## Appendix A: WGU Details

Western Governors University (WGU) is an accredited non-profit online university. ${ }^{1}$ It has an undergraduate enrollment of approximately 64,000 students and, as is common among online universities, offers degrees in business and vocational areas including (1) Business, Management, and Marketing, (2) Computer and Information Science, (3) Education, and (4) health professions. Like many online student populations, students at WGU are older than traditional college students, have a higher utilization of federal student loans (59\%), persist and graduate at lower rates than at traditional universities, with $74 \%$ persisting into second year and $26 \%$ graduating within 6 years. ${ }^{2}$

WGU also differs in a several important ways from many other online universities. First, course and term schedules at WGU are completely asynchronous. Students can enroll in any month and work through courses at their own pace. Students pay approximately $\$ 3000$ for each sixmonth semester and can complete as many courses in that time as they would like. Second, instead of providing students with grades, students passing is typically determined by performance on projects or proctored course competency exams. ${ }^{3}$ Third, with few exceptions, WGU students are required to successfully complete at least one college course at another institution before they can be admitted into WGU.

[^0]
## Appendix B:

## Details for the Online Modules in Oreopoulos, Patterson, Petronijevic, and Pope (2018)

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## PLANNING TREATMENT AT CAMPUSES OF U OF T

## Introduction

Here at University X, we want to better help our students excel in their courses while having a great experience. To that end, we've been conducting research with ECO100 students for the last several years. We asked why some students arrive at UofX and do really well with their academics while others, with excellent high school grades, nevertheless struggle. We received feedback from thousands of students about barriers to success and how they've been overcome. And we met and coached hundreds of students to learn from their perspectives.

From this research we observed many different challenges, but by far the most common one was time management. Many students told us that they struggled to find enough time to study while trying to balance their lives with other activities. They regretted studying too late, or not spending their time effectively. On the other hand, those who were able to stick to a regular study routine usually did very well.

## Exercise Details

We constructed this warm-up exercise to offer assistance to help you master your time, to better manage your assignments, your activities, and your life. The exercise involves 2 parts:

- In Part 1, you will be asked to read about students who struggled last year but did much better in the next year. This will help you understand how lots of students face challenges in managing time effectively and how you might be able to avoid these struggles from the beginning.
- In Part 2, you will be asked to design a weekly time schedule that balances your time effectively. We'll turn this into a calendar you can access online or on your phone. You'll also be invited to use this calendar to set weekly study goals.


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## Part 1: Planning For Academic Success

The most common barrier to academic success reported among ECO100 students is 'not devoting enough time to keeping up with course material'.

In some ways, university is the opposite of high school. During high school you may have spent 30 hours a week in classes and done homework for about $10-$ 15 hours a week. At university, more emphasis is placed on you as an independent learner supported by professors and a range of other student services outside the classroom. The average university student spends about 10-15 hours a week in classes and is expected to spend as long as it takes outside of class to master the content of the course. As a general rule of thumb, most professors suggest students spend about 20-30 hours a week (4-5 hours a day) regularly studying outside the classroom.

It is therefore helpful to think of university like a full time job - ideally a job that you love to do. Studying regularly, even with no upcoming midterms or assignments, allows you to learn the material in-depth, feel organized, and get the most out of the course, including satisfying grades.

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## Many Students Underperform Here - Here's How to Avoid This

This is last year's distribution of ECO100 students' high school and UofX grades. You can see that UofX students arrive with excellent high school grades, but some experience much lower grades after their first year. This does not have to be the case! Regularly studying a sufficient amount of time is the key to avoiding this fall in grades.


## One of the Strongest Predictors of Grades is Study Time

Those who regularly study at least 20 hours each week (more during exams) earn grades about 10 percentage points higher, on average, for all their courses compared to students who typically don't study more than 5 hours a week. This is about the same difference as between a 2.5 and 3.5 GPA.

In economics courses, the average difference in grades between these two groups is 11 percentage points. The chart below shows this with the median introductory economics grade for those who study at least 20 hours per week being 75 percent, and that for students who study 5 or fewer hours each week being 64 percent.


Those who regularly study are more than two and a half times as likely to get an A over all courses than those who cram. Those who study few hours and tend to cram for tests are also five times as likely to get a D+ or worse. No one who regularly studied 20 hours or more per week had a failing average over all their courses.
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## Regular Studying Even Helps Predict Being Happy

And it's not just grades that set studiers and non-studiers apart. ECO100 students who study regularly 20 hours or more are three times more likely to report they are very satisfied with life and their university experience. Thus, staying on top of course material may help lower stress and balance life priorities between both work and play.


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## Learning How To Study Effectively from Former Students

For many students, treating school like a full-time job can seem challenging, but this doesn't have to be the case. You can learn to manage your time so that you can work consistently towards your long term goals and still have time for a balanced life.

To understand common struggles with time and how to overcome them, we asked students who had performed poorly in their first year, but greatly improved by the end of their next year, to share their experiences.

Their statements have been edited to improve clarity and preserve anonymity.

Let's read what they had to say:
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## Story 1 of 8

I did really well in high school without having to do a lot of homework, but when I tried the same thing in university the first term didn't go well. I signed up for a workshop on study skills and realized I just wasn't spending the time I needed to do well, so I tried to get more organized. I made a schedule and began studying everyday after dinner. My grades started shooting up and I started to feel more confident. I ended up with a 3.74 Winter GPA. So my advice to future students is to stay organized from the very start. Once you get in the habit, it's much easier to stay motivated and it'll be worth it.

Planning to study regularly and starting at the beginning of term will help you get into a rewarding habit.

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## Story 2 of 8

There were not a lot of deadlines at the start of class so I sort of coasted for the first few weeks. But when I finally did start getting ready for midterms it was too late - there was too much material to try to understand at once. I tried to make up for the bad start but things didn't go the way I wanted in my first year. I thought hard about a better strategy over the winter break and, in my second year, I started from the beginning studying every day. That had an amazing effect and I started doing so much better. Now I know I can be a good student. I just have to actually find the time.

Studying from the beginning of term will give you the time you need to really understand the material. When you don't understand, you can keep working on it until you get it. And when midterms or assignments approach, you'll have a strong base of understanding and be prepared.

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## Story 3 of 8

In my first year, I worked at a grocery store 15 hours a week and commuting from home took a lot out of me. I'd get home and feel too tired to do anything. My lack of studying showed when I wrote my first tests. I realized I had to make a trade-off. Instead of trying to find more time to study, I scaled back to taking only 4 courses instead of 5 , and that gave me enough breathing room to focus and get into a routine that worked better. I have to take an extra course in the summer, but spreading out my course load allows me to space things out more evenly.

A trade-off may exist between time spent working and time spent studying. It is all the more important to find a routine that works well that prioritizes your own individual goals.

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## Story 4 of 8

I watched tons of Netflix and YouTube in first year, and I didn't realize how much time this was taking. When I started using a schedule, I learned that I could have more time if I wasn't wasting so many hours online. I mean, I wasn't even watching good shows or anything, and having an actual calendar made it easier to keep myself from clicking on the next video. When I got more organized, I had more time to study and do things more important to me like intramurals, meeting up with friends, or going to the gym.

Organizing your time helps make the best use of your time and supports all of your goals.

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## Story 5 of 8

During my first year at UofX I struggled a lot with my courses. Growing up in China, I was used to attending exam review sessions and having someone else outline key points to do well on the test. When I arrived at University X, however, it was my responsibility figure out what were the key points. I didn't do well in my first test and was really discouraged. Luckily, I spoke to an upper year student who gave me advice on how to better prepare. For me the key has been to try to spend my study time writing down the material in my own words, without looking at the notes or textbook, and going through a lot of practice problems. And if I don't understand, I get help. This takes more time, but it's a much better way to study than just reading the text and trying to remember

It's important to find sufficient time to study, but it's also important to spend that time studying effectively. Memorization and repetition are sometimes unavoidable, but there are usually better, more active strategies to use. Trying to explain a concept or how to solve a problem in your own words is an awesome way to learn.

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## Story 6 of 8

The first Calculus midterm I took, I bombed, and I mean really bombed. I don't know if I even got $25 \%$. I thought that I should just accept I wasn't cut out for university. My mom advised me to stick to it and pointed out it was only worth $20 \%$ - I could still do well, and even if I didn't, I could learn from the mistake and improve going forward. That's when I decided to leave no excuses: I made sure I understood why I didn't do well and started studying more. Since then I've been doing great. So getting a bad Calculus grade turned out to be the best mistake I ever made, because it made me realize how good I could be if I really tried.

Setbacks happen, but they are opportunities to learn. If you keep trying and take a long-run perspective, you will keep improving.
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## Story 7 of 8

During the first year, I took the bus to school 5 days a week, about 1 hour each way. I didn't use to study when travelling, because I thought I couldn't get into the right mindset during the commute. I had the same attitude towards the little hour-long gaps I had between classes. Instead of studying, I would just hang out and go on Reddit. However, this commuting time and time between classes added up to about 15 hours each week. I learned that even if I couldn't spend that time studying in chunks, I could still use it to review notes or even meet with a TA or visit the help desk. Using little pockets of time has allowed me to become more productive.

Your best studying is often done during blocks of time spanning 3 hours or more with short breaks in between, but you can also use shorter periods productively by reviewing notes, thinking about problems, and meeting with instructors, study groups, or teaching assistants.

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## Story 8 of 8

My biggest challenge this year was staying focused. I was putting too much energy into other things instead of studying. In December, a high school friend of mine got offered a job by Facebook and, I'm not going to lie, I was so jealous. I was happy for him but it made me realise I wasn't working as hard as I should. I didn't feel proud of myself. I decided to change that, and that's what made me work harder this year. I started studying so that I would feel good about myself, instead of studying just to get good grades if that makes sense.

Your time at university is short. There are many reasons to spend a lot of it studying. Being proud of your efforts is one of them.

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Now what do you think? What are your own thoughts about how you can motivate yourself to stick to a regular study routine from the beginning?
Think and write about this for a few sentences, then click 'next'.

What are the benefits from staying organized and following a study routine early?

How can a regular routine help balance your goals and activities?
What else motivates you to study besides getting good grades?

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## Identifying Your Most Effective Study Strategies

Studying even when you don't have a test or assignment immediately due allows you time to go through material carefully. It allows you time to think about what makes sense and what doesn't, ask questions, and get help if needed.

Pick TWO suggested study strategies you think will help the most as part of your regular study routine.

- Read through material and lecture slides ahead of schedule to get more out of lectures
- Review class material and rewrite concepts in your own words to see if you really understand
- Mark down any parts you don't understand or problems you find difficult to answer, and meet regularly with tutors, instructors, study groups or visit help desks for clarification
- Look up similar material from other sources, like the internet or other texts to help better understand
- Be curious and think about how the material you're studying can be applied to real world cases, or learn more about how people came up with these ideas to begin with.
Develop your own opinions - what parts of the material or ideas do you agree with, what parts do you think rely on weak assumptions or weak evidence?
- Think about what kinds of questions might come up in a test and how you would answer them
- Create flashcards, index cards, or short notes on your phone so you can easily study on the go without pulling out your books or laptop
- Create concept maps relating topics, definitions, and concepts you've learned throughout the course to each other in order to consolidate your understanding


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## Creating Your Own Schedule

Now that you've had a chance to think about why a weekly routine with sufficient study time is key for doing well in your courses and having a good experience, let's try to put one together.

In this last part of the exercise, you'll be guided in constructing a weekly calendar that includes your regular activities. You'll be able to use the calendar you create afterwards online or on your phone, and you'll have the chance to receive feedback and check in with an upper-year student to receive advice and ask questions.

Your routine can be flexible to accommodate special events, things that take longer than anticipated, and extra time for tests. But, for now, think about putting together a general plan that will be your starting point each week. Start with a plan that you are generally satisfied with and think will help you meet your goals and balance your priorities.

Make sure your browser window is 'full-screen' (and you are not using a phone) to see both the calendar and the instructions on the next page.

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## Scheduling Personal Time

Making time for exercise, hobbies, social activities, clubs and other personal events is important for a student's overall well-being. Students who achieve the right balance between school and personal priorities experience greater satisfaction and have a more consistent academic performance than those who do not. Of course, you'll also need time to eat, some of which can be combined with social activities.
If you do not live on campus you may have to spend a significant amount of time commuting to and from school. Even if you do live on campus, it may take 20 minutes to walk to the library or the first class of the day.

Enter in your calendar any additional regular parts of your week you would like to remember as part of your regular weekly routine. How detailed is up to you

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## Checking In

Well done! You now have a study plan that you can add or make changes to throughout the year. One last thing:
To help with your own success this year we are starting a new program that makes available to you an experienced upper-year coach, whose job is to check in with you periodically by text to help with your study goals and provide extra support outside the classroom. The program is called You@UofX.

This is a pilot project and you have been selected by lottery to receive this support. Your UofX coach is responsible for texting once a week to ask about how you are managing and offer tips and advice for having a great year.

So that your UofX coach can contact you, please provide your mobile phone number below.
Enter your cell phone number (e.g. 905-123-1234)

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## Checking In

We think you would really benefit from having a UofX coach send you an occasional text instead of email. Are you sure you don't want to participate in the texting program (you can always unsubscribe)?

Enter your cell phone number (e.g. 905-123-1234)

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## PLANNING TREATMENT AT WGU







## Appendix C:

## Text Message and Completion Benchmark Reminder Examples for Oreopoulos, Patterson, Petronijevic, and Pope (2018)

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## Table C1: Check-in Text Message Examples at UofT

| Date of Message | Message |
| :---: | :---: |
| 2017-09-13 15:01 | Hello \{first_name\}! Thanks for completing the ECON warm-up exercise and welcome to You@UofT! My name is \{coach_name\} and, as your coach, I look forward to helping you stay on track towards your study and personal goals. I'll be reaching out now and then to check-in, or you can text me anytime and I'll do my best to help. |
| 2017-09-15 12:05 | Hi \{first_name\}, happy Friday! It's \{coach_name\} checking in to see how you're doing with your studying so far. Have you started trying to follow your schedule? |
| 2017-09-15 13:08 | Hi \{first_name\}, let me know if another time might be better to chat. I'd love to hear how your study routine is working out so far. |
| 2017-09-18 12:57 | You@UofT Tip: The concepts you are learning right now will be used throughout the rest of the semester and even through your whole degree. So stay curious and motivated when you study. Don't just memorize material - work at it until you're able to explain concepts and ideas in your own words. You'll enjoy the time much more if you do! |
| 2017-09-22 12:05 | Hi \{first_name\}, it's \{coach_name\} from You@UofT checking in to see how things are going. Are you getting into a weekly routine that works well for you? |
| 2017-09-25 10:55 | You@UofT Tip: When you read a passage in a textbook, review some notes, or complete a problem, ask yourself: could I explain it to others? Why might others disagree? Developing your own opinion helps you grow and learn. |
| 2017-09-29 12:05 | Hello! This is \{coach_name\}, your You@UofT coach. Around this time, assignments and activities start to pile up. Have you been happy with the way you've been managing your time so far? |
| 2017-10-02 15:55 | You@UofT Tip: If things don't quite make sense when studying, write down two clear questions about what's confusing. Then ask a TA, an instructor, a friend, or visit a help desk. Getting help from others is an essential part of university success. |
| 2017-10-06 12:09 | \{first_name\}! ;P It's \{coach_name\} checking in. It's a good time to take stock of how the semester's been going so far and whether any changes to your studying might make things better. Would any changes help you? |
| 2017-10-09 11:38 | Happy Thanksgiving \{first_name\}! I hope you've been able to relax or maybe catch up on some work this weekend. Sometimes we get so busy we forget to keep life in perspective. Take a moment today to remind yourself about how far you've come, the opportunities that lie ahead, and what you're grateful for :D |
| 2017-10-10 12:20 | You@UofT Tip: Once you feel pretty good about a concept, write down an explanation without any notes. Compare the result to your notes or textbook to find where you can improve further. If you find something that doesn't make sense, definitely seek out additional resources. Go to office hours, help centres, or look online for materials that clarify. Your TAs and instructors would love to help and attending office hours is super valuable! |
| 2017-10-18 10:55 | You@UofT Tip: An hour totally free from distraction is extremely valuable. Shut off your phone or computer or use a productivity app to block yourself from interruptions. We love to multitask and have many tabs open but focusing on just one task for an extended period of time is the best way to be productive! |
| 2017-10-20 12:09 | Hey \{first_name\}, Happy Friday! ;) How did your study plan go this week? (super amazing/pretty good/room for improvement)? |
| 2017-10-20 16:10 | How's your plan looking for the next couple weeks? Are you still aiming for 20 hours of study? |
| 2017-10-21 12:11 | I hope you're still finding my messages helpful. We're almost half-way through the semester. Keep trying to plan ahead and stay organized. You'll see that the rest of the term will fall in place. |
| 2017-10-25 13:55 | You@UofT Tip: Remember, even if you don't have any immediate deadlines, there's still lots to do to help your learning: e.g. read ahead; rewrite lectures in your own words; review hard stuff; download past exams and practice problems; study slower for a deeper understanding; get started on things that seem a long way off, because they close in fast. |
| 2017-10-27 12:08 | Hello Hello! :) It's \{coach_name\}. Are you all done now with tests for the next couple of weeks? (yep / nope / I'm writing one right now) |
| 2017-10-27 18:09 | Now's a good time to take a well-deserved breather, think about lessons learned, and plan ahead. Use your calendar to note all your remaining deadlines, think about how best to study for them, and just keep enjoying your journey! |
| 2017-11-02 10:58 | You@UofT Tip: Good writing takes practice and patience. It can also be a lot of fun because it gives you an opportunity to express your thoughts and ideas. Read what you write out loud, then edit. Get feedback from friends, family, TAs and instructors -- then edit again until you're proud of the result. |
| 2017-11-03 12:08 | Hi \{first_name\}! Have you thought about what you're going to do with your time now that midterms are over? |
| 2017-11-03 17:09 | Whether you're thinking of making more detailed plans, increasing your study hours, or using your time more effectively, the path to long-run success is to be patient and keep trying. Small concrete steps now lead the way forward. |


| 2017-11-10 12:08 | Hey \{first_name\}! Final Exam Dates are online now. Have you marked them down in your calendar and thought about how you're going to prepare? (I'm on top of it; need to do that soon; omg please send me the link) |
| :---: | :---: |
| 2017-11-10 17:11 | Believe it or not, to prepare really well, it's recommended that you spend around 5-7 full days getting ready for each exam. There's nowhere near that much time during exams, so try to get going now to avoid feeling rushed. |
| 2017-11-11 18:12 | A general plan would be 2-3 days to download past exams, review and rewrite notes; 2-3 days to go through past problems and seek help for anything unclear; and 1 day to relax and anticipate questions that may come up. You can do this! |
| 2017-11-12 10:25 | You@UofT Tip: One game to play in studying is guessing the questions that profs will ask. Often, you can figure out types of questions and what format they will be in. This will help with grades, and learning the insights that are important to the prof. |
| 2017-11-17 12:08 | Happy Friday \{first_name\}! I hope I'm not being too repetitive in my advice, but keep trying to find at least 20 hours each week to go through course material and problems slowly. You'll feel more upbeat and really notice a difference if you can stay focused and organized approaching the end of term. Take care, \{coach_name\} |
| 2017-11-18 10:58 | You@UofT Tip: Instead of worrying too much about your grades when you study, focus on wanting to learn and understand. The more you do this, the more you'll enjoy studying. Good grades are just a side-effect of intellectual curiosity! |
| 2017-11-23 15:58 | You@UofT Tip: Don't be shy to attend office hours as you're reviewing for exams. It can be the best way to clear up issues and develop a deep understanding, even when you feel you have no clue. Your professors and TAs actually want to help, and are in better position to write you a reference letter if you get to know them, so take advantage! |
| 2017-11-24 12:08 | Two weeks of classes left! Might be a good time to ramp up your studying. What do you think? (already on it / good idea / lemme hit the snooze button a couple more times) |
| 2017-11-25 13:09 | Try to find some activities you can set aside until exams are over - you'll be able to enjoy the holidays much more when they arrive! |
| 2017-11-27 12:55 | It always seems impossible until it's done -- Nelson Mandela. No matter how busy your schedule is getting with exams and assignments, remember that many students before you have gone through this and many students after you will too. Focus on what is in your control. Make a plan, stay committed to it, do your best, and forget the rest! |
| 2017-12-01 12:08 | Exams are around the corner, you got this! Stick to your study plan and give yourself some well earned breaks. |
| 2017-12-01 18:39 | Try the pomodoro technique as a way to study effectively without losing your mind. Have you heard of it? |
| 2017-12-04 9:16 | The Pomodoro technique is to use a timer 25 min . of committed, focused study, then 5 min break, then a longer break after 2 hours. Repeat until you feel ready. |
| 2017-12-04 10:55 | You@UofT Tip: focus on what you don't know sometimes. Write down a list the things you don't understand or can't explain the relevance for, and then individually fill in these gaps in your knowledge. Try to discern the really important elements of something you are studying and put them down in your words. |
| 2017-12-08 12:08 | Keep focused on what's important as you close out the term, \{first_name\}. Good Luck and reach out if I might be able to offer help or advice - that's what I'm here for! |
| 2017-12-15 12:08 | Hi \{first_name\}, this is my last message this year. If you're done, happy holidays and safe travels! If not, I'll leave you with another quote: Success comes from knowing that you did your best to become the best that you are capable of becoming. |
| 2018-01-03 15:33 | Welcome to the new year \{first_name\}! If you found your study hour calendar helpful last semester, and you want to make a new one with updated courses, you can do so here: https://warmup.utoronto.ca/update_calendar |
| 2018-01-12 13:10 | $\mathrm{Hi}\{$ first_name $\}$, welcome to Winter (Term)! I'm not going to text as frequently this semester, but if there's anything I can help with, let me know. Are there any big or small changes that might help you get in the groove? Now's the time to build on lessons learned last term. |
| 2018-01-12 18:11 | Also, if you didn't know, there's nothing more exciting at the beginning of the term than to go through your calendar! ;P If you haven't yet made a new schedule, you can do so at https://warmup.utoronto.ca/update_calendar |
| 2018-01-15 15:55 | You@UofT Tip: Try to find your motivation to stay focused as you hunker down this week: "Expect anything worthwhile to take a long time" - Debbie Millman |
| 2018-01-19 13:10 | Good afternoon \{first_name\}! It's \{coach_name\} checking in at the start of the semester, reminding you how important it is to get into a good study routine early. Are things good so far? [yup / maybe / don't bother me I'm studying / don't bother me I'm partying / please bother me I need help getting organized]. |
| 2018-01-19 18:11 | Let me know if you'd like any tips for studying at the start of the semester (when there are often no immediate deadlines), and have a great Friday! |
| 2018-01-23 11:56 | You@UofT tip: If youre reading something and you find yourself unable to focus or blanking out, try stopping to go for a walk. Getting some fresh air may seem a bit cliché, but it does work :) |
| 2018-01-26 13:10 | Hey \{first_name\}, I hope you feeling well and things are going smoothly as we get into the main part of the semester. I realize you might be busy so maybe I'll just say this: Being productive every day and organized in |


|  | how you use your time is a skill that can be learned. Just like a sport or a musical instrument, practice takes <br> practice :) |
| :---: | :--- |
| You@UofT Tip: One good way to start getting ready for a test, is to figure out what you don't know. Think: |  |
| 2018-01-31 10:57 | "Can I explain everything going on in my class to friends? What are my weak areas?" or "What do I not <br> understand?" Then, go eliminate those weak spots! |
| Hey \{first_name\}! With midterm season starting to ramp up, its really important to plan: try to anticipate how |  |
| the test will look like, organize your notes, and start reviewing. Do you think studying is going according to |  |
| plan so far? (so far so good / ramping up now, thanks / maybe I should turn off Netflix...) |  |



Table C3: Completion Benchmark Reminder Examples at WGU

| Course Title | Block | Completion Benchmark Reminder Text |
| :---: | :---: | :---: |
| Principles of Accounting | 1 | Complete work for Accounting for Business Today and Financial Statements sections by August 22 to complete "Principles of Accounting" on time. |
|  | 2 | Complete work for Journalizing and Posting Transactions and Recording Business Information sections by August 30 to complete "Principles of Accounting" on time. |
|  | 3 | Complete work for Preparing and Adjusting Entries Part 1 and Sales and Receivables Part 1 sections by September 7 to complete "Principles of Accounting" on time. |
|  | 4 | Complete work for Purchasing and Payables, Cash and Controls, and Employee and Payroll Accounting sections by September 14 to complete "Principles of Accounting" on time. |
|  | 5 | Complete work for Preparing and Adjusting Entries Part 2 and Financial Statements sections by September 22 to complete "Principles of Accounting" on time. |
|  | 6 | Complete work for The Accounting Cycle Part 2 and Accounting Information Systems sections by September 30 to complete "Principles of Accounting" on time. |
| Teaching and Learning: Literacy | 1 | Purchase textbook, read Ch. 1 and 4 in Literacy Development, and complete modules and learning activities by August 22 to complete "Teaching and Learning: Literacy" on time. |
|  | 2 | Read chapters 5, 6, and 8, view Annenberg sessions 3, 4, and 7and complete learning activities and modules by August 30 to complete "Teaching and Learning: Literacy" on time. |
|  | 3 | Read Ch. 7 in Literacy Development, watch Writing Video, share three ideas, and complete Task 1 by September 7 to complete "Teaching and Learning: Literacy" on time. |
|  | 4 | read Ch. 3 in Literacy Development and complete Task 2 by September 14 to complete "Teaching and Learning: Literacy" on time. |
|  | 5 | Complete Annenberg session 6, all Cengage modules, and Performance Task 3 by September 22 to complete "Teaching and Learning: Literacy" on time. |
|  | 6 | Read Ch. 2, 4, 5, and 13, complete Cengage modules and Task 4, take pre-assessment by September 30 to complete "Teaching and Learning: Literacy" on time. |
| Software I | 1 | Take Pre-assessment, install NetBeans, read Ch. 1 and 2 and Two Minute Drill Sections, and do Review Questions by August 22 to complete "Software I" on time. |
|  | 2 | Complete Ch. 3 and 4, read the Two Minute Drill Sections, and do the Review Questions by August 30 to complete "Software I" on time. |
|  | 3 | Complete Ch. 5 and 6, read the Two Minute Drill Sections, and do the Review Questions by September 7 to complete "Software I" on time. |
|  | 4 | Complete Ch. 7 and 8, read the Two Minute Drill Sections, and do the Review Questions by September 14 to complete "Software I" on time. |
|  | 5 | Schedule assessment, complete Ch. 9 and 10, read the Two Minute Drill Sections, and do the Review Questions by September 22 to complete "Software I" on time. |
|  | 6 | Complete all 5 practice tests, vendor-assessment, and any remaining tasks by September 30 to complete "Software I" on time. |
| Introduction to Nursing Arts and Science | 1 | Complete work for Competency 1 and 2 of 8: The Nursing Process Concepts and Therapeutic Communication by August 22 to complete "Introduction to Nursing Arts and Science" on time. |
|  | 2 | Complete work for Competency 3 and 4 of 8: Basic Principles of Safety and Quality and Cultural Awareness by August 30 to complete "Introduction to Nursing Arts and Science" on time. |
|  | 3 | Complete work for Competency 5 of 8: Theories of Growth and Development across the Life Span by September 7 to complete "Introduction to Nursing Arts and Science" on time. |
|  | 4 | Complete work for Competency 6 of 8: Health Perception /Health Management by September 14 to complete "Introduction to Nursing Arts and Science" on time. |
|  | 5 | Complete work for Competency 7 of 8: Medical Terminology, Symbols, and Abbreviations by September 22 to complete "Introduction to Nursing Arts and Science" on time. |
|  | 6 | Complete work for Competency 8 of 8: Principles of Ethics, Bioethics, and Nursing Regulation by September 30 to complete "Introduction to Nursing Arts and Science" on time. |

## Appendix D

Table D1: Balancing Tests at WGU

|  | Treatment Status |  |
| :---: | :---: | :---: |
|  | Control | Treatment |
| Student Characteristics | Sample Mean [Standard Deviation] | Difference [Standard Error] |
| Male | 0.337 | 0.001 |
|  | [0.473] | [0.010] |
| Age | 35.800 | 0.218 |
|  | [9.295] | [0.200] |
| Hispanic | 0.096 | 0.007 |
|  | [0.295] | [0.006] |
| White | 0.780 | -0.001 |
|  | [0.414] | [0.009] |
| Black | 0.118 | 0.003 |
|  | [0.322] | [0.007] |
| Asian | 0.048 | -0.001 |
|  | [0.213] | [0.005] |
| Employment status=full time | 0.790 | 0.009 |
|  | [0.407] | [0.009] |
| Employment status=part time | 0.124 | -0.004 |
|  | [0.330] | [0.007] |
| Employment status=unemployed | 0.086 | -0.005 |
|  | [0.280] | [0.007] |
| Income=less than 16, 000 | 0.056 | -0.003 |
|  | [0.230] | [0.006] |
| Income=16, 000 to 24, 999 | 0.071 | -0.003 |
|  | [0.257] | [0.005] |
| Income=25, 000 to 34, 999 | 0.101 | -0.009 |
|  | [0.301] | [0.006] |
| Income=35, 000 to 44, 999 | 0.125 | -0.003 |
|  | [0.330] | [0.007] |
| Income=45, 000 to 64, 999 | 0.198 | 0.019** |
|  | [0.399] | [0.009] |
| Income=65, 000 or more | 0.581 | -0.015 |
|  | [0.493] | [0.011] |
| First generation student | $0.410$ | $0.015$ [0.011] |
|  |  |  |

Notes: Summary statistics and differences are calculated using the full sample of students at WGU. Robust standard errors are reported in brackets. ** indicates significance at the 5 percent level.

Table D2: Treatment Effect on Click Data at WGU

|  | (2) | (3) | (4) |
| :---: | :---: | :---: | :---: |
| Dependent Variable | Control Mean | Treatment | Treatment |
|  | [Standard Deviation] | Difference | Difference |
| Fraction of Days Logged in | 0.414 | 0.001 | 0.000 |
|  | [0.185] | [0.004] | [0.004] |
|  |  | 8,817 | 8,817 |
| Log Mouse Clicks | 7.176 | 0.019 | 0.014 |
|  | [0.687] | [0.015] | [0.015] |
|  |  | 8,817 | 8,817 |
| Log Mouse Moves | 8.300 | 0.022 | 0.016 |
|  | [0.719] | [0.016] | [0.015] |
|  |  | 8,817 | 8,817 |
| Log Scroll Count | 10.536 | 0.017 | 0.013 |
|  | [0.953] | [0.020] | [0.020] |
|  |  | 8,817 | 8,817 |
| Controls? |  | No | Yes |

Notes: The dependent variable in each regression is indicated in the rows of column (1). The unit of observation is a student. Control variables include age, sex, race, first generation status, employment status, and six income bins: (1) less than 16,000, (2) 25,000-34,999. (3) 35,000-44,999, (5) 45,000-64,999, and (6) $65,000+$. Robust standard errors are reported in brackets in columns (3) to (4). The number of observations used in each regression appears below the standard errors.

Table D3: Treatment Effects on Credit Accumulation and Retention

| (1) | (2) | (3) | (4) |
| :---: | :---: | :---: | :---: |
|  | Control Mean | Treatment | Treatment |
| Dependent Variable | [Standard Deviation] | Difference | Difference |
| Attempted Credits | 15.901 | 0.132 | 0.132 |
|  | [9.942] | [0.234] | [0.228] |
| Credits earned | 13.683 | 0.064 | 0.047 |
|  | [9.942] | [0.214] | [0.210] |
| Retention | 0.898 | -0.015** | -0.018** |
|  | [0.303] | [0.007] | [0.007] |
|  |  | 8,817 | 8,817 |
| Controls? |  | No | Yes |
| Notes: The dependent variable in each regression and the sample used are indicated in the rows of column (1). The unit of observation is a student. Control variables use in the WGU sample are described in the notes of Table 2. Robust standard errors are reported in brackets in columns (3) to (4). The number of observations used in each regression appears below the standard estimates. ** indicates significance at the 5 percent level. |  |  |  |

## Figures



Figure D1: Days Logged in Per Week
Notes: This figure shows the distribution of the average number of days a student logs into WGU's online portal per week. The data used is for all WGU students from January 1, 2015 to July 23, 2018. The vertical line represents the median of the average number of days per week a student logs in.


Figure D2: Relationship between Days Logged in and Credits Earned at WGU
Notes: This figure presents estimated association between the days per week students $\log$ in to the WGU web portal and credits accumulated during the semester. The sample is restricted to students in the control group at WGU. We construct this figure by first grouping students into 20 equally-sized (vingtile) bins in the distribution of the mean number of days logged in per week and then calculating the mean number of credits earned within each bin. The plotted circles represent these means, while line represents the associated linear relationship, estimated on the underlying student-level data.

Days Logged in by Week of Semester


Figure D3: Days Logged in By Week of Semester
Notes: This figure shows the average number of days students log into the WGU website for each week during their first semester. The solid line is for the treatment group and the dashed line is for the control group. The data used is for WGU students in the experimental sample.

## Appendix E: Supplemental Results

Table E.1: Treatment Effects on Self-Reported Study Times at UofT in 2018-19

| (1) | (2) | $(3)$ | $(4)$ |
| :--- | :---: | :---: | :---: |
| Sample and | Control Mean | Treatment | Treatment |
| Dependent Variable | [Standard Deviation] | Difference | Difference |
|  |  |  |  |
| Pooled UofT Sample |  |  |  |
| Regular Week Study | 17.883 | $2.44^{* * *}$ | $2.245^{* * *}$ |
|  | $[12.854]$ | $[0.457]$ | $[0.437]$ |
| Extra Exam Week Study |  | 3,045 | 2,845 |
| UTSG | 8.785 | 0.428 | 0.425 |
| Regular Week Study | $[7.343]$ | $[0.262]$ | $[0.267]$ |
|  |  | 3,043 | 2,843 |
| Controls? |  |  |  |

Notes: The dependent variable in each regression and the sample used are indicated in the rows of column (1). The unit of observation is a student. Control variables include student age, selfreported study hours per week during high school, expected paid-work hours per week, tendency to study at the last minute, commuting time (in minutes) to campus, and indicator variables for first-year status, international student status, first-generation status, gender, English mother-tongue status, a self-reported desire to earn more than an undergraduate degree, and a self-reported expectation to earn an A- average grade or greater. Robust standard errors are reported in brackets in columns (3) to (4). The number of observations used in each regression appears below the standard errors. ${ }^{* * *}$ indicates significance at the 1 percent level; ** indicates significance at the 5 percent level.

Table E.2: Treatment Effects on Study Times from Time-Use Diary at UofT in 2018-19

| (1) | (2) | (3) | (4) |
| :---: | :---: | :---: | :---: |
| Sample and | Control Mean | Treatment |  |
| Dependent Variable | [Standard Deviation] | Difference | Difference |
| Pooled UofT Sample |  |  |  |
| Total Study Time Yesterday | $\begin{gathered} 3.385 \\ {[2.770]} \end{gathered}$ | $\begin{gathered} 0.262 * * * \\ {[0.100]} \end{gathered}$ | $\begin{gathered} 0.224 * * \\ {[0.100]} \end{gathered}$ |
|  |  | 3,059 | 2,859 |
| Alone Study Time Yesterday | $\begin{gathered} 2.568 \\ {[2.494]} \end{gathered}$ | $\begin{gathered} 0.200 * * \\ {[0.092]} \end{gathered}$ | $\begin{gathered} 0.187 * * \\ {[0.092]} \end{gathered}$ |
|  |  | 3,059 | 2,859 |
| UTSG |  |  |  |
| Total Study Time Yesterday | $\begin{gathered} 3.750 \\ {[2.881]} \end{gathered}$ | $\begin{gathered} 0.269^{* *} \\ {[0.129]} \end{gathered}$ | $\begin{aligned} & 0.224^{*} \\ & {[0.130]} \end{aligned}$ |
|  |  | 2,045 | 1,852 |
| Alone Study Time Yesterday | $\begin{gathered} 2.889 \\ {[2.642]} \end{gathered}$ | $\begin{gathered} 0.152 \\ {[0.119]} \end{gathered}$ | $\begin{gathered} 0.146 \\ {[0.121]} \end{gathered}$ |
|  |  | 2,045 | 1,852 |
| UTM |  |  |  |
| Total Study Time Yesterday | $\begin{gathered} 2.670 \\ {[2.383]} \end{gathered}$ | $\begin{gathered} 0.248 \\ {[0.155]} \end{gathered}$ | $\begin{gathered} 0.250 \\ {[0.152]} \end{gathered}$ |
|  |  | 1,014 | 1,007 |
| Alone Study Time Yesterday | $\begin{gathered} 1.937 \\ {[2.034]} \end{gathered}$ | $\begin{gathered} 0.298^{* *} \\ {[0.139]} \\ 1,014 \end{gathered}$ | $\begin{gathered} 0.303 * * \\ {[0.136]} \\ 1,007 \end{gathered}$ |
| Controls? |  | No | Yes |

Notes: The dependent variable in each regression and the sample used are indicated in the rows of column (1). Total study time is the sum of time spent studying alone, time spend studying with other students, and time spent with a tutor or instructor. The unit of observation is a student. Control variables include student age, self-reported study hours per week during high school, expected paid-work hours per week, tendency to study at the last minute, commuting time (in minutes) to campus, and indicator variables for first-year status, international student status, first-generation status, gender, English mother-tongue status, a self-reported desire to earn more than an undergraduate degree, and a self-reported expectation to earn an A- average grade or greater. Robust standard errors are reported in brackets in columns (3) to (4). The number of observations used in each regression appears below the standard errors. ${ }^{* * *}$ indicates significance at the 1 percent level; ** indicates significance at the 5 percent level; and * indicates significance at the 10 percent level.

Table E.3: Associations Between Weekly Study Time and Student Grade Outcomes at UofT in 2018-19

|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Panel A: Mean Grade and GPA Across All Fall Courses |  |  |  |  |  |  |  |  |
| Dependent Variable: | Mean Fall Grade |  |  |  | Mean Fall GPA |  |  |  |
|  | OLS | OLS | IV Using Baseline Survey | IV Using Daily Study Time | OLS | OLS | IV Using Baseline Survey | IV Using Daily Study Time |
| Study Time/Week | $\begin{gathered} 0.081^{* *} * \\ {[0.022]} \end{gathered}$ |  | $\begin{gathered} 0.225 * * * \\ {[0.053]} \end{gathered}$ | $\begin{gathered} 0.303 * * * \\ {[0.071]} \end{gathered}$ | $\begin{gathered} 0.007 * * * \\ {[0.002]} \end{gathered}$ |  | $\begin{gathered} 0.018^{* * *} \\ {[0.004]} \end{gathered}$ | $\begin{gathered} 0.023^{* * *} \\ {[0.006]} \end{gathered}$ |
| Daily Study Time |  | $\begin{gathered} 0.442 * * * \\ {[0.101]} \end{gathered}$ |  |  |  | $\begin{array}{r} 0.033^{* *} \\ {[0.008]} \end{array}$ |  |  |
| Mean of Dep Var. <br> [Standard Dev.] |  |  |  |  |  |  |  |  |
| Observations | 1,702 | 1,711 | 1,702 | 1,702 | 1,702 | 1,711 | 1,702 | 1,702 |
| Panel B: Mean Grade Across Fall Math and Economics Courses |  |  |  |  |  |  |  |  |
| Dependent Variable: | Mean Fall Math Grade |  |  |  | Mean Fall Economics Grade |  |  |  |
|  | OLS | OLS | IV Using Baseline Survey | IV Using Daily Study Time | OLS | OLS | IV Using Baseline Survey | IV Using Daily Study Time |
| Study Time/Week | $\begin{gathered} 0.150 * * * \\ {[0.043]} \end{gathered}$ |  | $\begin{gathered} 0.420 * * * \\ {[0.113]} \end{gathered}$ | $\begin{gathered} 0.493 * * * \\ {[0.153]} \end{gathered}$ | $\begin{gathered} 0.106^{* * *} \\ {[0.035]} \end{gathered}$ |  | $\begin{gathered} 0.314^{* * *} \\ {[0.087]} \end{gathered}$ | $\begin{gathered} 0.367 * * * \\ {[0.117]} \end{gathered}$ |
| Daily Study Time |  | $\begin{gathered} 0.691^{* * *} \\ {[0.230]} \end{gathered}$ |  |  |  | $\begin{array}{r} 0.516^{* *} \\ {[0.159]} \end{array}$ |  |  |
| Mean of Dep Var. <br> [Standard Dev.] |  |  |  |  |  |  |  |  |
| Observations | 671 | 673 | 671 | 671 | 966 | 969 | 966 | 966 |
| Notes: The dependent variable in each regression is indicated in the column headings. All regressions are run at the student level and pool all control group observations from all campuses while including campus fixed effects. In columns (3) and (7), we instrument for weekly study time using expected weekly study time at the baseline survey, the expected number of hours students expect to work for pay each week, commute time to campus, selfreported hours spent studying per week in high school, and self-reported tendency to study at the last minute. In columns (4) and (8), we instrument for weekly study time using the measure of total daily study time obtained from students' time-use diaries from the follow-up survey. Robust standard errors are reported in brackets. ${ }^{* * *}$ indicates significance at the 1 percent level |  |  |  |  |  |  |  |  |

Table E.4: Comparing Study Time from Student Calendars to Expected Study Time at Baseline

| Dependent variable | UTSG |  | UTM |  |
| :--- | :---: | :---: | :---: | :---: | :---: |
|  | Control | Treatment | Control | Treatment |
|  |  |  |  |  |
| Calendar - Expected Time at Baseline | - | $7.041^{* * *}$ | - | $9.489^{* * *}$ |
|  | - | $[11.746]$ | - | $[12.309]$ |
|  |  | 446 |  | 402 |
| Self-Reported at Follow-Up - Calendar Time |  |  |  |  |
|  | - | $-8.230^{* * *}$ | - | $-9.561^{* * *}$ |
|  | - | $[14.711]$ | - | $[12.994]$ |
|  |  | 446 |  | 402 |
| Self-Reported at Follow-up - Expected Time at Baseline | -3.267 | $2.079 * *$ | -2.409 | $2.337^{* *}$ |
|  | $[15.249]$ | $(0.964)$ | $[14.406]$ | $(1.005)$ |
|  | 507 | 446 | 364 | 402 |

Notes: The sample is restricted to students who completed the follow-up survey. The numbers in brackets are standard deviations while the numbers in parentheses are robust standard errors. ${ }^{* * *}$ indicates significance at the 1 percent level; ** indicates significance at the 5 percent level.

Table E.5: Correlations of Student Grades and Other Characteristics at UofT

|  | (1) <br> Actual Study Hours/Week | (2) <br> High <br> School <br> Grade <br> Average | (3) <br> Work <br> Hours/Week | (4) <br> Expected Study Hours/Week | (5) <br> Expect A <br> Average | (6) <br> Finish <br> What I <br> Start | (7) <br> Manage Time Well | (8) <br> Cram for Exams | (9) <br> Think About Future | (10) <br> \# Days to Start Online Exercise |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| A Student | $\begin{gathered} 7.063^{* * *} \\ {[1.695]} \end{gathered}$ | $\begin{gathered} 4.838^{* * *} \\ {[0.357]} \end{gathered}$ | $\begin{gathered} -2.929 * * * \\ {[0.756]} \end{gathered}$ | $\begin{gathered} 3.337 * * * \\ {[1.008]} \end{gathered}$ | $\begin{gathered} 0.176^{* * *} \\ {[0.040]} \end{gathered}$ | $\begin{gathered} 0.106^{* *} * \\ {[0.037]} \end{gathered}$ | $\begin{gathered} 0.190^{* * *} \\ {[0.040]} \end{gathered}$ | $\begin{gathered} -0.091^{* *} \\ {[0.039]} \end{gathered}$ | $\begin{gathered} 0.079 * * * \\ {[0.029]} \end{gathered}$ | $\begin{gathered} -2.261^{* * *} \\ {[0.298]} \end{gathered}$ |
| B Student | $\begin{gathered} 4.111^{* * *} \\ {[1.263]} \end{gathered}$ | $\begin{gathered} 2.289 * * * \\ {[0.313]} \end{gathered}$ | $\begin{gathered} -1.956^{* *} * \\ {[0.681]} \end{gathered}$ | $\begin{gathered} 0.650 \\ {[0.821]} \end{gathered}$ | $\begin{aligned} & 0.064^{*} \\ & {[0.033]} \end{aligned}$ | $\begin{gathered} 0.050 \\ {[0.032]} \end{gathered}$ | $\begin{gathered} 0.089 * * * \\ {[0.033]} \end{gathered}$ | $\begin{gathered} -0.071^{* *} \\ {[0.033]} \end{gathered}$ | $\begin{gathered} 0.068^{* * *} \\ {[0.026]} \end{gathered}$ | $\begin{gathered} -1.739 * * * \\ {[0.271]} \end{gathered}$ |
| C Student | $\begin{gathered} 1.438 \\ {[1.185]} \end{gathered}$ | $\begin{gathered} 1.249 \\ {[0.307]} \end{gathered}$ | $\begin{gathered} -1.671^{* * *} \\ {[0.642]} \end{gathered}$ | $\begin{gathered} 0.489 \\ {[0.799]} \end{gathered}$ | $\begin{gathered} 0.046 \\ {[0.033]} \end{gathered}$ | $\begin{gathered} 0.069 * * \\ {[0.031]} \end{gathered}$ | $\begin{aligned} & 0.060^{*} \\ & {[0.033]} \end{aligned}$ | $\begin{gathered} 0.011 \\ {[0.033]} \end{gathered}$ | $\begin{gathered} 0.031 \\ {[0.027]} \end{gathered}$ | $\begin{gathered} -0.955^{* * *} \\ {[0.271]} \end{gathered}$ |
| Mean of Dep Var. <br> [Standard Dev.] | $\begin{gathered} 15.595 \\ {[13.135]} \end{gathered}$ | $\begin{gathered} 87.99 \\ {[5.08]} \end{gathered}$ | $\begin{gathered} 7.131 \\ {[9.398]} \end{gathered}$ | $\begin{gathered} 17.396 \\ {[12.281]} \end{gathered}$ | $\begin{gathered} 0.450 \\ {[0.498]} \end{gathered}$ | $\begin{gathered} 0.694 \\ {[0.461]} \end{gathered}$ | $\begin{gathered} 0.447 \\ {[0.497]} \end{gathered}$ | $\begin{gathered} 0.390 \\ {[0.488]} \end{gathered}$ | $\begin{gathered} 0.832 \\ {[0.374]} \end{gathered}$ | $\begin{gathered} 9.407 \\ {[4.136]} \end{gathered}$ |
| Observations | 8,23 | 1,289 | 1,726 | 1,726 | 1,726 | 1,726 | 1,726 | 1,726 | 1,726 | 1,726 |
| Notes: The dependent variable in each regression is listed in label of each column. Each regression restricts the sample to students in the control group across both campuses and includes campus fixed effects. Students are classified as "A Student" if their mean fall grade is 80 percent or better; they are classified as "B Student" if their mean fall grade is higher less than 80 percent but greater than or equal to 70 percent; they are classified as "C Student" if their mean fall grade is higher less than 70 percent but greater than or equal to 60 percent; and they are classified as "D Student or Worse" (the omitted category) if their mean fall grade is higher less than 60 percent. All regressions are run at the student level and robust standard errors appear in brackets. ${ }^{* * *}$ indicates significance at the 1 percent level; ** indicates significance at the 5 percent level; and *indicates significance at the 10 percent level. |  |  |  |  |  |  |  |  |  |  |



Figure E.1: Densities of Study Time from Second Year Experiment
Notes: Panel (a) presents the densities of student study time during an average regular week without midterms or exams approaching at UTSG while Panel (b) presents the same densities at UTM. The blue solid line in each panel is the density for the control group; the red dashed line in each panel is the density for the treatment group.


Figure E.2: Densities of Expected Study Time at Baseline and Study Time from Calendar
Notes: Panel (a) presents the densities of student expected study time from the baseline survey and from the calendar for treated students at UTSG while Panel (b) presents the same densities at UTM.


Figure E.3: Student Engagement with Text Message Coaching
Notes: This figures presents the fraction of treated students who ever responded to a text message from their coach over time (grey line) and the fraction who responded to a text message in each week of the fall semester (black line).


[^0]:    ${ }^{1}$ Accreditation by Northwest Commission on Colleges and Universities for general programs and CNURED for nursing programs. Source: https://nces.ed.gov/collegenavigator/?q=Western+Governors $\backslash \& s=$ all $\backslash \& i d=433387$. Accessed 8/16/2017.
    ${ }^{2}$ Source for information on degree programs, federal loan utilization, retention, and graduation rates comes from the Integrated Postsecondary Education Data System (IPEDS): https://nces.ed.gov/collegenavigator/?q=Western+Governors $\backslash \& s=$ all $\backslash \& i d=433387$. Accessed 8/16/2017
    ${ }^{3}$ Students who repeatedly fail course competency exams not only fail a course but are also required to leave the university.

