaction with friends, family, and even business associates on a purely social level (Kraut et al., 1999). This is key in business, because evidence suggests that relational communication and task-oriented communication and support are irrevocably intertwined (Keyton, 1999).

Instant messaging in e-commerce. E-commerce is an area of growing importance for businesses. It is a process that allows businesses to conduct transactions through wireless and computer devices, in real-time, and from any location (Tarasewich, Nickerson & Warkentin, 2002). Activities that are conducted via e-commerce include establishing and maintaining online relationships within the primary organization, suppliers communicating with dealers and customers, strategic planning with partners, and creating a support network (Warkentin et al., 2001). IM is an effective way of maintaining many of these goals. One way that businesses implement IM is to install an IM chat feature on the customer support page of their website, so that customers can directly converse with support agents in order to resolve their issues. For example, Rob Batchelder of Gartner research reported in an interview that “Websites have horrible problems with shopping cart abandonment rates. Having instant messaging, in many instances, could have saved that sale. It's spontaneous, and it fits right into the flow of the transaction” (Hirsh, 2002). In other words, if consumers could communicate directly, in real-time, with sales professionals via IM, the one-on-one interaction would make them less likely to abandon items they seriously considered purchasing. This is because when

problems arise, email response is a slow and less personal form of communication that leads to consumer frustration (Hirsh, 2002).

Shortcomings of instant messaging in business. Unfortunately, there are also serious problems with using instant messaging (IM) as a business feature to facilitate customer service. First and foremost, most companies' networking is not yet developed enough to handle the problems that can arise when a large number of consumers try to use IM based communication at the same time (Hirsh, 2002). There is no infrastructure to handle thousands of new conversations all at once, nor the network sorting ability to ensure that consumers reach support staff that is knowledgeable in their area of concern, and capable of providing them with appropriate assistance (Hirsh, 2002). As a result, it is key that businesses pursue the upgrades and safeguards necessary to establish a solid foundation for the future implementation of effective real-time communication.

Add Tutor to a List

Understanding how to find or re-find items in the physical world. Everything we physically have is organized by both name and location. In other words, we know what to call it, and where it can be found. Moreover, we can know and understand its characteristics. In the book *About Face 3: The Essentials of Interaction of Design*, Cooper, Reimann and Cronin (2007), write that just as a book in our home can be identified by color, size, and shape, items in our digital world need to be named and organized to be easily identified (pp.324). As such, strong storage retrieval in the digital space starts with the organization of folders, in directories that allow the information to be sorted according to specific characteristics, mimicking the organizational logic of our physical world (Cooper, Reimann & Cronin, 2007).

Findability. Findability must adhere to information-seeking behaviors, or mannerisms and systemization of how people search for information on the web. For some, this means coming up with the "right" or best answer to a specific question; however, for others, like those coming to the tutor database and looking for a group of tutors who meet their needs, the goal of the search is not to find a single, but multiple best answers (Morville & Rosenfeld, 2007). In this case, the users are seeking for multiple suggestions, in order to find the best possible answer for themselves. Additionally, the

search feature needs to be tied into re-findability, which allows those who find the information they seek to bookmark it, so that it can be recalled for later use (Morville & Rosenfeld, 2007).

Re-findability. Ensuring this level of re-findability not only means that information can be searched, sorted, and found, but also that it can be retrieved when needed (Ding & Lin, 2010). Note that retrieval is directly tied to findability, but needs “special attention.” This is a personalized experience, and centers on content organization. Without re-findability, websites lack long-term usability and consumer satisfaction (Ding & Lin, 2010).

Designing for re-findability. One of the major design elements for re-findability is metadata structuring (Crumish & Malone, 2014). Metadata is key in ensuring that information, once viewed, can be viewed again. However, because of the sheer volume of searchable and sharable data, this can be extremely challenging. As a result, metadata structures must be created so that the data are given context and are highly filterable (Crumish & Malone, 2014). Different means of collecting these metadata include adding to favorites, sharing, and bookmarking, all of which create a kind of context for what the users are interested in (Crumish & Malone, 2014).

Exporting results and result recall. It is essential that there is a way for users to export their results and recall search results in order for them to be able to generate a list of the data they wish to see again. One key element is the ability to group results, so that the most closely related results are grouped together, clustered according to common aspects, or placed on a kind of list. Once the desired results are located, the user needs to be able to export and save the results for easy use. One way to do this is bookmarking, where the information is exported to a saved area inside the search engine’s network (Morville & Rosenfeld, 2007). Another option is to print or email a result list. This has the advantage of portability, but does not have the researchability, or actionability of online versions of the saved data. For a more personalized, and extremely specific use of result recall, users can select a specified subset of information, and save only that subset, rather than the full array of results (Morville & Rosenfeld, 2007). This also allows users to select specific results and to track them, so they are shown as preferred, and moved to

the top of the list feature. This may also include adding items to a shopping cart on an e-commerce site for later availability and purchasability, and selecting an item that is of specific interest.

Based on the literature review, several design decisions have been made. Concerning the search user interface, I decided to keep the search interface simple and prominent at the center of the “above the fold” part of the page, to instantly grab the user’s attention and to easily convey the purpose of the site. On the search results page (SRP), the filtering options menu will be placed horizontally at the top of the page. Placing it in such a prominent way will encourage users to narrow and manipulate the resulted outcome, thus giving them a greater chance to find a satisfying item. Moreover, to apply the concept of information scent in the search results page, a descriptive line under each tutor’s name is displayed, containing key words that summarize his or her qualifications, skills, and experience. Information scent is also present in the clear labeling and positioning of each tutor’s hourly rate and ratings. In order to promote “sense-making” in the search results interface, I incorporated “bookmark tutor” button so that users can quickly scan the results and save multiple potential tutors in a single place, then easily find them later to get a closer look at their qualifications, compare them, and hire the one most suited to their needs. To avoid what is known as “pogo-sticking”, the most crucial information that will facilitate the process of evaluating the tutors and making informed decisions is displayed next to each tutor on the results page. Such information includes hourly rate, ratings, the descriptive line, location, and name. The rest of the information components are omitted in order to save screen space and present as many results as possible.

Regarding the representation of a tutor’s availability schedule, I chose the table format, instead of the list format to display a tutor’s available hours. The table contains a tab for each day of the week, and the hours are divided into two groups: am and pm. As mentioned in the literature review, people tend to grasp ideas and information faster and easier when it is presented in a clear visual structure.

As shown in the literature review, progress bars or completeness indicators are small features that greatly impact the user experience. Implementing a progress bar

encourages the user to complete a given task, because it shows their progression toward the goal and reduces the risk of abandoning the task. On my website, students are required to answer several questions about their tutoring needs when filling a “request a tutor” form, in case they did not find what they were looking for in the search results. To ensure they answer as many questions as possible and complete the task, I incorporated a completeness indicator at the top of the form box.

Concerning the messaging feature, students are enabled to communicate with and send messages to potential tutors in the form of a one-on-one conversation. All conversations are located on the messages page where students can quickly access the list of all the tutors they have contacted and easily scroll through the list to see which tutors are online. Students are notified by a message icon badge with the number of messages received, which will allow for faster communication.

Finally, to apply the concept of re-findability in my design, a “bookmark tutor” button is placed next to each search result. This will allow users to save multiple potential tutors they consider hiring, and easily retrieve this set of tutors when they visit the website again.

Chapter 3: Current Site Evaluation

My Private Tutor (<http://www.myprivatetutor.sa.com>) is a tutoring site in Saudi Arabia. The site targets three types of users: students, tutors, and institutions. The purpose of the site is to help students find private tutors, help tutors find tutoring jobs and showcase their qualities to potential students, and provide institutions with the opportunity to present their courses to thousands of students. However, there are still several user needs that have not been fulfilled by the site. Below is a list of features that could be improved or implemented to meet these needs.

Site Search

The main service of the site is the search function. However, it is not displayed in a prominent way. Placing the search box above the fold and at the center of the page will instantly capture the attention of the users and make them aware of the purpose of the site. Moreover, the search function is simply a listing of tutors in a given city and subject. It lacks significant search tools, such as search refinement options and sorting search results. These tools will make the search process more efficient, connecting the most qualified tutor with students in a timely manner.

Saudi Arabia is a conservative society. All schools are segregated by gender. As a result, some female students might prefer female tutors, and vice versa. Adding a drop-down list with the options: male, female, or no preference to the refinement tools will help to reduce the search time.

Potential Tutors List

While students are viewing the list of available tutors for the selected city and subject, they might find several potential tutors who could be a good match. In this case, they might want to combine them on one page, either to contact them later or to compare their qualifications and fees for hiring purposes. Using the current site, if a student found five potential tutors to hire from this long list of tutors, but cannot contact them in the meantime, the only way is to add tutors' profiles to the browser's reading list in order to easily find them for later contact. One way to solve this problem is to provide a "Potential Tutors" list, where students can add as many tutors as they want, to view their profiles and contact them later.

Profile Completeness Bars

A tutor's hourly fee can be a deal maker or breaker. The price is a critical element, along with the tutor's expertise, in deciding whom to hire. For this reason, students need to have this kind of information available at an early stage of the search process, and to use the price information for filtering and sorting search results. Having the hourly fee available from the beginning will help the students make better decisions and therefore be more satisfied. However, on the current site, most tutors do not specify the hourly fee and write "negotiable." In addition, the more information students have about a tutor, the more accurate and timely decisions they make. In order to have tutors fill in all of their information along with the hourly fee, progress bars for profile completeness could be a useful feature. The tutors who have complete profiles would have better chances of being located by students.

Instant Messaging

Giving the students the opportunity to chat instantly with potential tutors who are online will improve their experience with the site. Instead of sending a message to the tutor and waiting several hours or days for a reply, they can instantly discuss their tutoring needs, the tutor's qualifications and experience, and scheduling. Without it they might spend several days exchanging messages back and forth until they come to an agreement. It will also encourage both students and tutors to be more active and involved on the site, making the site more interactive and current.

Ratings and Reviews

Ratings and reviews are significant features for any site that sells products and services. The current site enables users to write reviews and give ratings; however, they do not appear on the search results page next to the tutor's primary information. This makes it difficult to instantly click on a potential tutor from the long list for more detailed information. It is also cognitively difficult to compare tutors based on ratings if the user needs to go back and forth to view ratings instead of having them all displayed on the tutors' listing page.

Chapter 4: The Proposed Design of the New Site



Figure 1. The home page.

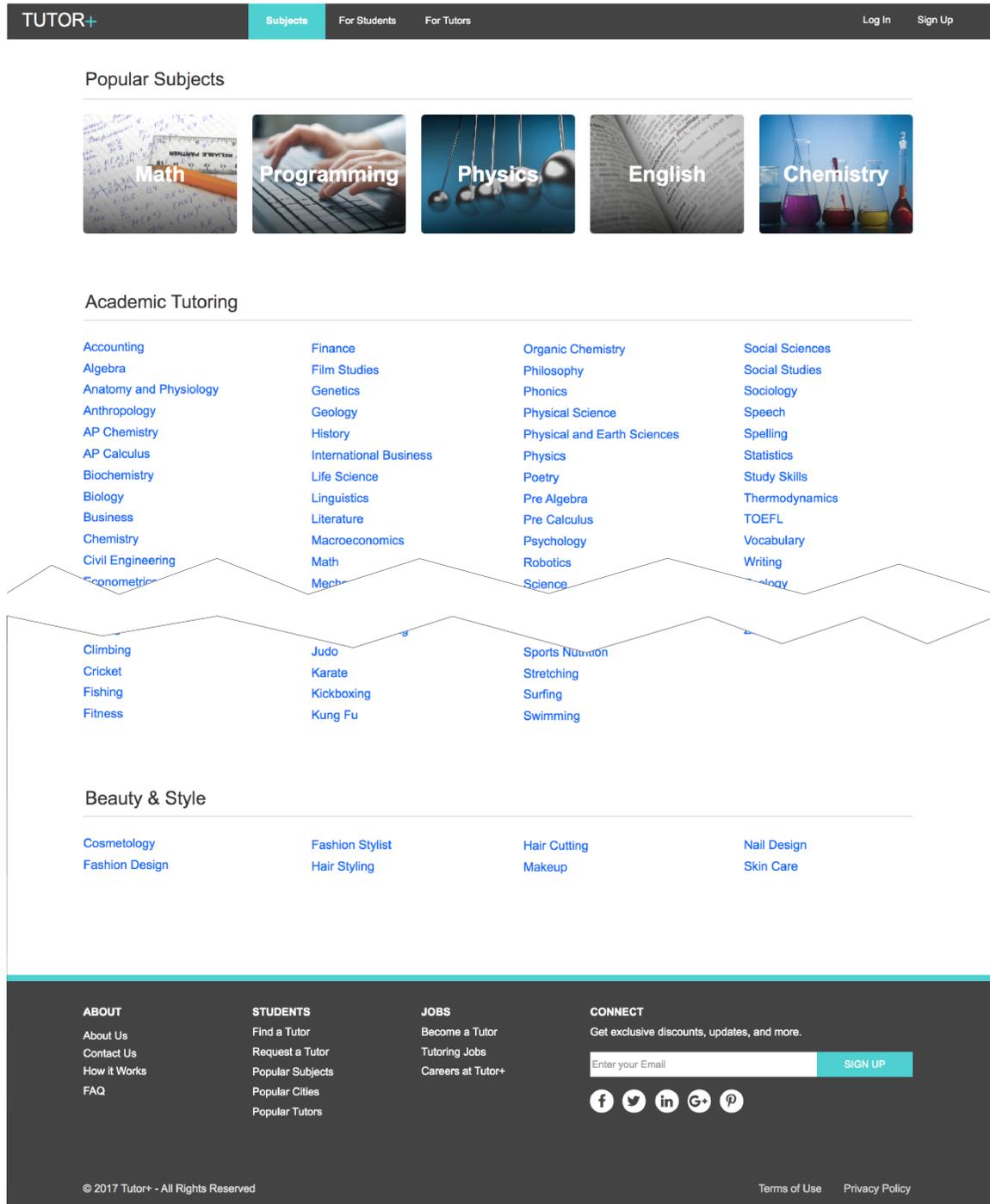


Figure 2. All subjects page.

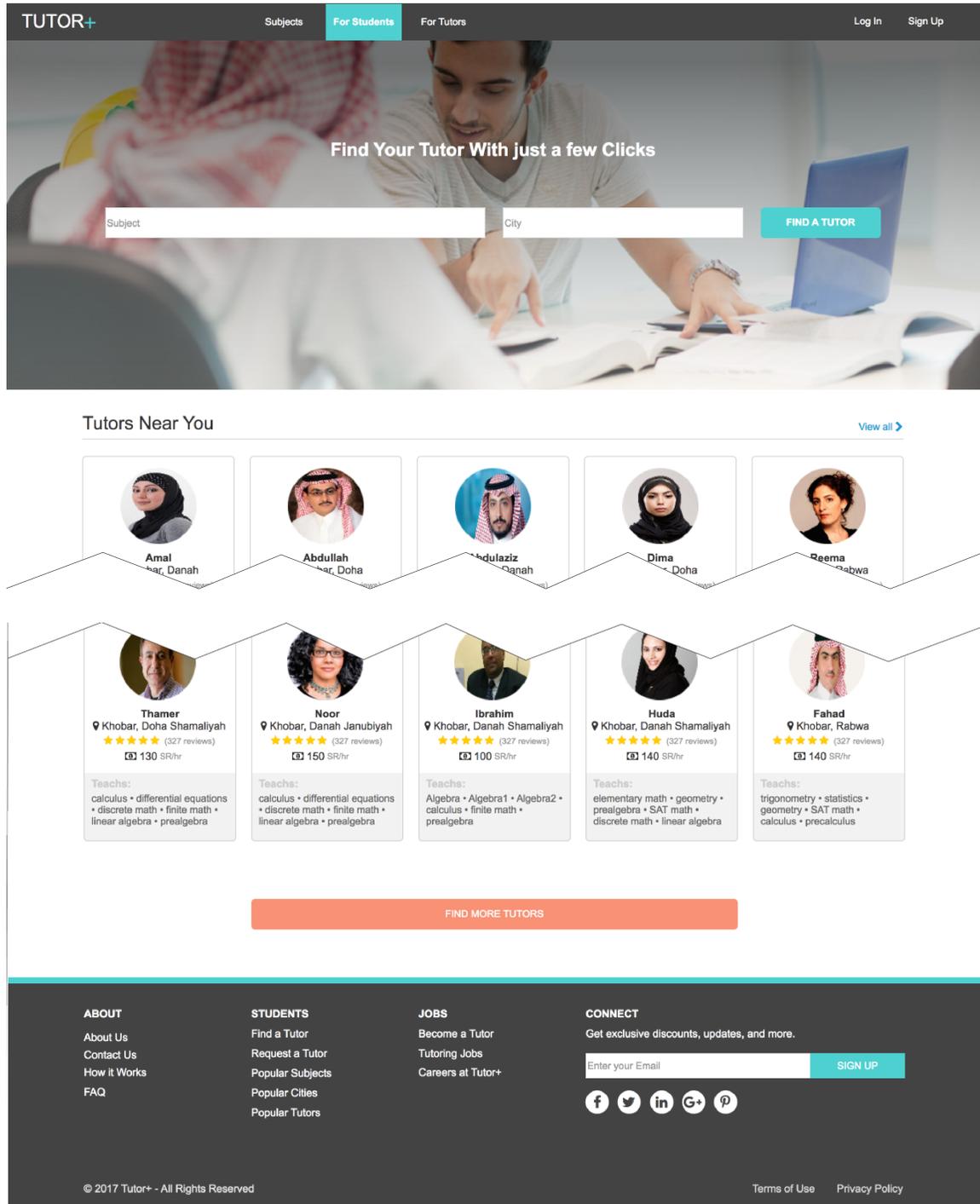


Figure 3. Find a tutor page.

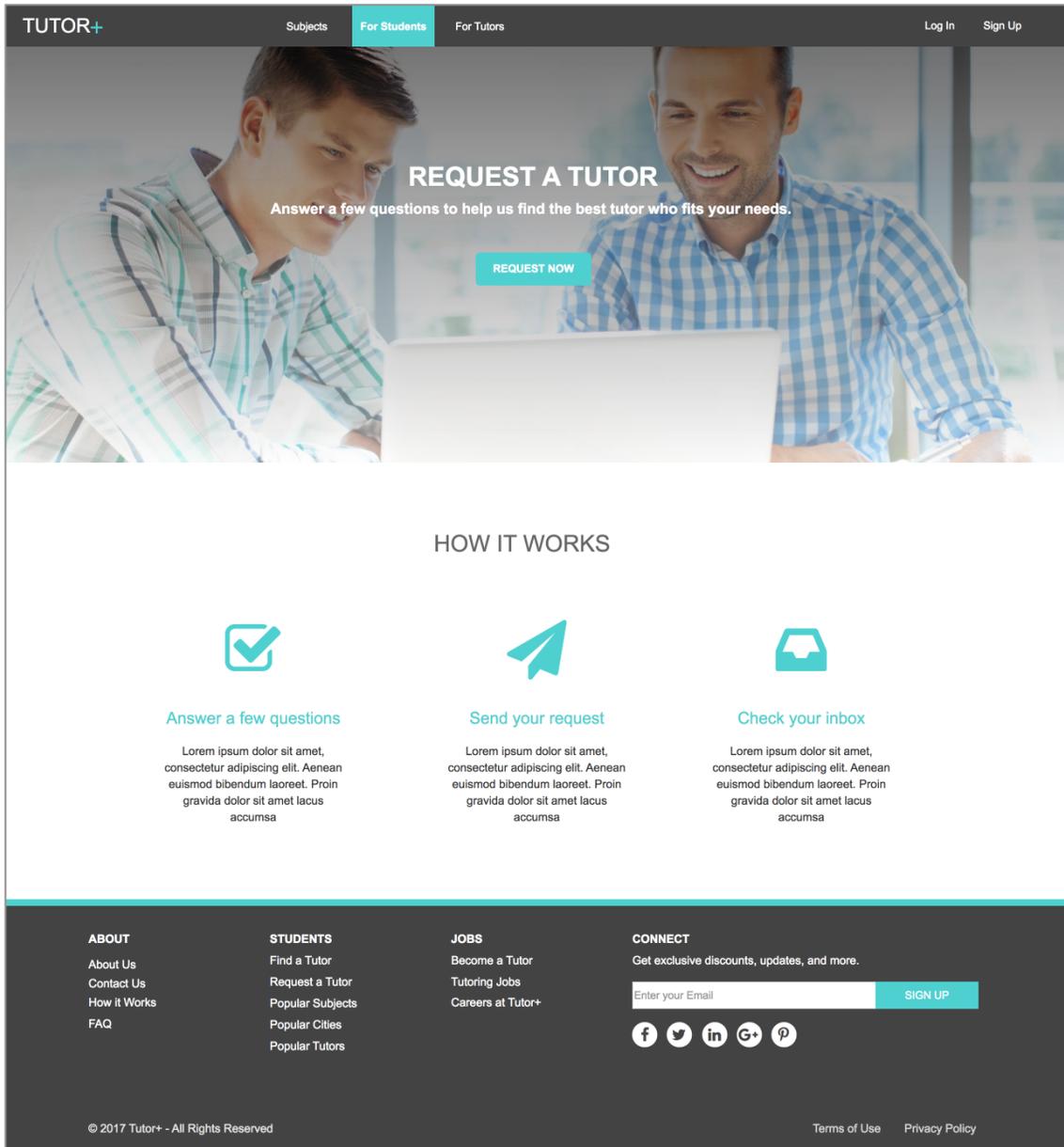


Figure 4. Request a tutor page.

TUTOR+
Log In Sign Up

FIND A TUTOR

Area ▼
Gender All ▼
Hourly Rate ▼
Tutoring Type All ▼
Sort By Rating ▼

8 tutors

	<p>Noor 📍 Khobar, Danah Janubiyah</p> <p>Qualified and Patient for (Advanced) Mathematics</p> <p style="font-size: 0.8em;">I specialize in tutoring math subjects for students in high school and college. I have tutored math since taking calculus when I began holding after-school sessions with groups of my peers. I have experience tutoring a wide array of subjects in math: ... read more</p>	<p>150 SR / hour</p> <p>★ 4.9 (328 Ratings)</p> <p style="background-color: #009688; color: white; padding: 5px; border-radius: 3px; text-align: center;">Bookmark Tutor</p>
	<p>Sarah 📍 Khobar, Doha Janubiyah</p> <p>Math, Stats, Physics and Data-science Tutor</p> <p style="font-size: 0.8em;">I am a middle and high school math teacher who has tutored students from middle school through college in PreAlgebra, Algebra I and II (regular and Honors level), Geometry, and PreCalculus, and Calculus. In addition, I have also tutored ESOL students ... read more</p>	<p>100 SR / hour</p> <p>★ 4.8 (328 Ratings)</p> <p style="background-color: #009688; color: white; padding: 5px; border-radius: 3px; text-align: center;">Bookmark Tutor</p>
	<p>Huda 📍 Khobar, Danah Shamaliyah</p> <p>Highly Skilled and Knowledgeable Math Tutor</p> <p style="font-size: 0.8em;">I have been teaching for 25 years, 16 of which have been at the university level in a teacher education program where I taught math and science methods to both elementary and secondary teachers and well as special ed. I am a patient and resourceful t ... read more</p>	<p>140 SR / hour</p> <p>★ 4.7 (328 Ratings)</p> <p style="background-color: #009688; color: white; padding: 5px; border-radius: 3px; text-align: center;">Bookmark Tutor</p>
	<p>Fares 📍 Khobar, Doha Janubiyah</p> <p>Math and Physics tutor</p> <p style="font-size: 0.8em;">I tutored all math courses ranging from prealgebra through multi-variable calculus (Calc III) and some differential equations and linear algebra. I also tutored physics, both for non-science majors and science majors. I have tutored many students in ... read more</p>	<p>150 SR / hour</p> <p>★ 4.6 (328 Ratings)</p> <p style="background-color: #009688; color: white; padding: 5px; border-radius: 3px; text-align: center;">Bookmark Tutor</p>
	<p>Fahad 📍 Khobar, Rabwa</p> <p>Engineering Available for Math Tutoring</p> <p style="font-size: 0.8em;">You can expect to be assisted in whatever coursework you have, and be provided custom tailored lesson plans and materials based on your learning preferences to help you achieve your goals. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Aene ... read more</p>	<p>140 SR / hour</p> <p>★ 4.5 (328 Ratings)</p> <p style="background-color: #009688; color: white; padding: 5px; border-radius: 3px; text-align: center;">Bookmark Tutor</p>
	<p>Reem 📍 Khobar, Danah Janubiyah</p> <p>Effective, Engaging Math Tutor</p> <p style="font-size: 0.8em;">Math is truly a challenge for many people. I would like to help you in conquering this subject and help you understand this in your own way. Instead of trying to teach it to you by copying off a book. Math may look complicated, and yes it could becom ... read more</p>	<p>200 SR / hour</p> <p>★ 4.4 (328 Ratings)</p> <p style="background-color: #009688; color: white; padding: 5px; border-radius: 3px; text-align: center;">Bookmark Tutor</p>
	<p>Thamer 📍 Khobar, Doha Shamaliyah</p> <p>Experienced and Creative Math Tutor</p> <p style="font-size: 0.8em;">Tutoring all levels of mathematics for public, private and home-school students. I follow each student's curriculum, providing supplemental materials as needed. Although math is not everyone's best subject, it doesn't have to be stressful. Anxiety an ... read more</p>	<p>130 SR / hour</p> <p>★ 4.3 (328 Ratings)</p> <p style="background-color: #009688; color: white; padding: 5px; border-radius: 3px; text-align: center;">Bookmark Tutor</p>
	<p>Ibrahim 📍 Khobar, Danah Shamaliyah</p> <p>Caring, Intelligent and Entertaining Math Tutor</p> <p style="font-size: 0.8em;">Are you looking for an SAT Expert? A Math Mentor at any level? I am a caring, intelligent and entertaining tutor with nearly 10 years of experience working with students in SAT and ACT prep, Physics, Chemistry, and in all levels of Math from Algebra ... read more</p>	<p>100 SR / hour</p> <p>★ 4.2 (328 Ratings)</p> <p style="background-color: #009688; color: white; padding: 5px; border-radius: 3px; text-align: center;">Bookmark Tutor</p>

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Figure 5. Search results page.

TUTOR+
Subjects For Students For Tutors
Log In Sign Up



Noor
Qualified and Patient for (Advanced) Mathematics

Khobar, Dannah Janubiyah
★ 4.9 (328 Ratings)

[Bookmark Tutor](#)

Math Qualifications

I specialize in tutoring math subjects for students in high school and college. I have tutored math since taking calculus when I began holding after-school sessions with groups of my peers. I have experience tutoring a wide array of subjects in math: from prealgebra to precalculus, to multivariable calculus and linear algebra. I am here to help you achieve your goals

Related subjects: [algebra 2](#), [calculus](#), [differential equations](#), [discrete math](#), [finite math](#), [linear algebra](#)

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Education	Accounting King Fahd University for Petroleum and Minerals
Policies	<ul style="list-style-type: none"> Hourly Rate: 150 SR / hour Lesson Cancellation: 8 hours notice required Lessons Type: In Person Group Lessons: Offers group lessons Levels Taught: Elementary, Middle School, High School, College. Genders Taught: Male and Female students.
Subjects	GMAT, grammar, statistics, ACT English, ACT Reading, grammar SAT, reading, algebra 2, calculus, differential equations, discrete math, finite math, linear algebra, prealgebra.
Reviews	★ 4.9 (328 Ratings)

Prepared and Patient Tutor

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★★★★★
Review by Student Name

Educated tutor

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★★★★★
Review by Student Name

Very helpful

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★★★★★
Review by Student Name

Great Tutor

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★★★★★
Review by Student Name

Schedule your tutoring session

Math 150 SR / hour

1 Choose a location

My place

Tutor's place

Library/Public place

Online

2 View availability

Su	M	Tu	W	Th	F	Sa
AM 9 - 12						
PM 12 - 8						

3 Type a message

Explain your goals, experience level, special requests, etc.

Send Request

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Figure 6. Tutor profile page.

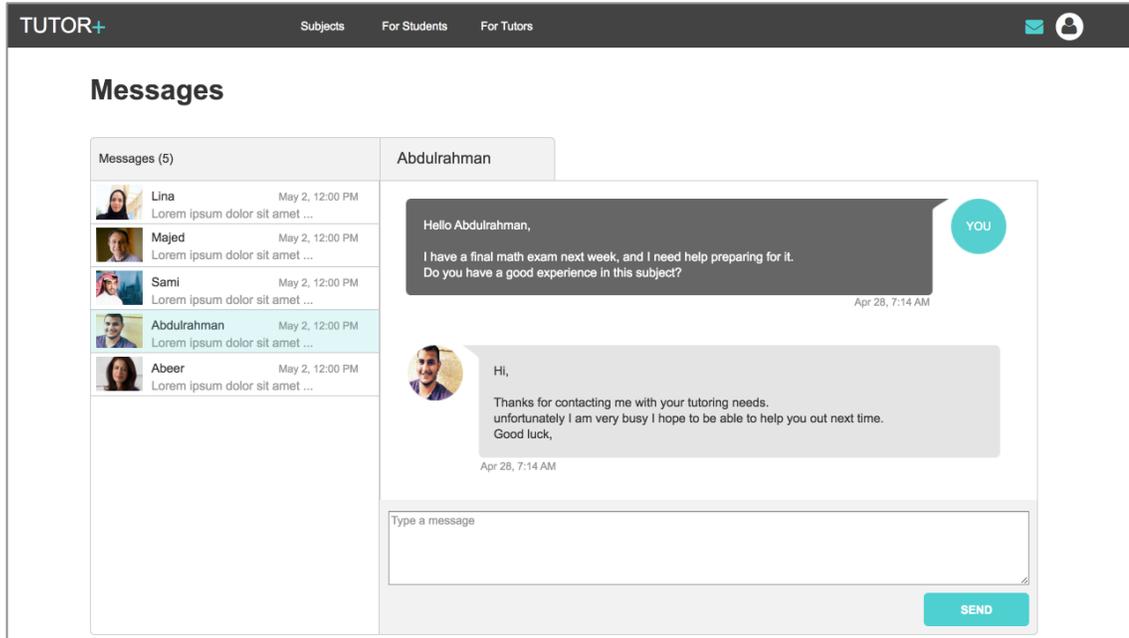


Figure 7. The user’s messages page.

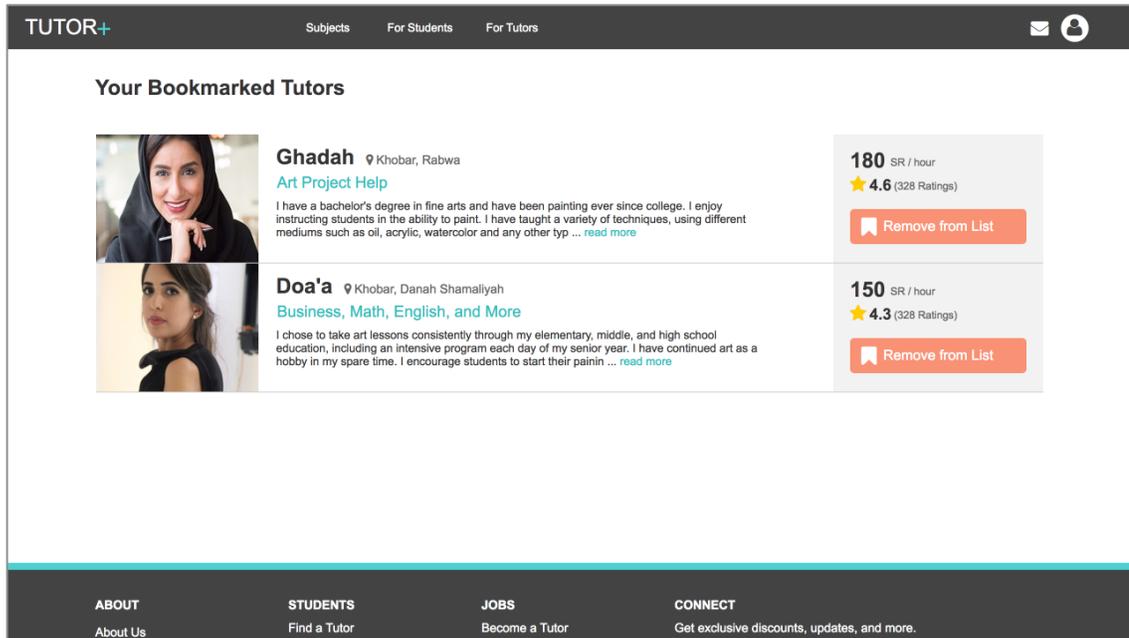


Figure 8. User’s bookmarked tutors list.

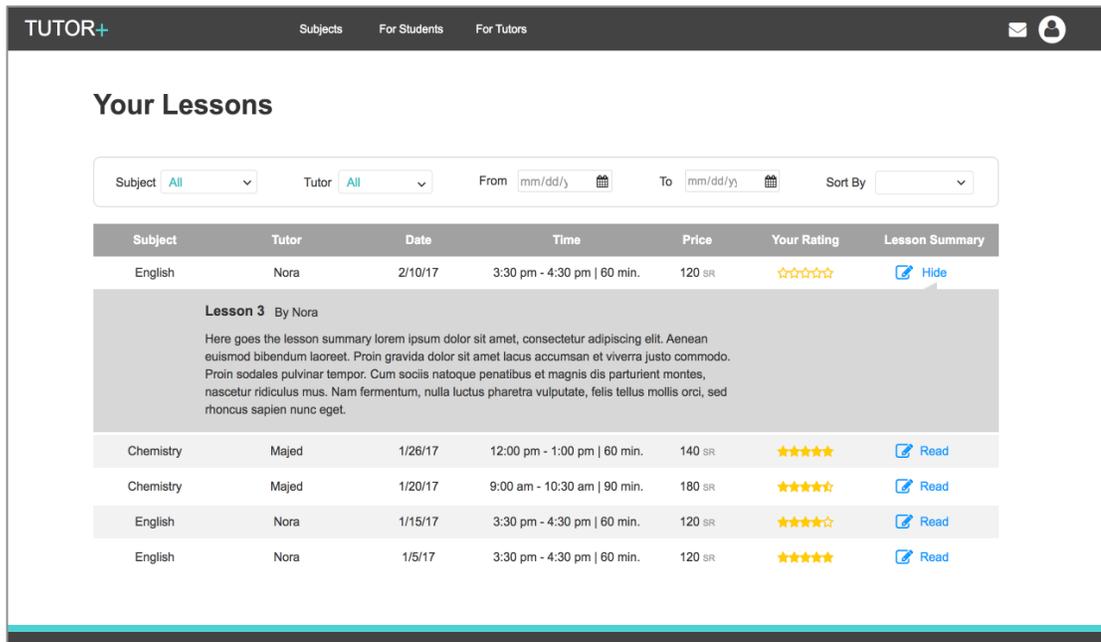


Figure 9. “Your lessons” page.

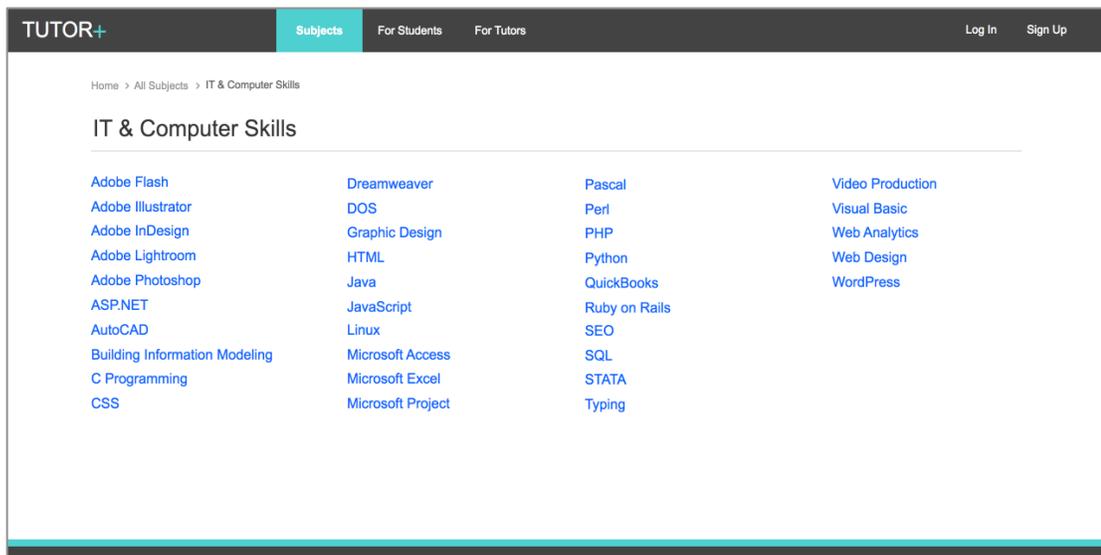


Figure 10. Subject category page.

Chapter 5: Methodology

The usability testing was conducted on a high fidelity prototype, in an attempt to make the user experience as realistic as possible, and was tested with eight participants. Each session started by explaining to the participants the nature of the testing session and clarifying its goal. Specific instructions were provided, such as asking the participants to think out loud while performing the tasks, and to show their honest reactions when encountering any confusing, unclear parts of the interface. They were then requested to read and sign the consent form (see Appendix C). The participants read and performed the task scenarios. Each testing session lasted about an hour. After completing the final task, participants were asked some follow-up questions addressing certain choices they made while performing the tasks. In addition, they were asked the following general questions:

- What was the most confusing, difficult task? And why?
- What was the most easy, straightforward task? And why?
- Could you suggest any improvements or additions to the website?

Testing Environment and Equipment

The test was conducted at my house in a closed room to avoid any potential interruptions that may reduce the accuracy of the time-on-task usability metric. Silverback 3 usability testing software was used for audio, video, and screen recording. In addition, a Crazyegg plugin (mouse click tracking plugin) was added to the prototype; it tracks mouse clicks during each individual session, and then generates an overall click heat map combining all the sessions' results. The study was conducted on a Mac OS X operating laptop computer, and the prototype was viewed using the safari browser at a 2560 x 1600 pixel screen resolution.

Participants

Eight participants were recruited for this study. They were friends and family members, and between 18 to 29 years of age. Most of them were students, but some were employees, and others were stay-at-home moms. I tried to recruit participants who can understand and speak English very well, so that the language of the interface they are

interacting with would not affect its usability. Table 1 provides information on the participants:

Table 1

Participant Information

	Age	Gender	Occupation	English skills/level	City
P1	26	Male	Mechanical Engineer	Very advanced	Khobar, Saudi Arabia
P2	18	Male	High school student	Advanced	Khobar, Saudi Arabia
P3	27	Female	Stay-at-home mother	Advanced	Khobar, Saudi Arabia
P4	29	Male	Accountant	Very advanced	Khobar, Saudi Arabia
P5	20	Male	College student	Advanced	Khobar, Saudi Arabia
P6	19	Female	College student	Advanced	Khobar, Saudi Arabia
P7	25	Female	Freelance writer	Advanced	Khobar, Saudi Arabia
P8	23	Female	College student	Intermediate	Khobar

Tasks

The participants were asked to perform five task scenarios on the prototype. The tested tasks were as follows (see Appendix A for complete task scenarios):

1. Book a tutoring session.
2. Bookmark several tutors and view the bookmarked tutors list.
3. Request a tutor from Tutor+.

4. View previous lessons.
5. Send a message to a tutor.

Limitations

One problem that arose was the difficulty in recruiting suitable participants. They needed to have a certain level of English, as the interface was in English and I did not want the lack of English skills to interfere with how they interacted with the prototype, which may affect the credibility of the data collected. As a result, only eight participants were recruited, and seven of them spoke English well. They did not face any difficulties related to the language of the interface while interacting with it. Participant eight, however, also knows English, but her language skills were not as strong. However, this did not have much impact on her performance, and she was able to complete all the given tasks.

Another problem was the slowness of the prototype. The interactions were not as fast as they would normally be on an actual website. For example, the items on the top navigation bar should instantly show the second level navigational menus when a user hovers over them. However, the drop-down menus took a few seconds to appear, and as a result, some of the participants missed it. This made them think that clicking on the top navigation items would direct them to another page, instead of showing them a drop-down menu with more options.

In addition, there was no formal testing laboratory available where the testing was conducted. Therefore, I had to invite the participants to my home and perform the testing there. Since there were no laboratories available I did not have access to eye tracking tools, so I tried to compensate for that by incorporating other tracking options, such as Crazyegg plugin, which tracks and generates click heat-maps.

Chapter 6: Findings and Recommendations

Completion Rate

All eight participants were able to complete all given tasks; however, some tasks were more difficult to complete than others. Participants were able to complete Task 1 (book a tutoring session) and Task 2 (bookmark several tutors and view bookmarked list) with ease. As they described it “the process is very streamlined and straight forward.” Task 3 (request a tutor form the website) was confusing to three participants, they instantly went to the “contact us” link, but it was not linked to any page, as a result they eventually found the “request a tutor” page. The other five participants completed Task 3 with ease. All eight participants completed Task 4 (view previous lessons) with ease. Finally, four participants found Task 5 (send a message to a particular tutor) to be very simple and straightforward. The other four were able to complete it after a few attempts (see Table 2).

Table 2

Task Completion Rates

	Task 1	Task 2	Task 3	Task 4	Task 5
P1	√	√	√	√	√
P2	√	√	√	√	√
P3	√	√	√	√	√
P4	√	√	√	√	√
P5	√	√	√	√	√
P6	√	√	√	√	√
P7	√	√	√	√	√
P8	√	√	√	√	√
# Of Success	8	8	8	8	8
Completion Rates	100%	100%	100%	100%	100%

Note. √=participant completed the task.

Time on Task

Task 1, which required participants to search for and schedule a tutoring session with a tutor who fits their needs, took the longest of all tasks to complete, with an average time-on-task of 8 minutes and 57 seconds. The times to complete Task 1 ranged from 6 minutes and 30 seconds to 14 minutes and 55 seconds, with a standard deviation of 3.1 minutes. Task 2, which required participants to bookmark several potential tutors who give oil painting lessons and view their saved list, had the second highest average time-on-task after Task 1, with an average of 5 minutes and 3 seconds. The fastest participant took 2 minutes and 6 seconds, while the slowest took 12 minutes and 51 seconds; the

standard deviation was 3.3 minutes. The average time spent on Task 3 was only 1 second less than on Task 2, with an average of 5 minutes and 2 seconds and a standard deviation of 1.8 minutes. In Task 3 participants were asked to submit a tutor request by answering a series of simple questions. The fastest participant took 2 minutes and 13 seconds, while the slowest took 8 minutes and 4 seconds. The lowest average time, which equals 1 minute and 32 seconds, belongs to Task 4, where the participants were asked to view previous lessons. Completion times ranged from 30 seconds to 2 minutes and 57 seconds with a standard deviation of 1 minute (see Table 3).

Table 3

Time-on-Task

	P1	P2	P3	P4	P5	P6	P7	P8	Avg.	S
Task 1	6:30	6:39	7:43	8:20	12:41	6:45	8:10	14:55	8:57	3.1
Task 2	4:17	2:56	5:28	2:06	4:34	3:35	12:51	4:44	5:03	3.3
Task 3	3:35	4:40	6:25	6:16	3:53	2:13	5:12	8:04	5:02	1.8
Task 4	00:49	1:07	2:47	1:02	2:29	00:40	2:57	00:30	1:32	1.0
Task 5	00:24	1:40	3:44	1:22	2:11	00:43	1:19	4:34	1:59	1.4

Note. S=sample standard deviation in minutes.

Website Issues

Issue 1: Viewing tutors' availability. Interestingly, all eight participants were confused on how the tutors' availability schedule works. They all tried to select a lesson time immediately, even though it was clearly labeled "view availability" (see Figure 11). Only three participants realized, after several clicks on the desired time, that they needed to state the meeting time in the message box. The other five sent the lesson request without stating the preferred time for the lesson in the message. The way am and pm times of the day are presented also confused some participants. It misled them to think

that they have two time options for each day, either am or pm, and they need to choose between these two. Later, they realized that the pm, for example, includes several hours of availability and they need to specify the exact hour (see Table 4).

Table 4

Participants' Comments on Issue 1: Viewing Tutors' Availability

Participant #	Participant's Comments
2	"How do I choose A.M. or P.M.?"
4	"from 8-10, from 12-6, okay I will go there and (he clicks on time) how do I choose?" "Here is a problem haha, it doesn't enable time selection." "(Participant insisting on selecting a time) How do I book?" "I want to select an appointment." "The time here from 12 to 6, but I need, for example, from 5 to 6 or from 4 to 6. How?"
5	"Okay I will choose Wednesday, for example, but there are a lot of hours I want to choose a specific time. Or do I assign it when I call her?"
6	"is the time picked now or what?" "just like selecting the day tab, I should be able to select one of these (am – pm)... Oh. okay I just realized its 9 hours. So maybe I should've specified the exact time in the message box?" "I wasn't concentrating, I expected that at pm she can only offer one lesson and the same regarding the am."
7	"I am trying to select the time but I don't know how?"
8	"How do I reserve p.m.?"

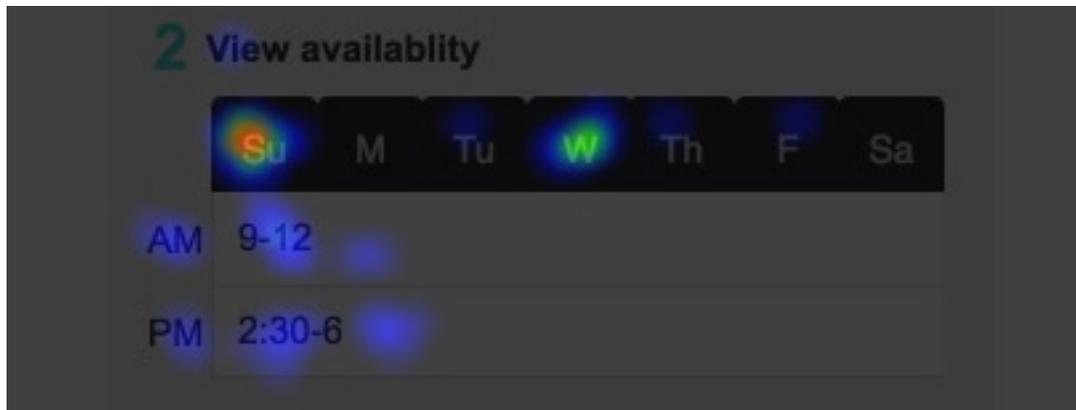


Figure 11. Click heat map of the tutor's availability schedule.

Recommendation. To solve this problem, users should be able to select hours directly from the form, rather than have to exchange messages with the tutor to agree on a lesson time. This could be done by showing a drop list of the available hours when either clicking on the am row or pm row. Then, the user would select a specific time. Another approach is to incorporate a 24-hour clock that communicates to the users which hours are available (and not available) for a specific tutor on a particular day. Then, the users could select one or more hours when they move the mouse over the portioned pie chart. Visually representing the tutor's schedule in a pie chart format would hopefully make it easier to scan and gather the information clearly (see Figure 12).

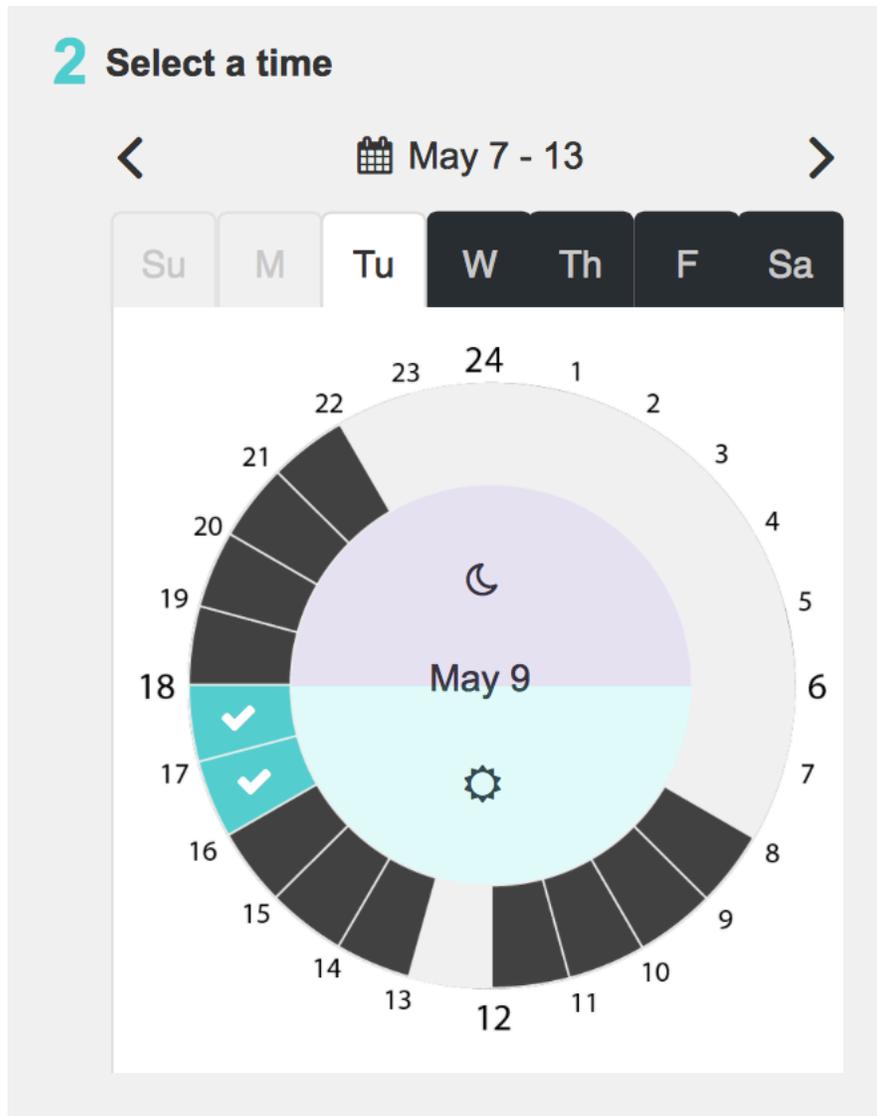


Figure 12. The redesigned availability schedule.

Issue 2: “Bookmark Tutor” button. When participants were performing Task 1, booking a tutoring session with a math tutor, they all clicked on the “bookmark tutor” button, expecting it would take them to another page to continue the booking process. The labeling was confusing, and they read it as “book a session” rather than “bookmark”. Also, the placement, color, and size of the button made it prominent so it was the first thing that caught their eye when they decided on a particular tutor. All eight participants experienced this confusion while they were attempting to accomplish this critical task. This makes it a serious usability problem that needs to be fixed, even though they

eventually realized the intended purpose of the button (see Table 5).

Table 5

Participants' Comments on Issue 2: "Bookmark Tutor" Button

Participant #	Participant's Comments
1	"'bookmark tutor' is like 'buy' on amazon, normally the button is here right in front of the thing we need to select. And it's the most primary button in relation to the person or the thing I am trying to select so I automatically hit it."
2	"bookmark?! No, I want to book a session."
3	"bookmark means save?! I thought it meant booking."
5	"I am clicking to book a tutor but nothing is happening! Oh... this says 'bookmark'."
6	"am I supposed to click this button?"
8	"I want a lesson with this tutor so I go to this button 'book'."

Recommendation. To avoid this confusion, it might be better to change the button labeling to "add to favorite", "add to list" or "save", since the two words "bookmark" and "book a session" are too similar. The button could also be made less prominent by changing its color and/or size. Adding another button next to it for booking a session may also help to overcome this problem. Because of the participants' experiences with popular e-commerce websites, they are used to seeing buttons such as "add to shopping cart" or "buy" next to the purchasable items or services offered, which is the equivalent of "book a session" in this case.

Issue 3: Top navigation menu. For at least five participants, many parts of the top navigation items were not clear. In one case, three participants thought that "for students" and "for tutors" will take them to two different login portals for the two different user types. Another two participants thought that "for tutors" means "for finding tutors" and by hovering over it, a drop-down menu containing links that will help them

find tutors would be displayed. For more illustration, when they were trying to complete Task 3, requesting a tutor, they went to look under the “for tutors” menu option.

All participants had a difficult time reaching the “request a tutor” page while performing Task 3. Three participants reached it from the footer links, two from the search results page and only one navigated to this page through the top menu (see Figure 13 and Figure 14).

The “for students” drop-down contained two confusing links as well. These are “find a tutor” and “request a tutor.” Four participants wondered about the difference between those two (see Table 6).

Table 6

Participants’ Comments on Issue 3: Top Navigation Menu

Participant #	Participant’s Comments
1	“What is the difference between ‘request a tutor’ and ‘find a tutor’?”
2	<p>“I assumed that ‘for tutors’ would show me the different kinds of tutors available, for example, math tutors.”</p> <p>“When I read ‘for students’ I don’t know why I thought it will ask me to sign in first if I clicked on it, then it will show me the different options offered for students who want to use the site.”</p> <p>“The way it is phrased made it seem like ‘if you want a tutor go here’.”</p> <p>“Find a tutor, and request a tutor, what is the difference?”</p>
3	“When I first read ‘for tutors’ I thought it meant for finding tutors, but then I realized it’s the tutors’ link not mine.”
4	<p>“I feel like I am kind of biased here, because on my university’s website I need to go to a link that says ‘for students’ in order for me to login. That’s why whenever you ask me to find account related stuff I go to ‘for students’.”</p> <p>“What is the difference between ‘find a tutor’ and ‘request a tutor’?”</p>
6	“Oh I didn’t know they show a drop-down, it takes time to appear.”
7	“the top navigation elements didn’t appear like if they were drop-down lists. Also if I hover over them, it takes time for the drop-down to show.”

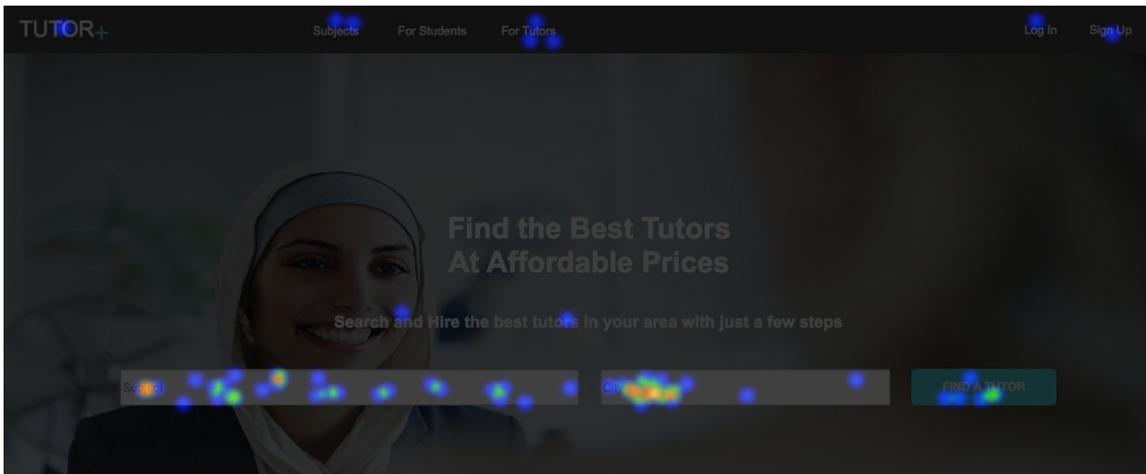


Figure 13. Click heat map of the home page.

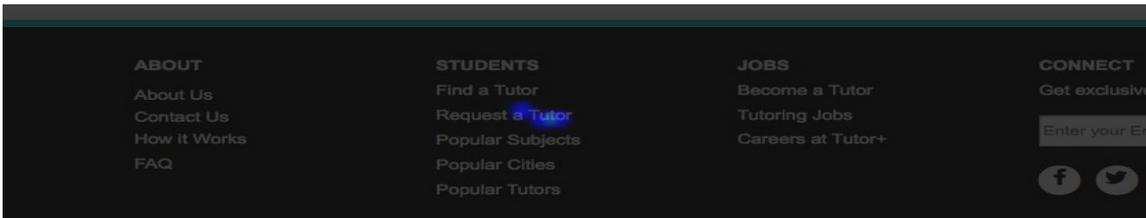


Figure 14. Click heat map of the home page footer.

Recommendation. Several modifications need to be applied to the primary navigation menu in order to improve its usability. One change is to move all the links in the “for students” drop-down menu to the top navigation bar. Therefore, the students who visit the site will be aware of all the different options and services offered by the site from the first glance such as “request a tutor”. Users will also be able to easily access and find such links when they are not buried at deeper navigation levels. Another modification would be adding arrows pointing downward to some of the navigational items as a way of indicating that they will show a drop-down list when placing the mouse over them. Such visual cues will help the users to identify at a glance which items will show dropdowns and which will not, thus saving time and minimizing the cognitive load. The labeling of the two links “find a tutor” and “request a tutor” were confusing to several participants. Therefore, perhaps the first label should be changed to “search for

tutors” and the second one to “request a special tutor” or “didn’t find a tutor?” Hopefully this small change will make it easier for the users to understand the difference between those two different services.

Issue 4: Reschedule an upcoming lesson. In Task 5, when the participants were asked to send a message to a particular tutor asking him to reschedule the lesson, the goal was to check if they could easily navigate to the messages page and to see how they would interact with it. The participants predicted that this task could be accomplished through the user’s account related links, so they directly navigated to the upper right corner of the page. However, instead of clicking on the “messages” link, four participants clicked on “your lessons” and scanned the page looking for the tutor’s name provided in the scenario to click on it and send the message. They were confused when they did not find the tutor’s name, but then realized it is only a list of their previous lessons, and does not include their upcoming lessons. They were clearly dissatisfied with that feature (see Table 7).

Table 7

Participants’ Comments on Issue 4: Reschedule an Upcoming Lesson

Participant #	Participant’s Comments
2	“Okay so I go to ‘my lessons’ and then I go to Sami. Where is Sami he is not here? Weird! So these are only the lessons I already finished? Okay now I don’t know where to go.”
3	“So from here, I go to ‘my lessons’, there is no math! I should see all the lessons I booked here.”
4	“I will go straight ahead to the student account, then ‘your lessons’, no let’s go back, I will go to ‘support’ or maybe I could send him a message through ‘messages’.”
8	“Of course I’d go to ‘my lessons’ ... All the lessons are together the ones I finished and the ones I didn’t finish right? I expected to find Sami here.”

Recommendation. The lessons page should include all the lessons a user has taken and will take. Three tabs should be added to categorize the different types of lessons, such as “upcoming”, “completed”, and “pending” lessons. This approach makes it easier to navigate through the page and to view information on any given lesson. In the “upcoming lessons” tab, users should be able to reschedule or cancel any lesson by simply clicking on the “cancel” and “reschedule” buttons. Unlike the initial method, where users had to navigate to the messages page, select the conversation they had with that particular tutor, and then compose a new message, the new method offers a more simplified, straightforward solution that requires only one or two clicks to complete the task. Also, it will give the students more control over their schedule by providing easy access to such functionalities.

Chapter 7: Discussion

For some of the results, there might be other interpretations or causes that made the participants take certain paths or interact with the prototype in a particular way. Based on the participants' comments, Task 1 and Task 2 were the simplest:

- “The first task was probably the easiest. But again all of them were pretty straightforward.”
- “Finding a math tutor was the easiest because when you open the site the first thing you see in the interface is the subject and city search fields.”

However, both had the longest completion times. Compared to the other tasks, these two tasks required more cognitive and mental effort from the participants. They both required reading and comparing the different rates, reviews, and qualifications offered by the different tutors and then making a decision, which explains the long completion times.

In order to accomplish Task 3 (request a tutor from the website) there are three alternative paths:

- Path one: from the top navigation menu “for students > request a tutor.”
- Path two: from the footer and clicking on the link “request a tutor.”
- Path three: from the search results page, a message with a “request a tutor” button appears when the search yields zero results.

However, after reading the task scenario, three participants instantly scrolled down the page looking for the “contact us” link in the footer. Since “contact us” was static and not linked to any page, they tried another method to reach their goal. However, if it had been linked, they would most likely have filled out the “contact us” form and considered the task as accomplished, which means a different completion rate for Task 3.

Another factor that might have complicated the performance of Task 3 is the slowness of the prototype, especially the slow response of the top navigational elements, which is one possible path to complete Task 3. When participants moved the mouse over the top navigation items, the CSS styles of the items instantly changed to the hover styles, but the drop-down menu took more than one second to appear. The lack of synchronization between the element style and the appearance of the drop-down menu

led most participants to think that they were clickable links that would open a different page rather than show a drop-down menu. As a result, most participants preferred other navigating options such as scrolling and scanning.

Chapter 8: Conclusion

Overall, the website was easy for the participants to use. They stated that the interface design was simple and intuitive. The prominent placement of the search feature on the homepage and the avoidance of unnecessary content made it the first element to catch the user's eye. Also, it allowed the users to instantly grasp the main purpose of the site. Users were able to easily find, sort through, and narrow down search results. The design of the search results interface allowed the users to easily scan the information, compare different tutors, and select the best fit. However, the usability testing also revealed a few issues in the design. One issue was the tutors' availability schedule. It was difficult for the users to scan the available hours, and most importantly, they all expected the schedule to be interactive, allowing them to specify the lesson time. The prominent way that the "bookmark tutor" button was displayed and labeled next to the corresponding tutor confused the users, and led them to think that this is where they should click to book a tutoring session. Moreover, it was the only call-to-action associated with each tutor element. The main navigation system was confusing as well. In Task 3, users had a difficult time navigating to the required page. Most users completely avoided using the top navigation, and instantly went to the footer links and other alternative options. The "your lessons" page was easy to navigate to and interact with, however, some users expected to find their upcoming lessons listed there as well. Although the users encountered such usability problems, their final impressions and comments were strongly positive, and they repeatedly mentioned that the overall website was very easy and simple to use.

Chapter 9: Next Steps

After implementing the changes to the initial design, a second round of testing with a different set of participants is required to make sure that these recommended solutions actually solve the emerged usability problems, and to make sure they do not produce new ones. Also, additional supportive features may be added to create a richer user experience. One feature is to process payments online through the website. Many people may want to avoid making financial transactions online for security reasons, especially here in Saudi Arabia. They tend to hesitate even more when it comes to adding their payment information to national e-commerce websites and applications. Therefore, users should be allowed to choose their preferred payment method. Such methods include paying by cash, bank transfer, and debit or credit cards. Another feature would be to integrate an online meeting tool, which enables the users to access online lessons directly through the website instead of using other video calling applications. Specific features may be incorporated into this online tool that allow for collaboration and particularly enhance the learning process by addressing the specific needs of students and tutors. Since the focus of this project was on one user type, the students, further research, design, and testing should be implemented to create a positive user experience for the tutors as well. And, finally, a mobile application of the website would give users easier and faster access to their lessons, tutors, and messages. Creating a mobile app will also help in reaching a wider range of users.

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Appendix A: Usability Testing Tasks

1. Book a tutoring session

Task scenario: you are in high school and you need help in preparing for your final math exam that will occur next Monday. Use the website to book a tutoring session with a skilled math tutor who lives in your city, and requests a reasonable hourly rate.

2. Bookmark several tutors and view bookmarked list.

Task scenario: you're interested in taking oil painting lessons after you are done with your final exams. So you decided to visit the website and take a look at the different qualification and rates offered by the tutors. Choose 2 potential tutors and save their profiles so you could easily find them later. If you want to view your saved list where would you go?

3. Request a tutor from Tutor+.

Task scenario: You are an interior design student and you need an urgent help in learning how to use AutoCAD software for one of your class projects. You searched through the website, but there are no local or online tutors who teaches this subject. Use the website to send a request to be provided with a tutor that teaches AutoCAD as soon as possible.

4. View previous lessons.

Task scenario: You have hired an English tutor to improve your 6-year-old daughter's English skills. Use the website to know what she has learned in her most recent English lesson with her tutor Nora.

5. Send a message to tutor.

Task scenario: you told your math tutor Sami that you're available this Friday evening at 5:00 p.m. to meet for a lesson, but then you remembered that you have another appointment at this time. Send a message to Sami asking him to re-schedule the lesson to Saturday afternoon at 1:00 p.m.

Appendix B: Post-Test Questions

1. What was the most confusing/difficult task? Why?
2. What was the most easy/straightforward task? Why?
3. Could you suggest any improvements or additions to the website?

Appendix C: Consent Form

I agree to participate in the study conducted and recorded by Shahd Alruwaili. I understand and consent to the use and release of the recording by Shahd Alruwaili. I understand that the information and recording is for research purposes only and that my name and image will not be used for any other purpose. I understand that participation in this usability study is voluntary and I agree to immediately raise any concerns or areas of discomfort during the session with the study administrator.

Please sign below to indicate that you have read and you understand the information on this form and that any questions you might have about the session have been answered.

Date: _____

Name: _____

Signature: _____