StudyBuddy

Time Tracking and Study Support

CSE 440 Section B
Final Report
Autumn 2017

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Problem and Solution Overview

People's time is valuable and limited, especially for college students who have to balance school, work, and social lives. As university students we spend a lot of time "studying" or "working," but with the large number of distractions around us it can be surprisingly easy for our productivity to lag. Frequently, friends will go to study together and end up spending more time on Facebook or shopping than actually doing what they had intended. This time loss commonly manifests in a collection of short breaks and so students are often unaware of the scope of the cumulative amount of time being wasted. In a busy schedule this wasted time can lead to loss of sleep, lower prioritization of physical activity, and even poor performance on assignments and exams.

While many students are interested in boosting productivity, it's a complex goal and not necessarily easy to do. In order to address this issue, StudyBuddy makes use of physical sensors and integrated software to help students track and improve their productivity - and also to create more balanced study habits overall.

Figure 1: Distracted student
http://s3.amazonaws.com/rapgenius/67-13-Culture-Distractions-Adams-web.jpg

Design Research Goals, Stakeholders, and Participants

Design Research Methods

Through our design research we hoped to learn what types of interruptions most impact students, and how technology could be used effectively to increase productivity. We gained this information through interviews of different students at the University of Washington. We focused on questions about the types of distractions they encounter, the process of becoming distracted and subsequently returning to work, and their feelings about the impact of distractions. Lead-in questions invited the participant to recall and explain their habits. In addition to the interviews, some participants were discreetly observed while studying, then prompted with follow up questions to gain insight into their awareness of their habits. It seemed that traditional contextual inquiry would be ineffective in this context because trying to partner with a participant as they study could provide additional distractions or, conversely, promote increased focus.

Stakeholders and Participants

While there are many people who could be interested in a focused time management system, we chose to focus our research on undergraduate students. Individuals in this demographic commonly spend a large amount of time trying to complete homework and other focused tasks, and also generally lead active social lives ripe with the kinds of "distractions" we're interested in studying. All of our participants are students at the University of Washington but are from varying majors, years, and living situations. We wanted to learn from students with a range of responsibilities, experience, and study habits.

Stakeholders

- **Students** typically spend a large portion of their time completing assignments and studying for exams. Having an application that makes this time more effective will be desirable.
- **Educators** could find this application useful for encouraging improved time usage and management for their students.
- **Employers** looking for ways to increase office productivity could find this application useful. This application could help employee's work more efficiently and help employer's identify sources of interruption.

Participants

- Participant 1 is a senior in the UW Department of Economics. He studies mostly at home, alone and only during the week. The two most significant distractions that commonly pull him away from his studies are social media and messaging apps.
- Participant 2 is a sophomore in the UW Bioengineering department. She lives in a sorority, and usually studies in her room or a library. She spends a lot of time studying and says that social interruptions are her biggest distraction.
- Participant 3 is a junior in the UW CSE Department. He is 20 years old and is a Hawaiian native. He has loose study habits, only focusing heavily on his work when there is an impending deadline to be met. He is easily distracted when he becomes bored.
- Participant 4 is a senior in the UW Physics department. He is 24 years old and is a Korean native. He lives at studio by himself, so he tends to study alone at his place, but we studied together at the library for this observational interview. It was observed that phone calls, text messaging, and social media notifications mainly distracted him.

Design Research Results and Themes

Throughout the course of our design research, a handful of themes began to emerge which seemed to be 1) common to all of our participants and/or 2) indicative of the generalized problem at hand. Some of these themes aligned with our initial predictions, but we were also surprised by new insights, which challenged our previous assumptions.

Interruptions only become detrimental after they've consumed "too much" time.

While our initial focus was on the negative impact of distractions while studying, all of our participants pointed out that short breaks for social media, eating, or interacting with friends, etc., can actually provide a healthy "breather" during long study sessions. It became clear that it is only when our participants inadvertently end up spending larger lengths of time pulled away from their work that they begin to feel "distracted". (i.e. the interruptions are not always viewed as negative and can even promote productivity under certain circumstances)

Common interruption types are *not* generally the same for different participants.

The most common type of distraction varied from one participant to the next. Social media commonly distracted some participants, while others said they make a point of never accessing their social media networks while studying. Some said interaction with friends and roommates was a main source of interruptions, while others said they always study alone. Overall, after considering feedback from all of our participants, it became clear that in order to generalize our design we would need to be able to take a wide range of distraction types into account - since from person to person the nature of problematic interruptions may be very different.

Overall, participants would be interested in technology that could help them monitor (if not alter) their study and distraction habits.

While students might not commit to using the technology to make systematic and habitual changes, all of our participants have suggested that they would at least be interested in receiving objective feedback about exactly how much they commonly spend on distractions. Our participants don't seem to want overbearing suggestions on how to "improve" study habits or on when and when not to set aside time for work or social activities. But they did tell us they would be interested in getting a clear idea of what their time-management looks like from a neutral, outside perspective so that they themselves can then reflect on this information in their own way.

Positive feedback and/or rewards may be just as useful as pushy reminders to "get back to work".

This theme we hadn't originally foreseen. We had initially imagined that our efforts should focus on limiting distractions while studying. However, some of our participants voiced that they would actually appreciate receiving study break reminders - in addition to information about how much time they spend distracted while studying. This concept of promoting "balanced" study habits (instead of simply limiting distractions) has allowed us to expand the scope of our design ideas to make the overall design more attractive to our prospective customers while still maintaining focus on productivity in general.

Task Analysis

Who is going to use the design?

People who want to manage their time well and be productive. We have chosen to focus on students, since they typically spend a lot of time studying and have to balance that with other responsibilities, social activities, and maintaining personal health. Other customers could include those who have just joined the workforce, parents, or teachers. The ideal design will work for anyone that wants to know more about specific time usage, and needs to spend periods of time on specific activities.

What tasks do they now perform?

Students are all studying and completing homework. While doing this work they are trying to mitigate their distractions and interruptions. Some are using applications, like the timer app that participant 4 uses. Others have manual strategies, like how participant 1 turns his phone off while working, and participant 2 chooses isolated environments to focus. None of the participants we interviewed had an ideal solution or strategy they are currently using to maximize their efficiency while studying.

What tasks are desired?

People would like a way to get an objective perspective on their time usage and management. They want to gain more awareness of how they spend their time without judgement or overbearing suggestions. In addition, some participants would like smart suggestions for how to allocate their time for future assignments and responsibilities.

How are the tasks learned?

The participants already had their own study strategies, but mentioned that they want a tool that helps them be more productive. To receive an objective perspective on their time usage and management, they should receive a report about how much time they have spent on different activities and tasks. This report should be generated with as little effort as possible from the participant. People will not use the product if it takes time to set up a report, or enter a lot of personal information. However, if presented in a meaningful way, this information could be very helpful in giving customers a "bird's eye view" of their own time management - possibly introducing new perspectives on how to improve it.

Where are the tasks performed?

Places where people spend time for studying and working. (e.g. home, library, coffee shops, workplace, etc.)

What is the relationship between the person and data?

The data would be an objective representation of the person's time management. Data would be collected by the person's check-in and check-out, and physical and device sensors. The data would be accessible from multiple machines; the machines must communicate to create a comprehensive view of the customer's time. People tend to move between machines depending on what kinds of tasks they are performing. The relationship would not change over time since how the data is collected and what they represent would not change over time.

What other tools does the person have?

Some people use applications to improve their time management skills, such as calendars or timers. However, most of the people have difficulty tracking the amount of time they spend on distractions when it comes to many distractions that take up small periods of time.

How do people communicate with each other?

Studying tends to be a solo activity for many people, and yet social interaction in many forms can pose distractions. Whether in person, by text, or by messaging via social networks, social interactions are actually one of the biggest sources of interruptions that the participants brought up.

How often are the tasks performed?

Tasks are performed whenever people try to be productive. For students, it is almost every day because they have classes and homework, and they only have a limited amount of time to complete their work. Many people would like to be able to improve their time management and be productive on a daily basis.

What are the time constraints on the tasks?

People would like to be given an objective perspective of their time usage and management. The necessary data for providing this information could be collected over the course of days, weeks or longer. The tasks themselves are happening constantly (as people are often working) and work is usually open-ended or at least ongoing. Thus time constraints are few in this study, with the exception that specific deadlines are constantly coming and going.

What happens when things go wrong?

If time tracking is performed incorrectly, participants may attempt to make behavioral changes based on false information - which may then lead to unsatisfying results. Additionally, if technology geared toward effective time tracking becomes too complicated and involved, the technology itself may become a new distraction - thus defeating the purpose of trying to help people improve their productivity. In the end, if time-management is inefficient, productivity suffers and frustration, lack of sleep, or poor performance may ensue.

Proposed Design Sketches - "3x4"

Physical Sensor Time Tracking

Our first design relies on the use of physical sensors to monitor how much time a person spends engaged with their work vs distracted (or away from their work). Sensor types could vary, but possible examples include a webcam for eye tracking or detection of physical presence in front of the computer, a smart pencil that tracks when a person is actively writing or BookWurm which can tell when you're reading a book. This design embodies the general approach of "passive" time tracking, wherein the user goes about their work as usual and the technology does the tracking autonomously and reports the results to the user.

Figure 2

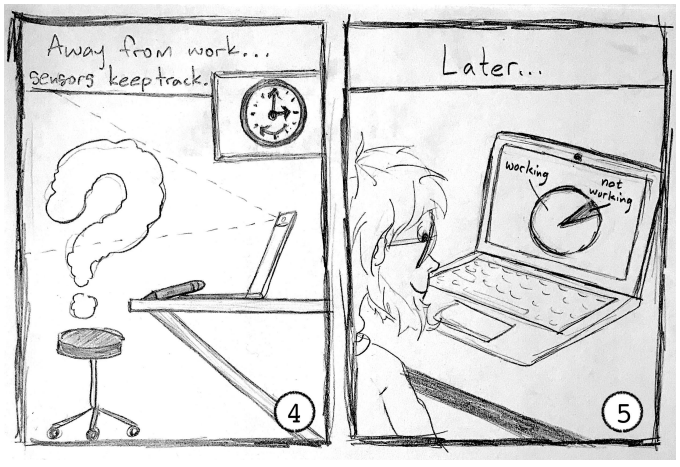

Figure 3

Device Time Tracking

Device tracking focuses on tracking the usage of softwares and websites and classifying that time as working or not working. With this design, customers do not have to actively record their time usage since they are automatically tracked. Whenever the customer starts using social media applications or go into websites that are not related to work, the application automatically starts a timer (Figure 6), and the customers are able to see how much time they have spent on each application or website. Later, they are able to view their time usage data in the application (Figure 4). Even though this design will only allow users to track distractions that include utilizing devices, it will be a powerful design to prevent device-using distractions and provide insight about how they spend their time.

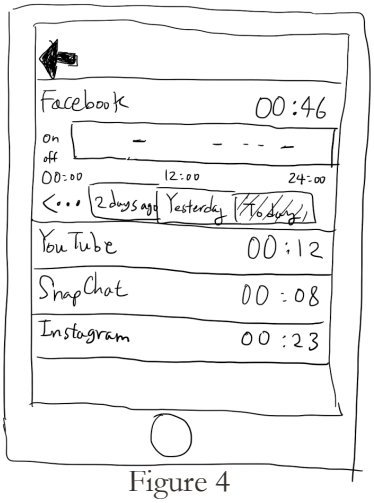

Figure 4

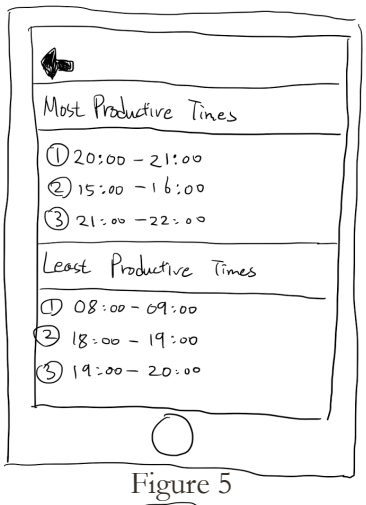

Figure 5

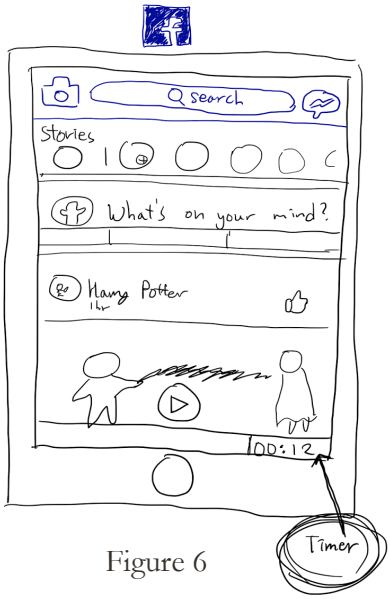

Figure 6

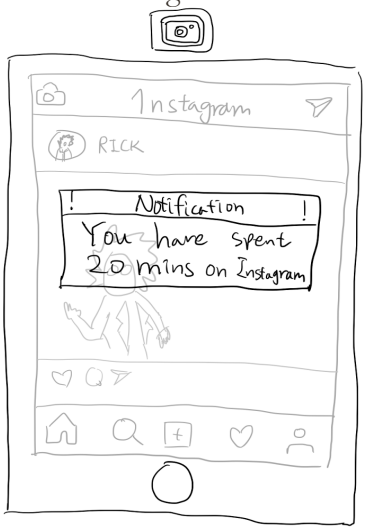

Figure 7

Active tracking

This design utilizes active tracking through a mobile app to allow the user to track their time usage. The mobile app's main feature is an interactive calendar (Figure 8) to which the user can input their assignment deadlines, and when they intend to work on those assignments. The app will have features to track the amount of time each assignment takes, schedule their time, and provide suggestions for how to allot time between their many assignments (Figure 10/11). This will enhance applications like Google calendar through the addition of timing capabilities and smart suggestions.

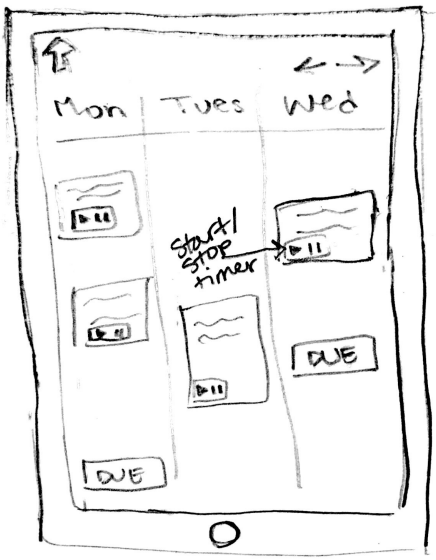

Figure 8

Figure 9

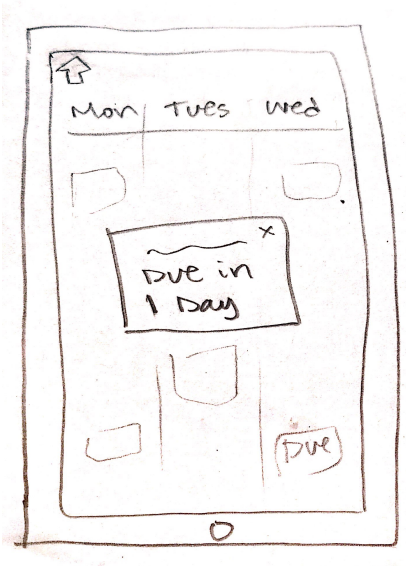

Figure 10

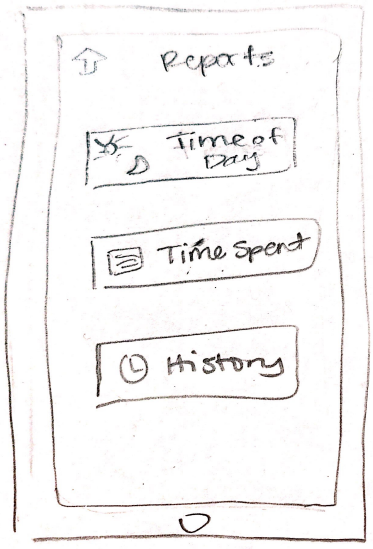

Figure 11

Selected Design

Instead of selecting one design from the designs that we proposed, we decided to combine the best features from each of them, mostly from designs 1 and 2. The design utilizes a combination of physical sensors, such as laptop cameras, and software device-usage tracking, which the user will activate through a one-touch selection in the application. We chose this combination of sensors and software tracking since one design would not successfully target the many types of distractions present. The first task this design addresses is to track the amount of time a person spends distracted while studying. This task was widely requested by our participants and is at the root of other tasks, like getting homework assignments done on time and becoming better at planning your schedule. The second task is to receive notifications when distractions begin to take too long. Through a combination of preferences, physical sensors and device usage tracking, the application will know when the customer has been away from their work longer than they intended to be, and will send a reminder. Our participants all agreed that some distractions are inevitable, but would like a way to pull themselves back to work more quickly. The combination of these two tasks will provide customers an effective way to gain awareness about their time usage and study habits, while working to minimize time spent distracted.

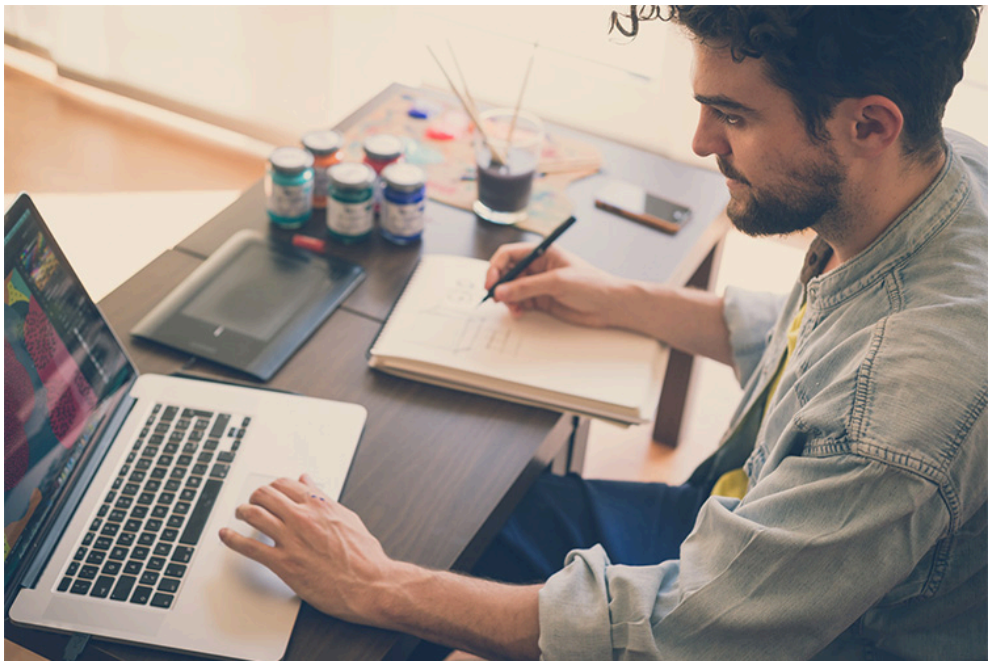

Figure 12: Focused person

https://www.wanderlustworker.com/wp-content/uploads/2016/02/staying-focused-on-goals.jpg

Written Scenarios - "1x2"

First Task (Figure 13)

Joe is a junior in the University of Washington Computer Science program. He studies every day for anywhere between 2 to 6 hours, but takes a casual approach to his work; he often pauses to check his social media feeds or to peruse Reddit or other news sites. Joe suspects that he could improve his productivity and decides to use StudyBuddy to get an objective look at just how inefficient his study habits might be.

At the beginning of each session, Joe accesses StudyBuddy's assignment list and taps the assignment he wants to work on to activate the tracking sensors and software. Joe then proceeds with his work as normal, including his frequent media breaks. Throughout his study session, the sensors and software work together to track the amount of time Joe spends focused on his work vs the amount of time he spends distracted from it. For example, when he leaves his computer or turns away from it, his webcam is able to see he is not focused on his work. Similarly, when he peruses his Facebook feed, the tracking software in his phone categorizes this time as non-work-related. When Joe is finished with his study session, he taps "Done" if he has finished the assignment or "Pause" if he will come back to it later. After processing the tracked information, StudyBuddy then provides Joe a clear breakdown of the way he's actually spending his dedicated study time.

Second Task (Figure 14)

Joe, the student introduced above, has started using StudyBuddy and learned that his intended ten-minute breaks commonly end up lasting up to half an hour. He decides that he needs to be more careful with his break times, and enlists the support of StudyBuddy. He selects a ten-minute break time limit on his application, then selects his data visualization assignment to activate the sensors, and starts working. After about 45 minutes, he receives a twitter notification and becomes absorbed by all of the new tweets he's missed while studying. He's lost track of time, but fortunately his StudyBuddy alerts him that he has been tweeting for ten minutes already. He remembers that he needs to complete his data visualization assignment by tonight, and gets back to work.

Storyboards of the Selected Design

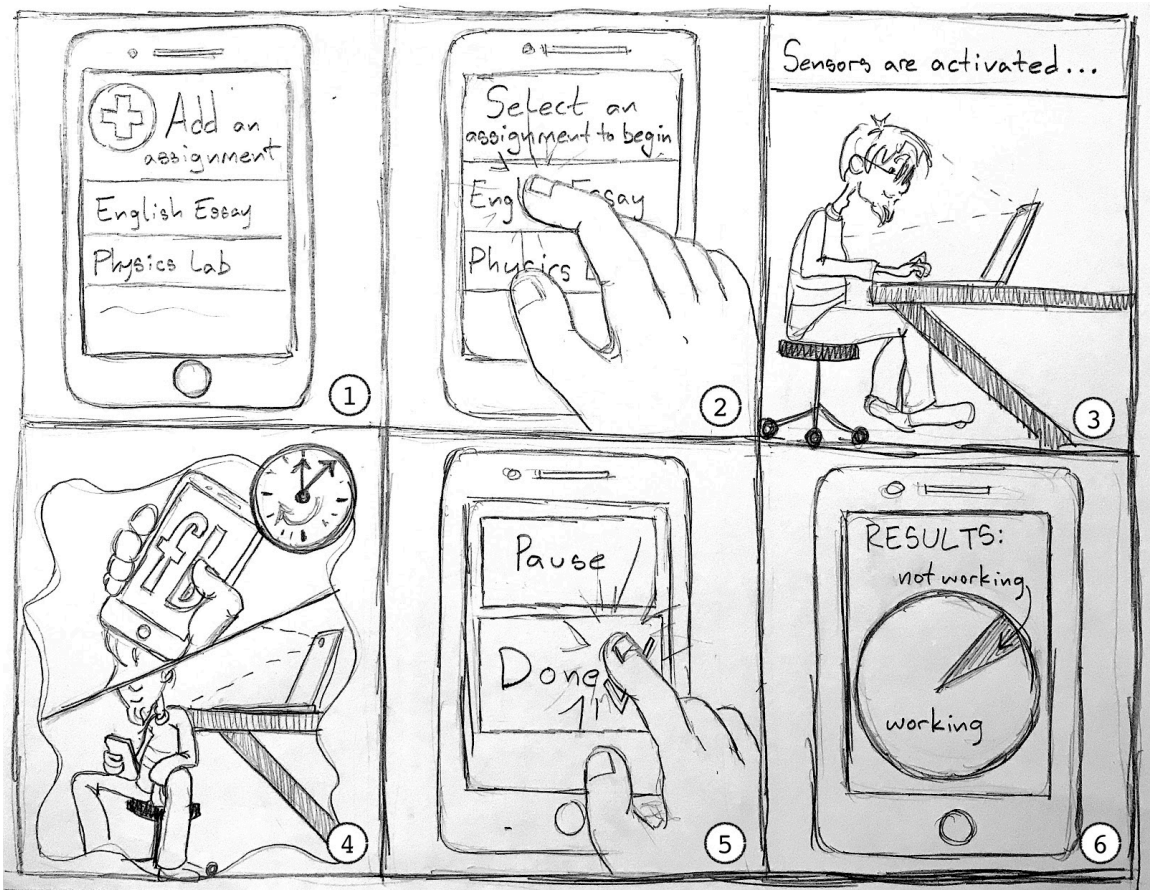

Figure 13

Figure 14