



Published in final edited form as:

Trends Biochem Sci. 2022 April ; 47(4): 279–283. doi:10.1016/j.tibs.2021.12.010.

Time management for STEMM students during the continuing pandemic

Sandra A. Murray^{1,7,@}, Jamaine Davis^{2,@}, Haysetta D. Shuler^{3,@}, Elsie C. Spencer^{4,8,@,*}, Antentor Hinton Jr.^{5,6,8,@,*}

¹Department of Cell Biology, University of Pittsburgh, Pittsburgh, PA 15261, USA

²Department of Biological Sciences, Winston-Salem State University, Winston-Salem, NC 27110, USA

³Department of Biochemistry, Cancer Biology, Neuroscience and Pharmacology, Meharry Medical College, Nashville, TN 37208, USA

⁴Teachers College, Columbia University, New York, NY 10027, USA

⁵Department of Molecular Physiology and Biophysics, Vanderbilt University, Nashville, TN 37232, USA

⁶Hinton and Garza Lopez Family Consulting Company, Iowa City, IA 52246, USA

⁷First author.

⁸Co–senior authors.

Abstract

One of the biggest obstacles to success is a lack of practical time management skills. Here, we provide suggestions on how to optimize time management.

Introduction

Many factors contribute to the academic success of students in science, technology, engineering, math, and medicine (STEMM). One important factor is time management, and lack of time management is a major impediment to student success [1,2]. Multiple articles discuss effective time management. However, here we focus on the skills that students, particularly those in STEMM, need to successfully employ to manage their time. STEMM students must develop skills that enable them to solve problems, such as the coronavirus disease 2019 (COVID-19) pandemic and the response of those in STEMM research to address this pandemic and its subsequent vaccine development. For STEMM students to enter, thrive, and be innovative in their future careers, they must possess excellent time management skills. We provide methods, resources, and strategies to help students better

*Correspondence: ecs2221@tc.columbia.edu (E.C. Spencer) and antentor.o.hinton.jr@vanderbilt.edu (A. Hinton).

@Twitter: @murraysister (S.A. Murray); @jscdavis (J. Davis); @PStrengthen (H.D. Shuler); @Elsielacubana (E.C. Spencer); @phdgprotein86 (A. Hinton Jr.).

Declaration of interests

The authors declare that they have no competing interests.

manage their time, which requires clear goal setting and proper time allocation to complete tasks. We begin by discussing goal setting followed by time management. Offering our combined experience in mentoring and training STEM students and our time management skills, we direct our comments to students.

Goal setting

Goals are blueprints for your future that impact success and life satisfaction. To be successful, setting long-term goals such as career goals (e.g., What do I want to do with my life?) and short-term goals (e.g., What do I want to do today?) are important steppingstones to achieving long-term aspirations (Table 1). A career goal should be your own rather than a path guided by another person's hopes for you. While this may seem obvious, students often select goals based on other people's suggestions. For instance, your mother may want you to be a physician, or your teacher may see a PhD in your future, while your friends may want you to join their career path. They all may have your best interests in mind; however, if these are not your aspirations, you will be unhappily working toward a dream that isn't yours until you finally admit that this is not the career you want to pursue. It is important to recognize what you want, which requires you to be honest and commit to your future. Thinking about who you are, what you like, and what makes you happy will help to clarify your goals. Also, identify careers that you will enjoy that will also provide sufficient income and opportunities to live well and contribute to society. Introspective goal choices will help focus your priorities, leading to better time management and success reaching and succeeding in your future career goals.

Manage your time

Many students struggle to balance time between academics, work, and other obligations, which may reflect poor planning and an inability to effectively prioritize time [3,4]. Categorizing tasks and establishing priorities will improve your planning and project management success and contribute to effective time management.

Often, you are too busy studying and taking care of outside commitments to accomplish every task on your endless to-do list. At the end of a day, we tend to focus on uncompleted tasks rather than on completed tasks, which leads to feeling overwhelmed and anxious. If this occurs daily, it can increase stress and decrease academic and work performance [1]. Stress creates an unproductive cycle that saps your energy and time and compromises your mental acuity. You can break this cycle by learning to properly manage time instead of allowing time to manage you. One effective method for managing tasks is the Eisenhower Matrix (Table 1) [5].

The Eisenhower Matrix

Successfully managing multiple tasks requires prioritization. The Eisenhower Matrix prioritizes tasks by categorizing them based on urgency and importance (Figure 1A). Tasks that are both urgent and important are completed first, while nonurgent and unimportant tasks are last. As a deadline approaches, a task in one matrix box may need to be moved to another. For example, washing underwear may be considered neither urgent nor important

if you have a drawer filled with clean underwear. However, in time, this task becomes both urgent and important as you run out of clean underwear.

While some things may be dropped from the matrix, you typically need to work on tasks in all four matrix boxes. When your energy is low, work on nonurgent or unimportant things. However, when energy is high, tackle urgent and important tasks. Ideally, work on the nonurgent but important box, especially if you have many obligations to juggle. One benefit of completing an important task before it becomes urgent is that there is time to get feedback from peers and instructors before the deadline. Accomplishing a task and meeting deadlines requires that you understand what must be done and allocate sufficient time to complete it.

Time allocation and deadlines

Effective time allocation requires that you know when tasks are due. Deadlines serve as a checkpoint and an effective tool to stay on task, thus preventing you from falling behind in project planning and execution. As a deadline approaches, tasks become daunting, and anxiety may take over. With limited time, planning stops; you rush to complete the task, cut corners, and overlook details; and inevitably this leads to suboptimal performance and unsatisfactory results. As the due date approaches, an important/urgent task demands your attention regardless of your energy or stress level. Ideally, allocate time in advance to ensure that tasks are completed before becoming urgent. A calendar indicating deadlines and a to-do list are valuable tools to help allocate time and complete tasks.

Making the to-do list

The common time management to-do list [6] may seem unnecessary when important tasks are looming as you know they will be easy to remember. However, a to-do list is more than just a reminder of upcoming events; it also helps you examine and prioritize activities to be accomplished before beginning an upcoming task. For example, you may consider whether to prioritize an extremely important project due in a few weeks or a less important task due in a few days. Awareness of your tasks also encourages you to categorize them, such as those necessary for your coursework or job versus those necessary for upkeep of your house or social life. Such priorities also help you to say no [7] before placing a task on your to-do list or into a matrix box (see Table 1 for organizational apps and artificial intelligence).

To-do lists allow you to integrate your home, school, and work lives, which will help you to retain a sense of identity and balance. A to-do list should be specific, defining every task, and should be reviewed and edited every morning or evening [6]. Breaking to-do list tasks into smaller subtasks will make it easier to start and complete these projects. Mentors can be particularly helpful when learning to identify roadblocks to success [8].

The calendar as a tool

Here we describe tips on calendar use, based on Fiore's (1980) concept of 'time mapping' (Figure 1B) [9]. We suggest using a calendar with 7 days of the week, each day divided into 60-minute time slots. Seeing the entire week and 4 weeks in the month can help you manage activities and complete assignments with less stress. A feeling that there is infinite time to complete a task causes procrastination. Therefore, draw a line on the calendar indicating

the time that you will stop working every day. Sometimes, you will need to work past the marked time, but do not make that a habit. Cross out times on the calendar when you will be unavailable to work on tasks (e.g., class, gym, and mealtimes). Just seeing how much or little time is available to complete tasks will significantly improve your time management. Also, add deadlines to your calendar and allow sufficient time to complete important tasks before they become urgent.

Now that you have the calendar set, add your tasks. But first add some fun stuff! Adding nonwork personal recreation and social activities to the calendar will encourage you to complete your important tasks (Figure 1B, green). We suggest three calendar methods that can be used alone or together to complete tasks: (i) scheduling, (ii) ‘unscheduling,’ and (iii) logging. For scheduling, identify one to three tasks you want to complete, and add them to open slots on your calendar (e.g., writing a term paper introduction; Figure 1B, yellow). Scheduling tasks increases the probability that you will work on them, keep that time slot reserved to complete the tasks, and decline other obligations. Unscheduling is the process of rewarding yourself for completing a task by adding a bright color (Figure 1B, red) on your calendar. For example, when you write the term paper introduction, add a bright color to your calendar. Psychologists have shown that seeing a bright color that you like on your calendar is an incentive that increases the will to continue working. In the third method, logging, you keep a log of your time to analyze time usage. You might be surprised how much time you spend chatting, texting, or emailing rather than working. You also might identify times of the day when you are most productive, which can be used to match tasks to your energy levels.

Concluding remarks

Effective time management requires you to identify and analyze your goals, effectively plan and manage projects, and properly allocate time. Ineffective time management not only hampers productivity, making it difficult to meet deadlines, but also disrupts your work–life balance. Work–life balance issues can disrupt your research and cause some trainees to leave the pipeline [10]. Work–life imbalance can also damage your professional reputation and increase stress [11]. In contrast, effective time management leads to efficiency and productivity. The strategies discussed here will help you achieve better planning and organization, resulting in reduced stress [11], improved judgment, and a better professional reputation. Being organized, efficient, and meeting deadlines will establish your reputation as a competent and dependable professional and lead to exciting career opportunities and advancement.

Acknowledgments

We thank Heather Beasley for helping make the figure in BioRender. We also thank Kit Neikirk for assistance with editing and formatting of the paper. This work was supported by the UNCF/BMS EE Just Grant Faculty Fund, Burroughs Wellcome Fund CASI Award, Burroughs Wellcome Fund Ad-hoc Award, NIH SRP Subaward to 5R25HL106365-12 from the NIH PRIDE Program, DK020593, Vanderbilt Diabetes and Research Training Center for DRTC Alzheimer’s Disease Pilot & Feasibility Program and A.H.J. NSF grant MCB 2011577I and NIH T32 5T32GM133353 to S.A.M.

References

1. Adams RV and Blair E (2019) Impact of time management behaviors on undergraduate engineering students' performance. *SAGE Open* 9 215824401882450
2. Parke MR et al. (2018) When daily planning improves employee performance: the importance of planning type, engagement, and interruptions. *J. Appl. Psychol* 103, 300–312 [PubMed: 29154579]
3. Stemmler D (2019) *Time Management Secrets for College Students: The Underground Playbook for Managing School, Work, and Fun!*, College Success Academy Press
4. Cullman R (2013) *Mastering Time Management and Creating Success and Abundance by Giving to Others*, CreateSpace Independent Publishing Platform
5. Tool S (2019) *The Eisenhower Matrix: Task Management Through Notebook, Distinguish Between Urgent & important Tasks, Make Real Progress in Your Life, Eisenhower ... Your Own Professional Development Plan*, independently published.
6. Allen D (2003) *Getting Things Done: The Art of Stress-Free Productivity*, Penguin
7. Hinton AO et al. (2020) The power of saying no. *EMBO Rep.* 21, e50918 [PubMed: 32596868]
8. McReynolds MR et al. (2020) The art of virtual mentoring in the twenty-first century for STEM majors and beyond. *Nat. Biotechnol* 38, 1477–1482 [PubMed: 33273732]
9. Fiore N (1980) *The Now Habit: A Strategic Program for Overcoming Procrastination and Enjoying Guilt-Free Play*, Penguin Random House
10. Hinton AO et al. (2020) Patching the leaks: revitalizing and reimagining the STEM pipeline. *Cell* 183, 568–575 [PubMed: 33125882]
11. Rolle T et al. (2021) Toxic stress and burnout: John Henryism and social dominance in the laboratory and STEM workforce. *Pathog. Dis* 79, ftab041 [PubMed: 34410372]
12. Ballantyne C (2012) *How to Set Goals: Ultimate Goal Setting Guide to Having Your Best Year Ever*, Early to Rise Publishing
13. Bolles RN and Brooks K (2021) *What Color Is Your Parachute? Your Guide to a Lifetime of Meaningful Work and Career Success (50th Anniversary ed)*, Ten Speed Press
14. Ziglar Z (2019) *Goals: How to Get the Most Out of Your Life*, Sound Wisdom
15. Marku A (2019) *The Art of Setting Smart Goals: Set Winning Goals and Live a Life of Abundance, Success and Achievement by Success and Achievement*, Amazon Digital Services
16. Linda A (2001) *What's Holding You Back*, Basic Books
17. Ambrose D (2006) *Making Peace With Your Work: An invitation to Find Meaning in the Madness*, Expert Publishing

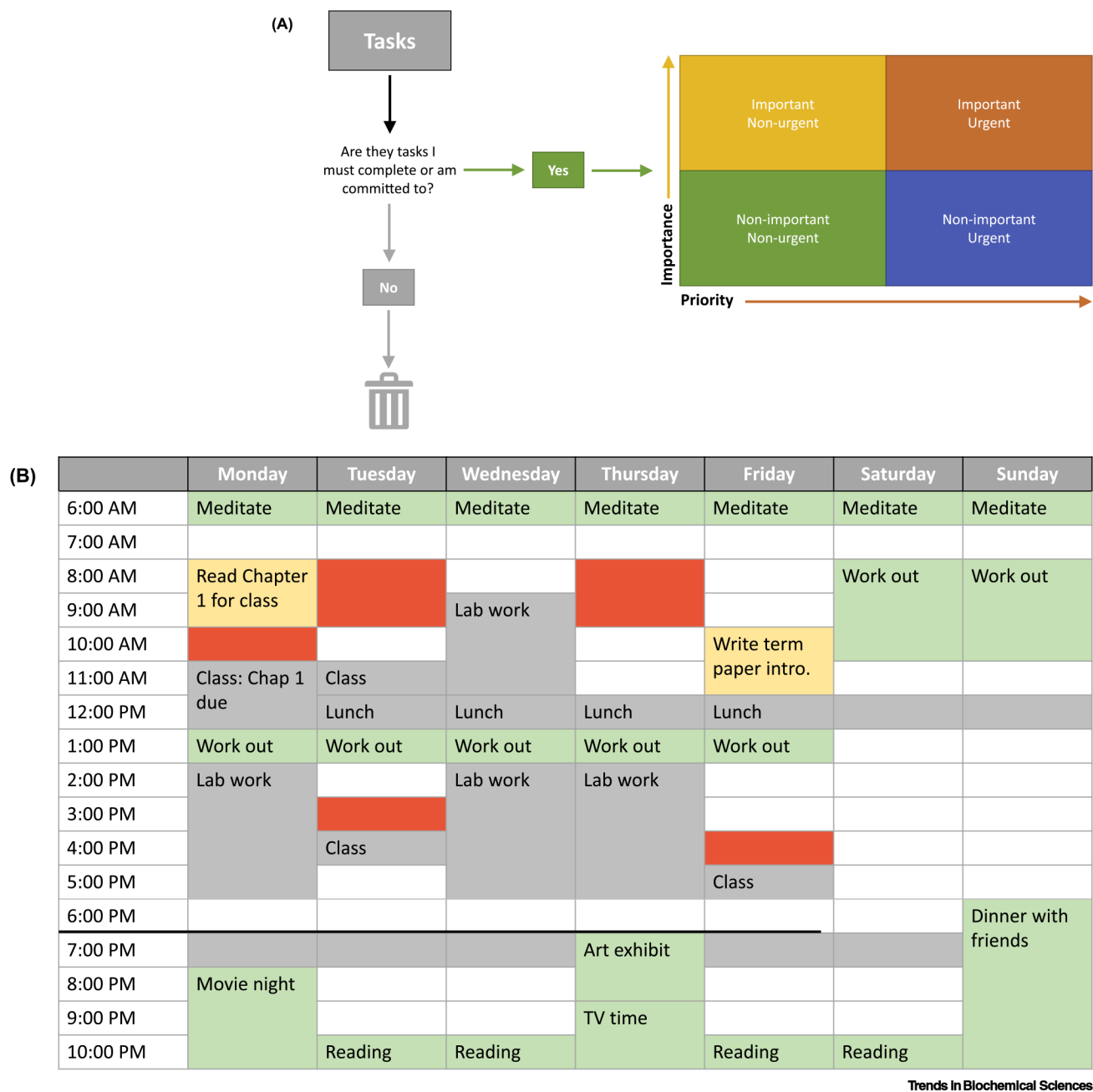


Figure 1. Task priority matrix (A) and calendar (B) as time management tools.

(A) To prioritize the tasks using the matrix, each task should be categorized based on its urgency and importance. Tasks that are both urgent and important will need to be done first. However, try to work on tasks before they are in the urgent and important box. The use of a calendar will help you keep track of deadlines so that tasks do not become urgent. (B) Examples of scheduling (yellow timeslots) and unscheduling (red timeslots) are demonstrated on a calendar that has been set up by graying out slots for times during the day when you will be unavailable to work on tasks because of other obligations. A line has been drawn to indicate the time when work will stop every day, and fun activities (green

timeslots) have been added to increase the probability that you will complete important tasks while enjoying a well-balanced life. Use of a calendar to allocate your time can increase your productivity and the probability of completing tasks and help you to use time rather than lose time.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Table 1.

Goal-setting resources

Resource	Description	Refs
How to set goals	Match what you do to what you want in life	[12]
What color is your parachute?	Match who you are to careers	[13]
Goals: how to get the most out of your life	Set goals for balanced life	[14]
The art of setting SMART goals	Goal setting	[15]
Strong interest inventory assessment	Match who you are to a career	https://www.themyersbriggs.com/en-US/Products-and-Services/Strong
Individual development plan	Set future goals and career path	https://myidp.sciencecareers.org
Myers-Briggs type indicator	Assess your personality type	https://www.myersbriggs.org/my-mbti-personality-type/mbti-basics/
InterSECT job simulations	Real-to-life job simulations	https://intersecjobsims.com/library/
What's holding you back? and Making peace with your work	Set clear goals, reach and risk failure, believe in yourself!	[16,17]
Apps		
App name	Purpose	Download
Rescue Time	Use (not lose) time	https://www.rescuetime.com
Remember the Milk	Task management	https://www.rememberthemilk.com
Todoist	Digital to-do list. helps prioritize, add deadlines	https://todoist.com/downloads
Focus Keeper	Stop procrastinating and get stuff done	https://apps.apple.com/gb/app/focus-keeper-time-management/id867374917
MindNode	Focus and get stuff done	https://www.mindnode.com/download
Focus@Will	Music and neuroscience to increase focus	https://www.focusatwill.com
Forest	Grow virtual trees to increase focus and get stuff done	https://www.forestapp.cc
Trello	Put task on cards and shift cards to get it done	https://trello.com/en-GB/platforms
Quire	Work in a team to get stuff done	https://quire.io
Evernote	Put all reminders in one place to get stuff done	https://evernote.com/download
MyLifeOrganized	Decide how to get stuff done	https://www.mylifeorganized.net/todo-list-windows.shtml
IPassword	Application for storing passwords to save time	https://1password.com/downloads/mac/
Eisenhower Matrix	Matrix for prioritizing tasks.	https://www.eisenhower.me/
Priority Matrix	Matrix for prioritizing tasks when working in a team	https://sync.appfluence.com/manage/downloads/
Focus Matrix	Prioritize task: focus on the important and drop or delegate the rest	https://apps.apple.com/us/app/focus-matrix-task-manager/id1087284172?mt=12
Pocket	Put web stuff in a 'pocket' for later and tackle important tasks now	https://getpocket.com/en/

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Resource	Description	Refs
Artificial intelligence		
Resource	Description	
Alexa Echo Devices	Personal assistant	
Google Home	Personal assistant	