

Productivity Strategies for Non-traditional Students

by

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## Abstract

Becoming an adult involves taking on additional roles and responsibilities, and with these come the inevitable challenge of facing competing commitments. One extreme and common case of this is the returning student, and because their needs are particularly dire, they are the primary focus of my research. Balancing areas of the returning students' busy lifestyle is crucial to their success, and at the core of competency lies a strategy for allocating efficient use of their time, attention, and energy. Moreover, although time management and productivity tools abound, no single tool specifically addresses the obstacles returning students confront in managing their limited time, energy, and attention across sometimes conflicting and seemingly incompatible areas of life. As a proposed solution, I created a prototype of a mobile app chock full of productivity strategies that will benefit this target demographic—non-traditional students—among others. This paper presents key findings obtained from a usability research study testing the proposed solution with participants representative of the audience.

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## Chapter 1: Introduction

### **The Issue**

Non-traditional students are characterized as 25 years of age and older, who have delayed enrollment—in an accredited college or university in pursuit of a degree—beyond the year of high school graduation and have one or more of the following adult responsibilities: job, spouse, dependent(s), and home. Adding the role of student to an already substantial list of major roles, however, has proven quite challenging for many nontraditional students, and low rates of persistence and degree attainment bear this out.

### **Insights into Solutions**

Providing sound strategies for optimizing their time, attention, and energy can bolster their ability to successfully juggle multiple roles, negotiating competing commitments in pursuit of their academic goals. To this end, a review of the literature has been conducted to uncover valuable strategies, guidelines, insights, tips, and lessons learned.

Findings from the review indicate the most promising strategies are grounded in the conviction that it is energy that fuels our ability to wisely determine our priorities, direct our attention toward them, fully engage with them, and sustain that immersion in the service of what matters most. From this premise, it can be asserted that productivity requires focusing on the right things (highest-priority, highest-impact) at the right time (during one's energy peak time of day), fueled by the right energy (which mobilizes the most robust mental processing power, patience, and willpower).

By identifying the patterns by which their own energy levels naturally ebb and flow throughout the day, individuals can leverage their energy peaks and troughs. Aligning our daily schedule with our body's natural rhythms allows us to allocate the things that matter most to our energy peak times of day, and relegate routine and low-priority tasks to our energy troughs. It is imperative, however, to underscore that

productivity requires coordinating our attention, energy, and time resources; i.e., attention management, energy management, and time management.

### **Proposed Design Solution**

After researching the literature, I built an initial prototype for a mobile app to educate non-traditional students on strategies for dealing with inordinate demands placed on their time, attention, and energy as they negotiate competing priorities in pursuit of their academic endeavors. Although the mobile app focuses on productivity strategies, it is not intended to directly support the completion of coursework, but rather to provide sound approaches for successfully juggling a busy lifestyle. In addition, while the app was designed to support the needs of non-traditional students, it is not exclusive to them. Anyone attempting to manage a busy lifestyle may also find the app beneficial.

While employing an iterative design approach (Medlock, Wixon, McGee, & Welsh, 2005), the prototype underwent five rounds of usability testing. Participant feedback from each round informed my design decisions for the subsequent version. And through a series of iterations—test, obtain feedback, redesign, test—I was able to successively improve the prototype.

With this design solution, not only can non-traditional students go through the entire app the first time to learn the principles, they can also refer back to the list of strategies and take a deeper dive into the explanation of each to refresh their memory after having completed the training. Doing so can serve to reiterate key principles and help users better integrate them into their lives. Moreover, given that most people carry their smartphones with them everywhere they go, this mobile app would be accessible to them anytime and anywhere.

### **Structure of This Paper**

This paper presents a detailed look at the proposed design solution. Chapter 2 covers a review of the literature on the target audience, the challenges they have faced, and the strategies with the highest potential to help them improve their productivity. In addition, scholarly journal articles and expert advice from the literature review—which

helped me shape the prototype design concept—are discussed. Chapter 3 outlines the methods and materials used for the usability test sessions, while Chapter 4 highlights key study findings along with corresponding design improvements. Finally, Chapter 5 is the conclusion of the paper.

## Chapter 2: Literature Review

**Overview of Time Management Field**

Time management began in the late 1800s during the Industrial Revolution with Frederick Taylor [who conducted a series of studies designed] to improve efficiency in the mass production [of goods] within American factories (Chandler, 1977, 1990, 1992; Jensen, 1993; Lamoreaux, 1985; Levinson, 2004; McCraw, 1981). “Taylor’s scientific approach to management ... centered on better usage of time [and] became the basis for modern time management approaches” (Nayab, 2011).

Working in factories is where our “traditional views of managing our time arose” (Bailey, 2016, p. 90). Running factories effectively required time management as timing had to be coordinated between the arrival of raw materials, employee schedules, and railway and shipping timetables (Chandler, 1977, 1990, 1992; Jensen, 1993; Lamoreaux, 1985; McCraw, 1981). Employees began to be “governed more and more by machine time, ... and wages based on time became the norm” (Levinson, 2004, p. 11).

**Major Voices**

As time management evolved over the years, key individuals made significant contributions in shaping the field. Frederick Taylor conducted a series of studies using a stopwatch to measure the time it took machinists to perform their job tasks in factories then he devised a scientific method for decreasing that time that was widely adopted by managers (Chandler, 1992; Jensen, 1993; Levinson, 2004). By applying Taylor’s scientific method to her “study of housework and home management,” Lillian Gilbreth was able to “increase the efficiency and effectiveness of the household [giving] women more leisure time. The mother of twelve children, Lillian garnered worldwide notability for balancing career and family—and the 1948 book and subsequent 1950 movie *Cheaper by the Dozen* were inspired by her life” (Levinson, 2004, pp. 14-15). Catherine Beecher wrote *A Treatise on Domestic Economy*, which served as a guide for time

management teaching “habits to avoid wasting time in favor of productive activities” (cited in Gannon & Buchanan, 2011). Former U.S. president Dwight Eisenhower popularized a personal time management technique using a decision matrix to evaluate and prioritize tasks by placing them into quadrants based on importance and urgency. Tasks in the important/urgent quadrant—quadrant one (QI)—were to be taken care of immediately, while tasks in the important/non-urgent quadrant (QII) were to be scheduled. Tasks in the unimportant/urgent quadrant (QIII) were to be delegated, while tasks in the unimportant/non-urgent quadrant (QIV) were to be eliminated (Kirillov, Tanatova, Vinichenko, & Makushkin, 2015; Gannon & Buchanan, 2011). Like Eisenhower, productivity expert Stephen Covey (2004) also subscribed to the basic paradigm of urgency and importance in scheduling our time (pp. 159-160). In his book *The 7 Habits of Highly Successful People*, Covey (2004) advocated for a principle-centered approach to time management, encouraging us to do the right things based on our values rather than doing more things faster (p. 40). “Be governed by your internal compass,” he urged, “not by some clock on the wall” (Covey, Merrill, & Merrill, 2003, p. 16). Covey asserted that living by your internal compass required self-management by putting “first things first” in everyday decisions (Covey, Merrill, & Merrill, 2003, p. 27).

### **Major Assumptions**

Many people tend to view time management as ranking tasks according to priority and then scheduling them into open blocks of time on the calendar. But all hours of the day are not equal, and every open time block does not guarantee access to quality attention and sufficient energy. Yet time management literature and tools rarely, if ever, mention this, which suggests it has not been considered. It also suggests that people assume attention and energy are at their beck and call, and they can summon it whenever it is needed. Though time management literature encourages us to rank our tasks by value (prioritization), no mention is made of ranking the value of the time blocks on our calendar. Certainly, we can acknowledge working more effectively at specific times of

the day, yet this concept does not seem to transfer into the planning process when scheduling our time.

Consider, for example, the following advice commonly given to undergraduates during orientation prior to their first semester: For each credit hour per course, you should put in  $n$  hours of study time per week. This guidance implicitly suggests all hours are equal. Because no distinction between the hours is made, the advice implies that every hour a student devotes to studying will be supplied with a sufficient amount of energy and quality attention. Though the amount of time a student devotes to his studies is germane to his academic success, the quality of effort he is able to apply to that time is more important. One hour of study time when he is able to fully engage with his coursework can be worth more than two hours of study time when he is exhausted and cannot think clearly or concentrate.

### **Non-traditional Students**

Numerous studies reflect a significant transformation in the demographics of the college student population (Bye, Pushkar, & Conway, 2007; Newbold, Mehta, & Forbes, 2010; Scott & Lewis, 2011). Today's typical college student bears little resemblance to the traditional 18-year-old high-school graduate enrolled full-time with few, if any other commitments. The current majority return to school after the age of 25, attempting to succeed academically while meeting the demands of adulthood, which can include: holding down a job, maintaining a home, being an attentive spouse, and caring for dependents (children, elderly parents, others in poor health). This non-traditional demographic characterizes 73% of the student population in post-secondary education across America (U.S. Department of Education, 2015), with an increase of up to 18% projected by 2025 (NCES Digest of Education Statistics, 2015).

Although their penchant for acquiring new skills and even lifelong learning is highly commendable, “non-traditional students have significantly lower retention and graduation rates when compared to their traditional counterparts” (National Center for

Education Statistic (NCES), 2015). Moreover, this demographic was “most at risk of dropping out in their first year” (NCES, 2015; Choy, 2002), and of those who did persist, most eventually dropped out (Ryan & Bauman, 2016 per U.S. Census Bureau Current Population Survey; Goncalves & Trunk, 2014; Pontes & Pontes, 2012). Demand overload from numerous commitments and role conflict have been ascribed as the most prevalent barriers to completion (Giancola, Grawitch, and Borchert, 2009; Markle, 2015; Wyatt, 2011).

### **Reviewing the Literature for Insight**

Managing often competing areas of a busy lifestyle is crucial to a non-traditional student’s success, and at the core of competency lies a strategy for allocating efficient use of one’s time, attention, and energy. To this end, a review of the literature has been conducted to explore ways in which these limited resources can be optimized to concurrently meet academic, work, and family commitments. Leveraging successful approaches and lessons learned, the insight garnered can serve as a foundation from which to craft a mobile application comprised of productivity strategies non-traditional students, among others, can employ to bolster perseverance and facilitate degree attainment.

### **Definition**

Although multiple definitions of a non-traditional student can be found throughout the literature, the National Center for Education Statistics (NCES) provides the official version used in this paper. For an individual to be considered a non-traditional student, he must meet at least one of the following criteria: over the age of 24, delayed entry into college (by one or more years after high school graduation), employed while enrolled, financially independent of parents, has one or more dependents, or is a single parent (NCES, 2002). This demographic can be further categorized based on the number of characteristics its members possess. For instance, having one characteristic is considered minimally non-traditional, two or three is considered moderately non-traditional, and four or more is considered highly non-traditional (Pelletier, 2010).



**Risk Factors**

These defining characteristics have been perceived as risk factors to educational success, given their negative correlation with persistence and ultimately, with degree attainment (Goncalves & Trunk, 2014; NCES, 2011). An NCES study found even those who were minimally non-traditional, did not persist in postsecondary education as well as traditional students. In addition, Wagner (2002) asserted the “risk [of attrition] increases in proportion to the number of the non-traditional characteristics they possess” (p. 4).

**Barriers to Persistence**

Barriers to persistence and ultimately completion have been a topic of considerable interest for many years. In several studies, non-traditional students reported that attempting to juggle multiple roles while pursuing a degree was a major source of stress (Butler, 2007; Forbus, Newbold, & Mehta, 2011, p. 111; Markle, 2015). Giancola, Grawitch, and Borchert (2009) found that “the extent of demands within work, school, and personal life, and the role conflict between work, family, and school” pose the biggest challenges. In addition, Brus (2006) reported that an inverse relationship between the number of family responsibilities and how well students performed academically was noted in multiple studies (Curtis, 2004; Fogg, 2003; Sullivan, Hollenshead, and Smith, 2004; University of California, Berkeley, 2005; Williams, 2004; Younes & Assay, 1998). Adult female students with dependents were found to be the most negatively impacted, considering “women ... continued to bear the main responsibility for raising children and maintaining the household” (Markle, 2015). Given the expectation women are supposed to be the nurturers, role conflict often ensues from the perception that the female adult student is shortchanging her family of the time, attention, and energy that is rightfully theirs, in favor of her academic pursuits. Pressure from the family typically carried a lot of weight with female adult students, engendering feelings of guilt and prompting them to question their decision to go back to school.

In several studies, adult students recounted the tremendous burden of having to continually decide between competing priorities as well as the significant angst

associated with being responsible for any negative impact imposed on others as a result (Thom, 2001; University of California, Berkeley, 2005; Wlodkowski, Maudline, & Campbell, 2002). Brus (2006) contended that “the difficulty associated with decision making is found in the accumulated weight of repeating the process several times a day, every day, often for years” (p. 35).

Students commonly reported struggling with time management while trying to juggle multiple roles (Martinez, Ordu, Della Salla, & McFarlane, 2013; McAlpine, Jazvac-Martek, & Hopwood, 2009; McCoy & Gardner, 2011; Polson, 2003). Furthermore, part-time attendance—which is quite common among non-traditional students—was found to be associated with an increased risk of dropping out (Wlodkowski, Mauldin, & Campbell, 2002). Findings suggest that drawing out the process of attaining a degree exerts the additional burden of enduring a gradual yet relentless wearing down of their fortitude and resilience.

### **Competitive Analysis**

Available resources for improving the productivity of non-traditional students are limited in number, scope, and substance. College and university websites were the most common and reputable source of information, yet few covered topics beyond preparatory guidance, such as helping adults determine whether to go back to school, and how to get into college programs and apply for financial aid. In the few instances when guidance on increasing academic success was included, at best only generic, rudimentary advice—such as getting enough sleep, taking care of oneself, and applying strategies for reading, note-taking, and test preparation—was included; all of which bore a striking resemblance to the advice typically given to high school students.

### **Broadening the Scope**

Due to the lack of resources on improving the productivity of non-traditional students, it was necessary to broaden the scope of the search. The goal was to procure sound strategies—intended for those experiencing similar challenges—that could

ultimately be applied to non-traditional students. Resources from the following topic areas were analyzed: managing competing commitments while juggling multiple roles; attaining work-life-school balance; and dealing with demand overload.

### **Bias toward Time Management**

Of the productivity resources that addressed these issues, most were heavily biased toward time management. Specifically, too many gurus or experts of time management start with the premise that you have to get it all done, and that perfect time management involves planning and filling every minute of one's day (Allen, 2015; Bregman, 2011; Covey, 2004; Drucker, 2006; McKeown, 2014; Schwartz, Gomes, & McCarthy, 2010). Endemic to our society is the belief that success means being supermen and superwomen who can get it all done. Consequently, caught up in the busyness of life, the masses mistake busyness for productivity. Racing against the clock, inevitably frustration ensues, and people are left feeling starved for time. Convinced they need to better manage their time, they succumb to evangelists proclaiming time management as the end all, be all.

Expert reviews of productivity tools confirmed that most hinge on time management and are focused on how to get it all done but failed to address how to do so within strict time limitations (Allen, 2015; Bregman, 2011; Covey, 2004; Drucker, 2006; Keller & Papasan, 2013; Kruse, 2015).

A staple of the time management industry, the to-do list, is one of the most common features in productivity tools. Though ubiquitous, the to-do list also has a dark side:

While to-dos serve as a useful collection of our best intentions, they can also tyrannize us with the trivial, unimportant stuff we feel obligated to get done—because it's on the list. Which is why most of us have a love-hate relationship with our to-dos. If allowed, they set our priorities the same way an inbox can dictate our day. Most inboxes overflow with unimportant emails masquerading as priorities. Tackling these tasks in the

order we receive them is behaving as if the squeaky wheel immediately deserves the grease.

(Keller & Papasan, 2013, p. 34)

Often originating as requests from others, list items are added reactively rather than proactively from our own priorities. Caught up in the check-off game, we allow the insignificant and the inconsequential to consume our time, attention, and energy (Kruse, 2015, p. 31). With a tendency to grow, the to-do list becomes an unorganized and unwieldy running tally, a guilt list reminding us of those things left undone. Getting caught up certainly seems out of reach when the finish line is a moving target.

Stemming from the popular, yet flawed goal of trying to get it all done, many people have resorted to putting in extra hours to compensate for an overwhelming task load. Whether trying to become more productive for school or work, this approach has been proven ineffective and unsustainable. In fact, more than 150 years of research has shown that overworking does not yield additional quality results (De Graff, 2003; Galinsky, Bond, Backon, Kim, Brownfield, & Sakai, 2005; Golden, 2009; Hughes, 2008; Robinson, 2012; Schor, 2003; Sullivan, 2015). Furthermore, Parkinson's Law states that the amount of effort necessary to complete our work adjusts to fit the amount of time we allocate for it (Parkinson, 1955). In fact, a Stanford study confirmed that paradoxically, “the more hours you work, the less you get done” (Pencavel, 2015). According to neuroscientist David Rock (2009), the answer is not to force yourself to sit there for as long as it takes to get your work done; “your best quality thinking lasts for a limited time” (p. 9). Once the point of diminishing returns is reached, productivity begins to plummet. We are no longer able to think clearly or concentrate, and distractions become harder to ignore. Also more prone to error, we begin making mistakes that *cost* us time. With executive functioning now compromised, we are no longer able to make wise decisions to direct our course of action. The human body was simply not built to withstand continuous work. But “in a world where overwork is seen as a ... virtue” best-selling author Wayne Muller contends, “We are poisoned by the hypnotic belief that good

things come only through unceasing determination and tireless effort” (2000, pp. 1, 19). “We’re misguided by a fatal assumption that the best way to get more done is to work longer and more continuously” (Schwartz, Gomes, & McCarthy, 2010, p. 4). Ultimately, we pay dearly for these erroneous beliefs, in terms of diminished health, damaged relationships, and a darker outlook on life.

Micromanaging one’s time is yet another failed approach for getting it all done. By rigidly holding oneself accountable for every minute of every day, micromanaging entails stuffing tasks into every available moment to ensure as much as possible gets done, as quickly as possible, with zero waste. But expecting oneself to operate as a productivity machine or robot, in effect, reduces one’s value to the amount of output produced within the shortest amount of time. Furthermore, it is impossible to be deliberate 100% of the time. Working at a frenzied pace does not afford the time or attention necessary for doing things purposefully or with intention. Moreover, functioning in a constant state of hyperactivity rapidly depletes one’s energy, compromising the amount of attention available for subsequent tasks. The added stress and anxiety of expecting endless productivity also exacts a heavy toll on the mind and body. Micromanaging, therefore, is also an unsustainable approach.

Even productivity resources that are not solely focused on time management still enshrine it as a core principle. But while productivity experts Loehr and Schwartz (2003) acknowledged that managing time efficiently is important, they caution that focusing on time management is no guarantee individuals will focus on the right things and bring the energy necessary to summon and sustain clear thinking and quality attention (p. 4). Moreover, productivity expert Chris Bailey (2016) challenges us to consider that “when we schedule time for something, what we’re actually doing is simply deciding *when* we will invest our attention and energy into [a] task” (p. 91). Maintaining that time management should be thought of as the “backdrop against which [we] work,” Bailey contends that “managing time becomes important only *after* [we] define *what* [we] want

to accomplish and understand how much energy and attention [we] have throughout the day” (2016, p. 114).

### **Most Promising Productivity Approaches**

In fact, several noteworthy productivity experts contend that the most productive people not only manage their time well, they also manage their attention and energy well (Bailey, 2016; Schwartz, Gomes, & McCarthy, 2010; Loehr & Schwartz, 2003; Kruse, 2015). These key ingredients—attention management, energy management, and time management are integral to productivity and are tightly interconnected.

In viewing productivity through the lens of non-traditional students, it is easy to perceive how managing attention, energy, and time *in concert* is fundamental to successfully juggling multiple roles and responsibilities. For example, if a non-traditional student cannot bring quality attention to what he is doing and sustain that attention, it does not matter if he knows what his priority tasks and commitments are. In like manner, if he cannot manage his energy well, it does not matter how well he manages his time or attention; he will not have enough fuel to tackle everything he has planned. Rather, he will likely be too tired, unmotivated, and/or mentally exhausted to carry through on his intentions. Similarly, if he does not spend his time wisely, it does not matter how much energy and focus he has, he will not be able to accomplish what truly matters. And above all, if these individuals cannot coordinate managing their attention, energy, and time, it will be virtually impossible for them to work deliberately throughout the day (Bailey, 2016, p. 15).

### **Preview of Overall Lit Review Organization**

Productivity requires doing the right things, fueled by the right energy, at the right time. In other words, the best productivity strategy entails tackling an individual’s highest-priority tasks (what matters most to him), fueled by the capability to work on it (the necessary mental processing power), during the time of day when his energy naturally peaks.

Attention management refers to the *what* of productivity. It entails choosing what we direct or dedicate our attention toward; in effect, what we decide to focus on or do. Energy management refers to the *how* of productivity. Energy fuels our capability to get things done. It provides the means by which we are able think clearly and sustain concentration. And energy management involves intentionally directing our effort toward something we have deemed worthy. But it also involves understanding our own personal energy patterns and leveraging them make the best use of this limited resource to fulfill your goals. Time management deals with the *when* of productivity. Time management entails scheduling the best time for a particular task or activity.

The literature review is structured into sections based on productivity's key ingredients: attention management, energy management, and time management. And before we can discuss the *how* or the *when* of productivity, we must first address the *what*.

### **Attention Management**

Many experts contend that productivity is not about doing more things; it is about doing the *right* things (Covey, 2004; Covey, Merrill, & Merrill, 2003; Drucker, 2006; Ferris, 2009; Koch, 2008). "Taking a step back from your work to identify your highest-impact tasks will let you invest your time, attention, and energy in the right things" (Bailey, 2016, p. 27). Skillful attention management ensures the object of our focus is worthy of our attention, the quality of our focus is commensurate with its cognitive requirements, and the strength of our focus is sufficient to sustain engagement.

### **Determining What to Focus On**

Most non-traditional students readily admit to having too many things to do. Productivity expert, Kevin Kruse (2015) urges us to accept that we cannot do it all, and to realize that no matter how much we attend to, there will always be more to do. He urges us to stop trying to do it all, learn to say no without guilt, and guard against over commitment (pp. 57-58).

**The Pareto Principle.** The Pareto Principle, a universal truth about the imbalance of inputs and outputs, provides guidance on identifying the *right* things to focus on. This principle, also referred to as the 80/20 Principle, states that 20% of one's tasks are responsible for 80% of one's results, 20% of one's efforts generate 80% of one's results, and 20% of one's time produces 80% of one's results (Pareto, 1896; Juran, 1951; Zipf, 1949). Koch (2008) zeroed in on the heart of the matter when he said, "only 20% of one's total tasks really matter" (p. 143). It is, therefore, in our best interest to identify the 20% of tasks that hold the greatest potential for real impact.

**Selective, Not Exhaustive.** All tasks are not of equal value. Some clearly hold more value, have a bigger impact, or yield a higher return on investment. Keller and Papasan (2013) offer some very wise and thought-provoking advice on being selective, not exhaustive with our attention:

Extraordinary results are directly determined by how narrow you can make your focus. ... You have only so much time and energy, so you want your achievements to add up, but that actually takes subtraction, not addition. You need to be doing fewer things for more effect instead of doing more things with side effects.

(Keller & Papasan, 2013, p. 10)

While the approach most people take is to react to the 'urgent' requests of others, allowing those to drive their day, and ultimately allowing life to happen *to* them, Keller and Papasan (2013) subscribed to a different approach:

Achievers operate differently. They have an eye for the essential. They pause just long enough to decide what matters and then allow what matters to drive their day.... Achievers always work from a clear sense of priority.

(Keller & Papasan, 2013, p. 35)

Productivity expert Peter Bregman (2011) warns: "Never before has it been so important to be grounded and intentional; to navigate more deliberately, and to know what is important" (p. 122).



Equally as important to being strategic about what we choose to do, we must also “make hard decisions about what *not* to do” (Bregman, 2011, p. 101). It was William James who said, “Wisdom is the art of knowing what to overlook.”

**Satisficing.** Then there are tasks, responsibilities, and commitments that must be taken care of, even though they are of lesser priority. This is where satisficing can be a particularly helpful strategy. A term coined by Nobel prize winner Herbert Simon, “satisficing is a decision-making strategy that entails searching through the available alternatives until an acceptability threshold is met” (A. Foster, 2017). In the book entitled *The Organized Mind: Thinking Straight in the Age of Information Overload*, best-selling author Daniel Levitin asserts that satisficing is “one of the foundations of productive behavior [in that] it helps us avoid wasting time on decisions that do not [critically] matter and on trying to find improvements that are not going to make a significant difference” (2014, p. 4). To ensure our attentional resources are being judiciously managed, Kruse (2015) suggests we “do the most important things exceptionally well, and the rest just good enough or not at all” (p. 110). Satisficing helps to protect our limited attentional capacity and to reserve it for the things that matter most.

### **Sharpening and Sustaining Focus**

Focus requires being fully present, giving our undivided attention to what we are doing, whether it be an assignment for school, a project at work, an activity with the family, or a conversation with a friend. To successfully reach and sustain quality attention, we must be able to leave distractions behind.

**Overcoming distractions.** The best way to manage distractions and interruptions is to prevent them from occurring in the first place, when possible. By anticipating the most likely causes, we can preemptively remove predictable distractions and interruptions to increase our chances of having unimpeded blocks of time to get some work done. Distractions typically fall into two categories: internal and external.

**Internal distractions.** Internal distractions come from within oneself, and typically include mind wandering as well as emotional interference such as stress,

anxiety, worry, preoccupation, and negative self-talk. Distributed cognition is a particularly effective approach for dealing with many internal distractions. Smartphones, calendars, lists, and notes are common examples of distributed cognition systems and tools. Sometimes referred to as “brain extenders,” they enable us to “[externalize] onto paper or into computer chips myriad details that we no longer have to keep in our heads” (Levitin, 2014, p. 67). We rely on these tools to help us capture, organize, store, and retrieve thoughts, ideas, and knowledge. A major advocate of distributed cognition, productivity guru David Allen contends, “[Our] conscious mind is a focusing tool, not a storage place” (2015, pp. 24-25). Given the ephemeral nature of working memory, distributed cognition tools are invaluable in that they shift the burden from our fleeting, fragile working memory to a more permanent external format.

“Studies have demonstrated that our mental processes are hampered by the burden put on the mind to keep track of things ... without a trusted plan or system in place to handle them” (Allen, 2015, p. 25). Given that working memory has a limited capacity, “memory processes can easily become distracted or confounded by other similar items” (Levitin, 2014, pp. 34-35). Simply put, when we fail to stay organized and keep track of all our commitments, sharpening and sustaining focus is practically impossible.

Considering the overly busy lives of non-traditional students, it would likely come as no surprise they might be anxious about their ability to stay organized, keep track of numerous commitments, stay on course with their goals, and not forget anything. If they do not have, regularly use, and rely upon a trusted system—external to their minds—set up for handling such concerns, these individuals will be at the mercy of preoccupations that will relentlessly gnaw at them—impeding their ability to think clearly, fully engage, and sustain focus—until they are dealt with. By shifting the burden of organizing and storing from the brain to the external world; i.e., a trusted external storage system, they can compensate for the limitations of working memory. Every commitment is then recorded and safely stored where it can easily be retrieved when needed. With the reassurance they are working on the most important thing at that particular moment, non-

traditional students can then confidently let go of their distracting concerns and worries, and re-engage with the task at hand.

Another example of internal distraction entails when a student is trying to concentrate, but thoughts unrelated to the task at hand pop into his mind, interrupting his train of thought. Key insights and a-ha moments, for instance, typically do not occur on demand. In fact, internal distractions seem to favor appearing during the most inopportune times. Distractions of an emotional nature also tend to arise at times during which it is unsuitable to deal with them. Allen (2015) notes that many of his clients spin their wheels at work, worrying about things they need to do at home, and when they are at home, they worry about work. It is easy to see how non-traditional students might adopt such ineffective behavior, given they strive to juggle many roles. While ruminating over our thoughts so they are not forgotten is a common approach, it is not advised. Doing so not only weakens our resolve to return to the task at hand, it also wears down our limited attentional resources. Only by capturing our thoughts and concerns in a trusted external storage system instead, are we able to stop thinking about them, return to the task at hand, and give it our undivided attention.

Another distraction non-traditional students may be particularly susceptible to is getting stuck; that is, arriving at an impasse and not knowing how to get beyond it. This is commonly caused by becoming so absorbed in the details that one loses sight of the goal. But rather than taking a break to disengage, recharge, and reconnect with his goal, he forces himself to stay put and focus more intently on the details. The problem with such an approach is that it is difficult for our minds to hold onto, organize, keep track of, and manipulate myriad overwhelming disorganized details. Neuroscientist John Medina, author of *Brain Rules: 12 Principles for Surviving and Thriving at Work, Home, and School*, recommended that we attend to “meaning before details” (2008, p. 84). There is greater effectiveness and efficiency in simplifying concepts to their essence, focusing on the gist, and working with fewer, broader concepts (Bransford, 2000, p. 36). These broad concepts can then be recorded on sticky notes—unburdening the mind—spread out on a

table, making it easier to make sense of the concepts and detect relationships between them, rearrange the sticky notes as often as necessary, and move the task forward with greater ease.

“If you want to be able to focus, ... you need to be able to control your emotions” (Jast, 2015, p. 86). “Emotions can hold sway over our ability to focus” (Jast, 2015, p. 87). Emotional resilience can be bolstered by adopting a lifestyle that promotes balance. “Though exercising, eating well, and getting plenty of sleep may sound like tired clichés,” according to neuroleadership experts Fabritius and Hagemann (2017), “they are cited again and again for good reason: They work. Few things can better build your resilience in facing oncoming stress than this trio” (pp. 38-39). An enormous body of research supports the emotion-regulating benefits of exercising (Motl, Berger, & Leuschen, 2000; Salmon, 2001; Sharma, Madaan, & Petty, 2006), eating well (Evers, Marijn Stok, & de Ridder, 2010; House, Su, & Levy-Milne, 2006; Schwarzer & Renner, 2000), and getting plenty of sleep (Weber, Webb, Deldonno, Kipman, Schwab, Weiner, & Killgore, 2013; Vandekerckhove & Cluydts, 2010). In addition, evidence continues to mount regarding the emotion-regulating benefits of managing self-talk (Barker, 2007; Goleman, 2005; Hamilton, Scott, & MacDougall, 2007); practicing mindfulness and meditation (Grossman, Niemann, Schmidt, & Walach, 2004); expressing gratitude (Sheldon & Lyubomirsky, 2006); and getting outdoors in nature (Berman, Jonides, & Kaplan, 2008).

Best-selling author of *The Organized Mind: Thinking Straight in the Age of Information Overload*, Daniel Levitin contended that “Facing so many trivial decisions in daily life creates neural [decision] fatigue, leaving no energy for the important decisions” (2014, p. 5). “It’s as though our brains are configured to make a certain number of decisions per day and once we reach that limit, we cannot make any more [wise decisions], regardless of how important they are” (Levitin, 2014, p. 6). Making [numerous] choices impairs subsequent self-control (Vohs, Baumeister, Schmeichel,

Twenge, Nelson, & Tice, 2008), and in turn, impaired self-control weakens our ability to resist the lure of distractions.

To preempt mental fatigue, including decision overload, experts agree that satisficing (Buchanan & Kock, 2001; Foster, 2017; Levitin, 2014; Paul & Nazareth, 2010, Simon, 1997) and using external memory aids (Allen, 2015; Barkley, 2010; Levitin, 2014; Norman, 2013) can make a positive impact. External memory aids—such as to-do lists, daily planners, calendars, digital and voice notetaking devices, reminders (digital or sticky note), checklists—are good tools for “organizing, categorizing, and keeping track of things” (Levitin, 2014, pp. 12-13); thereby, reducing the amount of cognitive load (drain) on the mind.

***External distractions.*** External distractions generally refer to those in one’s environment. Examples most relevant to non-traditional students include: distractions in ones’ workspace, interruptions from others physically dropping by one’s workspace, and technology—i.e., email, devices, notifications, Internet, social media, and information overload.

Taking preemptive measures to ensure our work and study environments are distraction-free and foster concentration is a good first step. Additional strategies include making sure the desk, monitor, and chair are ergonomically set up, and ensuring the workspace is free of clutter and any visually distracting objects. In addition, letting others know you do not wish to be disturbed, closing the door, and wearing noise-cancelling headphones or earbuds are also recommended. (Desimone & Duncan, 1995; McMains & Kastner, 2011).

Although our attentional filter is meant to ensure we do not get distracted by irrelevancies, today these filters are easily overwhelmed as “we are confronted with an unprecedented amount of information” (Levitin, 2014, p. 6). Numerous research points to technology as a major impediment to focus. “If you want to improve your ability to concentrate . . . , you must control the way you use technology and not let it control you” (Jast, 2015, p. 68). With a continuous stream of pings, rings, beeps, and notifications—

from email, instant messaging, social media, text messages, smartphones, and landlines—so many things are relentlessly interrupting our thought processes and vying for our attention. During times of intense work, it is advisable to turn off all notifications and any other visual or auditory distractions. Silencing one’s phone (smartphone and landline), activating an out-of-office voicemail message, and letting calls go to voice mail have also been recommended.

Limiting the amount of time spent on the Internet is another wise strategy. “This may sound obvious, but people don’t realize how much time they waste just browsing or doing research” (Jast, 2015, p. 69). Access-blocking software or apps—such as StayFocused, LeechBlock, RescueTime, and Self-Control—can be used or apps that facilitate focus, such WriteRoom and Concentrate. It is also wise to put a limit on the amount of time spent on research. Jast (2015) contends that, “The pursuit of information/knowledge can turn into a never-ending chase after the next shiny object or the elusive perfect piece of evidence” (p. 69).

Email can be a serious drain on one’s attention. “Although it seems like an easy task, answering emails is actually quite taxing” contends neuroscientist Josh Davis. “Spending time answering emails depletes the very resources to do well at the tasks that matter most” (Davis, 2015, p. 48). Dr. Christine Carter (2015) warns that “Checking email is not the same as working, [and] constantly checking it reduces our productivity” (p. 36). By limiting the number of times email is checked to a few, pre-defined times per day, many individuals have garnered significant increases in productivity. A rather intriguing email strategy developed by Carter entails creating separate accounts for different purposes. For example, four different email accounts would be set up: work, school, personal, and bulk. The first three accounts would be restricted to messages related to their respective roles. (The personal email account would include only messages to/from friends and family.) The bulk account, however, would be reserved for all of one’s subscriptions, newsletters, social media notifications, retail purchase confirmations, shipping notifications, etc. It would be the only email address ever given

to a company or organization (other than one's place of employment and school). Utilizing such strategy engenders a sense of promise for improving focus and preempting distractions.

From information overload and opinion overload to cognitive overload and decision overload, impediments to the quality and sustainability of our attention abound.

**Multitasking as an impediment to attention.** Levitin (2014) provides insight into the costs of multitasking and what to do in lieu of this approach:

Multitasking is the enemy of a focused attentional system. Increasingly, we demand that our attentional system try to focus on several things at once... We can't truly think about or attend to all these things at once, so our brains flit from one to the other, each time with a neurobiological switching cost. The system does not function well that way. Once on a task, our brains function best if we stick to that task. ... Attention is a limited-capacity resource. To pay attention to one thing means we do not pay attention to something else.

(Levitin, 2014, p. 16)

Single-tasking—which is focusing on one task at a time at a slower, more deliberate pace—allows us to work more calmly with more awareness and mindfulness.

***Avoid multitasking.*** Some boast of their ability to pack more into less time, by working on tasks simultaneously. Brain research, however, reveals multitasking is a myth, and what appears to be concurrent task completion is in effect switching back and forth between tasks. Studies show that task-switching divides our attention, requiring that we reorient to where we left off with the task, the goal, and the approach we were taking – all of which lengthen the time to completion (Nass & Ophir, 2009). The Director of the Brain Center for Applied Learning Research, John Medina, found that “multitasking made participants less efficient and more distracted, their error rate increased by 50%, and they took twice as long [compared to single-tasking]” (2008, p. 36).

**Cognition-enhancing lighting.** Studies show that “both blue light and bright white light seem to enhance the number of mental faculties that can help us be highly effective” (Davis, 2015, p. 132). Replacing the current lightbulbs in one’s workspace with white lights that include more of the blue spectrum, even if it’s just a desk lamp, is also recommended. Research suggests “there is a good chance you’ll activate your eyes’ retinal photoreceptive cells that communicate with your circadian clock, helping you stay more alert (Berson, Dunn, Takao, 2002; Hattar, Liao, Takao, Berson, & Yau, 2002). Researchers also found that workers exposed to bluish-white light were more likely to see improvements in alertness, concentration, clear thinking, and performance (Berson, 2007; Foster, R., 2005; Viola, James, Schlangen, & Dijk 2008) and enhanced self-control (Ferlazzo et al., 2014).

**Attention-enhancement strategies.** Additional resources also provided guidance for enhancing attention. Medina (2008) found that “memory is enhanced by creating associations between concepts” (p. 84). LaBar and Cabeza (2006) found that emotional arousal is not always a distraction; it can also help the brain to more deeply encode new information. In addition, researchers found that we learn best when we involve several of the senses at once (Cytowic, 2002; Hubbard & Ramachandran, 2005; Mayer, 2008 & 2002). Creating visuals of concepts that are easy to forget or too difficult to remember is a great way to help an individual remember new material. Speech-to-text apps are an efficient way to take notes. And when learning new information, experts recommend that it should be gradually incorporated and repeated at timed intervals; in effect, spaced repetition cycles are the key to remembering (Kramár, Babayan, Gavin, Cox, Jafari, Gall, & Lynch, 2012, Schacter, 2000). Furthermore, cramming sessions should be avoided, since it is better to spread out the ingestion of new information over several days as opposed to one long session (Schacter, 2000).

### **The Power of a Pause**

**Self Check-Ins.** The Pomodoro Technique developed by Francesco Cirillo in 1992 is a simple, yet powerful means to assist individuals in focusing on the task at hand



to incrementally meet objectives. The technique is flexible enough that it can be used for various purposes. When used for self check-ins, the process is as follows: Set the Pomodoro timer to 25 minutes. When it rings, the person takes a 5-minute time-out to: ask himself if he is still on track, then recommit his focus to the task at hand for the next 25 minutes. One of the benefits of the Pomodoro Technique is that it curtails the amount of time wasted when a person does veer off track, as the ring of the timer will remind him to course correct. And although it is impossible to be deliberate 100% of the time, "what separates the most productive people from everyone else is that they make course corrections ... to gradually get better at everything they do" (Bailey, 2016, pp. 163-164).

**Daily and Weekly Reviews.** Bailey (2016) contended that "Taking a step back from your work to identify your highest-impact tasks will let you invest your time, attention, and energy in the right things" (p. 27). Moreover, he asserted "You'll plan more, come up with better ideas, and become able to work more deliberately" (p. 182). Daily and weekly reviews also serve as opportunities to pause, evaluate, and course correct. Bregman (2011) referred to daily reviews as evening minutes during which five minutes is spent to pause, breathe, and review the day while contemplating what worked well and commit it to memory so it can be repeated, and admit what did not work and change it (pp. 139-141). In addition, he recommended comparing what actually occurred to what was scheduled on one's calendar (Bregman, 2011, pp. 139-141). Similar to daily reviews, weekly reviews are also very important. Weekly reviews are for reflection and looking toward the week ahead. At the end of each week, Koch (2008) recommended to:

Do some quiet thinking, mine a few small pieces of precious insight, and then act: selectively, on a few objectives and a narrow front. ... The objective of 80-20 thinking is to generate action which will make sharp improvements in your life and that of others. Action of the type desired requires unusual insight. Insight requires reflection and introspection. (Koch, 2008, pp. 138-139)

### **Energy Management**

An abundance of evidence has suggested that energy is the X factor in productivity. “Without the right quantity, quality, focus, and force of energy, we are compromised in any activity we undertake” (Loehr & Schwartz, 2003, p. 4). “Your best quality thinking lasts for a limited time. The answer isn’t always to just try harder” (Rock, 2009, p. 9). “Time management ... is not an end in itself. Rather it serves the higher goal of effective energy management. Because we have a limited number of hours in a day, we must not only make intelligent choices about how to use them but must also insure that we have the energy available to invest in our highest priorities” (Loehr & Schwartz, 2003, p. 106). This requires managing our energy. Furthermore, although we cannot increase the number of hours in a day, we can maximize our energy and focus within the limitations of time (Kruse, 2015; Loehr & Schwartz, 2003). “Performance is grounded in the skillful management of energy” (Loehr & Schwartz, 2003, p. 5), and findings from several studies have substantiated this (Carpenter, 2017; Ericsson & Pool, 2016; Schwartz, Gomes, & McCarthy, 2010).

#### **Strategically Allocating Energy**

Energy fuels productivity, unlocking access to our most robust mental capacity. Considering energy naturally ebbs and flows, one’s energy peaks hold the greatest potential for productivity. Through observation and tracking, individuals can identify fluctuations in their own daily energy patterns and leverage their energy peaks and troughs. “The more we take responsibility for the energy we bring to the world, the more empowered and productive we become” (Loehr & Schwartz, 2003, p. 5).

**Energy Peaks.** It is discerning for an individual to match his energy peaks and troughs with tasks, based on the priority level and cognitive requirements of that task. Doing so entails reserving energy peaks for high-priority and high-impact tasks as well as tasks requiring deep concentration and/or rigorous mental processing. Leveraging one’s energy peaks allows an individual to invest his most naturally productive time and most potent attention in the right things, which are those things that he determines matter most

to him. This is accomplished by identifying when one's own energy naturally peaks, and then reserving those precious time blocks for one's priority tasks.

**Energy Troughs.** Even low-energy times can be leveraged; therefore, one must not overlook or squander the value inherent in one's own energy troughs. Our days inevitably contain tasks that must be done, but are routine, low-priority, low-impact, or require little to no cognitive ability (e.g., non-thinking tasks that can be done on autopilot). These types of tasks are best relegated to our energy troughs (Bailey, 2016, p. 27; Rossi, 1991, p. 97). And while matching task priority levels with task energy requirements may seem like an obvious approach, few realize the enormous gains generated from this fundamental principle because they fail to put it into practice.

**Mornings.** While there is consensus among experts that leveraging energy patterns increases productivity, controversy surrounds *when* energy peaks and troughs typically occur during the day. Several schools of thought exist, two of which divide a day into three distinct segments: morning, afternoon, and evening. The first school of thought is supported by myriad scholars who argue that mornings afford the most energy and evenings the least. They assert these morning energy peaks are manifested through appreciable increases in cognitive abilities: memory and learning (Broughton, 1975; Meissner, 1966; Rock, 2009), vigilance (Broughton, 1975; Rock, 2009), and sustained attention (Ericsson, Krampe, & Tesch-Römer, 1993; Meissner, 1966; Rock, 2009).

Therefore, it logically follows that attending to high-priority and high-impact thinking tasks during this time is, in effect, a wise and judicious choice. Those who believe morning is the most productive time of day advise us to schedule the things that matters most at the beginning of the day before doing anything else. In addition, aligning with the way in which the mind naturally functions amounts to taking the path of least resistance. Their rationale is that because sleep replenishes our energy stores, we awaken to an untapped supply that fuels our mental acuity and stamina, enabling us to start the day fresh and alert (Ericsson, Krampe, & Tesch-Romer, 1993; Ericsson & Pool, 2016;

Kruse, 2015; Rock, 2009). As the prime time for cognitive functioning, the start of the day is when we think most clearly and concentrate best (Bregman, 2011, pp. 125-129).

Willpower is at full strength, bolstering our ability to resist distractions and stay on course (Broughton, 1975, p. 234; Keller & Papasan, 2013, p. 71). Plus, early in the morning, requests, interruptions, and the needs of others can be postponed for later in the day (Bregman, 2011, pp. 130-133). With our patience at maximum capacity, we are also more adept at tackling difficult and challenging tasks. Keller and Papasan (2013) assert there is “magic in knocking down the most important domino early in the day” as it sets in motion our momentum to continue getting things done (p. 70). All of these highly significant capabilities that morning provides, however, decline over the course of the day, so it makes good sense to utilize them while they are at full strength for tasks meriting their energy (Bregman, 2011; Kruse, 2015; Rock, 2009). “Many studies of performance have ... reported a short-lived decrement of performance during the midafternoon hours” (Carrier & Monk, 2000). Whereupon, “the longer, more continuously, and later at night you work, the less efficient and more mistake-prone you become” (Loehr and Schwartz, 2003, p. 56).

“If [a task] matters to ... get it right, it would be better not to do it at the end of the day, because the odds are you will have a good amount of mental fatigue by that point. ... Complete your most important work first thing in the morning, before your brain has been depleted by hundreds of small decisions” (Davis, 2015, pp. 60-61).

**Chronotypes.** While some argue that mornings afford the most energy and evenings the least, others are adamant that individual chronotype plays a major role in when energy peaks and troughs take place. While the claims of such a robust set of abilities being ascribed to morning’s bounty seems plausible—and many can bear testament to them—the impact of chronotype on these abilities should not be overlooked. A study by Hasher, Goldstein, and May (2005) corroborating results from earlier studies (Intons-Peterson, Rocchi, West, McLellan, & Hackney, 1998; May, 1999; Hasher, Goldstein, & May 2005) suggested that performance related to attention and memory [in

adults] “varies in synchrony with chronotype, with better performance in the morning than later in the day for Morning-types and better performance later in the day than in the morning for Evening-types.” The patterns that emerged from these studies show faster, more accurate cognitive performance on novel tasks when tested during participants’ peak per self-identified chronotype. A number of studies suggested that chronotype plays a role in alertness and concentration levels (Hasher, Chung, May, & Foong, 2002; Hasher, Zacks, & Rahhal, 1999; Schmidt, Collette, Cajochen, & Peigneux, 2007; West, Murphy, Armilio, Craik, & Stuss, 2002). Because “optimal performance hours vary by chronotype” (Evans, Kelley, & Kelley, 2017, p. 6) the time of day when the test is administered is of particular importance (Schmidt, Collette, Cajochen, & Peigneux, 2007, p. 755).

In addition, research has shown a distinction in time-of-day effects between analytical and insight problem-solving, due to different brain activation (Bowden, Jung-Beeman, Fleck, & Kounios, 2005; Lavric, Forstmeier, & Rippon, 2000). For example, Weith and Zachs (2012) found that the non-optimal time of day was most conducive to solving insight problems. They ascribed this to a reduction in inhibitory control which typically occurs during one’s energy trough, making it easier for participants to “reinterpret the problem and approach it from a different perspective,” so they could overcome an impasse (Weith & Zachs, 2012).

The study of time-of-day effects on productivity is ongoing and consists of several research paradigms and conceptual models. While some study results suggested performance depends on the type and requirements of a task (Folkard, 1983; Gates, 1917; Monk & Leng, 1986; Muscio, 1920; Laird, 1925), other study results pointed to the association between chronotype and time of testing (Horne, Brass, & Pettit, 1980). Still other studies suggested the *amount of time since awake* plays a role (Carrier & Monk, 2000; Dijk, Duffy, & Czeisler, 1992; Folkard & Akerstedt, 1992; Jewett & Kronauer, 1999; Johnson, Duffy, & Dijk, 1992; Monk, Moline, & Fookson, 1989; Wyatt, Ritz-DeCecco, & Czeisler, 1999).

Settling the debate as to when energy peaks and troughs typically occur may not happen any time soon; however, in the interim, individuals should track patterns in how their own energy fluctuates throughout the day and observe how various levels of energy facilitate certain types of tasks. By doing so, they can choose the most advantageous times to work on high-priority and attention-demanding tasks.

### **Ultradian Rhythms**

Our daily circadian rhythm is composed of a series of more frequent 90- to-120-minute ultradian rhythms. “Regular shifts of energy and mood periodically occur throughout the day” (Rossi & Nimmons, 1991, p. 17). Rossi and Simmons (1991) contended that since the 1960’s, numerous research papers have demonstrated that an overwhelming number of the mind-body’s systems run on this same 90-to-120-minute ultradian rhythm of peak activity followed by restorative troughs (p. 23) (Sarabdjitsingh, Conway-Campbell, Leggett, Waite, Meijer, De Kloet, & Lightman, 2010; Srivastava, Srivastava, Chandra, & Kumar, 2017; Walker, Terry, & Lightman, 2010). Such evidence is suggestive, however, not conclusive.

**Pulse and Pause Method.** Using an approach based on ultradian rhythms, Tony Schwartz, founder of The Energy Project, claimed to have helped numerous fortune 500 companies improve productivity by assisting employees to manage their own energy. And although his strategies sound as though they would hold tremendous promise for non-traditional students, his method has not been substantiated by empirical evidence. Findings from a research study would be necessary to corroborate his claims. Nevertheless, the science behind his approach has some support; specifically, ultradian rhythms and their oscillatory nature (which is explained and cited in the Effects of Ultradian Rhythms on Hemispheres of the Brain section below).

In their New York Times best-seller, *The Power of Full Engagement: Managing Energy, Not Time, Is the Key to High Performance and Personal Renewal*, Loehr and Schwartz (2003) explain the Pulse and Pause method from which these strategies originate:

The shifts of energy that we experience are tied to ultradian rhythms that regulate physiological markers of alertness at 90- to 120-minute intervals. Oscillating between energy expenditure and intermittent energy renewal is a scientifically-based approach to manage energy more skillfully... Sustained performance is best served by assuming the mentality of a sprinter, not a marathoner. Performance is optimized by scheduling [tasks] into 90- to 120-minute periods of intensive effort followed by shorter periods of recovery and renewal.

(Loehr & Schwartz, 2003, pp. 60, 200)

For these shorter time periods, individuals are instructed to take a 15- to 20-minute break to mentally and physically disengage from the current task while the body rests and renews its energy stores. The pulse and pause cycle is repeated continually throughout day.

Rossi and Nimmons (1991) described the potential of the ultradian performance connection as such: “If we can learn to become aware of our ultradian rhythms, we can tap into our ... natural cycles ... to enhance performance” (pp. 27-28) “[but] it is essential that [we] do the right types of things at the right time” (p. 93).

**Effects of Ultradian Rhythms on Hemispheres of the Brain.** Nathaniel Kleitman—the pioneer who discovered the ultradian basic rest-activity cycle in 1960—later found this cycle continues throughout the day and night (1982, p. 311). In 1975, Broughton found “a continuous cyclic alternation of relative predominance of the left and right hemisphere in the basic rest-activity cycle” (p. 217).

In the journal article *Rhythms in Human Performance: 1 ½-Hour Oscillations in Cognitive Style*, Klein and Armitage (1979) reported on the results of their study on the basic rest-activity cycle using left- and right-brain tasks. Not only did their findings reveal “significant 90- to 100-minute oscillations for each task,” but also “alternating activation of processing systems residing in the two cerebral hemispheres.” During each 90-minute period, the left side of the brain was activated as evidenced by participants’

“stronger verbal-linguistic, analytic, and logical processes”. And during the 20-minute rest period, the right side of the brain was activated as evidenced by participants’ “stronger visual-spatial, wholistic, nonlogical processes” (Klein & Armitage, 1979).

Israeli sleep researcher Peretz Lavie (1998) found a 75- to 125-minute ultradian rhythm in alertness, which served as clear evidence of the cyclical nature of mental acuity and physiological fatigue throughout the day (cited in Kleitman, 1982).

During their study, Ericsson, Krampe, and Tesch-Römer (1993) discovered a common behavior that distinguished great performers from their less-skilled counterparts. Intuitively understanding the highest return on investment came from practicing intensely for 90-minute segments punctuated by 15- to 20-minute breaks, the best violinists naturally adopted work-rest cycles. During practice, these individuals committed their undivided attention and energy to fully engaging with the task at hand. Then when it was time to rest, they completely disengaged from work—as though they had changed the channel they were previously tuned into when practicing—which allowed them to recharge their metaphorical batteries.

**Consequences of Overriding Ultradian Rhythms.** Loehr and Schwartz (2003) contend that “Intermittently disengaging is what allows us to passionately re-engage” (p. 39). But as Schwartz, Gomes, and McCarthy (2010) maintain, “Obvious as it may seem to live in alignment with our inborn rhythms, we don’t” (p. 50). According to Loehr and Schwartz (2003), “Barriers to full engagement include negative habits that block, distort, waste, diminish, deplete, and contaminate stored energy” (p. 198). “When we work through these [energy] dips, relying on caffeine, adrenaline, and stress hormones to keep us alert instead of letting our bodies and brains rest” Dr. Carter explains “we ... create a state of chronic jet lag” (2015, p.8). Schwartz, Gomes, and McCarthy (2010) agree: “Often in the face of high demand, instead of taking a much-needed break, we tend to ignore the signals—physical restlessness, wandering attention, and greater irritability—and instead, grab a cup of coffee, a caffeinated soda, or an energy drink, ... which ultimately undermines our effectiveness” (p. 67). “When demand in our lives intensifies,”



Schwartz contends, “our pattern is to hunker down and push harder, rather than to refuel [take breaks] more frequently” (2010, p. 51). But Rossi and Nimmons (1991) warn that “People who consistently try to plow through the low point of their natural ultradian rhythms cannot help but sacrifice their peaks” (p. 93). Kruse (2015) also agrees as he advises us to “Work in short bursts of productive work instead of long, unproductive stretches” (p. 53). To get the maximum out of our breaks, Loehr and Schwartz (2003) advise us to create energy rituals that replenish either our physical, emotional, mental, or spiritual energy (p. 197).

### **Optimizing the Power of Habit**

“Positive energy rituals [are] highly specific routines for managing energy [and] are the key to full engagement and sustained high performance” (Loehr & Schwartz, 2003, p. 18). Certainly, habits can be formed to make the Pulse and Pause strategy part of one’s daily routine, to leverage one’s energy peaks and troughs, and to maximize the benefits of taking breaks by replenishing our physical, emotional, mental, or spiritual energy during that time.

Loehr and Schwartz (2003) asserted that without habits, we are “vulnerable to ... the limits of our conscious will and discipline” (pp. 172-173). They went on to contend that “The limitations of conscious will and discipline are rooted in the fact that every demand on our self-control ... draws on the same small, easily depleted reservoir of energy” (Loehr & Schwartz, 2003, p. 168). Corroborating these claims, Carter (2015) stated “Willpower is easily tired and fuel-inefficient” (p. 42).

“Installing energy rituals is the holy grail of optimizing your energy and performance,” Loehr and Schwartz (2003) pointed out, “[because] they renew energy without using up energy or willpower themselves” (p. 169). They went on to propose that “We can offset the limitations of conscious will and discipline by building positive rituals that become automatic and relatively effortless” (Loehr & Schwartz, 2003, p. 169). Carter (2015) substantiated this, stating that “When we use our brain’s natural ability to run on autopilot, we let habits bear the burdens that we’ve been hoping willpower would

shoulder” (p. xviii). Charles Duhigg (2014), the renowned author of *The Power of Habit*, asserted that our habits are “necessary mental energy savers” (p. 18). In addition, Carter (2015) affirmed, “Habits take the effort out of our daily tasks: they are the ultimate form of ease” (p. 39).

Constructive behaviors can be integrated into our daily routines, rather than relying on or being at the mercy of conscious will and discipline for our success. Cultivating an exercise regimen to facilitate sharper thinking is one example. Since exercise boosts mental acuity, we can make a habit of putting our exercise clothes, shoes, and gear beside the front door as part of our evening routine before going to bed. Doing so would produce a visual reminder the next morning that it is time to exercise. It would also help us get out the door more quickly for a workout; thereby, countering the temptation to bail out. Additionally, “once a habit ... is programmed, it requires relatively little conscious effort [investment of energy to maintain]” (Carter, 2015, p. 40). Eating a healthy breakfast is another example of a positive habit. Although skipping breakfast may get us to work more quickly, doing so deprives us of healthy nutrients that nourish brain cells and help sustain energy to think clearly and maintain concentration.

Loehr and Schwartz (2003) described rituals as anchors that, even in the midst of difficult circumstances, help ensure “we continue to use our energy in service of the values we hold most dear” (p. 166). They contended that “The bigger the storm, the more inclined we are to revert to our survival habits, and the more important positive rituals become” (Loehr & Schwartz, 2003, p. 167). They added that “Without the structure and clarity [rituals] provide, we are forever vulnerable to the urgent demands in our lives, the seductions of the moment, and the limits of our conscious will and discipline” (Loehr & Schwartz, 2003, pp. 172-173).

### **Time Management**

"Consider [that] when we schedule time for something, what we're actually doing is simply deciding when we will invest our attention and energy into the task [or activity]. Scheduling time for something is really just a way of creating attentional and energy boundaries around a task" (Bailey, 2016, p. 91).

Since it has been established that all times of day are not equal, it is essential that we attend to "the right types of things at the right time" (Rossi & Nimmons, 1991, p. 93).

Matching your work and study routines to your energy peaks optimizes productivity. This means "using your [biological] prime time for activities that require higher levels of concentration, while shifting the less demanding, [lower-impact] tasks and activities to that time of the day when your concentration levels are low" (Zogby, 2017, p, 138).

Although few of us have complete control over our time, we can optimize the control we do have. Today in the knowledge economy, most of us have more freedom and flexibility than ever before to choose what to work on and when, just as long as we accomplish what is required by the deadline.

"Rearranging our day around when we have the most energy is one simple way to work smarter instead of just harder" (Bailey, 2016, p. 46).

### **Conclusion**

This literature review provided insights into the challenges that non-traditional students have faced along with sound strategies from scholarly journal articles and experts in the field of productivity. Many of these insights and strategies were integrated into the design of the mobile app prototype described in the next section.

### Chapter 3: Methods and Materials

A small-scale study was conducted to critically evaluate the usability of my mobile app on productivity strategies for non-traditional students. An electronic, interactive prototype of the mobile app was used for testing.

As each user was given a set of tasks to complete, Zoom web conferencing software recorded video of the user's onscreen interaction with the prototype and feedback via a desktop computer and microphone during remote test sessions.

Session recordings were replayed, user interaction and feedback were analyzed, and key insights and patterns were noted. This section describes the test protocol and process that was used during the design of the mobile app prototype.

#### **Study Design**

##### **Study Design Type**

The prototype underwent a pilot test (2 users) and four rounds of user testing (12 users). The study employed the Rapid Iterative Testing and Evaluation (RITE) method (Medlock, Wixon, McGee, & Welsh, 2005; Medlock, Wixon, Terrano, Romero, & Fulton, 2002). Simply put, the design of the prototype was shaped iteratively through a cyclical process of design, test, collect qualitative data, analyze user feedback, redesign, and retest. This process produced multiple versions of the prototype, each one an improvement over its predecessor. I also incorporated the think-aloud protocol, asking participants to articulate their thought processes as they completed the tasks. Moreover, I asked users to elaborate when additional details or clarification was required to understand their comments.

## **Participants**

### **Recruiting**

Fourteen individuals from my social circle were recruited for the study. Emails were sent to family members, friends, and fellow University of Baltimore graduate students, soliciting their participation in the study.

### **Screening**

Using a questionnaire administered over the telephone, potential users were screened for non-traditional student characteristics prior to inclusion in the study. To participate in the study, individuals had to be 25 years of age or older who had delayed enrollment in college beyond the year of high school graduation. Beyond possessing these preliminary qualifications, individuals also had to meet at least one of the following criteria: employed while enrolled, financially independent of parents, and responsible for one or more dependents. The participant screener used to determine the eligibility of individuals is included in Appendix A.

### **Sample Size**

The sample size of fourteen participants was selected based on Rubin and Chisnell's recommendation of a minimum of 10-12 participants (2008, p. 72). My study included two users for the pilot and 12 users spanning four rounds of testing. Having so few users per round was intentional and based on the combined wisdom of several experts. "Research has shown that 4 to 5 participants ... will expose about 80% of the usability deficiencies of a product for that audience, and that ... 80% will represent most of the major problems" (Rubin & Chisnell, 2008, p. 72). Furthermore, Jakob Nielsen (2000) asserted that it is better to test in small groups, distributing the total number of users across multiple iterations of the prototype design and development phases. In doing so, he contends, the remaining 20% of deficiencies are likely to be detected (Nielsen, 2000).

### Demographics

Of the 14 participants, there were 8 females and 6 males (see Table 1). Three participants were in the 25-29 age range, six in the 30-39 range, four in the 40-49 range, one in the 50-59 range, and zero in the  $\geq 60$  range (see Table 2).

Table 1

*Participant Gender*

Gender	Number of Participants
Female	8
Male	6

Table 2

*Participant Age Range*

Age Range	Number of Participants
25-29	3
30-39	6
40-49	4
50-59	1
$\geq 60$	0

### Test Session Materials

#### Test Environment and Equipment

The study was conducted remotely using Zoom web conferencing software, which was downloaded to the users' desktop computer via an Internet connection. This made participating in the test sessions possible from the comfort and convenience of each user's personal computer within their home. Using this software allowed me to observe user interaction with the electronic prototype while listening to audio of the user's

feedback via Zoom's screen-sharing and video recording capabilities in real time as well as after the session concluded.

In addition to Zoom video conferencing software, other materials required for the study session included:

- Informed consent form
- Electronic prototype (link required to access)
- Demographic questionnaire
- Test script (which included pre- and post-test interview questions and tasks)

### **Prototype**

I created an electronic, interactive prototype using Adobe XD software. The original version was used for the pilot test. Throughout subsequent rounds of testing, each iteration yielded a revised version of the previous prototype.

### **Pilot Test**

A pilot test, consisting of two users, was conducted to practice the testing session and iron out any kinks prior to beginning the first round of testing.

### **Test Dates**

Testing sessions took place between March 20<sup>th</sup> and May 5<sup>th</sup>, 2018.

- Pilot: March 20<sup>th</sup>
- Round 1: April 9<sup>th</sup> and 12<sup>th</sup>
- Round 2: April 20<sup>th</sup>
- Round 3: April 26<sup>th</sup>, 27<sup>th</sup>, and 30<sup>th</sup>
- Round 4: May 3<sup>rd</sup> – 7<sup>th</sup>

### **Procedure**

This section discusses the activities that took place before, during, and after the test sessions.

#### **Pre-Test Activities**

Upon meeting the inclusion criteria in the participant screener, eligible individuals were emailed an informed consent form and asked to sign it and return it to me.

Participants were not compensated for participating in the study. The informed consent form can be found in Appendix B.

To prepare for the test sessions, I published and tested the prototype to ensure it was the current version and that its functionality worked as intended. Test sessions were then scheduled for the participants. Instructions for downloading Zoom web conferencing software to their computer and for connecting to a Zoom meeting (link to join and meeting ID) were emailed to participants.

#### **Test Session**

**Pre-task interview.** After administering a demographic questionnaire, users were instructed to look at the welcome screen and the homepage and were then asked the following questions:

- What is your initial impression of the app?
- What do you think the purpose of the app is?

**Task assignment.** Users were given one task at a time from the task list below.

- Does the app have any advice on priorities?
- Find some advice on how to make the best possible use of your energy every day.
- Try to get back to the homepage.

**Post-task interview.** Once users completed the tasks using the app prototype, they were asked the following questions:

- What are your final thoughts and impressions of the mobile app?
- Can you recall any aspects of the app that you liked?



- Were there any aspects of the app you found confusing?
- Were there any aspects of the app you found frustrating?

The test script can be found in Appendix D.

### **Test Duration**

Test sessions—including the pre-task interview, task completion, and post-task interview—took between 30 to 45 minutes, per participant. Variations in test duration were attributed to the ease with which the user was able to download Zoom, unmute his audio, and share his screen as well as the amount of feedback the user provided.

### **Post-Test Activities**

After test sessions had concluded, I replayed the recordings, analyzed the qualitative data collected, and made note of key insights as well as patterns among users. Following each round of testing, improvements were made to the next version of the prototype based on user feedback.

## Chapter 4: Findings

A summary of the key finding from 5 rounds of usability testing is included below. The minor findings are also included but in a separate list.

### **Key Findings**

- Confusion over start button on Welcome page
- Difficulty finding prioritization strategies
- Too many menu choices
- Oversaturated color
- Topics within major sections not obvious
- Missing scroll bar
- Bullet points interpreted as links
- Font is too playful on Welcome page and Homepage
- Bullet points mistaken for checkboxes
- Some text-heavy pages
- No access to Home and major sections from every page
- No instructions to interact with mapping exercise
- Need for a quicker way to access strategies

### **Minor Findings**

- Bullet points interpreted as links
- Color inconsistency among Homepage icons

### Findings from Pilot Test

This section covers key findings from the pilot test along with corresponding design solutions, which are updates that were made to the prototype design resulting from user feedback. Two participants (P1 and P2) took part in the pilot test.

#### Key Finding 1: Confusion over start button

During the pilot test, the buttons on the homepage (see Figure 1) confused both participants (P1 and P2). The Start button was interpreted as a lock-step entryway into the user test from which they could not return. The three buttons under Productivity's Key Ingredients were interpreted as an entryway into the app. P1 and P2 were perplexed as to which path to take: begin the user test (via the Start button) or explore sections of the app (via the buttons below Productivity's Key Ingredients).



Figure 1. Original homepage.

### Design Solution for Key Finding 1

From the original homepage (see Figure 1), I distributed the buttons among two pages – the Welcome page (see Figure 2) and the Homepage (see Figure 3). The Start button was moved to the Welcome page and the test script was updated to include reassurance to users that I would assist them in returning to the homepage if they could not find their way.

While the Homepage retained its button functionality to access the major sections of the app, I leveraged the additional space made available from distributing its original content among two pages. Buttons that consisted of only text were updated to also include graphics; button size was also increased.

Throughout the testing process, the wording was continuously updated to improve information scent, so users could more easily find content.

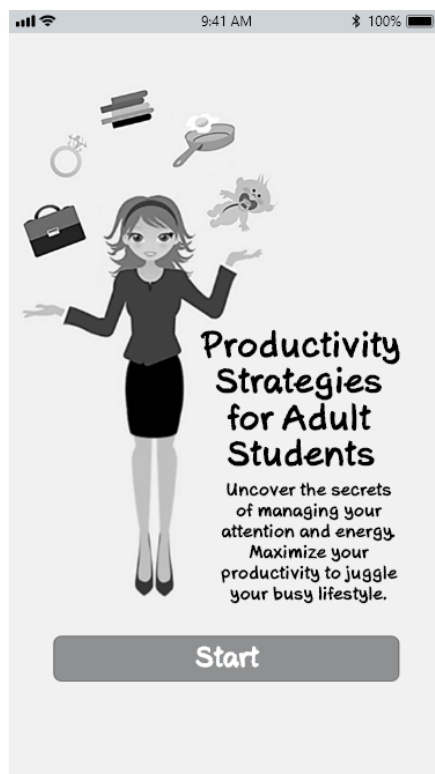


Figure 2. Welcome page (new).



Figure 3. Homepage (updated).

**Key Finding 2: Difficulty finding prioritization strategies**

When given the task to find advice on setting priorities, both participants first looked in the time management section. P1 and P2 were eventually able to find the correct section – attention management (see Figure 4). P1 commented that he interpreted the label *Prioritize Focus* to mean: make quality focus your priority; therefore, he gave up on the task. In contrast, P2 was confident that *Prioritize Focus* would lead him to the correct path, so he selected that menu option and continued, successfully finding the strategies required of the task.

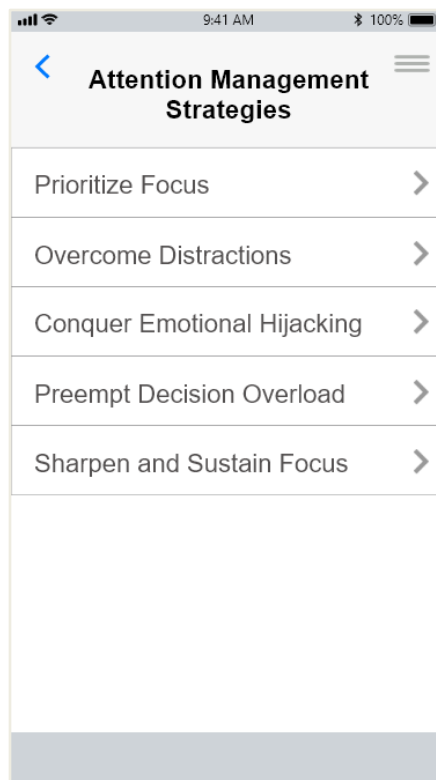


Figure 4. Attention Management menu.

### Design Solution for Key Finding 2

I added a site map (see Figure 5), so users could find prioritization strategies more easily (along with all other topics). I also made the site map (see Figure 6) accessible from the side-drawer menu via the hamburger icon on every page.

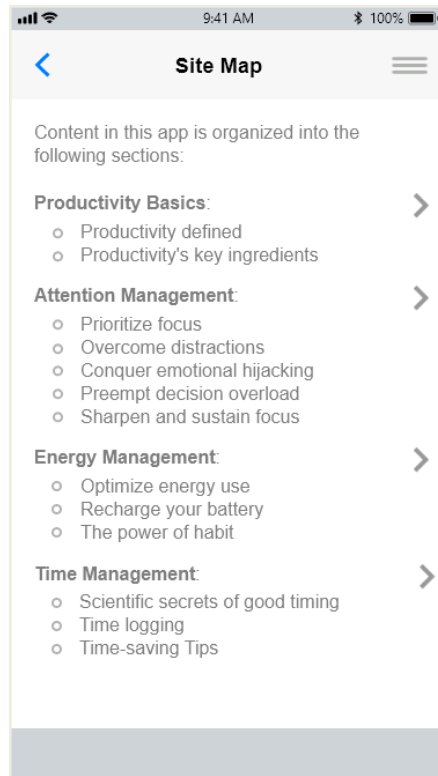


Figure 5. Site Map.

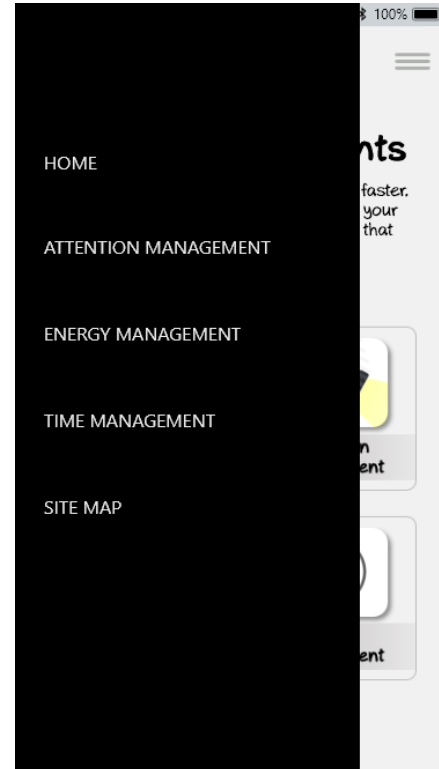
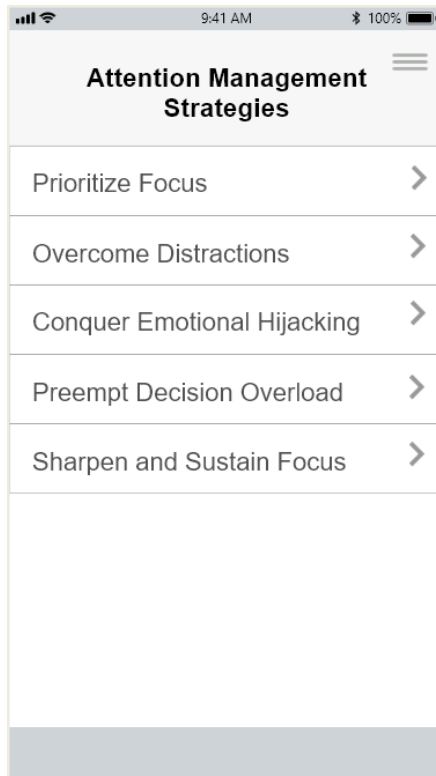


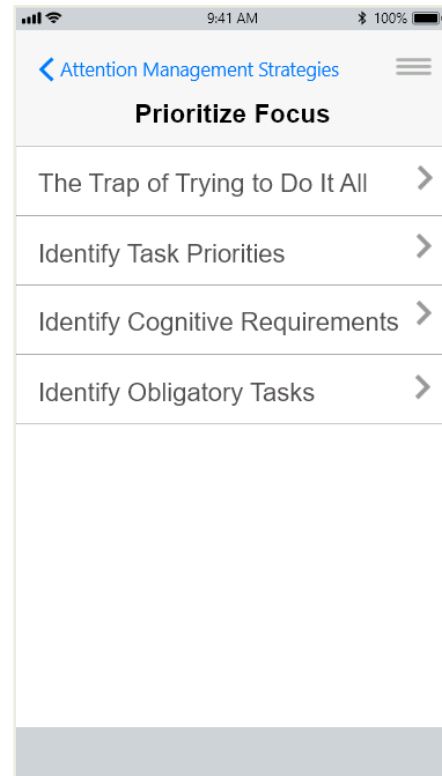
Figure 6. Side-Drawer Menu.

**Key Finding 3: Too many menu choices**

Too many menu choices made the scope of the app too deep. P1 commented that there were too many menu options to choose from on the Attention Management menu (see Figure 7) and submenu pages (see Figure 8). And P2 echoed the same sentiment.



*Figure 7.* Attention Management menu.



*Figure 8.* Attention Management submenu.

**Design Solution for Key Finding 3**

I deleted the Attention Management submenu (see Figure 8).

### Key Finding 4: Oversaturated color

P1 found the colors used on Chronotype Results page (see Figure 9) to be off-putting. P2 commented, “The orange is overpowering and distracting.”

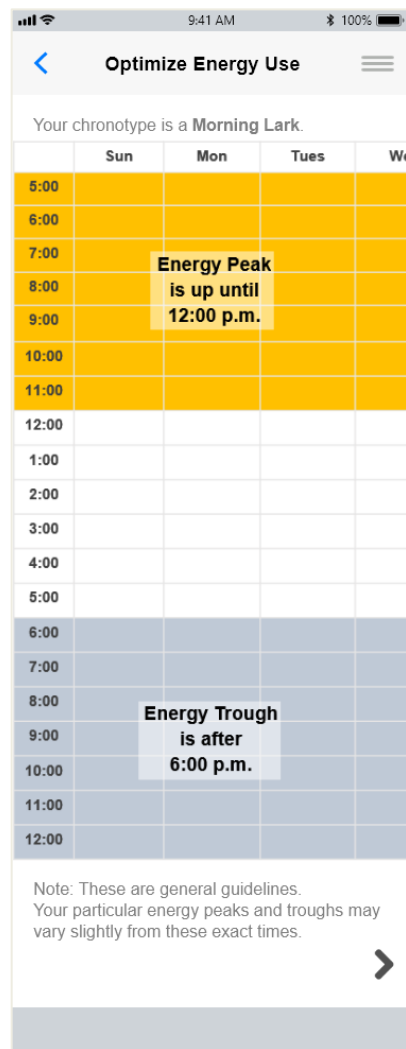


Figure 9. Overly-saturated color.

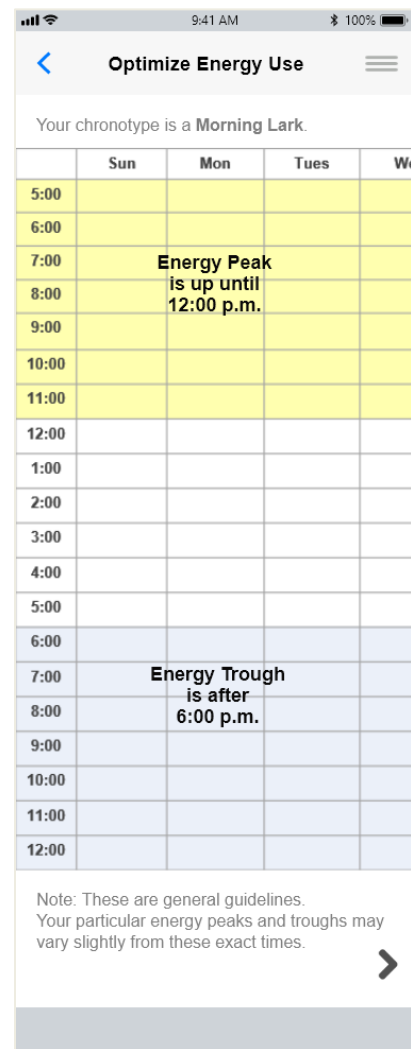


Figure 10. Saturation decreased.

### Design Solution for Key Finding 4

I decreased the saturation of the original orange and blue colors on this page, since color should be an asset to the page content and not a distraction (see Figure 10).



### Findings from Round 1 of Usability Testing

Two participants (P3 and P4) took part in round 1 of the usability test sessions.

#### Key Finding 5: Major section topics not obvious

P4 suggested using tool tips on the homepage to help users quickly and easily determine the subtopics covered within each major section of the app (see Figure 11).



Figure 11. Subtopics of major sections are not obvious.

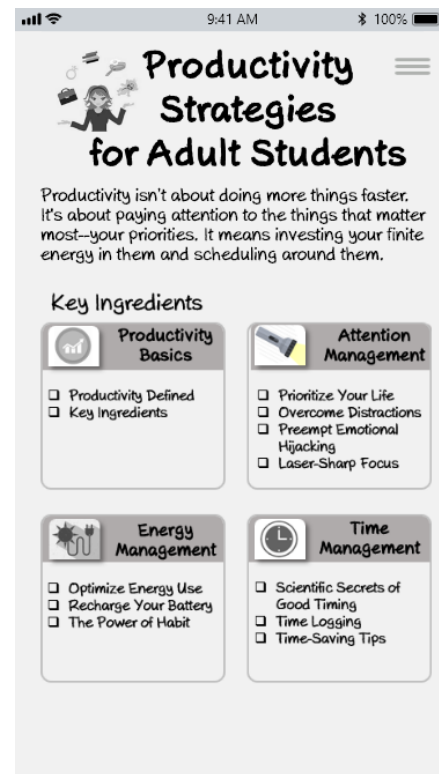


Figure 12. Subtopics of major sections are obvious.

#### Design Solution for Key Finding 5

Since tool tips are not functional on a mobile device, I added a list of subtopics below each major section to increase improve information scent (see Figure 12).

**Key Finding 6: Missing scroll bar**

A scroll bar is not visible (see Figure 13) when using a link to access published Adobe XD prototypes. While in Preview mode within the Adobe editor, the scroll bar does appear, however, I was not comfortable allowing participants to access the editor. After Googling the issue and researching Adobe knowledge bases and discussion boards, I found a myriad of complaints about this, with most commenters incredulous that a company such as Adobe would not provide a scroll bar for a published prototype.

During the task on finding strategies for making the best use of one's energy every day, P3 was unable to get beyond Chronotype Results page to access the strategies. While completing the same task, however, P4 did not mention that the scroll bar was missing, but rather defaulted to using her mouse wheel and was able to successfully complete the task.



Figure 13. Missing scroll bar.



Figure 14. Mock scroll bar added.

### Design Solution for Key Finding 6

I added a mock scroll bar to all long screens (see Figure 14, for an example) to encourage scrolling. My intent was to give users a chance to notice the scroll bar and behave unprompted. If any users did not naturally use their mouse wheel, I planned to instruct them to do so only after learning their initial inclination for interacting with the screen.

### Findings from Round 2 of Usability Testing

Two participants (P5 and P6) took part in round 2 of the usability test sessions. Both participants successfully completed all tasks quickly and easily and had positive impressions of the app before and after interacting with it. Only a few minor issues were experienced, with the finding below assessed as the most noteworthy.

#### Minor Finding 1: Bullet points interpreted as links

P5 and P6 thought the bullet points on the attention management and energy management landing pages were links to their respective subtopics (see Figure 15). Both users tried to click on the bullet points and then, within a few seconds, clicked on it.

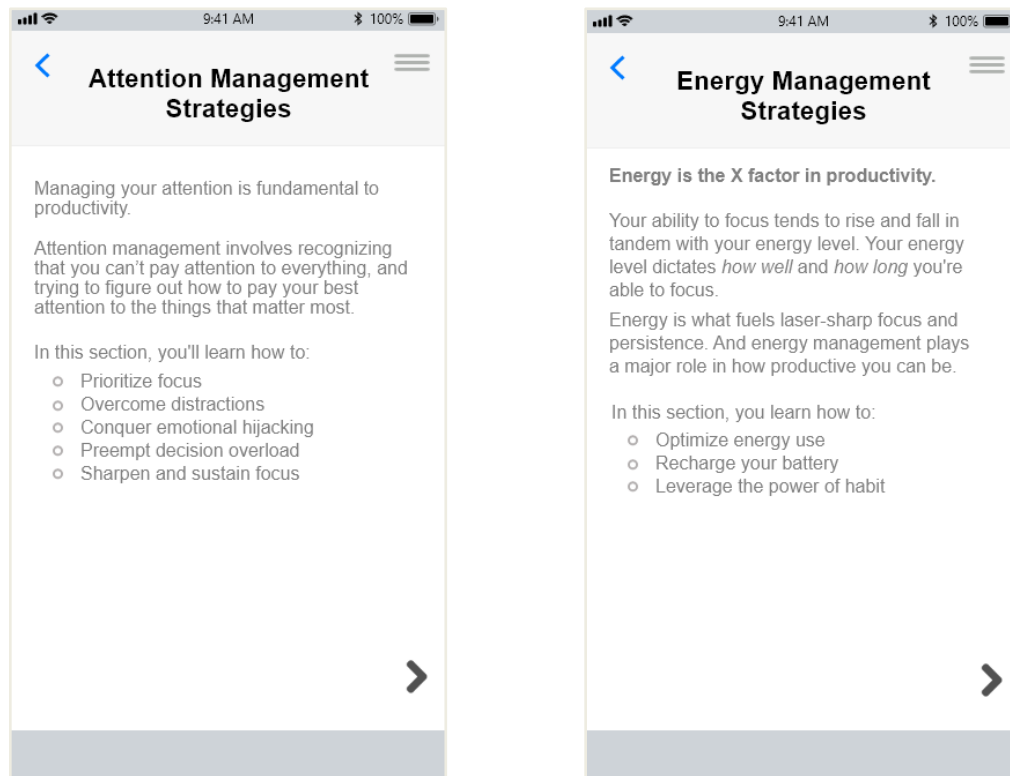


Figure 15. Bullet points interpreted as links.

#### Design Solution for Minor Finding 1

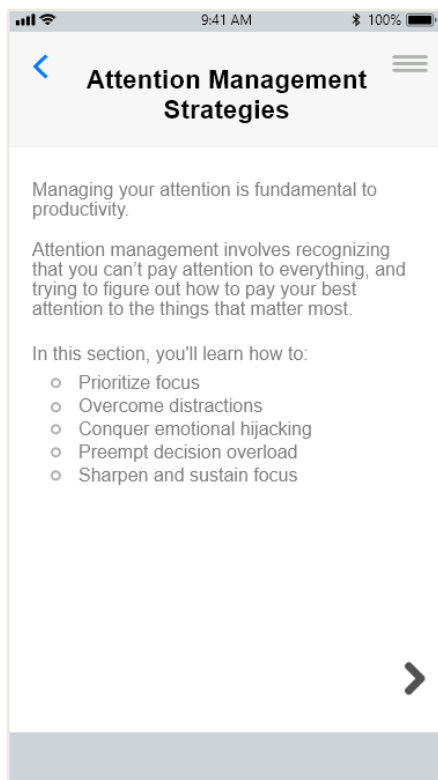
The decision was made to await feedback from other participants.

### Findings from Round 3 of Usability Testing

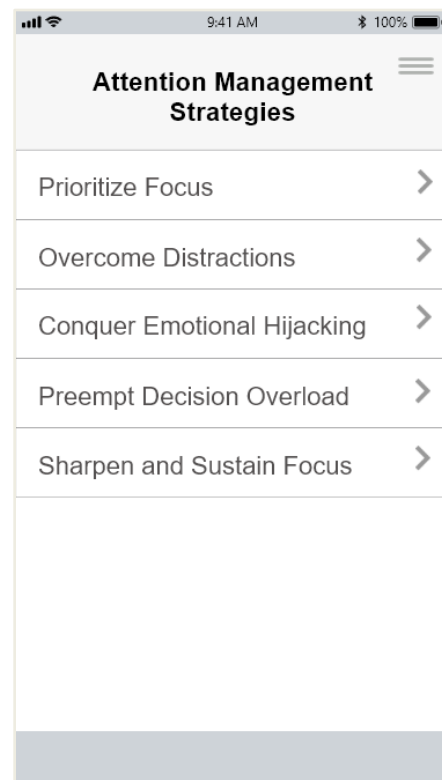
Three participants (P7, P8, and P9) took part in round 3 of the usability test sessions.

#### Key Finding 7: Bullet points interpreted as links (pattern)

P9, a technically savvy individual, commented that she felt inclined to select the bullet points on the landing pages even though she realized they were not links (see Figure 16). In addition, P9 questioned the need for the topics in the bulleted list (see Figure 16) to be repeated on the subsequent menu page (see Figure 17).



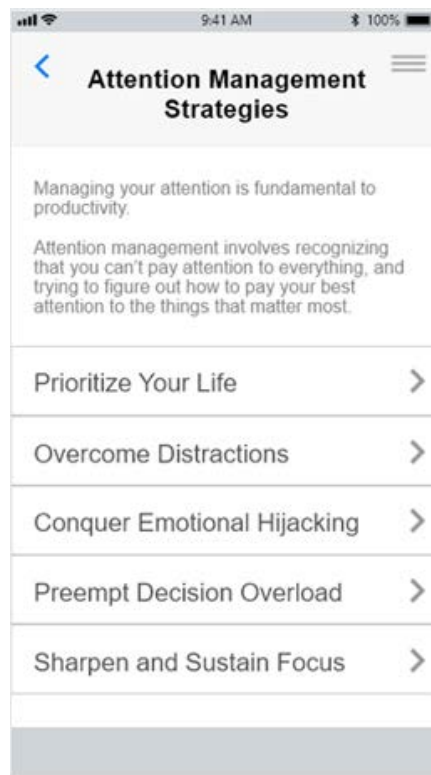
*Figure 16.* Bullet points on Attention Management landing page prompt user interaction.



*Figure 17.* Menu repeats bullet points from landing page.

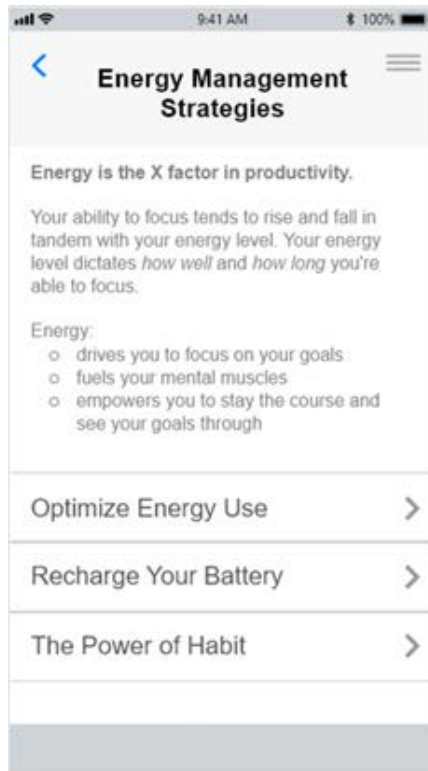
**Design Solution for Key Finding 7**

Now established as a pattern among several users (P5, P6, P9), this issue was promoted from a minor finding to a key finding. To address the issue, I removed the redundancy by replacing the bullet points from the attention management landing page (see Figure 16) with the menu options on the corresponding menu screen (see Figure 17), resulting in the revised screen (see Figure 18). Then I deleted the original menu screen (see Figure 17).

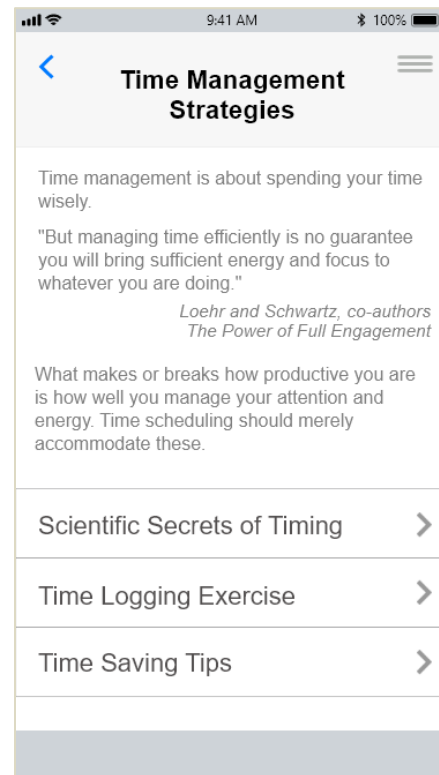


*Figure 18.* Contents of Attention Management landing page and its corresponding menu page are combined.

I applied this same design solution (for Key Finding 7) to the Energy Management page (see Figure 19) and the Time Management page (see Figure 20).



*Figure 19.* Contents of Energy Management landing page and its corresponding menu page are combined.



*Figure 20.* Contents of Time Management landing page and its corresponding menu page are combined.

**Key Finding 8: Font is too playful**

P8 commented that the font on the Welcome page and the Homepage was too playful and not professional (see Figure 21).

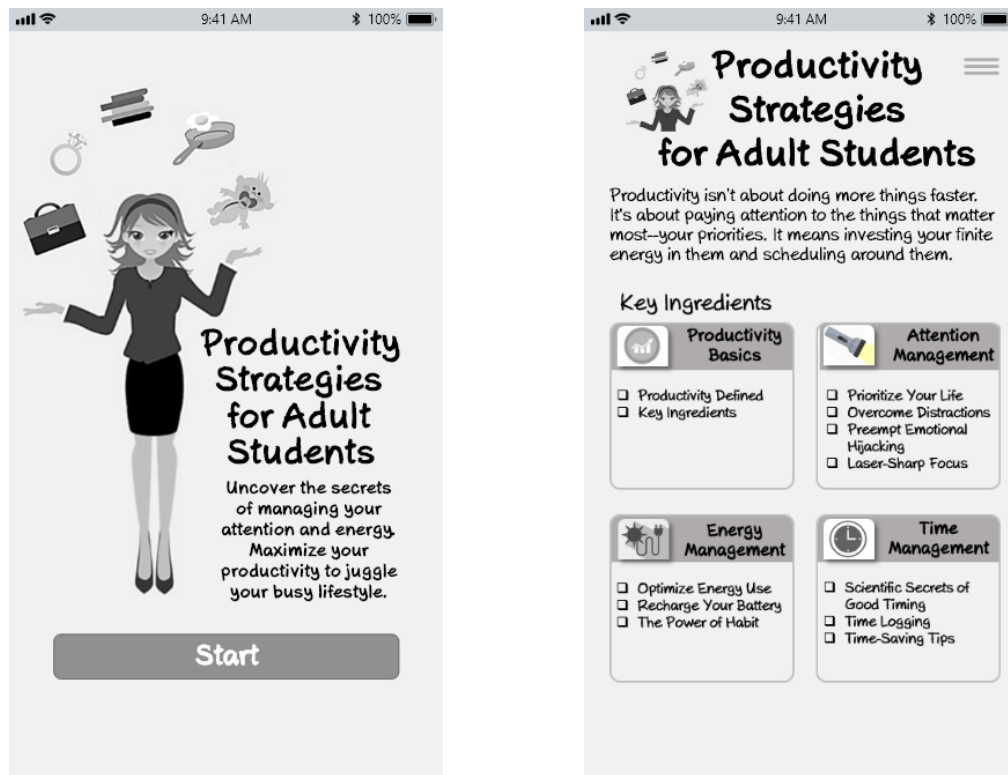


Figure 21. Playful font on Welcome page and Homepage.



**Design Solution for Key Finding 8**

I changed the font type from Axure Handwriting to Century Gothic on the Welcome page and the Homepage to provide a more professional appearance (see Figure 22).

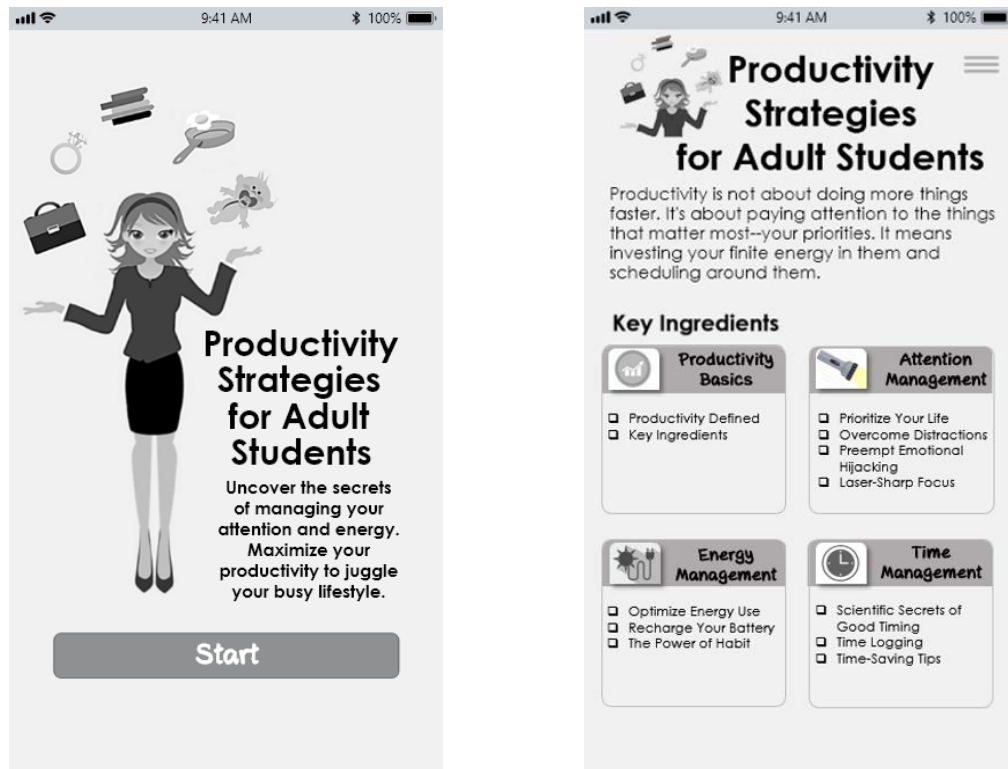


Figure 22. Professional font on Welcome page and Homepage.

### Key Finding 9: Bullet points mistaken for checkboxes

P7 and P8 thought the bullet points on the homepage were checkboxes. These participants said they expected each *checkbox* (bullet point) to appear as checked once these users had completed a section. (see Figure 23).



Figure 23. Bullet points perceived as checkboxes.



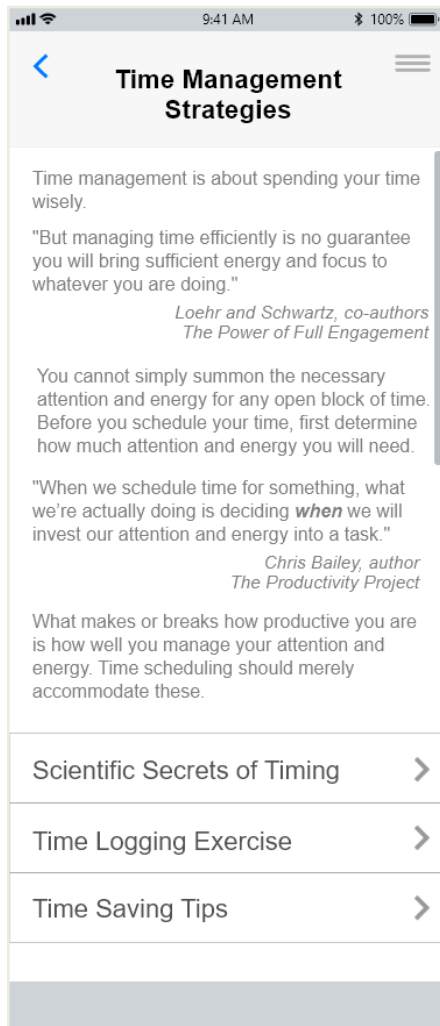
Figure 24. Bullet point type was changed.

### Design Solution for Key Finding 9

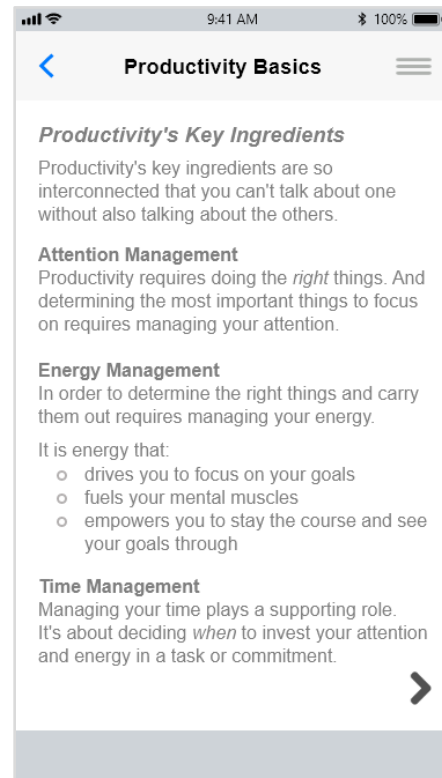
To preempt any further misunderstanding about the purpose of the bullet points, I changed the bullet point type from open rectangles to closed circles (see Figure 24).

**Key Finding 10: Some text-heavy pages**

P7 mentioned that the Time Management Landing page (see Figure 25) and the Productivity's Key Ingredients page (see Figure 26) contained too much text.



*Figure 25.* Text-heavy Time Management Landing page.



*Figure 26.* Text-heavy Productivity's Key Ingredients page.

**Design Solution for Key Finding 10**

I removed extraneous content from the Time Management Landing page (see Figure 27) and Productivity's Key Ingredients page (see Figure 28).

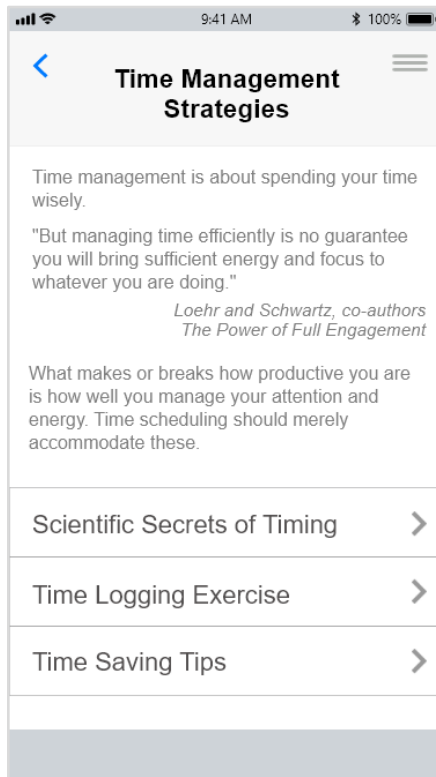


Figure 27. Succinct content on Time Management Landing page.

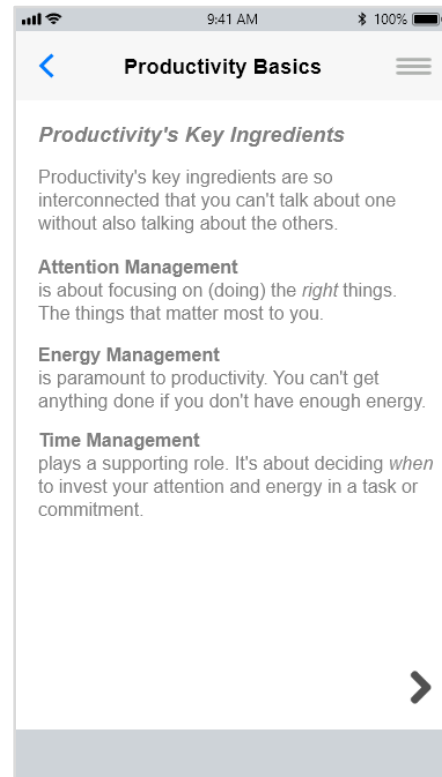


Figure 28. Succinct content on Productivity's Key Ingredients page.

**Key Finding 11: No access to Home and major sections from every page**

P8 mentioned that it would be nice to be able to get to the Homepage and all major sections from any screen within the app. The example below (see Figure 29) shows an empty bottom toolbar. This toolbar appears on all pages except for the Welcome page, the Homepage, and the Side-Drawer Menu page.

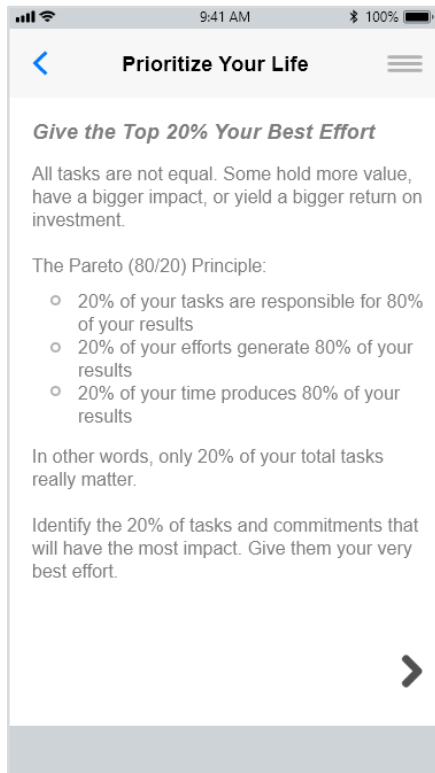


Figure 29. Empty toolbar.

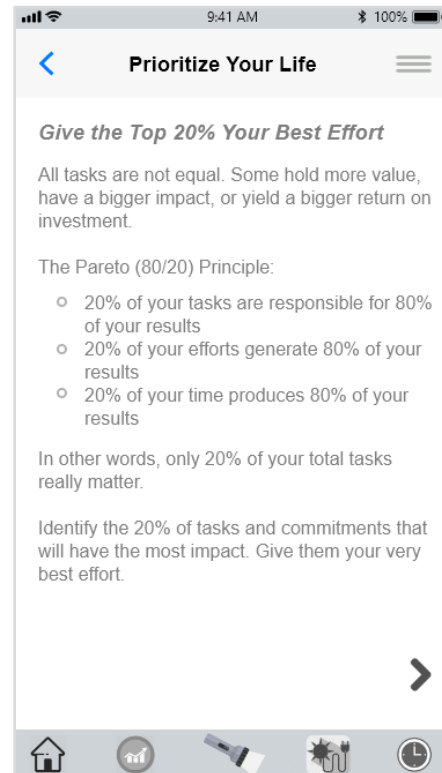


Figure 30. Populated toolbar.

**Design Solution for Key Finding 11**

I created a bottom toolbar containing icons that link back to the Homepage and all major sections within the app (see Figure 30).

**Key Finding 12: No instructions to interact with mapping exercise**

P9 expressed confusion over how to start the interactive mapping exercise (see Figure 31). She noticed there were no specific instructions for how to enter tasks into the time blocks.



Figure 31. No specific instructions for interaction.

**Design Solution for Key Finding 12**

Specific instructions for interaction with the mapping exercise were added (see Figure 32).



Figure 32. Specific instructions for interaction added.

### Key Finding 13: Need for a quicker way to access strategies

Though all three participants were able to find the strategies for prioritization (task 2) and optimizing energy (task 3), they expressed there should be a faster way to get to these strategies.

### Design Solution for Major Finding 13

One or more strategies are included in each page along the prioritization path and along the optimizing energy path. Because the strategies are spread across several pages, I created a single page with a list of those strategies at the beginning of the prioritization path (see Figure 33) and at the beginning of the optimizing energy path (see Figure 34).

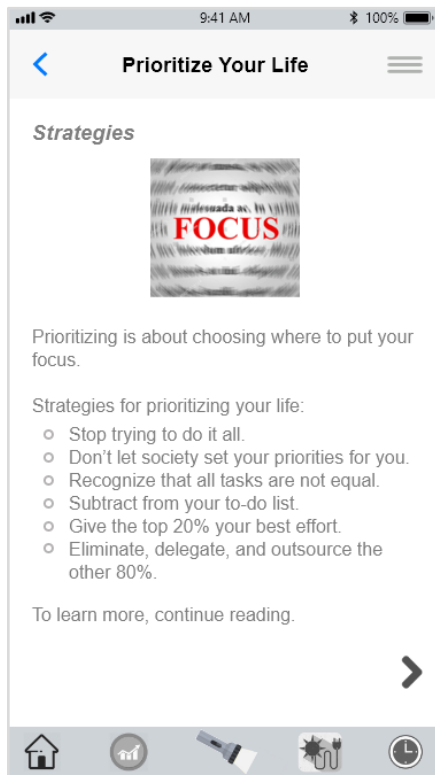


Figure 33. Strategy list for prioritization.

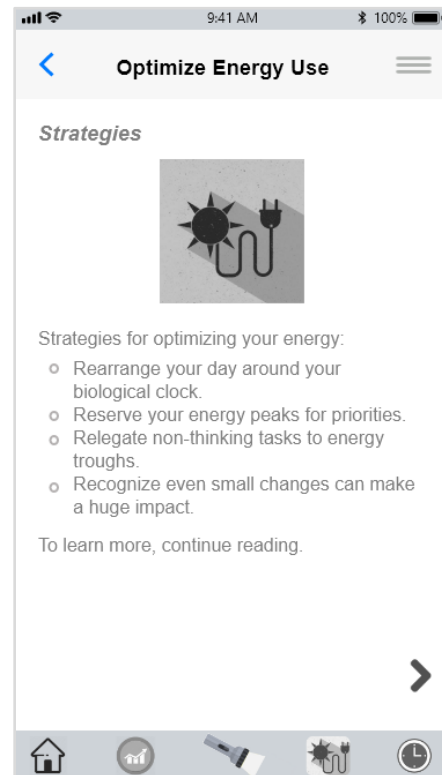


Figure 34. Strategy list for optimizing energy.



### Findings from Round 4 of Usability Testing

Five participants (P10 – P14) took part in the final round of the usability test sessions. Only a few minor issues were mentioned, the most noteworthy of which is included in this section.

#### Minor Finding 2: Color inconsistency for Homepage icons

P10 and P12 found the yellow in the Attention Management section icon on the Homepage distracting, since it stood out from the other grayscale icons (see Figure 35).



Figure 35. Single icon has color.



Figure 36. All icons are grayscale.

#### Design Solution for Minor Finding 2

I removed the color (yellow) from the Attention Management icon, making it consistent with the other grayscale icons on the homepage (see Figure 36).

## Chapter 5: Conclusion

This paper discussed the challenges non-traditional students have faced in attempting to succeed academically while juggling the demands of adulthood. Nontraditional students are characterized as 25 years of age and older, who have delayed enrollment (in an accredited college or university in pursuit of a degree) beyond the year of high school graduation, who also have one or more of the following adult responsibilities: job, spouse, dependents, home. Adding the role of student to an already ample list of major roles, however, has proven quite challenging for many nontraditional students as low rates of persistence and degree attainment bear this out. Providing sound strategies for optimizing a finite amount of time, attention, and energy can bolster their ability to successfully juggle multiple roles and negotiate competing commitments in pursuit of their academic goals. To this end, a review of the literature was conducted from which valuable strategies, guidelines, and insights were uncovered.

The literature revealed that the key ingredients of productivity include attention management, energy management, and time management. Moreover, these key ingredients were found to be so interconnected that they must be managed in concert to successfully juggle multiple roles and responsibilities. The findings also indicated that productivity requires focusing on the right things, fueled by the right energy, at the right time. In other words, the best productivity strategies involved focusing on an individual's highest-priorities, fueled by his capability to pay good quality attention to them, which occurs when his energy naturally peaks during the day, depending on his chronotype.

Attention management refers to the what of productivity and entails choosing what we direct or dedicate our attention toward. Energy management refers to the how of productivity, involves intentionally directing our effort toward something we have deemed worthy, and provides the means by which we are able think clearly and sustain concentration. But to make the most of this limited resource, we must understand our own personal energy patterns and mobilize them to fulfill our goals. Time management

pertains to the when of productivity. Within the context of this paper, time management refers to scheduling the best time—based on one’s chronotype—to attend to a particular task or activity based on its cognitive requirements.

Upon completion of the literature review, I created an initial prototype of a mobile app with the goal of instructing users how to make the best use of a finite amount of attention, energy, and time across competing areas of life in pursuit of their academic goals. Following the design of the initial prototype, a methods and materials section was drafted, which included the study design, the usability test protocol, a plan for recruiting participants, setting up the test environment, and obtaining the necessary test equipment and materials.

While employing an iterative design approach, the prototype underwent multiple rounds of usability testing. Participant feedback from each round informed design decisions for the subsequent version, and through a series of iterations—test, obtain feedback, redesign, and retest—improvements were successively made to the prototype.

### **Study Limitations**

Several research study limitations were noted. The first limitation involved inadvertently facilitating user task completion. Because I instructed participants to look around the app for a couple of minutes at the beginning of the session, they were able to get acquainted with how information was organized, which likely made it faster and easier to find the content required to complete tasks in the subsequent portion of the test.

The second limitation involved the potential for biased feedback due to my pre-existing relationship with users prior to the study. Because all participants were family members, friends, or fellow classmates, their relationship with me may have affected their ability to provide unbiased feedback. To preempt users from giving only positive feedback, I encouraged constructive criticism and explained that pointing out issues was not viewed as a negative, per se, but rather as areas of opportunity from which I could learn and write about in my thesis.

Lastly, is the third study limitation. Due to time constraints, only two task paths of the prototype were fully built and tested. The other paths still require populating the content and adding functionality so users can experience the app in its entirety.

### **Future Research**

This study provides a basis for ongoing research. In future studies, a more fully developed prototype would be required to test additional task paths. Moreover, if there were sufficient time, money, and resources, a diary study to evaluate the impact of adopting the app's strategies within a real-life context could be beneficial. Participants would be instructed to record their daily experiences in a journal as they apply the strategies over a designated period of time. The advantage of this type of study is that it would allow me to gauge or at least shed some light on the extent of improvement possible when applying the app's strategies to juggling a busy lifestyle, rather than merely testing how well users are able to locate information within the app as my current study has done. The strategies I find most intriguing and am therefore most inclined to focus on for a diary study include leveraging energy peaks and troughs based on one's chronotype and integrating the Pulse and Pause Method into one's daily routine. Further research would certainly also require testing individuals outside my social network.

### **Significance**

This study contributed to the existing body of research on non-traditional students in several ways. Most importantly, the study yielded strategies that can help this demographic preempt the main causes of academic attrition, a topic that has yet to be addressed in the literature thus far. In addition, the design of the app's information architecture facilitates content findability, which can increase the likelihood of potential users adopting this tool. Finally, the applicability of the strategies extends beyond the context of the target audience.

**Research addresses a gap in the literature.** Studies confirm that low rates of persistence and degree attainment among non-traditional students stem primarily from challenges inherent with juggling multiple roles and responsibilities, including demand

overload from numerous commitments and role conflict between work, family, and school. Yet, none of the literature I came across addressed how to mitigate these core causes.

Instead, current strategies for college students focus on improving academic skills, such as notetaking, studying, and test-taking as well as on generic advice such as getting enough sleep, eating right, and taking care of oneself. While it can be argued that non-traditional students may be out of practice with their academic skills, this is not the issue that pushes them to the brink of forsaking their educational goals. Moreover, although academic skills do have merit, they must be anchored to a sound productivity system—one that promotes the value and coordination of all three key productivity ingredients. Without the grounding of such a productivity system, students' attempts at applying academic skills can be severely compromised and their efforts may even be rendered futile. For example, it stands to reason that employing good study techniques when we are exhausted, unmotivated, or distracted typically leads to poor results.

Through my research, I have uncovered ways to secure such a foundation to preempt the core causes of non-traditional student attrition. My app helps non-traditional students mitigate demand overload and role conflict by providing strategies to leverage a finite amount of attention, energy, and time across competing areas of life in pursuit of their academic goals. Therefore, my research addresses a gap in the literature.

**Presentation of strategies facilitates user findability.** The mobile app provides a compilation of the best strategies culled from the literature and organized for quick and easy access. To get to these strategies quickly and easily, though, required strategic planning of the app's information architecture. The homepage, for example, was designed to enable users to preview topics contained within each section of the app, so they could quickly determine which path to take. Furthermore, once a path is chosen, a list of related strategies can be found at the beginning of that section. This design decision enables users to quickly scan the content, locate a topic of interest, grasp its meaning, and continue further if interested in obtaining more information about a particular strategy.

During the final version of prototype testing, research participants substantiated that the way in which the app's content was organized and presented helped them find what they were looking for. Additionally, according to most study participants, major topic categories were clearly delineated.

**Applicability of strategies extends beyond context of target audience.** Not only can integrating the app's strategies help non-traditional students with their academic endeavors while they are enrolled, it can also help them build fundamental productivity skills that last a lifetime. In addition, although the app was intended for non-traditional students, it is not exclusive to them. Certainly, anyone interested in learning how to better manage a busy lifestyle could also find the strategies beneficial.

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## Appendix A: Participant Screener

The participant screener is a questionnaire used to determine the eligibility of individuals to participate in the study. The screener contains questions regarding the possession of non-traditional student characteristics. The screener was administered over the telephone.

1. Participant Name: Please state your full name.
2. Age: What is your age?
  - $\leq 24$
  - $\geq 25$
3. Education: Are you currently enrolled in an accredited college or university?
  - Yes
  - No
4. Education: Are you currently pursuing a college degree?
  - Yes
  - No
5. Education: Did you delay enrollment in college by one or more years after high school graduation?
  - Yes
  - No, I began college within a year of my high school graduation
  - No, I did not attend college
6. Employment Status: Are you employed while enrolled in college?
  - Yes.
  - No, I am not employed.
  - Not applicable: I am not enrolled in college.

7. Employment Status: Are you currently...?
  - Employed part-time
  - Employed full-time
  - Not applicable
8. Financial Status: Are you currently financially independent of your parents or caretaker(s)?
  - Yes
  - No
9. Financial Status: Are you financially responsible for your home (apartment, condo, house)?
  - Yes
  - No
10. Parental Independence: Are you living apart from your parents or caretaker(s)?
  - Yes
  - No
11. Marital Status: What is your marital status?
  - Single
  - Married or domestic partnership
  - Divorced, separated, or widowed
12. Dependents: How many dependents are you currently responsible for? (Note: This can include taking care of a child, an elderly person, a disabled person, or person in poor health.)
  - 0
  - 1
  - $\geq 2$

## Appendix B: Participant Informed Consent Form

Participant informed consent forms were emailed to each eligible individual. The forms were signed and returned to me via email prior to user participation in the study.

I am being asked to be part of a research study. The purpose of this study is to obtain feedback that can be used to improve the next version of the prototype. My part in this study will last 30-45 minutes. The purpose of this study is to obtain both positive and negative feedback on the prototype to inform the researcher's design decisions for improving the usability of the proposed product. I understand that being part of this study is not harmful. I know that I can stop being a part of this study at any time.

With my permission, the researcher would like to record the interview and test session via remote web conferencing software to capture valuable feedback that can be used to improve subsequent versions of the prototype. This entails recording audio of my voice and video of my onscreen interaction with the prototype. My image will not be captured during the recording. I understand that my name will not be shared if the results of this study are published. My identity will not be disclosed in any report.

For video recordings:

- Yes, I give permission to use images of my screen in scientific publications.
- No, I do not give permission to use images of my screen in scientific publications.

For audio recordings:

- Yes, I give permission to use my voice in scientific publications.
- No, I do not give permission to use my voice in scientific publications.

Suzanne Royer has answered all my questions about being in this study. If I have any more questions, I can contact Suzanne Royer at [suzanne.royer@ubalt.edu](mailto:suzanne.royer@ubalt.edu) or 703-751-1446. For questions about my rights as a participant in this research study, I can

contact the head of the University of Baltimore Institutional Review Board at 410-837-6199, irb@ubalt.edu.

I understand the study described above. And I agree to participate in this study. I am 18 years of age or older.

---

Participant's Signature

---

Date

## Appendix C: User Instructions for Zoom Meeting

Instructions were emailed to each participant two days prior to the test date. The text below is the content of that email message.

Hello <participant name>,

Here are the instructions to set up for the user testing session.

*The Day Before the Meeting:*

Please download the Zoom web conferencing software the day before the meeting.

1. Install Zoom on a desktop computer (PC or Mac): <https://zoom.us/support/download> or [https:// zoom.us/download2](https://zoom.us/download2)

*The Day of the Meeting:*

2. I will call you at your home telephone number: ###-###-####. The telephone will be used as backup until I have confirmed you are connected to Zoom.

3. Here is the meeting information:

Topic: User Research Testing Session

Date: MM-DD-YYYY

Time: ##:## a.m./p.m. Eastern Time

Meeting Link: <https://zoom.us/#####>

Meeting ID: ###-###-###

4. Once you have joined the meeting, I will email you a link to the prototype.

Please copy and paste the link into a different browser. Do not click on the link inside the email as that may skew the way the prototype looks and functions.

5. Then, from Zoom, I will show you how to share your screen and turn on your audio.

Thank you,

Suzanne G. Royer



## Appendix D: Test Script

Thank you for agreeing to take part in my research study. My name is Suzanne Royer, and I am currently a graduate student in the University of Baltimore's Interaction Design and Information Architecture program.

I will be recording this session to ensure I do not miss any details, and to review later. Do I have your permission to record this study?

My objective is to observe you using a mobile app prototype, and to get feedback on what works and what does not work with the design.

During the session, I will be working from a script to ensure that my instructions to everyone who participates in the study are the same.

I will start by asking you a few questions to get some basic demographic information. Then I will give you some specific tasks to complete, and I will observe you as you do them. After each task, I will ask you a couple of questions about your experience doing the task using the mobile app. At the end of the session, I will ask you about your impressions.

As you go through the tasks, please try to do whatever you would normally do. Please try to think out loud while you are working. Tell me whatever is going through your mind. Your thought process is very important to me.

Also, please understand that I am not testing you. This is an evaluation of the product, not your performance. There is no such thing as a wrong answer. I am interested in learning what works for you and what does not work for you. So, please share your honest feedback. I need to know exactly what you think, and not what you think I want to hear. You will not hurt my feelings if you do not like something you see. I am looking for both positive and negative feedback. Please keep in mind: It is you who is helping me evaluate this mobile app design, and I value your input. Constructive negative feedback is not viewed as a mistake, per se, but rather an opportunity for me to learn.

The whole session will take about 30 minutes. Do you have any questions before we begin?

Appendix E: Demographic Questionnaire

The pre-task interview included a demographic questionnaire.

1. Participant Name: Please state your full name.
2. Age: What is your age?
  - 25 – 29
  - 30 – 39
  - 40 – 49
  - 50 – 59
  - $\geq 60$
3. Ethnicity: What is your ethnicity?
  - White
  - Hispanic or Latino
  - Black or African American
  - Native American or American Indian
  - Asian / Pacific Islander
  - Other
4. Gender: What is your gender?
  - Male
  - Female
  - Other
5. Education: What is the highest degree or level of school you have completed?
  - High school graduate, diploma or equivalent (GED)
  - Some college, no degree
  - Trade / technical / vocational training
  - Associate degree

- Bachelor's degree
  - Master's degree
  - Doctorate degree
6. Employment Status: Are you currently...?
- Employed part-time
  - Employed full-time
  - Out of work and looking for work
  - Out of work but not currently looking for work
  - A homemaker
  - Retired
  - Unable to work
7. Technology: Do you use any of the following devices on a regular basis?
- Desktop or laptop computer
  - Tablet
  - Smartphone
8. Technology: How would you describe your experience with technology?
- Novice
  - Intermediate
  - Expert
9. Technology: How would you describe your experience with mobile apps?
- I am not familiar with them.
  - I have heard of them but have never used them.
  - I use them occasionally, but it is a challenge.
  - I use them occasionally and they are easy for me to use.
  - I use them often.

10. Marital Status: What is your marital status?

- Single
- Married or domestic partnership
- Divorced, separated, or widowed

11. Dependents: How many dependents are you currently responsible for? (Note: This can include taking care of a child, an elderly person, a disabled person, or person in poor health.)

- 0
- 1
- 2
- $\geq 3$

12. Household Responsibilities: What percentage / share of household chores are you responsible for?

- 0%
- 1 – 24%
- 25 – 49%
- 50 – 74%
- 75 – 99%
- 100%

Appendix F: Task List and Pre- and Post-Task Interview Questions

Pre-task interview questions: Users were instructed to look at the welcome screen and the homepage and were then asked the following questions:

- What is your initial impression of the app?
- What do you think the purpose of the app is?

Task list: The study tasks included:

1. Look around the app for a couple of minutes.
2. Does the app have any advice on priorities?
3. Find some advice on how to make the best possible use of your energy every day.
4. Try to get back to the homepage.

Post-task interview questions: Having completed the tasks using the app prototype, participants were asked the following questions:

- What are your final thoughts and impressions of the mobile app?
- Can you recall any aspects of the app that you liked?
- Were there any aspects of the app you found confusing?
- Were there any aspects of the app you found frustrating?