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Chapter 5- Structure for Success: Incorporating Habits of Mind Into Online Courses

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Interest and participation in online courses in higher education has grown significantly over the past decade (Palvia et al., 2018). This growth was further amplified due to the increased online course options offered during the years of the Covid-19 pandemic. Data from the Integrated Postsecondary Education Data System indicates that about 73% of students were enrolled in a distance education course in the fall of 2020 as compared to about 36% in 2019. Even as pandemic restrictions eased, student enrollment in online courses remained high, with 59% of students enrolled in at least one distance education course in the fall of 2021.

Online courses provide increased accessibility, convenience, and flexibility as compared to their face-to-face counterparts, and these are often determining factors that lead students to choose this course-delivery method. Simultaneously, the asynchronous course format frequently proves challenging to students with respect to persistence, striving for accuracy, and metacognition.

My introductory college course, *CHEM 1010: Introductory Chemistry*, is a breadth physical science course. It is offered as an asynchronous online course with enrollments of up to 300 students per semester. Taken primarily by non-science majors to fulfill a general education requirement, students in *CHEM 1010* vary greatly in their

backgrounds; many students are just beginning their college education, while others are adult learners returning to the classroom after an extended break. As such, while *CHEM 1010* focuses on chemistry as the content, an instructor must also teach students from such wide backgrounds how to be successful learners, especially in an asynchronous environment. Therefore, some of the biggest challenges for the instructor of a large, asynchronous online course is how to balance requiring accountability from students, while also providing much-needed flexibility, as students are often balancing multiple courses, jobs, and other responsibilities. This requires fostering the development of students as learners by integrating and encouraging the Habits of Mind that will allow them to be successful both in the current course and in their future endeavors.

In this chapter, I elaborate on lessons learned over semesters of teaching *CHEM 1010*. The incorporation of evidence-based practices to create structure and encourage autonomy in an online course provides students with clear expectations and allows them to develop confidence in how they approach the course. Rather than individual assignments, I emphasize elements interwoven throughout the overall course design that promote the expansion of metacognitive skills, that help students strive for accuracy, and that encourage persistence in the online course environment.

Be Transparent

One of my initial goals in *CHEM 1010* is to ensure that students are aware of the course structure prior to the semester beginning and before committing to the course. Current learning-management systems provide a great deal of flexibility to instructors with respect to how they set up their courses. This flexibility often leads to a lot of variation in the way that classes are set up across the university (and even within departments). Because of the variability in online course configuration and design, supporting persistence in my online course begins with transparency with respect to both course design and expectations. It is a mistake to assume that these learners are familiar with educational terminology or the structure of one's class. In addition to transparency and expectation-setting being demonstrated to reduce student stress, this is a valuable way to embrace more inclusive and equitable teaching from the

beginning of the class (Hogan & Sathy, 2022).

Approximately a week before the start of each semester, I send students an email welcoming them to the class and inviting them to explore the online course. They are encouraged to read the syllabus and to watch a course introduction video that outlines the purpose and structure of the class. Both the video and syllabus provide details about the key features of the course to help clarify expectations. This introduction also aims to uncover the unwritten rules for academic success and to avoid hidden curriculum often inferred in the context of cultural norms and expectations. Clear expectations have been shown to benefit all students but are even more beneficial for students from underrepresented groups, like first-generation college students (Eddy & Hogan, 2014).

Included in my introductory video is the course designation and a short description of how this course fits into the general education framework of the degree, something that not all students will be familiar with at the start of their academic career. Additionally, my course is asynchronous and semi-self-paced, and I define these terms for my students. Within my introduction, I outline the expected time commitment for an online course and elaborate on how these hours should be distributed among the different components of the course. As a former high school educator, I am aware that the transition from the high school setting to the higher education classroom can be unfamiliar and challenging for new students. In high school, students are used to doing most of their learning in the classroom, while in higher ed, learning is more evenly distributed between hours spent in class and hours spent outside of class. In my experience, my students have found it valuable when I explicitly explain this difference. Furthermore, I highlight the inherent flexibility built into the course design and provide suggestions for how students might balance the incorporation of the class with their other commitments.

As an overarching principle, it is essential that I consider the tone of the language in my syllabus and introductory video (Hogan & Sathy, 2022). In a course with limited face-to-face contact, I endeavor to ensure that students find me approachable as a way to support student persistence. Developing the Habit of Mind of persistence requires that students are capable of persevering in a task through to completion, employing alternative problem-solving strategies to help them when they are stuck (Costa & Kallick, 2008). To encourage persistence, it is important

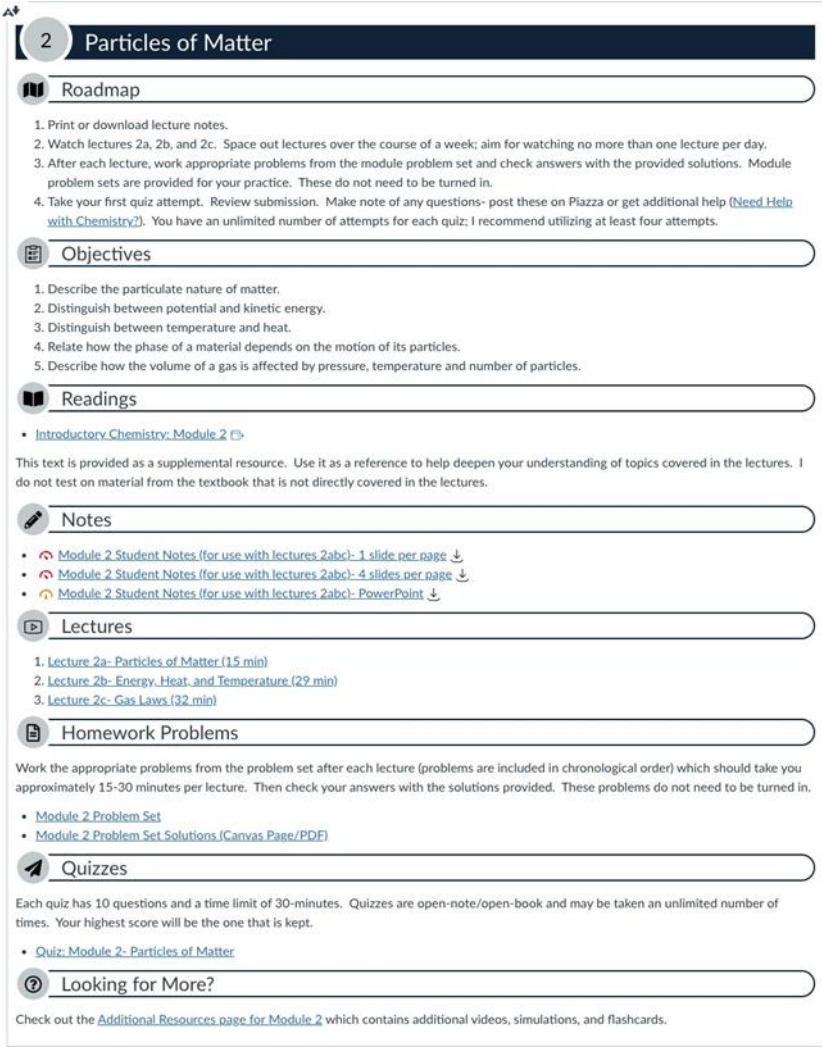
that hesitation to contact me is not a barrier that keeps students from seeking assistance or resources if they are struggling with material or falling behind in the course. After watching the course introduction video, students have expressed feelings of decreased stress and anxiety as well as a clear understanding of how to succeed in the course.

Establish a Clear Course Structure

My introductory chemistry course is designed with user experience in mind. Thoughtful and conscientious UX design is simplistically elegant, intuitive, and barely perceptible. "Quality UX design decreases cognitive load (or the overall amount of thinking going) so that student can focus on deeper learning" (Spencer, 2020). In an asynchronous online course, students interact more with the course itself than face- to-face with their instructor, so it is imperative that the course is well organized with a consistent flow and feel. Well-designed courses have consistency in language and experience that allow students to settle into a rhythm of participation in the course (Boettcher & Conrad, 2021). Many learning-management systems provide instructors with the ability to create templates within a course, which can be valuable in creating this consistency.

My online course is organized by modules, and while the subject content of each module varies, each module contains the same basic elements presented in a uniform format on a module overview page (Figure 5.1). Students follow the same general sequence of tasks to complete as they work through each module. Establishing a predictable rhythm allows students to proceed with confidence in the course, because there is no question as to what they should do next. In addition to course materials, there are several key features included on each module overview page. Student learning objectives are indicated at the top of each page and a time estimate is provided for each component of the module so that students know what to expect when beginning a task.

Figure 5.1
Example of CHEM 1010 Module Overview Page



2 Particles of Matter

Roadmap

1. Print or download lecture notes.
2. Watch lectures 2a, 2b, and 2c. Space out lectures over the course of a week; aim for watching no more than one lecture per day.
3. After each lecture, work appropriate problems from the module problem set and check answers with the provided solutions. Module problem sets are provided for your practice. These do not need to be turned in.
4. Take your first quiz attempt. Review submission. Make note of any questions- post these on Piazza or get additional help (Need Help with Chemistry?). You have an unlimited number of attempts for each quiz; I recommend utilizing at least four attempts.

Objectives

1. Describe the particulate nature of matter.
2. Distinguish between potential and kinetic energy.
3. Distinguish between temperature and heat.
4. Relate how the phase of a material depends on the motion of its particles.
5. Describe how the volume of a gas is affected by pressure, temperature and number of particles.

Readings

- Introductory Chemistry: Module 2

This text is provided as a supplemental resource. Use it as a reference to help deepen your understanding of topics covered in the lectures. I do not test on material from the textbook that is not directly covered in the lectures.

Notes

- Module 2 Student Notes (for use with lectures 2abc)- 1 slide per page
- Module 2 Student Notes (for use with lectures 2abc)- 4 slides per page
- Module 2 Student Notes (for use with lectures 2abc)- PowerPoint

Lectures

1. Lecture 2a- Particles of Matter (15 min)
2. Lecture 2b- Energy, Heat, and Temperature (29 min)
3. Lecture 2c- Gas Laws (32 min)

Homework Problems

Work the appropriate problems from the problem set after each lecture (problems are included in chronological order) which should take you approximately 15-30 minutes per lecture. Then check your answers with the solutions provided. These problems do not need to be turned in.

- Module 2 Problem Set
- Module 2 Problem Set Solutions (Canvas Page/PDF)

Quizzes

Each quiz has 10 questions and a time limit of 30-minutes. Quizzes are open-note/open-book and may be taken an unlimited number of times. Your highest score will be the one that is kept.

- Quiz: Module 2- Particles of Matter

Looking for More?

Check out the Additional Resources page for Module 2 which contains additional videos, simulations, and flashcards.

One of the challenges I have faced with the asynchronous online course format is how to require accountability from students while also providing a course that is flexible enough to accommodate the diverse needs and schedules of my students. Initially, I developed my course to be very low-structure. Students were provided with the course resources—recorded lectures, skeletal note outlines, and suggested homework problems, but were given the autonomy to work through the material on their own. The graded components of my course included quizzes and exams with only a few due dates throughout the semester. While the course was flexible, it failed to provide the structure required by many students to aid them in being successful in the course. After many iterations across many semesters, I finally settled on an approach that has allowed me to blend flexibility with moderate structure. A moderate course structure has been shown to increase course performance for all student populations and works disproportionately well for underrepresented students (Eddy & Hogan, 2014; Freeman et al., 2011). In my online course, the moderate structure approach includes in-class engagement and graded review assignments distributed throughout the semester.

In an asynchronous course, in-class engagement may look different than it would in a face-to-face class. To incorporate periods of active learning, I include embedded questions within my lectures using Kaltura quizzes. After a question is proposed, the lecture video automatically pauses, a literal interpretation of the concept of "hitting pause" (Rice, 2017). Students are then given as much wait time as needed to submit their answer to the question, after which, I discuss the problem, solution, and common errors or misconceptions. These questions are individually and automatically graded as students submit their answers within each lecture, but do not count directly toward a student's grade. If students answer a moderate percentage of the total questions in a semester correctly, they earn a few points of extra credit. This approach encourages students to complete the lectures and to strive for accuracy but does not penalize them during the learning process. This technique also encourages students to take responsible risks by requiring that they choose and submit an answer for each question but providing them with a buffer that allows them to miss questions without forfeiting points. This helps to keep the focus on learning instead of accuracy during these initial formative assessments. In my end-of-semester evaluations, students consistently mention the embedded questions within the lectures as one

of the most positive aspects of the course. Student comments center around how this active learning strategy helps to keep them engaged in the lectures and how it allows them to reflect in real time on their understanding of the concepts being presented. Providing students with instantaneous feedback in this situation allows them the opportunity to consider the effectiveness of their learning strategies using metacognition. There are two assignments provided as a follow-up to the lectures associated with each module. One is an ungraded problem set, while the other is a graded module review quiz. Assignments tied to grades are an important element of a moderate structure course, as they help students remain accountable for their learning. However, as discussed later in the chapter, these module-review quizzes also serve as a way I provide feedback to my students and allow them to learn without penalty as they strive for accuracy. For the module-review quizzes, students are allowed an unlimited number of attempts, with their highest score being the one that is kept.

To aid students as they develop as self-regulated learners, and to help students persist in the course, one of the most effective strategies I have used is to assign due dates for both the lectures and the quizzes. Only the due dates for exams are hard deadlines, and while the lectures and the quizzes have due dates assigned to them, students are allowed to submit them late and without penalty. As previous iterations of my course either included too few or too many deadlines, I have been amazed at how simply assigning a deadline inspires most students to continue to advance through the course at a regular pace. In this way, I can emphasize that consistent progress in the course is important but still provide flexibility and empower students to own the time-management process. In my course evaluations, students have commented their appreciation for the assigned due dates, which allows the lectures and quizzes to show up on their to-do list within our learning-management system and provides additional motivation for them to complete the task.

Provide Opportunities to Learn Without Pressure

Course flexibility and the opportunity for students to learn without penalty go together in encouraging students to strive for accuracy and persist in the online course environment. An essential component of allowing students to learn without penalty is through providing feedback on

formative assessments. The fact that *Introductory Chemistry* is a large course without graduate TA support has required me to think creatively about how I can give feedback to the 300 students in my class. One way that I have been able to accomplish this is by creating the lectures with embedded questions. The second method I have used to provide timely feedback to students is by creating large quiz question banks for each module quiz so that students can take each quiz an unlimited number of times. While the quizzes are still graded, students are given the opportunity to retake a quiz as many times as necessary to earn their desired score. This low-stakes format decreases the pressure on students and allows them to use the quizzes as formative assessments to evaluate their mastery of content and to self-reflect on their progress. It is also a valuable way for me to provide instantaneous and automated feedback.

Although I have allowed multiple attempts on module quizzes since I first began teaching introductory chemistry, in the past few semesters, I have transitioned from allowing a defined number of attempts (four) to allowing an unlimited number of attempts. Despite my best efforts to inspire students to begin their quiz attempts soon after finishing the module material, I continued to notice that they would often save those attempts until the last day that a quiz was available. In the moderate structure approach to my course, I wanted to find ways to encourage more distributed practice, as this method of learning is more conducive to long-term retention of knowledge (Dunlosky et al., 2013). After I switched to allowing an unlimited number of attempts on each quiz, I observed that although many students did not use more than four attempts, a much larger percentage of students began their quiz attempts earlier, which resulted in more distributed practice throughout the course of the semester. Having an unlimited number of attempts removed the pressure for students to only begin their attempts after they felt like they were completely prepared and is another way I encourage my students to take responsible risks. It also removed the desire for students to save their attempts to use later for exam preparation. As my quizzes were already open-note/open-book, and I had already developed an extensive quiz bank, converting from a defined number of attempts to an unlimited number of attempts was an easy adjustment to help achieve more distributed practice while maintaining course flexibility.

Provide Support

My working hours may be considerably different than the working hours of my students since I may have students from across the United States and sometimes around the world enrolled in my online courses. This means that the hundreds of students in the course may be operating on entirely different schedules. When I taught entirely online during the peak years of the pandemic, I became increasingly aware of my struggle to maintain a work–life balance. In my commitment to supporting my students during these challenging years, I neglected my life outside of work. To restore a better work–life balance, it became a priority of mine to integrate multiple layers of support into my online classroom so that students always had options for getting help without having to rely on me for immediate assistance.

To begin, I communicated my availability, including when they should expect email responses from me and how to schedule face-to-face meetings. I established boundaries and shared them transparently with my students. In addition, I outlined clearly what resources were available to them when I was not in a central location on a page titled "Need Help with Chemistry?" It was important to me that the course was designed so students could receive the assistance and support they required in the course regardless of their schedule. By providing options for support in the class that are always available, I demonstrate respect for their time as well as mine. This approach also functions to empower students to grow as self-regulated learners and to develop persistence as they learn to find their own answers using the scaffolding provided in the form of well-organized and well-structured additional resources.

The ability of students to develop persistence can also be positively affected by the encouragement of a mentor, although when I began teaching this course, I was overwhelmed at the idea of trying to communicate individually with each of my hundreds of students. While I do not send out completely unique messages to each of my students, I do send standardized messages to students to congratulate them on their performance or progress, to encourage them if they seem to be struggling or have gotten behind, or just as a general check-in. When I reach out to the entire class via these messages, on average 60 or more of the 300 students will respond. Often students indicate that they appreciate being checked on, but these check-ins have also provided a low barrier

pathway for students to communicate to me if they have concerns about their ability to attain success in the class, which then allows me to provide more personalized feedback.

Model Effective Learning Strategies

It is important for students to remain open to continuous learning, not just with respect to the course content they are learning but also with respect to techniques for successful learning.

Most often, when students communicate to me that they are struggling in my classes, it is because they are beginning to realize that their current learning strategies are ineffective. As students adapt to the increased rigor often required by college courses, they are learning both content and how to become learners.

In my classes, I have developed a series of weekly announcements sharing evidence-based learning techniques from the book *Make It Stick: The Science of Successful Learning* (Brown et al., 2014). In each announcement, I share a summary of a learning technique along with a short video that describes the science behind each strategy. As an example, instead of me simply telling students that they will be more successful if they space out their learning, they can view an explanation of the neuroscience behind why this strategy is more effective than spending an entire day cramming for an exam. One of the objectives for a breadth physical science course like *CHEM 1010* is for students to develop an understanding of the process of science. Demonstrating the science of learning and describing how the scientific process can be applied to everyday life is a great way to help students make connections between what they have historically seen as science and real-life applications. In the qualitative comments on my student evaluations, many comment on how they were not only able to apply these learning strategies in chemistry, but in their other classes as well.

Conclusion

Habits of Mind can be integrated into classes in a variety of ways and through many different contexts. This chapter highlights how Habits of Mind can be intrinsically built into a course through intentional, quality

course design and organization. Providing students with opportunities to self-reflect on progress and mastery of course content in a low-stakes environment encourages students to develop a growth mindset and resilience. Allowing for flexibility helps to motivate students to take responsibility for their learning and establish their own standards for time management. Merging Habits of Mind with course content can directly benefit students in a course, but this practice also provides students with transferrable skills that will serve them throughout the rest of their education and beyond.

References

Boettcher, J. V., & Conrad, R.-M. (2021). *The online teaching survival guide: Simple and practical pedagogical tips* (3rd ed.). Jossey-Bass.

Brown, P. C., Roediger, H. L. III, & McDaniel, M. A. (2014). *Make it stick: The science of successful learning*. The Belknap Press of Harvard University Press.

Costa, A. L., & Kallick, B. (2008). *Learning and leading with Habits of Mind: 16 essential characteristics for success*. Association for Supervision and Curriculum Development.

Dunlosky, J., Rawson, K. A., Marsh, E. J., Nathan, M. J., & Willingham, D. T. (2013). Improving students' learning with effective learning techniques: Promising directions from cognitive and educational psychology. *Psychological Science in the Public Interest*, *14*(1), 4–58. https://doi.org/10.1177/1529100612453266

Eddy, S. L., & Hogan, K. A. (2014). Getting under the hood: How and for whom does increasing course structure work? *CBE-Life Science Education*, *13*, 453–468.

Freeman, S., Haak, D., & Wenderoth, M. P. (2011). Increased course structure improves performance in introductory biology. *CBE Life Sciences Education*, *10*(2), 175–186.

Hogan, K. A., & Sathy, V. (2022). *Inclusive teaching: Strategies for promoting equity in the college classroom*. West Virgina University Press.

Palvia, S., Aeron, P., Gupta, P., Mahapatra, D., Parida, R., Rosner, R., & Sindhi, S. (2018). Online education: Worldwide status, challenges, trends, and implications. *Journal of Global Information Technology Management*, *21*(4), 233–241.

Rice, G. T. (2017). *Hitting pause: 65 lecture breaks to refresh and reinforce learning*. Stylus Publishing.

Spencer, J. (2020). *Empowered at a distance*. Blend Education.