K-12 Blended Teaching

A Guide to Personalized Learning and Online Integration

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Ryan Cain

Weber State University

This book has been indispensable in my instructional technology courses. Each semester, my students thank me for these high quality resources that they don't have to pay for.

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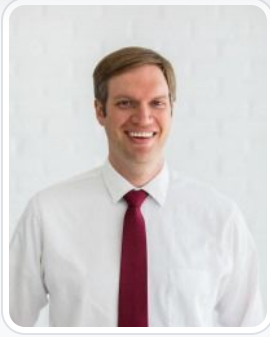
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Cecil R. Short is an Assistant Professor of School Leadership and Director of Secondary Education at Emporia State University. His research focuses on Personalized Learning, Blended Teaching, Open Educational Resources (OER), and OER-Enabled Practices. Before earning his Ph.D. in Instructional Psychology and Technology from Brigham Young University in 2021, Dr. Short served as a high school English teacher outside Kansas City, Missouri. More about Dr. Short and his work can be found online at www.cecilrshort.com.

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About This Book

This book is your guide to blended teaching in K-12 spaces. It was designed to help both pre-service teachers and in-service teachers prepare their classes for blended teaching. This book begins by orienting you to the foundational dispositions and skills needed to support your blended teaching practice. Then you will be introduced to four key competencies for blended teaching:

- **Online Integration** – ability to effectively combine online instruction with in-person instruction.
- **Data Practices** – ability to use digital tools to monitor student activity and performance in order to guide student growth.
- **Personalizing Instruction** – ability to implement a learning environment that allows for student customization of goals, pace, and/or learning path.
- **Online Interaction** – ability to facilitate online interactions with and between students.
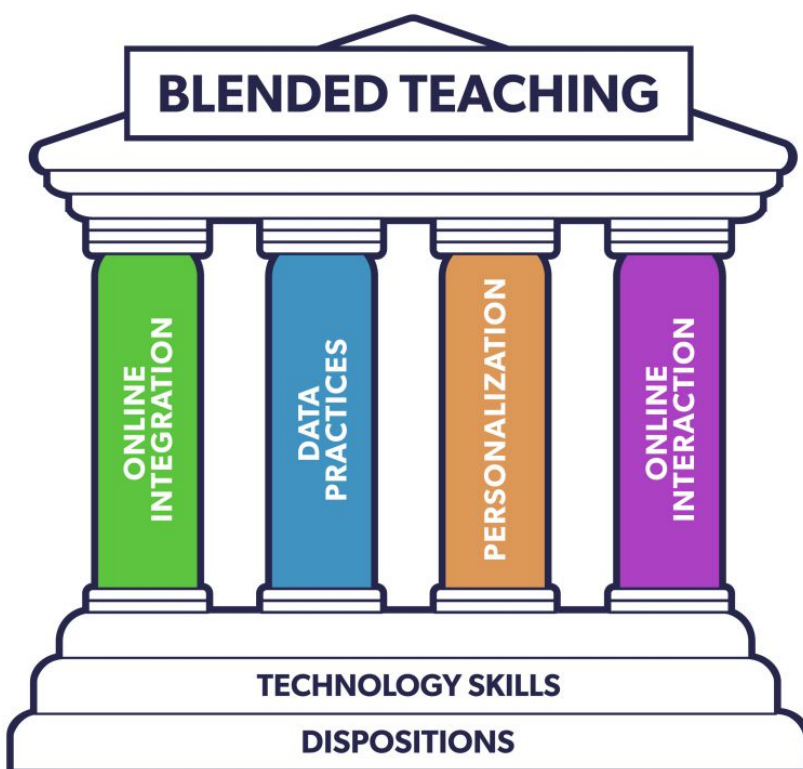
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Access it online or download it at https://edtechbooks.org/k12blended/about_this_book.

Preface

How To Use This Book

The figure of a building with four pillars represents the core organization of the book. This book begins by orienting you to the foundational dispositions and skillsneeded to support your blended teaching practice. Then you will be introduced to four key competencies for blended teaching represented by the pillars of (1) online integration, (2) data practices, (3) personalization, and (4) online interaction.The final chapter helps you bring all four competencies together as you implement blended teaching in your classroom. The chapters around these four pillars do not have to be read in order, though we have put them in the order that we think makes the most logical sense.

Definitions for words or phrases that are highlighted in blue can be found in the Glossary before the Appendices. Appendices contain additional source and resource information as well as examples of completed Blended Teaching Roadmaps for elementary and secondary school contexts.

Finally, the icons[1] found throughout the book will direct you to external features, in-chapter challenges, and badging features that will help your learning.

External Features

Readiness Survey - Each chapter begins with a link to a brief readiness self-assessment survey. The survey should take you 2-3 minutes. It will provide you with a sense of your current aptitude for blended teaching specific to each competency.

Video Examples - There are also videos throughout the book that will help you see specific examples of the skills taught in the chapter in practice.

Web Resources - External web resources are provided as helpful illustrative guides that will enhance your understanding of the skills taught in each chapter.

Feedback - Each chapter has a link where you can share your feedback, ideas, and experiences with blended teaching. Your input can help us to improve this resource for other teachers.

Review - At the end of each chapter you will find a review challenge. This challenge will help you check your understanding of the main concepts within the chapter.

Plan – Also included are practical planning prompts. These are intended to help you plan lessons and activities that utilize the knowledge and skills addressed in the chapter.

Build – In addition, each chapter has a few real-world challenges that will help you create an activity and/or assessment that can be used in a blended lesson.

Badging Features

Go for the Badge! - This feature provides you with the opportunity to put what you learn from reading this book into practice. At the end of each chapter, there is a link to a Chapter Roadmap that will lead you through applying the strategies and ideas from the chapter to your own classroom practices. To access the Roadmap, following the link to the Google Doc at the end of each chapter, and then click File > Make a copy. This will allow you to edit your own digital copy of the Roadmap. There are also examples of completed Roadmaps in Appendix C.

At this time the six Blended Teaching Badges are not fully available. However, working through the Roadmap will help you to see the evidence of blended practice they will likely require.

This book is your guide to blended teaching in K-12 settings. It was designed to help both pre-service and in-service teachers prepare their classes for blended teaching. Color and B&W print versions of the book can be obtained online at:

- PDF (Free)
- B&W Print ($6.54)
- Color Print ($31.28)
- ePub: coming

Acknowledgements

Katie Talbot

Research

This book was written for practitioners and so does not reference research throughout as you might see in an academic publication. However, the authors are all well-published researchers in the area of K-12 blended and online teaching.

If you are interested in the research related to the K-12 Blended Teaching Readiness model that is used to organize this book, below are some references that you can look up. Also, please feel free to reach out via email to charles.graham@byu.edu or any of the other authors.

- Graham, C. R., Borup, J., Pulham, E., & Larsen, R. (2017). *K-12 blended teaching readiness: Phase 1 - instrument development*. Lansing, MI. Retrieved from https://edtechbooks.org/-JgM
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- Short, C. R., Graham, C. R., Holmes, T., Oviatt, L., & Bateman, H. (2021 in press). Preparing teachers to teach in k-12 blended environments: A systematic review of research trends, impact, and themes. *TechTrends*.
- Short, C. R., Hanny, C., Jensen, M., Arnesen, K. T., & Graham, C. R. (2021). Competencies and practices for guiding k-12 blended teacher readiness. In A. G. Picciano, C. D. Dziuban, C. R. Graham, & P. D. Moskal (Eds.), *Blended learning: Research perspectives, Volume 3* (pp. 193–213). Routledge.
- Hanny, C. N., Arnesen, K. T., Guo, Q., Hansen, J., & Graham, C. R. (2021 in press). Barriers and enablers to k-12 blended teaching. *Journal of Research on Technology in Education*. https://edtechbooks.org/-JnSX
- Short, C. R., & Graham, C. R. (2021 in review). Blending and personalizing: A cross-disciplinary analysis of k–12 blended teaching practices for personalization.

Below are some publications related to the PICRAT framework that we use in section 2.3 of the book as a tool for evaluating blended activities.

https://edtechbooks.org/-hCJ

- Kimmons, R. (2020). Technology Integration: Effectively Integrating Technology in Educational Settings. In A. Ottenbreit-Leftwich & R. Kimmons (Eds.), *The K-12 Educational Technology Handbook*. EdTech Books. https://edtechbooks.org/-zqvn

1

Blended Teaching Foundations
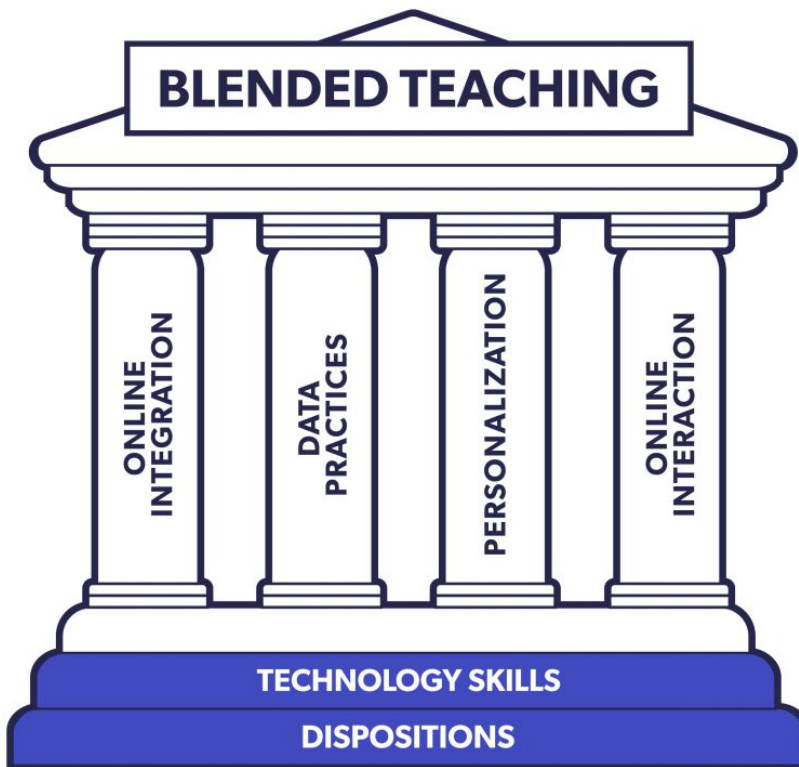
"Combine one flavor with another, and something new was created!" –[Remy the Rat](), Ratatouille[1]

1.0 What is Blended Learning?

Blended learning is the strategic combination of online and in-person instruction. According to the Christensen Institute, students in these classrooms learn "in part online, with some element of student control over time, place, path, and/or pace."[2] This type of teaching requires more than just classroom technology integration because it involves online learning as a part of the student experience. Because of this, you are required to have a broader set of skills than you would need for the typical classroom.

Blended Learning is the strategic combination of *online* and *in-person* learning. A common K-12 definition adds that the blend needs to provide students with some control over time, place, path, and/or pace.

We often hear the question, "Is online learning actually effective in K-12 contexts?" The short answer is that it is or can be, but the longer answer is that this is the wrong question to ask. No one would ask, "Is learning in a K-12 classroom actually effective?" While the **modality**, or environment, in which learning takes place is important to providing us with different opportunities for teaching, what we *do* in those environments has a much more direct impact on student learning. Consider the interplay of the **3Ms**– Media, Method, and Modality – as described in Video 1.1. **Media** are the tools we use to teach our students: tablets, laptops, textbooks, whiteboards, etc. **Method** is how we actually use those tools and the affordances of the environment together to foster student learning. So, a better question to ask is, "What can I do to teach effectively using the online or blended space?"

Media, Method, Modality
Video 1.1 (5:31) http://bit.ly/btb-v010

Watch on YouTube

What to Look For: Which of the 3Ms has the most direct impact on student learning?

as teachers is to determine how to effectively combine online experiences with existing classroom-based activities to maximize student learning. As described in Video 1.2, online and in-person experiences should be integrated so that they inform each other and are not isolated from one another.

Blending vs. Tech Integration
Video 1.2 (7:30) http://bit.ly/btb-v092

Watch on YouTube

What to Look For: How does blended learning differ from classroom **technology integration**?

1.1 Why Blend?

There are three main reasons why teachers might choose a blended teaching approach:

1. **Improved Student Learning.** Blended teaching can enable instructional strategies not practical or possible in traditional settings. These strategies can lead to improved student engagement and learning outcomes.
2. **Increased Access and Flexibility.** Blended teaching can provide increased flexibility and access to learning experiences by extending learning beyond the confines of the classroom.
3. **Increased Cost Efficiency.** Blended teaching can also lead to some cost efficiencies in terms of time and money for both teacher and students.

Though these benefits can improve practices, they cannot be gained by simply adding the online space to already existing in-person instruction. It is important to remember that blended learning is the *strategic combination* of online and in-person instruction. You need to make sure that the online space talks to or informs what happens in the in-person space, and that the in-person space talks to or informs what is happening in the online space. Adding a learning

Video 1.4 outlines six **pedagogical** challenges (six Ps) that you, theteacher, can address in the classroom to help improve student learning: pacing, preparation, participation, personal interaction, personalization, and place.

High Quality Blending
Video 1.3 (8:59)

[Watch on YouTube](#)

What to look for: What are some elements that characterize high quality blended learning?

Video 1.4 (2:40) http://bit.ly/btb-v005

Watch on YouTube

What to Look For: Which of these six challenges do you experience in your classroom?

In addition to the 6 Ps described in the video, we have added a seventh P, *Practice with Feedback*. The following is a summary of The 7 P's.

small groups only one person can share his or her ideas at a time. Even when everyone gets the opportunity to share, one student may dominate the conversation resulting in groupthink or in one student's ideas getting more attention than another's. Online discussions can help to equalize the amount of student participation.

2. **Pacing** — In the in-person space the class is expected to move as a whole when a unit or lesson has concluded.Within this aspect of blended teaching, students can move at their own pace, advancing when they have met specific benchmarks.

3. **Personalization** — It is difficult to personalize learning to every student's interests, skills, and goals. Online learning components can help teachers provide students with more agency in directing their own education.

4. **Place** — The online space is much more flexible than the in-person space. Using online instruction allows students to learn wherever and whenever is most beneficial to them, whether that be at school before, during, or after class, or at home when they get back from their late-night practices, rehearsals, or part-time jobs.

5. **Personal Interaction** — In the traditional classroom, instruction is often focused on the whole class. This practice helps monitor student behavior and manage the flow of classroom activities. However, in a blended environment, students are engaged in learning online, and you can spend more time conferencing and helping individual students.

6. **Preparation** — Blending allows students to have access to course materials through the online space, even before or after class time, providing students with additional opportunities to learn. This can help address some of the difficulties teachers often face, such as having students come to class unprepared or leaving class without having access to the materials needed to finish their work.

7. **Practice with Feedback**— You know that feedback is an important part of the learning process; however, it can be difficult to provide students with relevant, immediate feedback on all their work. Often, elements of online learning provide students with the opportunity to receive immediate feedback through responsive assessments and interactive activities.
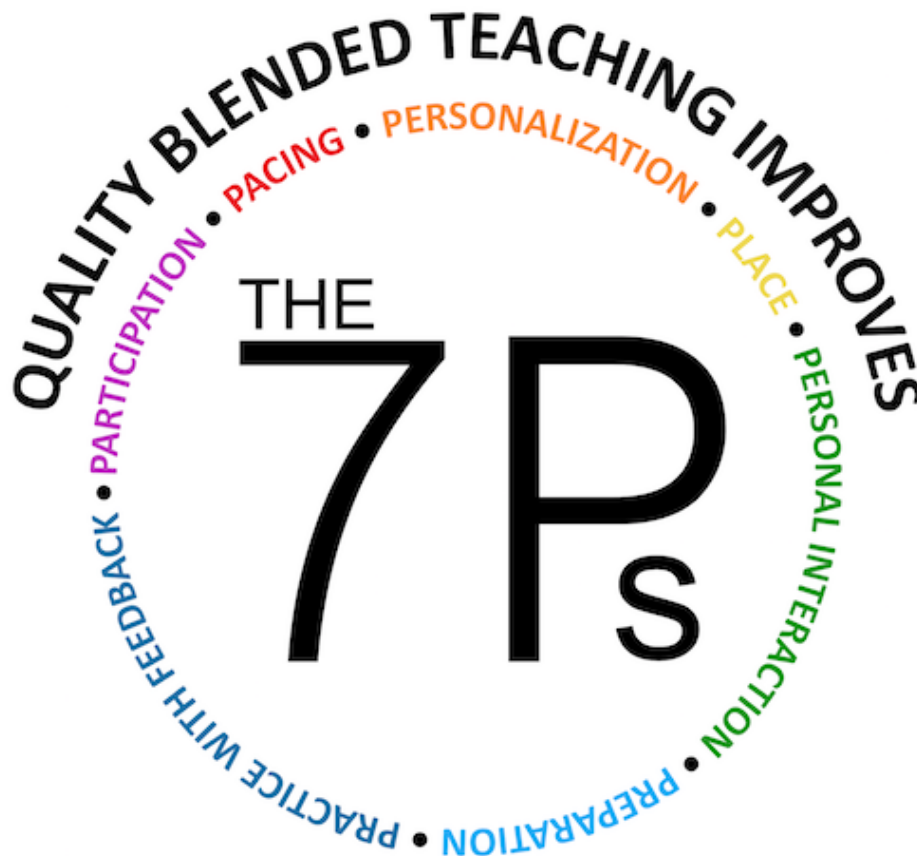

Figure 1.1: The 7Ps of quality blended teaching[4]

will need in four to five years, much less in fifteen to twenty-five years. However, The Partnership for 21st Century Learning (http://www.p21.org/) argues that at the time of graduation, all students should possess The Four Cs: Communication, Collaboration, Critical Thinking, and Creativity (see Figure 1.2). The Four Cs are not taught in addition to the course content. Rather, these skills are developed when students are learning the course content. To achieve this goal, you may need to change how you approach teaching and how your students approach learning. Blended classrooms can play an important role in making this change.

Figure 1.2 The Four Cs: Communication, Collaboration, Critical Thinking, and Creativity.[5]

Blended teaching is an excellent way to provide access and flexibility to student learning. For example, consider students who miss class time because they are ill or are participating in an extra-curricular activity. The integration of online learning options and in-person class activities could allow these students the flexibility they need to balance health and academics or academics and other activities that are a priority to them.

1.2 What Does Blended Learning Look Like?

It's important to remember that there are almost an infinite number of ways to blend online and in-person teaching. That said, there are many different models of blended teaching that are commonly used by teachers. It is valuable to learn about the different models and to select the specific approach that fits well with your own teaching philosophy, school culture, and student needs. Figure 1.2 shows a spectrum of models. Each model has strengths and limitations and works well for different schoolcontexts and student needs. We will provide more depth for each model in Chapter 2.

K-12 Blended Teaching Models

Flex Model
(Core Instruction is online within the brick and mortar school with in-person support as needed)

Rotation Models
(Station, Lab, and Flipped Models with some level of online instruction)

Enriched Virtual
(Almost entirely online with supplemental in-person contact)

Traditional In-Person
(No online components)

Fully Online
(No in-person components)
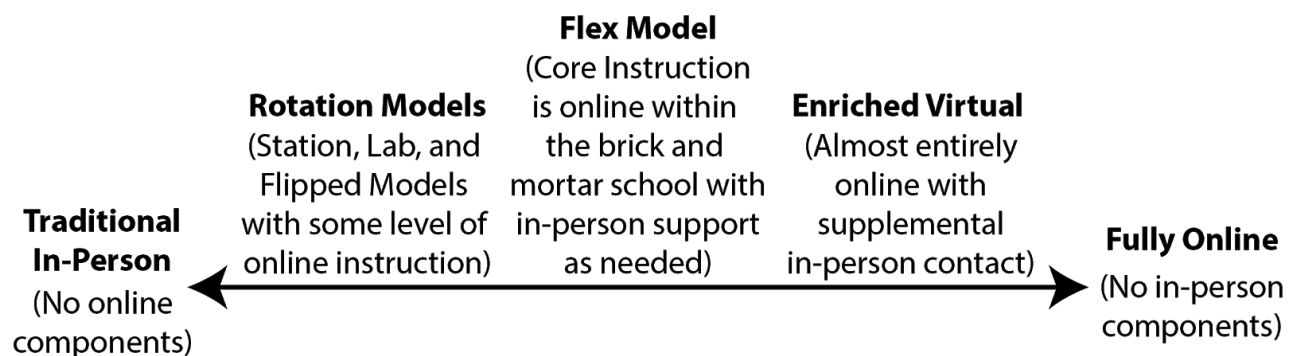
Figure 1.3 Spectrum of models of blended teaching for K-12 and higher education.[6]

Web Resource 1.1 http://bit.ly/btb-v032
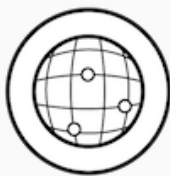
What to Look For: At this site you can see examples of seven different models of blended learning. You can also see links to schools across the United States that have adopted blended learning.

1.3 What Competencies are Needed?

As illustrated in the image at the beginning of this chapter, this book will address four core competency "pillars" that you will need to build as you develop your ability to teach in a blended environment. These areas are critical to success when it comes to blended teaching:

- **Online Integration**— Integrating online and in-person activities
- **Data Practices**— Using data practices to inform teaching
- **Personalization**— Facilitating personalized learning for students
- **Online Interaction**— Facilitating online learning interactions

Before learning about each of the core competencies of blended teaching, it is helpful for you to be aware of certain foundational dispositions and basic technology skills that will be helpful along your journey. Both of these areas are discussed in the following sections.

1.3.1 Foundational Dispositions

Dispositions are your core values, beliefs, and attitudes that influence the way you teach. Important dispositions for effective blended teaching build upon what is already important for successful teaching in the traditional classroom. Table 1.1 contains a few areas that are particularly important for you to consider when it comes to blended teaching. Below each description in this table are values statements that align with teachers who share a passion for blended approaches.

Table 1.1 Important dispositions for blended teachers

Dispositions	Description
Student Ownership and Agency	Successful blended environments often involve a shift from teacher-led to more student-centered instruction. This means students take on more responsibility for making decisions about the time, place, pace, and path of their learning. - I believe most students have better learning outcomes when technology enables them to adjust the pace of their own learning. - I believe individual student access to devices in the classroom should enable students to take greater ownership of their learning.

rather than **time-based progression** (see Chapter 3). This means that blended classrooms will likely involve much less whole-class directed instruction.

Mastery Learning Orientation

- I believe that online technology is critical to implementing a mastery-based approach to learning in the classrooms.

Successful blended environments almost always involve a reliance on data to help guide instructional decision-making.

Value of Data-Driven Decisions

- I believe that students should use data to guide their own learning progress.
- I believe that teachers who regularly use data to inform their teaching will be able to help their students more than those who don't.

Successful blended teaching will require taking risks, failing at times, learning to recover, and making improvements after failure.

Growth Orientation

- I believe it is important for teachers to explore new teaching strategies that blend in-person and online learning.

Successful blended teachers see value in using online technologies to enable the development of cross-curricular life skills such as creativity, collaboration, critical thinking, and communication.

Emphasis on Life Skills

- I believe individual student access to online devices in classrooms enables development of important life skills (e.g., creativity, collaboration, critical thinking, communication).
- I believe that students need to gain experience collaborating online with each other on projects.

Successful blended teaching requires the careful integration of online and in-person instruction. Online learning activities must be valued as a core, essential part of the blend.

Value of Online Learning

- I believe online technologies enable valuable activities allow students and teachers to do things that would be difficult or impossible to do otherwise in classrooms without online technologies.
- I believe that student learning is enriched when teachers and students interact in online discussions.

Your dispositions can change over time. If you find yourself feeling skeptical about some aspects of blended learning presented in this book, we hope that seeing actual classrooms in action will help you to see the possibilities.

1.3.2 Basic Technology Skills

The essential competencies needed for successful blended teaching are ultimately not technology skills. However, there is a requirement of basic technical literacy. As you develop a greater comfort level with online technology, using it in the classroom will become as native to you as using a whiteboard or book. While it would be impossible to outline all possible technical skills that teachers use, we have highlighted some of the most important elements you will need in Table 1.2.

Table 1.2 Important knowledge and skills related to technology for blended teaching

Technological Literacy	How are your abilities in the following areas?

Basic Literacy	encounter.
	• Find quality online content resources relevant to student learning needs (e.g., media resources, lesson plans, etc.).
Digital Citizenship	• Model the legal use of instructional materials (e.g., copyright, fair use, creative commons).
	• Ensure student online privacy (e.g., technology use agreements for sharing student data, protection of online data and identities).
	• Model online safety for students (e.g., ensure password protection, protect against cyberbullying, detect scams, use content filters and virus software, etc.).
	• Ensure academic honesty in an online learning environment (e.g., prevent cheating, check for plagiarism, etc.).
	• Ensure access to online learning activities for all students (e.g., low socioeconomic status, English language learners, special education, gifted, etc.).
Learning Management Systems	• Use the tools commonly found in a learning management system (e.g., gradebook, announcements, content pages, quizzes, discussion boards).
Educational Software	• Use content-specific educational software outside of the learning management system (e.g., math/literacy/science educational software, educational games).
Media Creation Tools	• Use tools to create or edit content found online to meet your specific needs.
Communication Tools	• Use a variety of tools for communication with students, parents and other stakeholders (email, text/SMS, video conferencing, etc.).
	• Using **student information systems (SIS)** to communicate activity and performance data to students, parents, and other stakeholders.

This book may provide you with some help in developing many of these technology skills, but that is not its purpose. The purpose of this book is to help you use the skills you have already developed to begin blended teaching. If you need guidance in developing some of the technology skills needed for blended teaching, online tutorials are usually just a search engine click away. The first blended teaching skills this book will help you develop are for integrating online and in-person teaching, which will be addressed in the next chapter.

> ## Competency: **I understand the foundational dispositions and technology skills I need for blended teaching** (1.1-1.2)
>
> **Challenge 1:** Use section 1.3 of the Blended Teaching Roadmap to do a self-assessment of your basic technology skills and foundational dispositions. Identify areas of strength and areas where you can work to make improvements. (http://bit.ly/BTRoadmap)

Check your understanding of the concepts in the chapter by taking this chapter quiz. (http://bit.ly/K12-BTQuiz)

Go for the Badge

Complete Section 1 of the Blended Teaching Roadmap to help identify your purposes for blending and areas where you can improve your blended teaching skills and dispositions. (http://bit.ly/MyBTRoadMap-Ch1) (See two examples of a completed Roadmap in Appendix C.)

2

Online Integration
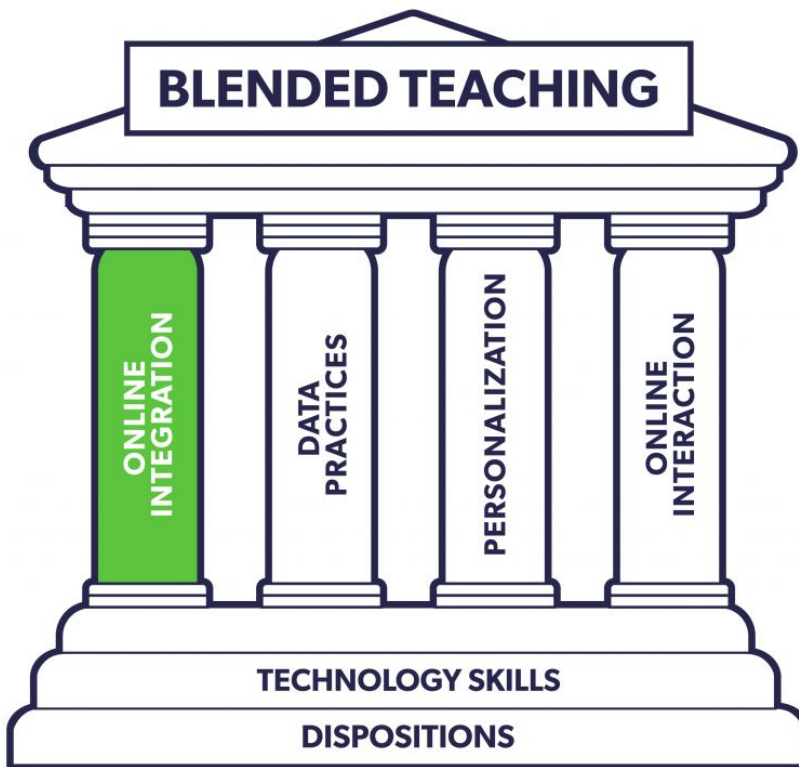
Blending Online and In-person Learning: Combining the Best of Both Worlds

> *"Together, we fill gaps."–Rocky Balboa, Rocky* [7]

Effective integration of online learning activities together with in-person teaching approaches is an essential part of the core knowledge and skills of blended teaching. By the end of this chapter you should be able to meet the following objectives:

- I can plan how to effectively combine in-person and online teaching (2.1).
- I can create activities that integrate the in-person and online spaces (2.2).
- I can evaluate the design of blended instruction, assessments, and activities (2.3).
- I can create guidelines for managing a blended lesson (2.4).

2.0 Introduction - Filling the Gaps

Both online and in-person learning activities have strengths and weaknesses. As an example, consider the differences between a teacher lecture and a textbook. Both are the source of a large amount of information, and students can learn from either. However, you as the teacher giving a lecture can do many things that a textbook can't, such as:

- Determine and monitor student understanding and interest
- Quickly adjust how information is presented based on students' needs and/or behavior
- Motivate students to more fully engage in the learning activity
- Establish relationships with students

There are also several advantages to a student reading a textbook over attending a lecture. A textbook can:

- Travel from school to home with the student
- Be reviewed as slowly or quickly as it takes the student to understand the material
- Be re-reviewed at any point for any reason
- Allow students to access and review the material in any order they choose

Check out Video 2.1 that describes the latest "technology" discovery by IKEA:

Video 2.1 (2:28) http://bit.ly/btb-v136

Watch on YouTube

What to Look For: Check out all the new benefits of this technology!

In this high-tech world we sometimes forget how amazing textbooks can be! Now, let's compare a textbook to modern online technologies.

While books are excellent resources and shouldn't be completely replaced, there are a multitude of online technologies that students can use to learn. For example, videos allow students to see things they would never be able to otherwise. Virtual worlds and simulations allow students to visit places and do things that would be too expensive or too dangerous to do otherwise. In addition, there are many online programs that continually assess students' understanding and automatically adapt to better meet students' needs. Furthermore, online programs allow you and your students to communicate and collaborate in ways never before possible.

"Often teachers don't have time to do what they do best because they are too busy lecturing and assessing students. Like many of you, I remember as a middle school teacher, giving a lecture to students and then having to repeat that lecture five times throughout the day, using the same examples, stories, and jokes. By the end of the day I was exhausted from the repeated performances and may have only had a handful of meaningful conversations with students. I realized that I wasn't spending my time doing what I felt I did best, which was providing individual help and encouragement to students. By offloading the presentation of content to technology, I could have spent my time more productively working with students one-on-one and in small groups.

Some worry that machines will replace teachers. I worry that teachers are spending too much time acting like machines."

- Jered Borup

In this chapter, we share guiding principles that will help you combine the best of both worlds. Our goal is to help you integrate both in-person and online learning in ways that will allow technology to show its greatest strength – the ability to empower teachers to do what they do best.

Test Your Readiness: Online Integration http://bit.ly/K12-BTR
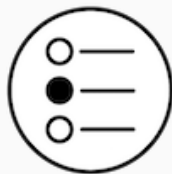
How ready are you to integrate both online and face-to-face teaching in your classroom? You can use the link above to find out.

2.1 Developing a Strategy

As mentioned in the previous chapter, there are many different blended teaching models. These models are structures and patterns that help teachers to organize online and in-person learning activities for a blended classroom. How a course is structured depends on many factors including the physical learning environment, the school's access to technology, the age and ability of the students, and the length of class time. While there are innumerable ways to structure a blended course, the Clayton Christensen Institute has identified several common organizational models (see Web Resource 2.1). We focus on four models in this book: flipped, **station rotation**, lab rotation, and flex.

Web Resource 2.1 http://bit.ly/btb-v149

What to Look For: In this Khan Academy resource, you can see video explanations and examples of four different blended learning models: flipped, station rotation, lab rotation, and flex.

2.1.1 Flipped Classroom

Traditionally students receive direct instruction at school and then apply what they learned at home on homework. However, students commonly get stuck on homework and don't have the resources or support to complete their work, creating a frustrating situation for you, your students, and their parents. The **flipped classroom** reverses that order so that before students come to class, they receive the direct instruction via online videos. Then, when they come to class, students can complete the "homework" and receive one-on-one or small group instruction. This enables them to have the necessary support when they get stuck.
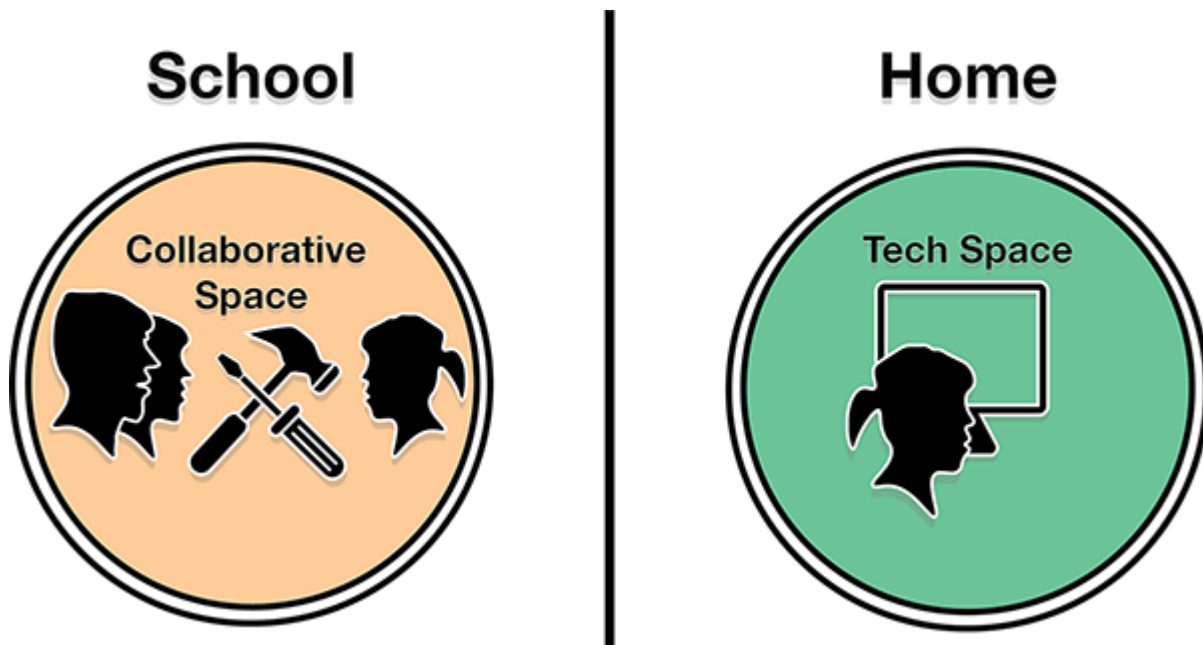
Figure 2.1 Simplified representation of flipped classroom model.8

Video 2.2 (2:14) http://bit.ly/btb-v187

Watch on YouTube

What to Look For: Observe how moving to a flipped classroom has changed the teaching and learning of this classroom!

2.1.2 Station Rotation

As implied by the name, a class that uses the **station rotation model** has stations set up so that students can rotate on a set schedule or at your discretion. At one of the stations, a small group of students works with you, so you can better customize instruction and assessments to meet your students' needs. This model is not new and has long been used in elementary schools. However, in a blended version of a station rotation, for at least one of the stations, students are learning using technology that collects assessment data that teachers can use to personalize small-group instruction. Another common use of stations is to allow students to discuss class topics or to collaborate on projects.
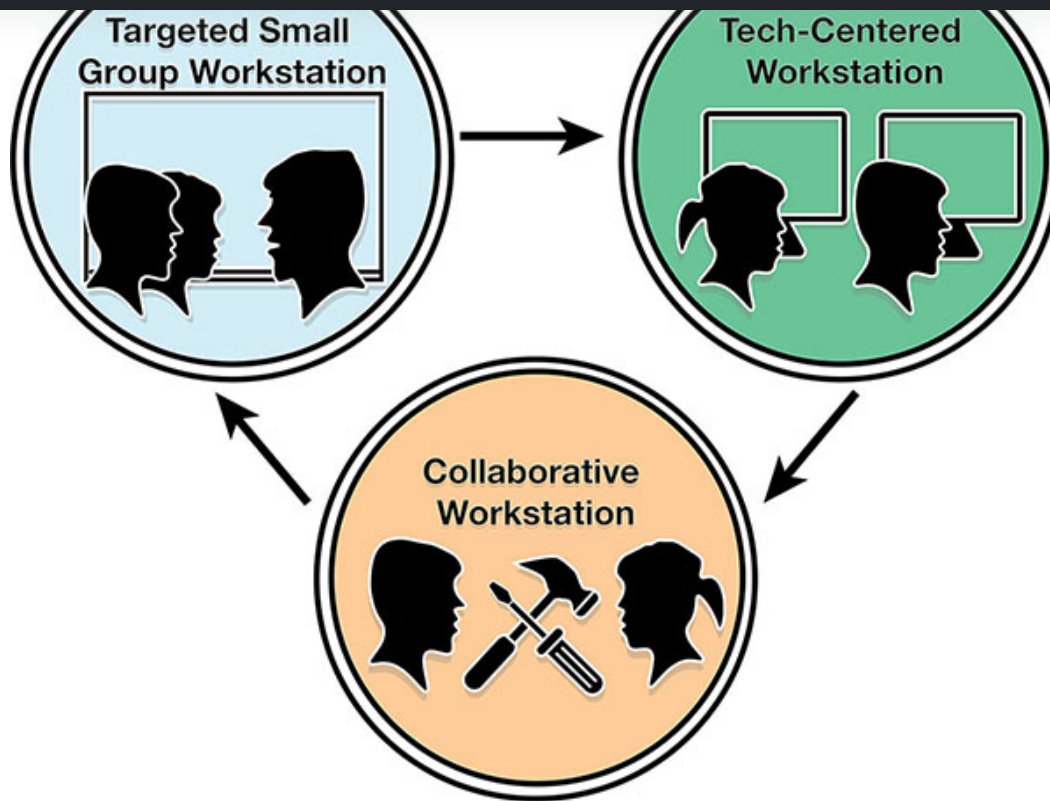
Figure 2.2 Simplified representation of station rotation model.[9]

In schools where every student does not have access to a tablet or laptop, **station rotation** is a popular form of blended learning. However, because you are working with a small group of students, it can be difficult to respond to inquiries from students at other stations. As a result, this model is most effective when students can be self-directed or when there is another facilitator in the room who can assist. Another way to make this model effective is to establish procedures that allow students to assist each other when certain issues arise. Videos 2.3 and 2.4 help show the station rotation model in action.

Video 2.3 (7:49) http://bit.ly/btb-v185

Watch on YouTube

What to Look For: Notice how the teacher's station organization and structures direct student learning and behavior.

Video 2.4 (5:24) http://bit.ly/btb-v151

Watch on YouTube

What to Look For: Listen to the reasons this teacher and her students enjoy the benefits of the station rotation.

2.1.3 Lab or Whole-group Rotation

The **lab or whole-group rotation model** is similar to the station rotation model except that students rotate as a whole group on a set schedule or at your discretion. This commonly involves students leaving the classroom to go to a computer lab or you, as the teacher, bringing a mobile lab into the classroom. This model is great for classrooms that have close to 1-to-1 devices. Your role in this model is also different from the station rotation model. Rather than spending the majority of your time working with students at a small group station, you spend your time working more freely with students throughout the room. Video 2.5 below is a classroom example and further explanation of the lab or whole-group rotation model.

Video 2.5 (6:54) http://bit.ly/btb-v194

Watch on YouTube

What to Look For: Look to see how the lab or whole group rotation may be easier to manage than the station rotation.

2.1.4 Flex Model

In the **flex model** the majority of learning occurs online. Because of this, students have a high level of flexibility to work at their own pace based on their individual needs. You can then use assessment data from the online activities to target where your student needs support through one-on-one or small group sessions. This model takes a high level of planning and preparation. It may occur in conjunction with a content-specific adaptive learning program. Among these are **ALEKS**[10] (**A**ssessment and **LE**arning in **K**nowledge **S**paces), which is a learning system that helps teach high school math including algebra, geometry, trigonometry, etc., or **SRA FLEX Literacy**,[11] which is a comprehensive reading and language arts intervention system for struggling readers. Using these adaptive systems, students can move through class content at their own pace, conferencing with you to work through difficult concepts or to receive additional one-on-one or small group instruction.

Some tools such as **Imagine Learning**[12] also have live online tutors that students can conference with when stuck. In some cases, students can also access supports in languages other than the dominant language at the student's brick-and-mortar school. When implementing this model, you should also carefully consider how to provide the student enough pacing flexibility while also fostering meaningful student-student interactions and teacher support. Watch Video 2.6 to get a better sense of the flex model in action.
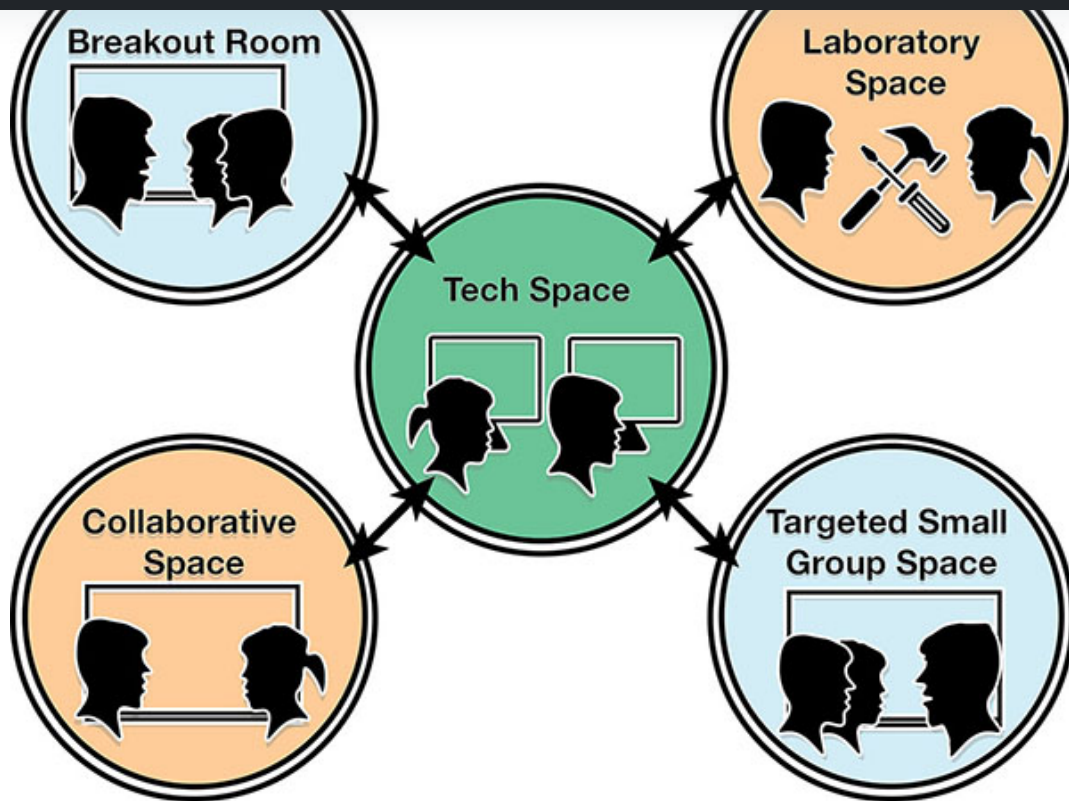
Figure 2.3 Simplified representation of the flex model.[13]

Video 2.6 (5:28) http://bit.ly/btb-v129

Watch on YouTube

What to Look For: How does this teacher decide what to have the students do online and what to have them do in-person?

2.1.5 Choosing your model

There is no right or wrong model to use in blended teaching. Therefore, you should select ideas from the various models then combine them in a way that will meet your specific teaching needs. For example, if you are wanting to devote more class time to a specific in-class activity, then you may want to utilize the flipped model. But, if you are wanting more small-group or one-on-one time with students, then you may use elements of the station rotation or lab rotation models. Conversely, if you want students to learn at their own pace online, then you will want to pull from the flex model. You do not need to become loyal to or an ardent devotee of a specific model. Your blended classroom should both use and combine various models to best meet your needs and the needs of your students.

teaching (2.1)

Challenge 1

Look for an adaptive learning program for content that you teach. Using the flex model, determine how you would incorporate this program to teach a lesson.

Challenge 2

Choose an in-class activity that you would like to have more time for. Find or create instructional tools that would allow you to use the flipped model to prepare students for the activity.

Challenge 3

Think about the digital devices you have access to and create a lesson with these devices that uses either a station rotation or lab rotation model.

2.2 Integrating Online and In-person Activities

Now that you've reflected on some blended learning models, it's time to consider strategies for creating the actual learning activities. One way to look at these activities is that they are a collection of the following types of interactions: student-content, student-teacher, and student-student interactions (see Figure 2.4). When designing a blended classroom, we blend the online and in-person versions of each type of interaction.

Figure 2.5 shows a quadrant with student-content interaction on the right and student-human interaction (i.e., instructor and peers) on the left. Traditional classrooms typically teach in the bottom half of the quadrant while fully online courses are more in the top half of the quadrant. Blended classrooms, however, can include interactions in all four quadrants.
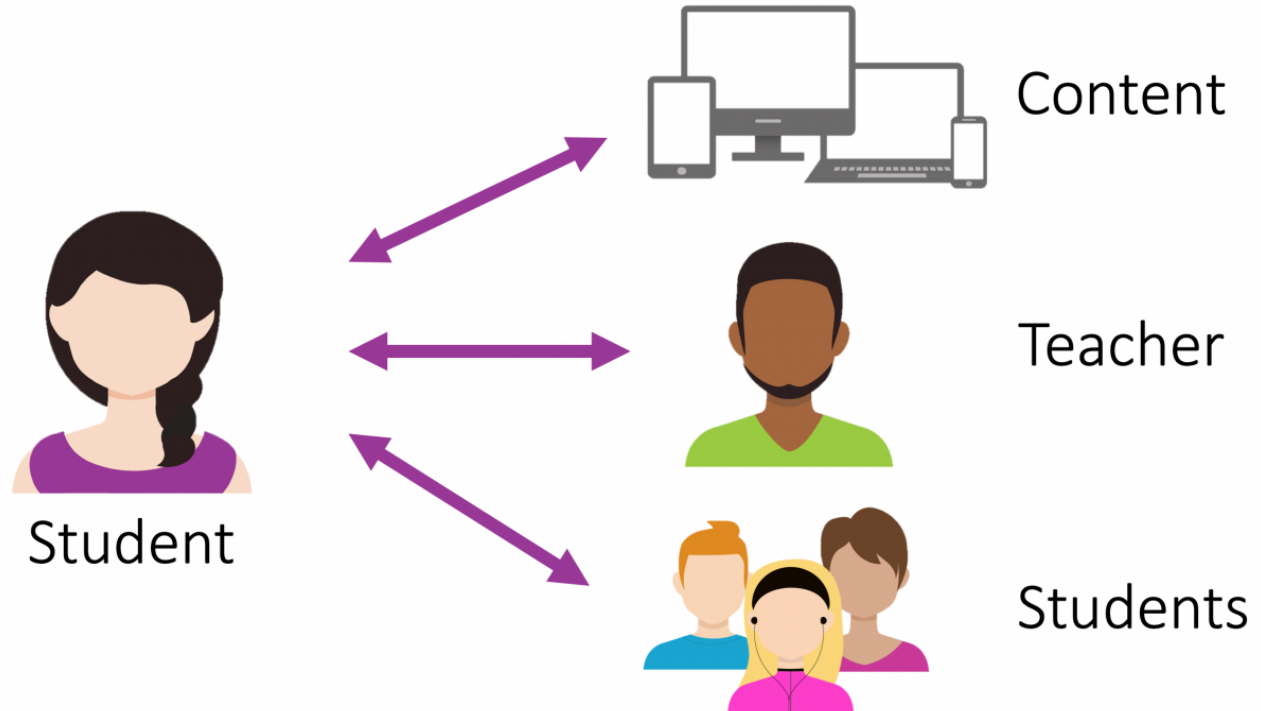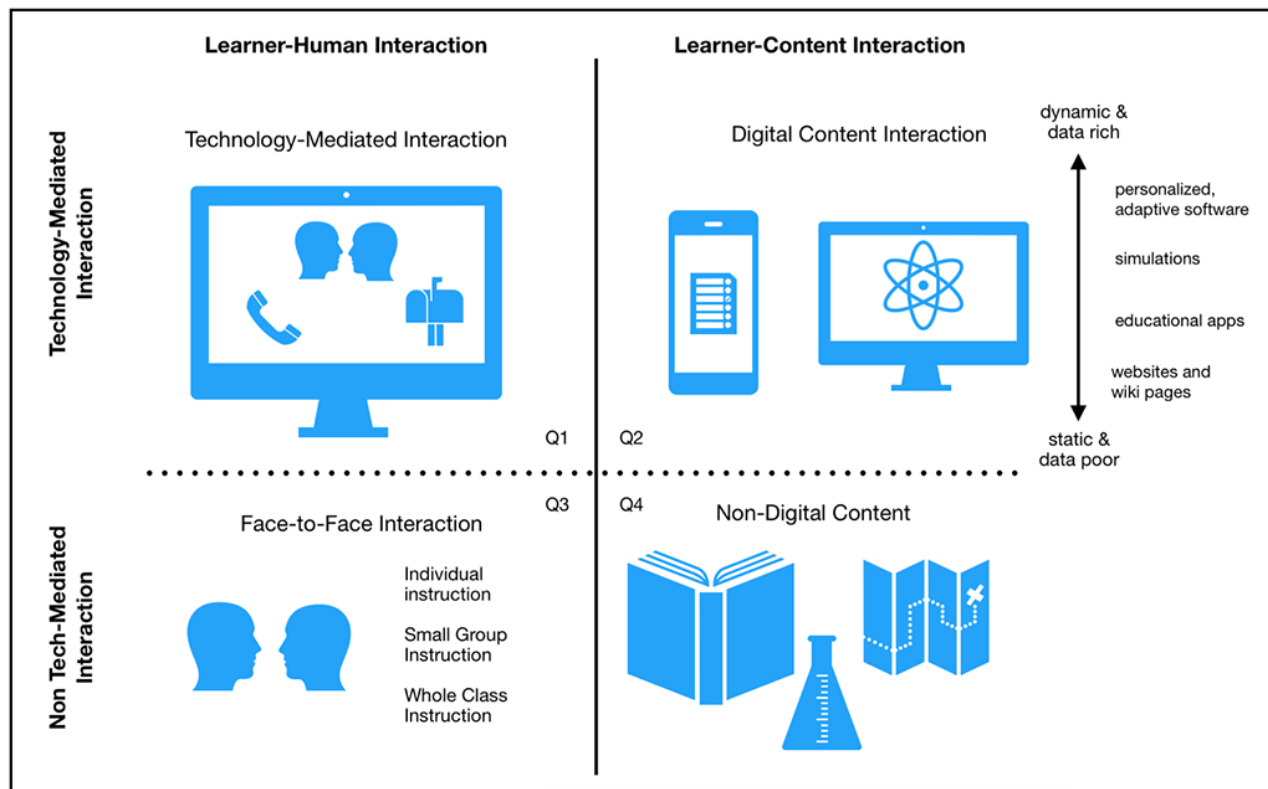
Figure 2.4 Three common types of learner interaction [14].

Figure 2.5 Combinations of human in-person and technology online interactions.[15]

meaningful experience, their interactions with you, as the teacher, and with the other students should be also be both on-line and in-person. (Chapter 5 focuses on blending student-teacher and student-student interactions.)

Quality blended teaching will not only have some student-teacher and student-student interactions online, but the use of technology will also make in-person interactions better. For instance, it is often easier for blended teachers to work with students 1-on-1 or in small groups than it is for more traditional teachers because

- having meaningful online activities for students frees the teacher to spend most of her time in individual or small group teaching
- access to online performance data (see Chapter 3) blended may give teachers a better sense of student performance levels and individual needs

By working with students in small groups on data driven activities, you are empowered to target your efforts on student needs and misunderstandings. In fact, some of the most powerful learning opportunities that occur in a blended classroom happen offline. As a result, when thinking of the term **blended learning** you don't actually need to only picture students on tablets and laptops. Instead Figure 2.6, where a teacher is working with a small group of students, is much more indicative of blended learning. However, it is important to note that digital devices do play an important role in being able to harness the advantages of online learning—a significant element of a blended classroom.

Figure 2.6 Teacher working with a small group of students.[16]

The word "blended" in blended teaching is used intentionally. Blended teaching goes beyond technology integration that simply adds online content or online discussions to an in-person course. The activities should be integrated in such a way that the online activities support the in-person activities and vice versa. It can actually be highly frustrating for students when online components are simply added to a fully in-person class (referred to as the "**course and a half**

Example Scenario

One of the most common mistakes novice blended teachers make is to have students engage in both online and in-person activities, without those activities complementing each other. Read the scenario below and see if you can identify the weakness in the blend.

- **Scenario:** A teacher is using a lab rotation model. During one rotation students go to the computer lab to use an adaptive math learning software where they advance at their own speed. During another rotation the teacher uses the whiteboard to teach math concepts from the core curriculum and go over example problems. The teacher is unaware of what specifically students are working on during lab time.
- **Comments:** In this scenario, students are participating in a blend of online and in-person activities, but the teacher has not integrated the two. This integration could easily happen if the teacher were aware of student progress in the online lab and then focused the in-person instruction to meet the specific needs of individuals or small groups of students.

The following scenarios describe some ways that learning activities can blend online and in-person activities:

1. You begin a discussion in class that is then extended to an online discussion board. You and the students can then wrap up the discussion in-person.
2. Students use adaptive learning software that provides you with data in ways so that you can easily recognize students' misconceptions. Using that information, you can provide in-person instruction that better targets students misconceptions.
3. Groups of students start to create a presentation using Google Slides in class. They can then complete their section individually online.

spaces (2.2)

Challenge 1

Think about an assessment, learning software, or online application that students use to learn in your class. Create a plan that uses data from this source to inform in-person teaching.

Challenge 2

Create an outline for a class discussion that starts in-person or online and then continues in the opposite format.

Challenge 3

Create a group project that students can either start online (maybe through a brainstorming discussion board) and then finish in-person, or vice versa starting in-person and finishing online (maybe through collaborating on a presentation or a Google Doc).

2.3 Evaluating Blended Activities

In Video 2.7, we see a daughter ask her father, in German, "Tell me dad, how do you get along with your new iPad that we gave you for your birthday?" Her father replies, "Fine!" Only then did the daughter realize that her father was using the iPad as a cutting board. The video reminded us of a Tweet we saw where a mom was using an e-reader as a bookmark for a paperback book (see Figure 2.7).

Video 2.7 (1:06) http://bit.ly/btb-v128

Watch on YouTube

What to Look For: How effective do you think this technology use is?

CAN WE ALL TAKE A MOMENT TO APPRECIATE MY MOTHER USING A KINDLE AS A BOOKMARK
instagr.am/p/WxGDicmT9b/

VIA THEMETAPICTURE.COM
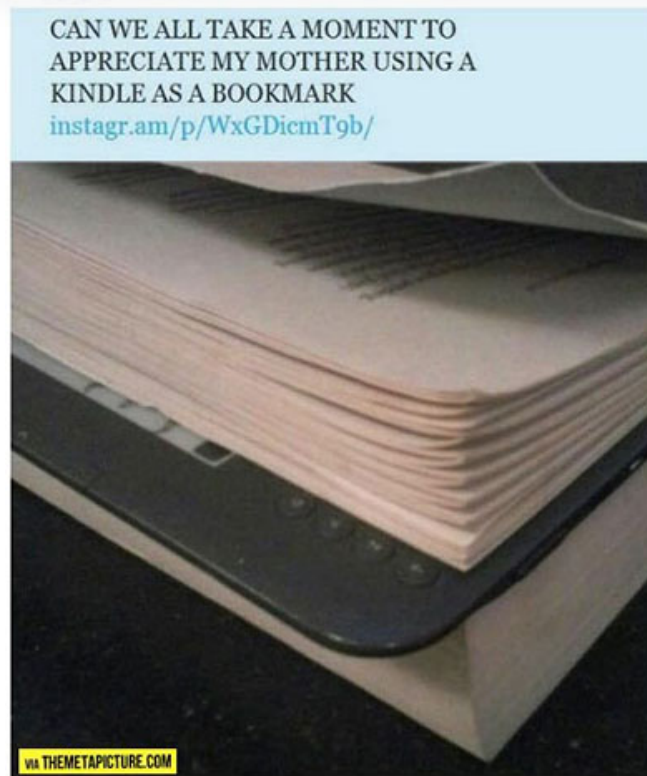
Figure 2.7 Not the best use of technology—using an e-reader as a bookmark.[17]

Ask yourself, "Is using an iPad as a cutting board or an e-reader as a bookmark a good use of technology?" Perhaps these *are* good uses of technology. The father and the mother in these examples had a need and they used technology to meet that need. That's a *good* use of technology, but we can all agree that it's not the *best* use of technology. One reason why it's only a good use of technology is that they only used the technology to make their lives a little better rather than using technology in ways that could open up new possibilities.

While we can laugh at a father using an iPad for a cutting board, if we really examine the history of technology integration, we find that teachers typically tend not to use technology in the best ways either. Teachers tend to use technology to make their current practices a little more efficient without really making meaningful changes to what occurs in their classroom. In fact, the term **technology integration** implies that teachers use technology to support their current practices.

With a quick look at the history of educational technology, you will find that it has largely been used to support **teacher-centered learning activities**. For instance, all of the technologies in Figure 2.8 (i.e., the blackboard, overhead projector, digital projector, document camera, interactive whiteboard, and screencast video) focus on making it a little easier for teachers to lecture.

Figure 2.8 Range of technologies used for teacher-centered learning activities.[18]

For technology to truly have an impact on students' learning, we have to do more than simply digitize what we've always done. If that's all we do, we will simply achieve the same learning outcomes—only faster. Furthermore, one thing that we have learned from research is that it's the learning activity—not the technology alone—that impacts learning. For technology to have a meaningful impact on student learning, it has to change how teachers teach and how students learn. One way to examine effective technology use is through the **PICRAT framework** discussed in the next three sections.

2.3.1 The RAT Framework

Figure 2.9 RAT framework for evaluating teacher use of technology in the classroom.[19]

The RAT frameworkis a helpful approach for seeing how the range of technology use can change how teachers teach and students learn (Hughes, Thomas, & Scharber, 2006). The use of technology can either replace (R), amplify (A), or transform (T) traditional teaching practice (see Figure 2.9). Each of these terms are defined below along with examples.

change in any meaningful way.
  - **Example**: Rather than handwriting an essay, students type their essays using a word processor.
- **Amplifies (A):**
  - **Description**: Technology allows the teacher or students to do the same activity with some improvements that would be difficult or impossible without technology.
  - **Example**: Rather than handwriting an essay or typing it on a word processor, students create their essay using a blog with images and videos, or an essay is written in a Google Document which allows students to synchronously collaborate.
- **Transforms (T):**
  - **Description:** Technology is used to reimagine the learning activity and to do something completely different that would be difficult or impossible without technology.
  - **Example**: Rather than creating an essay on paper, or using a word processor, students use video editing software to create a movie, or they create an infographic.

Too Much Technology?
Video 2.8 (0:38) http://bit.ly/btb-v158

Watch on YouTube

What to Look For: Think of practices in your own classroom that may work best without technology.

A meaningful blend of in-person and online learning activities will do more than only replace or replicate traditional learning activities. That said, using technology to replace or digitize your current practice is still a good use when it makes the activity easier, more efficient, more flexible, or more accessible for students to complete. Furthermore, we

2.3.2 Blended Activities That Engage (The PIC Framework)

Figure 2.10 PIC framework for evaluating student use of technology for learning.[20]

One advantage of blended learning is that it can make learning more engaging for students. Students tend to enjoy activities more when the exercises are hands-on. You may have heard the phrase "hands-on, minds-on" which emphasizes that hands-on activities help students to learn the material and develop new skills. This is known as *engagement* which describes students' positive feelings towards an activity. The next section focuses on what students are doing with technology and how it impacts their engagement levels. This is described by the PIC framework. Students relationship to the use of technology can be either passive (P), interactive (I), or creative (C).

- **Passive (P):**
  - **Description:** Technology is presented to students in a one-size-fits all approach that is meant for student consumption with no requirement for response.
  - **Examples**: Watching a video showing a volcanic eruption, observing the use of a document camera to model how to correctly measure a circle's radius, or reading poetry online.

- **Interactive (I):**
  - **Description:** Technology is responsive to student performance and behavior.
  - **Examples**: Students play educational games focused on improving literacy, learn math using software that adapts when students respond incorrectly, take a formative online quiz that provides them with feedback based on their responses, explore the architecture of the Notre Dame Cathedral using a virtual environment such as Google Earth, conduct experiments in a virtual chemistry lab, or participate in an online discussion board to examine elements of poetry.

- **Creative (C):**
  - **Description**: Students use technology to produce original materials.
  - **Examples**: Students create a mini-documentary on the American Revolution, an infographic showing the life cycle of a butterfly, or a website that shows the real-world application of geometry.

All three uses of technology (passive, interactive, and creative) can be good uses of technology. However, technology's potential is not being realized if students are only using technology in passive ways or if students rarely have the opportunity to create something original.

2.3.3 An Evaluative Framework for Blended Teaching

Now that we've discussed the PIC and RAT frameworks separately, let's bring the two together to form the **PICRAT matrix.**(See Figure 2.11). By examining the use of technology, we can complete the following statements to better understand how students are engaging with technology and how that use of technology changes our traditional practice.
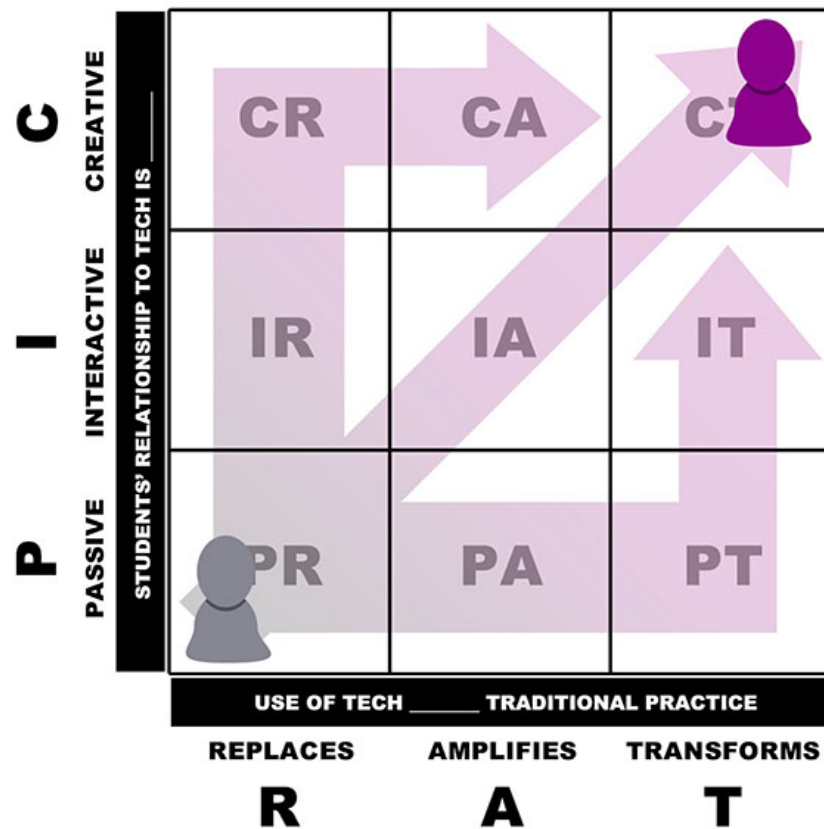
Figure 2.11 The PICRAT matrix for evaluating technology use for student learning.[21]

As teachers we want to ensure that technology is used in a variety of ways that best align with the instructional objectives. Watch Video 2.9 to reflect on how technology being used in your classroom fits within the PICRAT matrix.

Video 2.9 (4:33) http://bit.ly/btb-v123

Watch on YouTube

What to Look For: As you watch, consider the different uses of technology in your classroom and where they fit on the PICRAT matrix.

We can use the PICRAT matrix to determine if our blended activities are meeting the full potential of our teaching practices and therefore helping students to meet their full potential as students. When you use the PICRAT matrix to gauge your own teaching practices, there are three kinds of evaluation that you must complete.

- Determine the **PIC** to assess **student's relationship** to technology.
- Determine the **RAT** to assess **change to traditional activities**.
- Determine the RAT to assess **change to traditional classroom practices**.

The first test is to look at the student's use of technology and determine if it is passive, interactive, or creative. The PIC evaluation is usually the easiest assessment to make. If your students are absorbing information without providing any data input to the technology or manipulation of the technology, then their relationship to the technology is passive. If students are manipulating or using the technology in some way, then the relationship is either interactive or creative.

The RAT analysis, however, can be more difficult. This is because you must use the RAT side of the matrix to make two different evaluations. The first is at the individual student level. Does the use of technology replace, amplify, or transform a traditional activity? For example, if students are watching a lesson online instead of watching you provide a lesson in class then it is a replacement activity.

The second evaluation is at the classroom level. Does the use of technology replace, amplify, or transform your traditional practices? If students are watching a video lesson instead of attending the lesson in class, what is the ultimate goal? Is it because you want to have more class time for some kind of activity—a lab, a group assignment, a role play exercise, etc.? If so, then the use of technology at the activity level is still replacing, but the use of technology

the technology.

> ## Competency: I can evaluate the design of blended instruction, assessments, and activities. (2.3)
>
> ### Challenge 1
>
> Plan a use of technology that is **passive** and **replaces** a traditional activity but **amplifies** or **transforms** classroom practice.
>
> ### Challenge 2
>
> Create an activity that includes students **interacting** or **creating** with technology that also **amplifies** or **transforms** your classroom practices.
>
> ### Challenge 3
>
> Create a poster or graphic that communicates student expectations for at least one of the blended teaching routines that you will use in your classroom.

2.4 Managing the Blended Classroom

Learning management that includes specific classroom systems, procedures, and guidelines is especially important in blended courses for four reasons:

1. **Online Resources:** Blended courses have both a physical and an online learning space. Both need to be organized and managed.
2. **Digital Distractions:** The same technology that enables a learning activity can also distract students from it. As a result, teachers should help students to minimize distractions and stay focused on the learning objectives.
3. **Rotations:** Often students transition from online and in-person activities which may also require them to physically move to other areas of the classroom or school.
4. **Hardware and Software:** Devices and software need to be maintained and ready for student use (see examples in Videos 2.10-2.11).

Video 2.10 Part 1 (12:26)

[Watch on YouTube](https://www.youtube.com)

What to Look For: Think about which of the systems, procedures, and guidelines from this video could be useful in your blended classroom.

2.4.1 Managing the Online Environment

Just as a brick-and-mortar classroom holds physical learning materials, student projects, and spaces where students go to discuss, collaborate, and receive feedback, blended courses also need to have an online environment where students can go for online versions of those same materials and activities. Due to this need, most school districts now have learning management systems (LMS) that help you, as the teacher, organize online content, assignments, directions, projects, discussions, announcements, and feedback.

Many LMSs also help with a different aspect of blended teaching: managing digital distractions. In addition to monitoring students' in-class behavior, teachers need to manage online behavior, which is easier for students to conceal. LMSs typically provide a wealth of tracking data, including login, time in system, and click data, which can be used to monitor online behavior. In fact, some LMS software now provide you with helpful dashboards that display students' behavioral data in visual ways that help you to quickly recognize patterns and deficits (see Figure 2.12). In some cases, you may also want to look at the browser history for those students who you suspect may have been off task during class. Some school districts have actually disabled incognito modes on the internet browsers to make it more difficult for students to hide their online behavior. Other schools provide teachers with software that allows teachers to see their students' screens in real time. Figure 2.12 provides examples of data that can be provided by an LMS to monitor and track student actions while in the online environment.
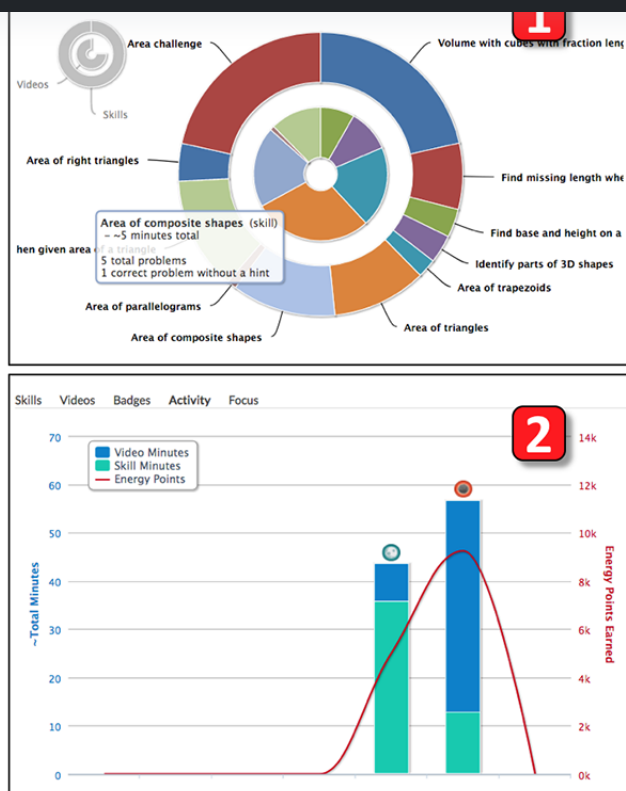
Figure 2.12 Examples of analytics tracking student activity in an LMS.[22]

Two strategies that work very well for helping students stay engaged in the blended environment are the **clamshell technique** and the **screen-time/face-time technique**.

- **Clamshell:** When students are using laptops, but you need to provide additional instruction or direction, students close their laptops to a 30-degree angle so all of their attention can be focused on you.
- **Screen-time/Face-time:** If students are using devices, it may often be more important for you to see their screens than their faces. In such circumstances, it is better to have students turn to face away from you so you can observe what is happening on their screens. When it is time for more instruction, or for the class to come back together, students can then turn back around and face you.

2.4.2 Managing Blended Rotations

In addition to monitoring student behavior in the online setting, blended teachers use many strategies for managing students' locations and movement during various rotations. The following list outlines some of the strategies that teachers commonly use to guide where students should be during a station rotation.

collaborate with peers in the same space, use a specific learning software, e.g., Imagine Learning, KidBlog, Khan Academy, in the same space, etc. All of the stations do not have to be used every time, but students should always know where all the stations are without having to wonder or wander around. The stations are labeled with age appropriate signage (symbols or icons for younger grades, words or words and icons for older grades).

- **Timed rotations:** Students begin a rotation at different stations and the teacher determines when the groups rotate based on a fixed time schedule, typically 15-30 minutes per station. The schedule is posted in a place where all students can see it, and the students are given updates on how much time is left before the next rotation. When it is time to rotate, students follow a specific order of stations.
- **Performance grouping:** Students are grouped for a station rotation based on performance data, so that students can go to the stations that will best help them advance their learning. These groups can move using either timed rotations or flex grouping.
- **Flex grouping:** This involves the practice of starting a rotation with groups at each station but then allowing students to move freely between stations as they need to. Instead of groups moving together from one station to the next, students can move to stations based upon their learning needs. If they are ready to learn or complete activities online, they go to the digital station; if they need your help, they rotate to the teacher station; if they are ready to create something or collaborate with others, they move to that station, etc. Their movements can still be timed, but students do not have to move from station to station with a group.

You can view examples of station management for elementary classrooms in Video 2.12.

Station Rotation Organization
Video 2.12 (3:39) http://bit.ly/btb-v173

Watch on YouTube

What to Look For: Consider how you could use some of these teachers' guidelines in your own classroom.

can simply count "One . . . Two . . . Three" with students responding to each number with the correct action—stand up, point, and walk.

- **Freeze and Listen:** You tell students that it is time to rotate. All students must freeze in a certain pose, like hands on head, then listen so they know which station they will be moving to next.
- **One-Way Street:** Students move from station to station in a single direction. If you're using flex grouping, some students may need to walk past other stations to get to their next station.
- **"Perfect" Transitions:** Teachers take time after each rotation to recognize and compliment students or groups who make high quality or "perfect" transitions that are orderly, quiet, and efficient. This is especially important at the beginning of the year when students are learning procedures for transitions.
- **Transition Signals:** Students are given a five-minute warning that allows them to begin writing about their progress and their next direction, logging out of devices, wrapping up conversations, etc. During transitions, other signals, such as music, can be used to create a timed break. For example, you might play a song for students to listen to during the transition. The song, in that situation, signals a "down time" from work, but when the song ends, you clarify that it's time to start working at the next station. Watch a classroom example of transition signals in Video 2.13.

You probably already have many procedures in your classroom that work well for managing student movement. Many of these can be adapted to fit your blended learning style. In the end, it's important that you find which strategies work best for you.

Station Rotation Transition Signals
Video 2.13 (2:59) http://bit.ly/btb-v111

What to Look For: Consider how this teacher's ideas for transition signals could inform your own.

2.4.3 Managing Technology Hardware and Software

Technology hardware is expensive and needs to last. Managing hardware is an especially new responsibility for many young students, and it can be hard on you, particularly in classrooms where there are one-to-one devices. Proper handling of devices is one thing, but what about updating software and keeping track of student login information? The following list includes some techniques for managing hardware (the actual computer, tablet, etc.) and software (online programs, apps, games on the device, etc.) in the blended classroom.

Hardware Management:

- **Two hands:** Students are told to carry all digital devices with two hands. This is a pretty basic idea for most people, but younger students may forget, and older students may become over-confident. If students carry devices with both hands, they are less likely to drop them, bang them into things, or slam them down. It also makes it more difficult for other students to be involved in causing an accidental drop.
- **Hardback before hardware:** Students practice checking out numbered hardcover books and carrying them in the right way before they start using devices. This helps students understand why they have numbered devices and why carrying them with two hands is so important.

Software Management:

- **Paint chip login:** At the beginning of the year students are given paint chip cards that have several sections of color on them. The top section is used for their name and class, while each of the other sections is assigned to an application or website that they will be using in class. Student's usernames and passwords for each application are written down in the corresponding square. You can collect the paint chip cards, and pass them out to students as needed, or they can be stored with the students' classroom resources.
- **Clipboard login:** All the students' usernames and passwords are copied and printed out for each of their applications and then stored on a clipboard that is accessible to all students. This makes it easy for students to find their usernames and passwords without having to ask you to look them up. If usernames identify the user, then they may need to be kept in a place that is separate from student passwords. Additionally, it is best to use a number that only a student can recognize, such as a student identification or lunch number, so passwords cannot be easily stolen.
- **Launch:** Students who will be using devices all launch their applications or websites at the same time—before class activities begin. Students are able to use this time to find their passwords if they don't remember them and talk with their friends if they need help finding the programs they will need. This is done outside of instructional activity time and outside of the teacher giving directions. It's a time simply for getting all of the digital learning devices ready to go. See Video 2.14 for launch ideas.

Using the Launch Approach
Video 2.14 (3:24) http://bit.ly/btb-v170

What to Look For: Look for the ways that the launch approach has helped this teacher and her students prepare for digital learning.

Again, you probably have some procedure for retrieving class materials and getting ready to learn in place already. Many of the procedures you already have can be adapted for blended learning. What matters most is that you find some procedures that work for you, and more importantly, work for your students.

2.4.4 Managing Students Who Need Help

Once appropriate routines are in place, feel free to put rules in place that let students help their peers with devices, questions, and routines. Students can usually follow routines and get answers to simple questions with the help of their

- **Hiring students:** You can give students jobs or roles to complete as part of managing hardware and helping others. One job can be to handle the devices, so that instead of everyone trying to mob the device cart, one student is responsible for handing devices to the people in line. Another role can be for a student to make sure all devices are plugged in and charging after they have been returned. You can let students know what their job will be for the day or tell them that you will be looking for someone to have that job for the day.
- **Computer captains:** Every transition in a blended class is important. It can be difficult for teachers to control and manage each of these transitions. Computer captains help the teacher by leading the rest of the class or their group in these transitions. For example, if all of the students need to get devices, the captain for the day can be the one who handles them at the device station or the one who makes sure everyone knows which station they are moving to next. Captains can be in charge of the many tasks that need to happen during a transition.
- **3 before me:** Before students ask you a question they must ask three of their peers for assistance. This idea is a valuable way to manage student questions, especially those that are repetitive or have already been answered a number of times. It also helps build the Four C's of creativity, critical thinking, communication, and collaboration, while also encouraging students to become independent learners and thinkers.

Competency: I can create guidelines for managing a blended lesson (2.4)

Challenge 1

Choose or create a strategy for moving students from station to station. Support your reason for choosing this strategy.

Challenge 2

Create a floor plan of your classroom. Decide where you will host different stations to use as part of a station rotation model.

Challenge 3

Create a poster that outlines the guidelines for various procedures students must follow when using devices in your classroom.

Check your understanding of the concepts in the chapter by taking this chapter quiz. (http://bit.ly/K12-BTQuiz)

Go for the Badge

Complete Section 2 of the Blended Teaching Roadmap to plan and evaluate elements of your blended teaching model and blended teaching routines. (http://bit.ly/MyBTRoadMap-Ch2) (See two examples of a completed Roadmap in Appendix C.)

This content is provided to you freely by EdTech Books.

Access it online or download it at https://edtechbooks.org/k12blended/online_integration.

3

Data Practices
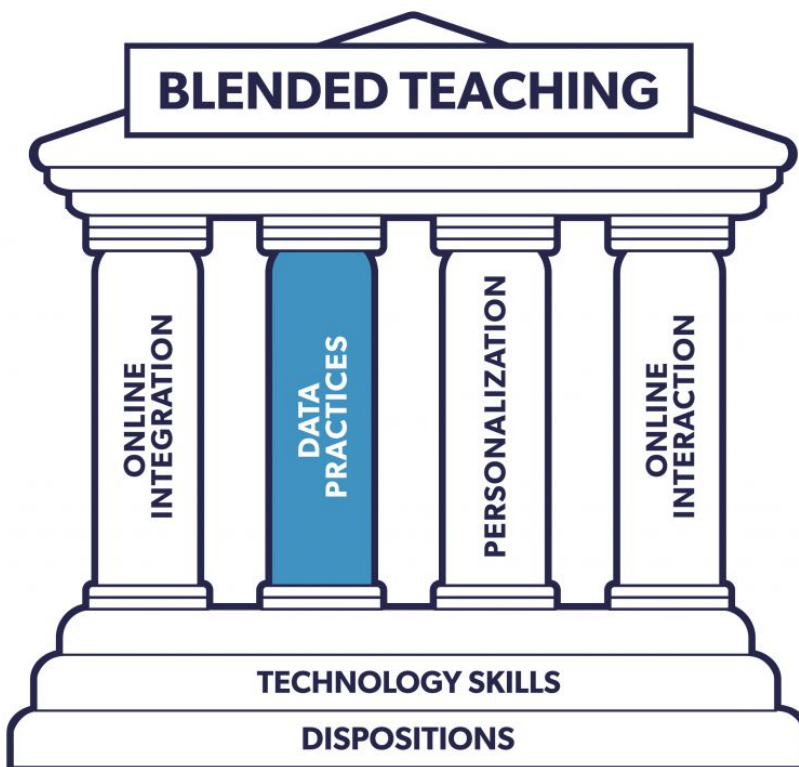
"Data! Data! Data! I can't make bricks without clay." –Sherlock Holmes in "The Adventure in the Copper Beeches" by Arthur Conan Doyle

Having core data practice knowledge and skills are essential to effective blended teaching. By the end of this chapter you should be able to meet the following objectives:

- I can create formative assessments with mastery-thresholds (3.1).
- I can create a mastery-tracker with assessments aligned to learning outcomes (3.2).
- I can identify important patterns in student performance data (3.2).
- I can use data to recommend focused learning activities for students (3.3).
- I can use data to evaluate and improve assessments and instructional materials (3.3).

3.0 Introduction - Storytelling with Numbers

Data can be an intimidating topic of conversation for many reasons. One of these reasons may be that data is often used in the context of reports and analyses of measurements that might be unfamiliar to us. It is used to predict weather patterns, the stock market, the outcomes of important sporting events, and even the time it may take you to get to the mall on Thursday night the week after Thanksgiving. However, all definitions of "data" have one central theme: the use of data is simply storytelling with numbers, and based upon those numbers, people tell the story of what was measured to have happened, why it seemed to have happened, and what might happen next. Data certainly don't give us clairvoyance, but they do help us to see patterns and use those patterns to predict the next thunderstorm, stock market crash, winner of the Division I Championship, or starting time of rush hour traffic.

Within education we use the term "data" to categorize numerical information such as assessment results, frequency of attendance, and engagement measurements, but we also use the data for categorical information such as student demographics. We can determine where students are in their understanding of learning objectives, why students are where they are, how we can help them get where they need to be, and when they are finally there. In other words, data helps us tell and direct the story of student achievement.

> ## Test Your Readiness: Data Practices http://bit.ly/K12-BTR
>
> You can use this link to obtain some data for yourself! See how ready you are to use data in your own blended classroom.

3.1 Developing a Mastery-based Classroom

To introduce data practices, we will first discuss the concept of **mastery-based progression**. Many blended classrooms use this approach because blended teaching's data practices provide a gateway to a successful mastery-based classroom.

3.1.1 What is mastery-based progression?

Mastery-based learning focuses on student performance rather than seat-time to determine how students progress through the curriculum. Students demonstrate mastery of a skill or topic before moving on to a more advanced one. Meanwhile, you maintain a fixed expectation of how students will perform and allow the time required to achieve that level to vary. In other words, learning becomes a constant and time becomes variable. In contrast, **time-based**
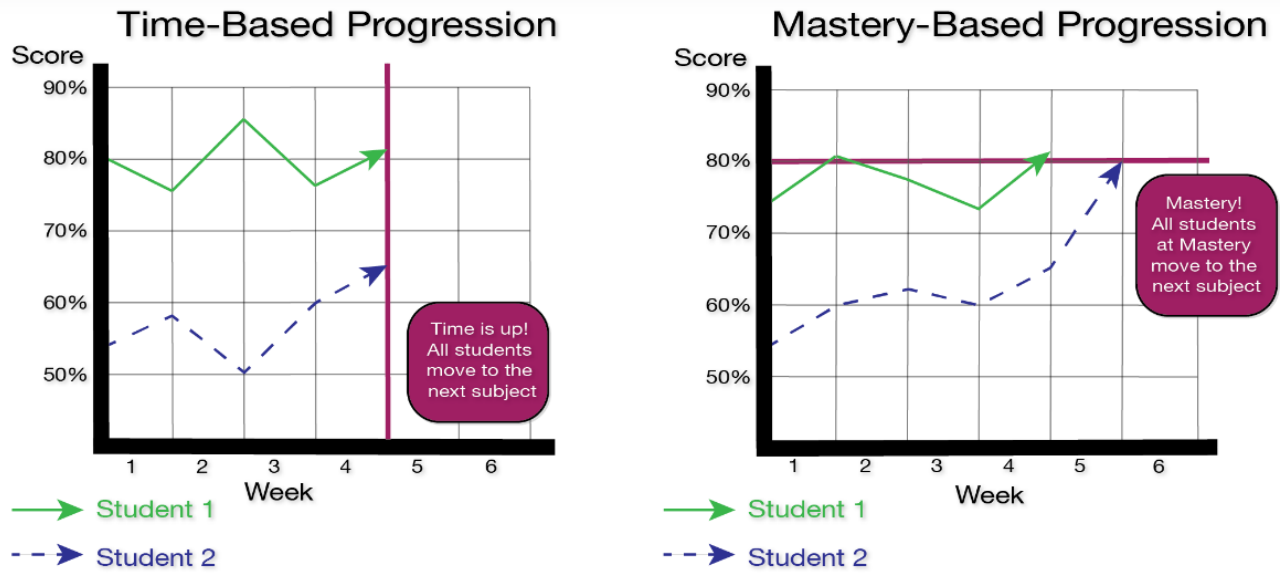
Figure 3.1 Time-based vs Mastery-Based Progression.[23]

Definition: Mastery Vs Competency-Based Learning

Mastery-based learning maintains that students should reach a certain level of performance before moving on to the next concept or skill.

Competency-based learning is often used synonymously with mastery-based learning, but also includes the idea that students who come with skills acquired outside of the classroom can demonstrate competence in those skills and move on.

Video 3.1 (2:30) http://bit.ly/btb-v208

Watch on YouTube

What to Look For: Identify the various reasons that students, teachers, parents, administrators, and even politicians like the idea of personalized learning.

Mastery-based progression is better for student learning than time-based progression. However, it requires a skill set that may be new to you: managing a classroom where students are progressing at a variety of different paces. It also requires you to be better at effectively using data to inform your teaching practices. Student data will help you and your students both know when he or she is ready to advance to the next concept or skill. Good data practices also provide insight into specific student deficiencies so that you can provide targeted interventions to help students overcome those deficiencies.

Elementary Video 3.2 (2:05) http://bit.ly/btb-v224

Watch on YouTube

Secondary Video 3.3 (3:36) http://bit.ly/btb-v274

Watch on YouTube

Good assessments are key to effective learning. Good assessments come in many forms and are designed to measure a student's growth towards the learning objectives. **Assessment validity** provides us a barometer for trusting that the assessment is accurately measuring what it is intended to measure and that it is appropriate for the students it is given to.

Types of evaluations are split up into two major groups: summative and formative. **Summative assessments** are usually given at the end of a unit, course, or school year and are often created by someone other than you. **Formative assessments** are typically shorter, more frequent, and diagnostic in purpose; they provide specific guidance to students and to you on what your students still need to learn.

You will develop a wide range of formative assessments for your classroom. Among this range is the variance of online versus in-person evaluations. Both types are central elements of effective blended teaching. Administering assessments online and in-person have different advantages that should be considered as you are planning your instruction. These are detailed below in Table 3.1.

Table 3.1 *Strengths of different assessment types administered in-person & online.*

Type of Assessment	In-Person Advantages	Online Advantages
Quizzes and exams	• Easier to prevent cheating	• Individualizes question selection • Automated scoring and feedback • Multiple attempts possible
Observations	• Immediacy of feedback	• Richness of data
Live presentations and physical demonstrations	• Sensory richness • Fewer technology barriers	• Flexibility in time and space • Time to provide detailed feedback between presentations • Can re-watch presentations • Management of peer review
Papers and projects	• Peer review may benefit from human connection	• Digital submission and collection • Online rubrics and gradebook integration • Management of peer review
Portfolios	• Allows for physical objects • Sensory richness	• Portability and share-ability • Ability to easily update • Can contain dynamic elements
Discussion Participation	• Attendance is easy to track - contribution more difficult • Energy of contribution can be easily felt	• Everyone can contribute • Quality of contribution can be assessed

For an assessment to be useful for **mastery-based progression**, each element needs to be associated with a specific student learning outcome (SLO). Rather than focus on overall scores for a quiz or exam, we will focus on scores at the SLO level. Consider the example in Figure 3.2. This figure shows the exam scores for a class where every student has scored 85% or higher on the exam. Pretty impressive! Are all the students in the class ready to move on to the next unit?

	CLASS NAME			HW 1	HW 2	HW 3	Exam 1
3	Teacher			10	10	10	100
5	Class average	B+	89%	9.5	9.7	9.5	86.8
6	Student 1	A	92%	10	10	10	90
7	Student 2	B+	87%	9	10	9	85
8	Student 3	A-	90%	10	10	10	87
9	Student 4	A-	90%	10	9	10	88
10	Student 5	B+	86%	9	9	9	85
11	Student 6	B+	88%	9	10	9	86

Figure 3.2 Gradebook with unit Exam 1 scores all at 85% or above.[24]

To answer this question and use this exam for mastery-based progression, you will need to match each item or question in the exam with the SLO that it is measuring as shown in Figure 3.3.
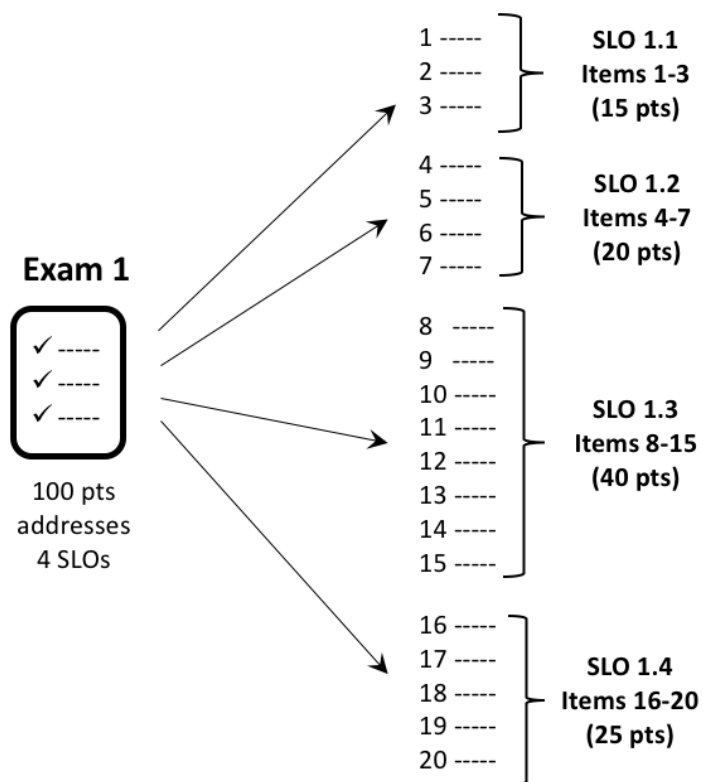

Figure 3.3 The relationship of items in the unit exam to four different SLOs.[25]

Figure 3.4 shows the unit exam results organized by SLO. Now when you look at the exam scores are all the students ready to move on to the next unit?

3	Teacher	100	15	%	20	%	40	%	25	%
5	Class average	86.8	13.3	89%	16.5	83%	35.3	88%	21.7	87%
6	Student 1	90	15	100%	19	95%	40	100%	16	64%
7	Student 2	85	14	93%	14	70%	38	95%	19	76%
8	Student 3	87	15	100%	19	95%	29	73%	24	96%
9	Student 4	88	9	60%	16	80%	38	95%	25	100%
10	Student 5	85	14	93%	14	70%	33	83%	24	96%
11	Student 6	86	13	87%	17	85%	34	85%	22	88%

Figure 3.4 Gradebook from Figure 3.3 with Exam 1 scores by SLO.[26]

Boxed areas of Figure 3.4 show that even though all students scored 85% or above on Exam 1, all but one student demonstrated significant weakness in at least one SLO. Moving on to the next unit without helping students to overcome deficiencies could lead to an increase in poor performance.

3.1.3 Identifying Mastery Thresholds

Mastery gradebooks or trackers are tools that allow you to quickly and easily see how well a student has mastered each SLO. To clearly communicate this, teachers typically will use a streetlight color coding scheme in the gradebooks (see Figure 3.5). In the mastery gradebook, green indicates a student has achieved a mastery level on an assessment or SLO, yellow indicates near mastery, and red indicates that the student needs more significant **remediation** or intervention.
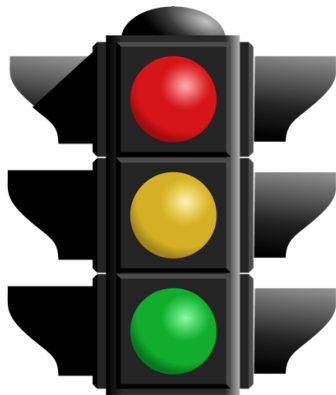
RED = **Remediation**

YELLOW = **Near Mastery**

GREEN = **Mastery**

Figure 3.5 The visual representation of whether students have reached established mastery thresholds.[27]

As you know, assessments can have many forms—quizzes, tests, reports, essays, projects, performances. The possibilities are nearly endless. The importance of a mastery assessment is that it is directly linked to a learning standard. This means the rubric for a project or essay is focused primarily on mastery of the objective and not on things like grammar, presentation length, format, etc. One of the ways to do this is to create a rubric that breaks apart your mastery into four different levels and transfer those levels over to the rubric. The four levels of your mastery rubric may include:

- Exceeds Mastery
- Mastery
- Near Mastery
- Remediation

It is important to know what each of these benchmarks looks like for a given standard and what form of assessment can best measure them.

You or your school will need to determine appropriate upper and lower mastery thresholds. There is research to support the idea that the upper mastery level should be set somewhere in the range of 80-95%. Figure 3.6 shows the gradebook from Figure 3.4 as a mastery gradebook with the upper threshold set at 85% and the lower threshold set at 75%.

Students			Obj1.1	Obj1.2	Obj1.3	Obj1.4
Student 1	3 0 1		MASTERY	MASTERY	MASTERY	REMEDIATION
Student 2	2 2 0		MASTERY	NEAR MASTERY	MASTERY	NEAR MASTERY
Student 3	3 0 1		MASTERY	MASTERY	REMEDIATION	MASTERY
Student 4	2 1 1		REMEDIATION	NEAR MASTERY	MASTERY	MASTERY
Student 5	2 2 0		MASTERY	NEAR MASTERY	NEAR MASTERY	MASTERY
Student 6	4 0 0		MASTERY	MASTERY	MASTERY	MASTERY

Figure 3.6 Example of a mastery tracker for SLOs (Mastery=85%, Near Mastery=75%).[28]

Challenge 1

Review the items in one of your unit assessments and map each item to the SLO that it is measuring as in Figure 3.4. Determine appropriate mastery thresholds for each SLO.

Challenge 2

Create a small quiz with 4-5 questions that all focus on assessing one SLO in your curriculum. Determine appropriate mastery thresholds for your quiz. Build the quiz in your learning management system.

Challenge 3

Use section 3.1 of the Blended Teaching Roadmap to determine mastery levels for a standard you use in your classroom and brainstorm mastery-based assessments for that standard (http://bit.ly/BTRoadmap).

3.2 Monitoring Student Growth

Once you have (1) created or acquired assessments, (2) matched assessment items to your SLOs, and (3) set appropriate mastery thresholds, you are ready to begin using your assessments to monitor student engagement and learning. In this section, we will cover how data can be used to monitor student performance and activity or engagement online. Included are a number of examples of data from educational software that help teachers monitor student learning and engagement. Finally, you will learn several strategies for identifying meaningful patterns when analyzing mastery data.

3.2.1 Using Data Dashboards

A **data dashboard** is simply a tool that helps you to visualize student data in real-time. It is different from a **printed growth chart** because the charts in the data dashboard are updated instantaneously as new student data is added to the system. Like a car dashboard, student data dashboards might also include several data displays that help you to understand patterns in student learning. Figure 3.7 is a simple example of a data dashboard with three pieces of data at the class level. Data dashboards will often let you view classroom-level data and then drill down to individual student-level data by clicking on the course-level charts. This allows you to look for patterns happening at both the class and student levels.
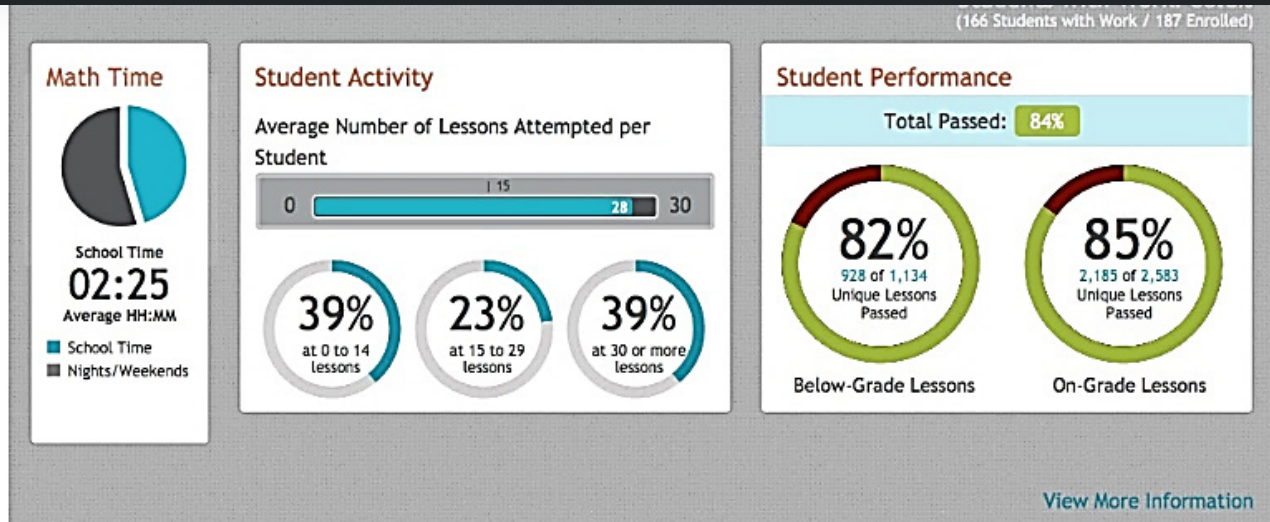
Figure 3.7 Example of a class-level data dashboard from ImagineLearning.[29-30]

There are two major categories of data that are typically used to monitor student growth and therefore visualized in data dashboards (see Table 3.2 for examples):

1. **Performance data:** Data that are direct measures of student learning such as how students have performed on assessments.
2. **Activity data:** Data that are indirect measures that often help explain student learning patterns such as participation, effort, engagement, and activity levels.

Table 3.2 *Examples of student performance and activity data.*

Example Performance Data Sources	Example Activity Data Sources
- Gradebook - Mastery Gradebook - Adaptive Learning - Performance Dashboard - State/National Exams	- Attendance - Participation - LMS login and activity - Engagement

Both types of data are important to understanding the story of student learning and growth.

Mastery gradebookswith their red, yellow, and green colors are good examples of simple performance data dashboards. Figure 3.8 shows several different examples of software that enable a mastery gradebook view of student performance.
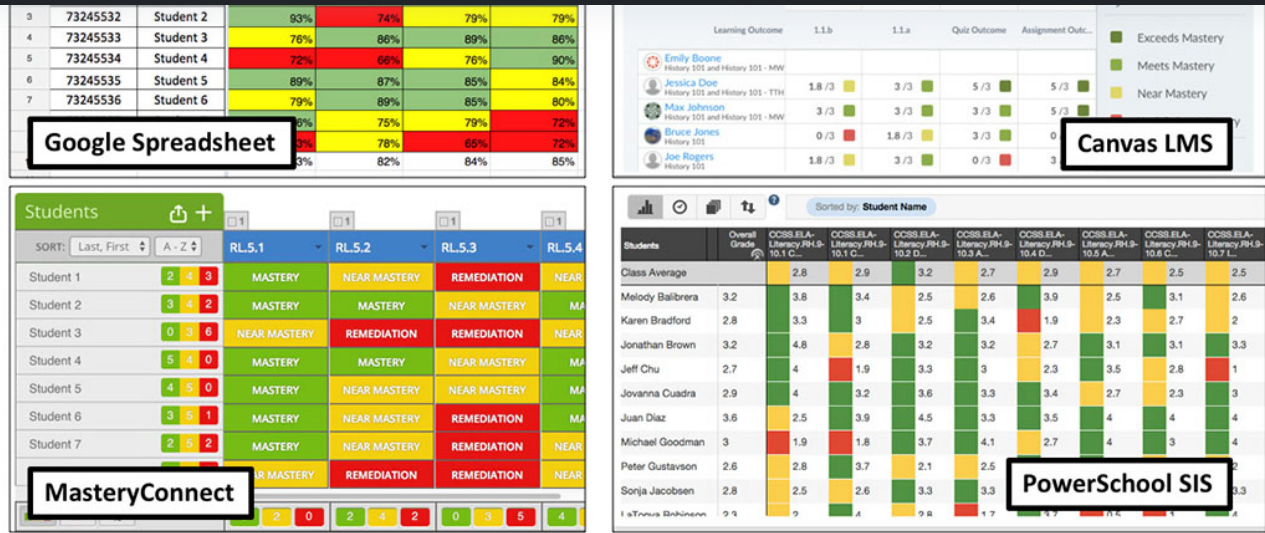
Figure 3.8 A few examples of mastery gradebooks.[31-32]

Figures 3.9a-c show some other examples of the variety of performance data dashboards available in commonly used software programs like Khan Academy,[33] Imagine Learning,[30] and ALEKS.[10]
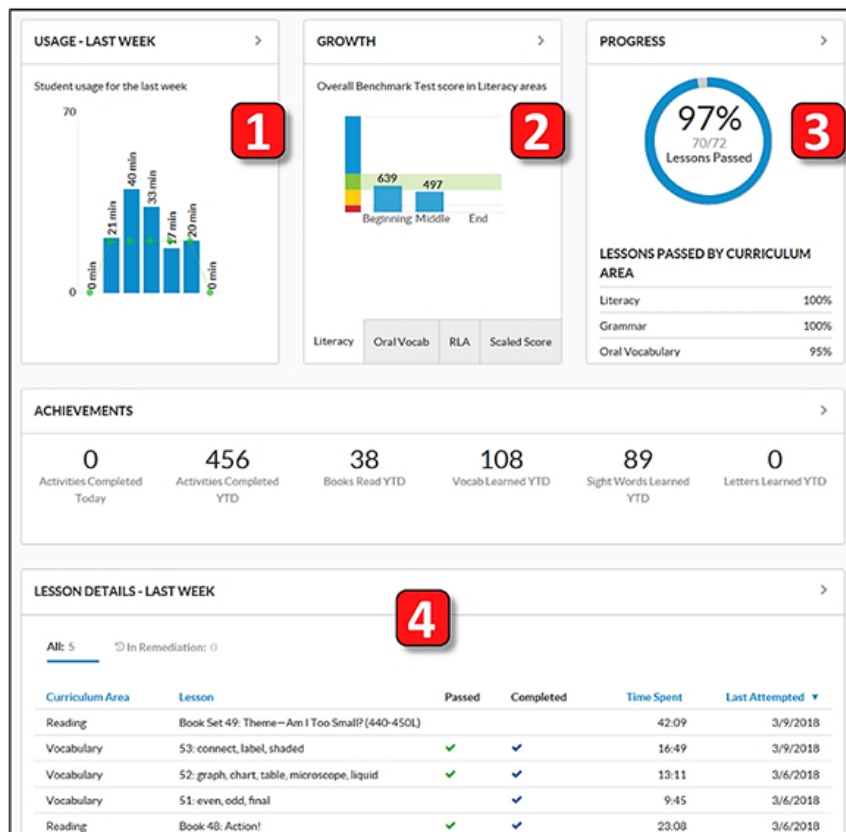
Figure 3.9a Example dashboard from ImagineLearning (1=activity data, 2-3=performance data, 4=performance and activity data).[34]
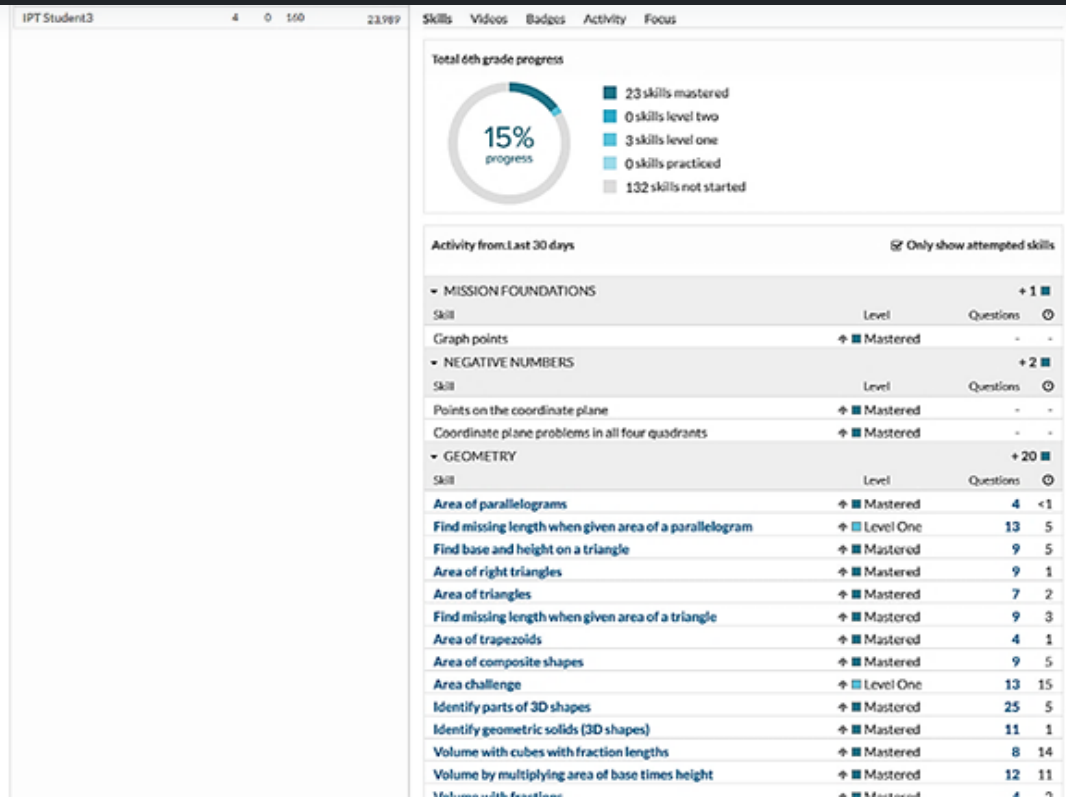
Figure 3.9b Example of a Khan Academy Dashboard (1=activity and performance data, 2=performance data, 3=activity and performance data).[35]

Figure 3.9c Example of an ALEKS Dashboard (1,4,5=performance data; 2,3=activity data).[36]

In addition to performance data, activity data gives you insight into how your students are spending (or not spending) their learning time. At the most basic level, this looks like attendance and participation data (see Figure 3.10). This kind of data may help explain performance levels for a student who is regularly missing school, who is frequently pulled out of class during a particular time of day, or who is not submitting assignments.
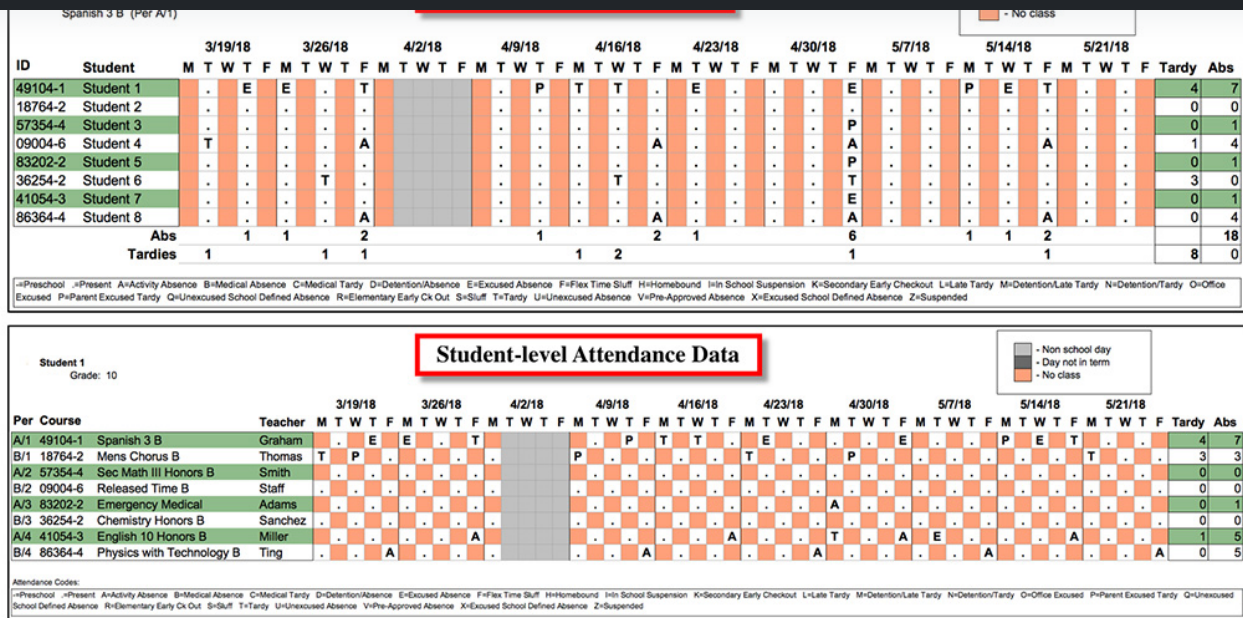
Figure 3.10 Attendance data at the class-level and student-level.[37]

In addition to basic attendance data, most LMSs and **adaptive software programs** also provide student activity data that can be helpful in understanding how students are using their time. For example, this data may allow you to see how often a student has logged into the software or how much time the student spent on a particular learning task. Figure 3.11 shows examples of dashboards with information about login, time spent on a particular topic, time spent watching instructional videos, and the number of attempts to answer assessment questions.

Students	Overall Grade	CCSS.ELA-Literacy.RH.9-10.1 C...	CCSS.ELA-Literacy.RH.9-10.1 C...	CCSS.ELA-Literacy.RH.9-10.2 D...	CCSS.ELA-Literacy.RH.9-10.3 A...	CCSS.ELA-Literacy.RH.9-10.4 D...	CCSS.ELA-Literacy.RH.9-10.5 A...	CCSS.ELA-Literacy.RH.9-10.6 C...	CCSS.ELA-Literacy.RH.9-10.7 I...
Class Average		2.9	6.7	4.3	2.8	4.5	1.6	2.2	1.2
Melody Balibrera	3.2	8	14	8	5	11	4	4	2
Karen Bradford	2.8	5	9	6	3	5	2	4	1
Jonathan Brown	3.2	4	7	5	3	6	2	3	2
Jeff Chu	2.7	3	6	4					
Jovanna Cuadra	2.9	2	6	4					
Juan Diaz	3.6	3	8	4					
Michael Goodman	3	2	6	3					
Peter Gustavson	2.6	3	6	4					
Sonja Jacobsen	2.8	3	12	10					
LaTonya Robinson	2.3	1	2	2					

PowerSchool Dashboard – showing how frequently a standard has been assessed (**darker** = higher assessment frequency)

Figure 3.11a Examples of activity data from PowerSchool SIS.[38]

le by multiplying area of base times height
ral problems on the coordinate plane
Volume with fractions
Videos
Area of composite shapes
ea by adding areas of faces
Skills
Area challenge
Surface area using nets
Area of trapezoids
Identify parts of 3D shapes
Volume with cubes with fraction lengths

Surface area word problems
Find base and height on a triangle
Area of triangles
Area of parallelograms
Area of right triangles
Volume word problems: f
Surface area
Identify geometric solids (
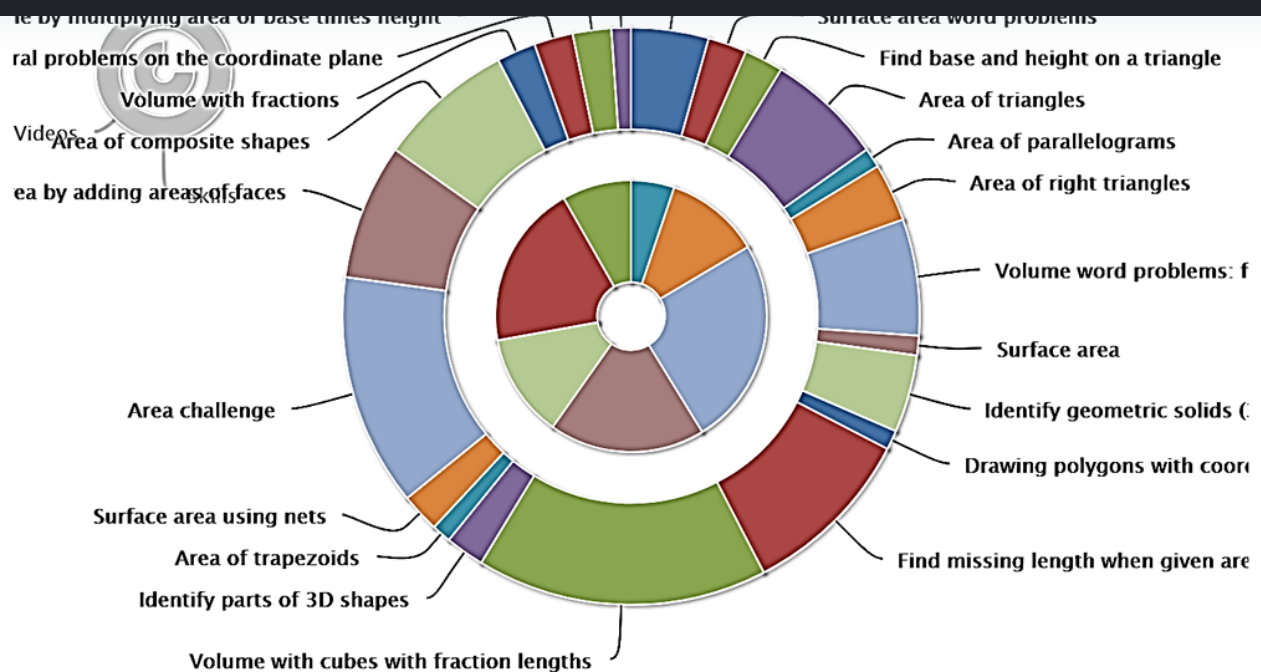Drawing polygons with coor
Find missing length when given are

Figure 3.11b Examples of activity data from Khan Academy illustrating the range of topics that students are engaging with.[39]
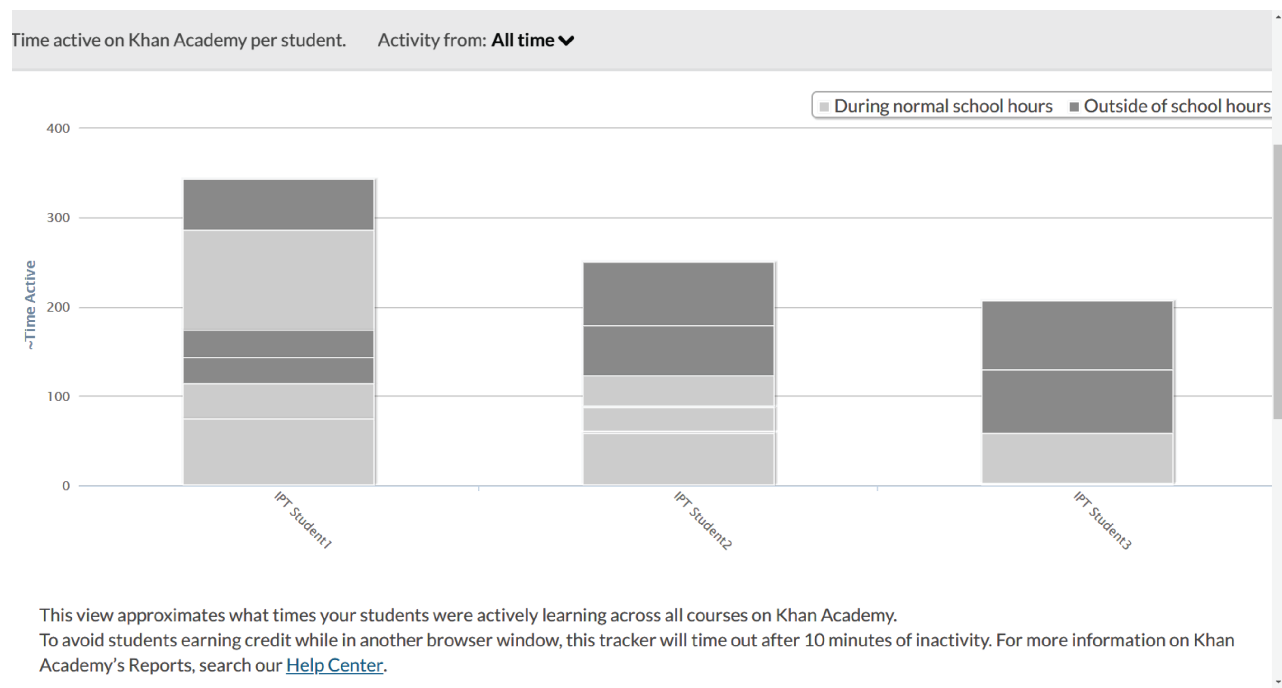

Figure 3.11c Example of activity data from Khan Academy illustrating the time spent watching videos and doing skill activities. 40

Student ▾	Page Views	Participations	Submissions	On Time	Late	Missing	Current Score
▨	390	26	32	20	12	1	87.32%
▨	381	23	32	32	0	0	97.64%
▨			0	0	0	32	--
▨	526	23	31	26	5	1	93.96%
▨	518	27	30	23	7	3	89.76%
▨	823	24	31	29	2	1	99.35%
▨	453	31	32	30	2	1	95.76%
▨			0	0	0	32	--
▨	8	0	0	0	0	32	--
▨	459	30	31	31	0	1	99.78%
▨	424	27	31	30	1	1	97.06%
▨	284	18	28	17	11	4	88.73%

Figure 3.11d Examples of activity data (whole class activity over time and individual student activity) from the Canvas LMS.[41]

3.2.2 Identifying Patterns in Student Data

While data dashboards are helpful for presenting large amounts of student data in visual form, you must develop the skills of interpreting student data and using the data to improve student learning. Interpreting patterns in student data is the process of reading and trying to understand the story that the numbers tell about a student's learning growth without having all of the narrative details.

For example, can you tell by looking at the dashboards in Figure 3.8 what outcomes each student is struggling with the most? Which data dashboard would you look at to see if attendance has been a barrier to his progress? What story does the data in Khan Academy dashboard (Figure 3.11a) tell about where the students are struggling? How many successful and unsuccessful attempts have been made on the problem set? What might you infer from this data about what interventions the student needs?

thumb that you can use as guidelines for interpreting information.

3.2.3 The AAA Process

Tables 3.3-3.5 show a generalized process for working effectively with data—the AAA Process. You always begin with identifying a question that you want to **ASK** of the data. This initial question is often focused on understanding patterns related to an individual, a group of students, or even the instruction itself. The second step of the process is to **ANALYZE** the data for patterns that can help you answer the question you have asked. Finally, you need to **ACT** on what you have found. This typically entails adjusting the student learning activities, the instruction, or the assessments used to gather data.

Table 3.3 *The AAA Process -- Step 1 ASK*

Step 1 - ASK		
Individual Student	**Small Group or Class**	**Instructional Materials**
1. What progress has the student made towards their learning goals? 2. What SLO is the student struggling with? 3. What has the student done to master the SLO?	1. Is there a group of students that need help with the same SLO? 2. Is there a group of students I can ask to work together? 3. Are there outcomes that the whole class needs help with?	1. Is the assessment accurately measuring the SLO? 2. Is the learning activity missing elements needed to help students achieve the SLO?

Table 3.4 *The AAA Process - Step 2 ANALYZE*

Step 2 - ANALYZE		
Individual Student	**Small Group or Class**	**Instructional Materials**
Some things to look for… 1. Performance patterns—SLO mastery completion. 2. Activity patterns— off-task behavior or excessive time on one SLO might indicate why performance is low. 3. Possible causes— low effort, absences, missing prerequisite knowledge, etc.	Some things to look for… 1. Actionable Groups — homogenous/ heterogeneous groups, groups in remediation. 2. Mastery Movement — coming out of remediation. 3. LMS Activity.	Some things to look for… 1. Assessment Functioning— items that most students are missing. 2. Activity Use—resources being used or not used. 3. Instructional Gaps —activity didn't cover concept or had misleading info or didn't help students reach mastery.

Table 3.5 *The AAA Process - Step 3 ACT*

Individual Student	Small Group or Class	Instructional Materials
1. Work with student to review and adjust goals. 2. Provide targeted remediation. 3. Recommend targeted materials/activities.	1. Provide small group direct instruction. 2. Establish learning groups or peer tutoring. 3. Recommend targeted materials/activities.	1. Improve assessments. 2. Improve learning materials.

Ultimately, you will want to become familiar with the data dashboards that are available to you in your classroom. You will need to know where to find performance and activity data for your students. In the section below, we will present some data dashboards from several different sources and typical questions that could be ASKED of that data. Test yourself to see if you can use the data in the scenarios below to ANALYZE patterns that can answer the questions posed. If you cannot answer the questions with the existing data dashboard, identify what data you would need to answer the questions.

Scenario 1: MasteryConnect Tracker Data

Figure 3.12a shows the mastery tracker with five student learning outcomes (SLOs) for a unit. If you were the teacher, what questions would you ASK of the data? What patterns do you see as you ANALYZE the data? What are possibilities for how you would ACT on the data? Table 3.6 shows a possible response to these questions.

Figure 3.12a Mastery Connect data - How would you use this data to help students progress?[42]

Table 3.6. *Example analysis of data in Figure 3.12a*

Which students or groups of students need remediation around which SLOs?	• A group of students need help with 6.5 • Two students need help with 6.1. • Victor is struggling with the whole unit.	• Begin with 1-1 tutoring session with Victor on 6.1-6.4. Pull in Sirius for tutoring on 6.1. • Create small group direct instruction for students needing remediation or at near mastery on 6.5.
Which students are close to achieving mastery? Which students have achieved mastery and could help peers?	• Many students at mastery (green) or near mastery (yellow) for 6.1-6.4.	• Option 1=provide online practice activities around SLOs for near mastery students. • Option 2=pair mastery and near mastery students to practice together on selected SLOs.

Scenario 2: Khan Academy Data

Figure 3.12b shows a Khan Academy dashboard for Student 3 who you have noticed is struggling with the unit on geometry. Figure 3.12c shows two data screens where you have drilled down further to see what the student's activity focus has been and what the data for the performance in the first troublesome skill set shows. What patterns do you notice in each of these screens and what is the story that the data is telling you? Table 3.7 shows a possible response to these questions.
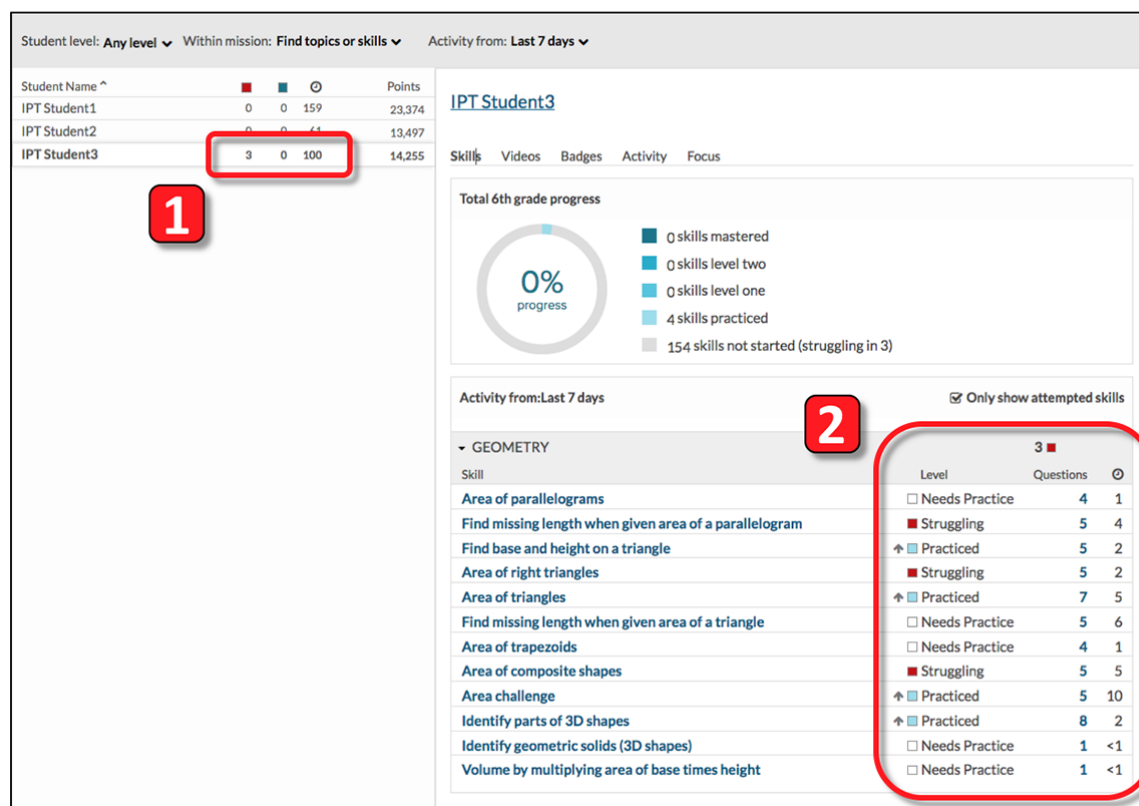

Figure 3.12b Khan Academy data - How would you use this data to help students progress?[43]

Figure 3.12c Khan Academy data - How would you use this data to help students progress?[44]
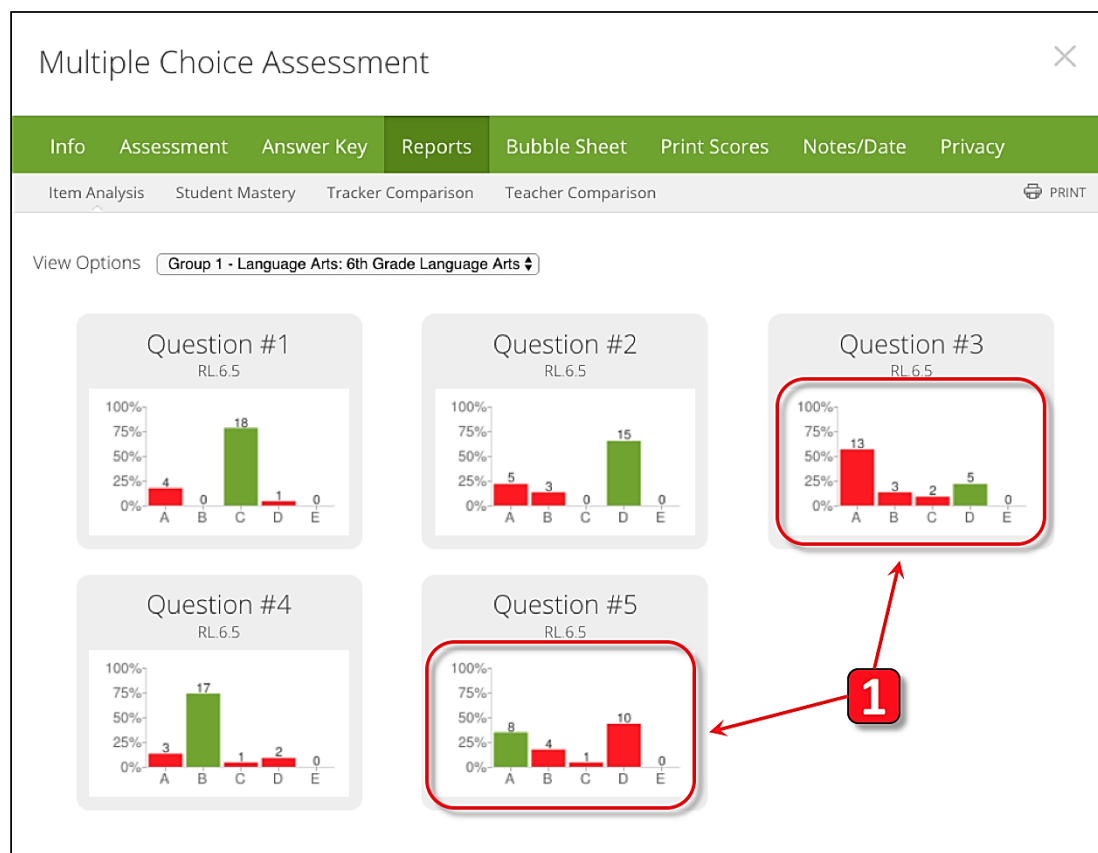
Table 3.7 *Example analysis of data in Figures 3.12b-c*

ASK	ANALYZE	ACT
What skills does the student need help with?	(#1) The student has spent 100 minutes and is listed as struggling in 3 skills. (#2) The student has had minimal practice in 4 additional areas.	Set a goal with the student to work on 1-2 skills at a time until mastered and not to work on a dozen skills simultaneously.
Why is the student struggling?	(#2 and #3) The student is jumping all around, spending 2-6 minutes in a dozen different skills. (#4) Looks like the student spent time trying to figure out Q#1-2 and even watched a little instructional video, then probably just guessed on Q#3-5.	Address persistence issue with instructional videos—observe student watching videos to see if language level is too high for comprehension.

Scenario 3: MasteryConnect Tracker Data

You are working to help students achieve mastery on SLO RL.6.5. Early in the class, you observed how your students were performing and only one student was at mastery level (see Figure 3.12d). In preparation for the outcome quiz, you conducted another observation during some class activities in which you saw that most of the class was at mastery or near mastery (see Figure 3.12d). You were surprised that when students took the assessment, nobody demonstrated mastery. You click on the assessment report to see if it can help you to better understand (see Figure 3.12e). What questions do you ASK of the data? What patterns do you see as you ANALYZE the data available? Table 3.8 shows a possible response to these questions.

Figure 3.12d MasteryConnect assessment data - What patterns do you see?[45]

Figure 3.12e MasteryConnect item analysis data - How would you use this data?[46]

Table 3.8 *Example analysis of data in Figures 3.12d-e*

ASK	ANALYZE	ACT

How are students progressing from Observation 1 to the final assessment?	• Observation 2 shows that most of the students have progressed to mastery or near mastery. • Final assessment shows students regressing away from mastery.	investigate questions #3 and #5 to see if the answers have been mis-keyed.
Why are so many students not mastering the SLO final assessment? **Is there possibly something wrong with the assessment or students' preparation for the assessment?**	Difference between scores for Observation 2 and final assessment suggest the following possibilities: • Students have regressed. • Measurement differences between observations and assessment. • (#1) exploring item scoring for the final assessment shows two items most students are missing which could be mis-keyed answers or dimensions of the SLO not observed in Observation 2.	If the answers are correct, evaluate the questions to see if questions match the SLO and if the instruction (including materials) needs to be updated to address the deficiency.

Competency: I can identify important patterns in student performance data (3.2)

Challenge 1

Identify the data dashboards available to you in the LMS or in the software in your classroom. What are some of the questions you can find answers to in the data you have access to?

Challenge 2

Create a mastery tracker for one curricular unit that includes formative and summative assessments that align with unit learning outcomes.

Challenge 3

Use section 3.2 of the Blended Teaching Roadmap to determine what data you have access to in your classroom. How do you plan to use both this data and a mastery gradebook to improve student learning and to inform classroom practices? (http://bit.ly/BTRoadmap).

3.3 Using Data to Improve Learning

Monitoring student performance and activity is pointless if we don't plan to ACT on what we have learned or if we provide the same instruction to everyone regardless of story the data tells. In this section, you will learn about how you can use student data to improve student learning by:

3. Improving assessments and learning materials

3.3.1 Informing Student Learning Goals

In the next chapter, we will discuss the importance of allowing students to co-create their learning experiences. Part of this co-creation is sharing ownership over student data. In the past, performance data has either been something that you see in the grade book, or something that students create during activities that are not reported in the grade book. However, when trends in data are shared with students and student-created data is shared with you, you and your students can work together to co-create learning. In order for this to occur, students need to not only have access to their own data but understand how to read it and recognize its trends.

Helping Students Understand Data and Set Goals
Video 3.4 (4:50) http://bit.ly/btb-v275

[Watch on YouTube](#)

What to Look For: Observe the different kinds of data this teacher and student discuss, and how each kind of data is used to set different kinds of goals (both academic and behavioral).

Setting individual learning goals with a student requires dedicating attention to that student's interests and performance data. Once you understand the story a student's data tells, you can conference with him or her to determine which learning activities, assignments, projects, and/or assessments are the best match. Consider the data in Figure 3.13.

SORT: Last, First / A - Z	RL.6.1	RL.6.2	RL.6.3	RL.6.4	RL.6.5
Abbott, Hannah	MASTERY	NEAR MASTERY	NEAR MASTERY	MASTERY	NEAR MASTERY
Black, Sirius	REMEDIATION	MASTERY	NEAR MASTERY	MASTERY	MASTERY
Brown, Lavender	MASTERY	NEAR MASTERY	MASTERY	MASTERY	REMEDIATION
Byers, Will	NEAR MASTERY	NEAR MASTERY	MASTERY	NEAR MASTERY	REMEDIATION
Chang, Cho	MASTERY	MASTERY	MASTERY	MASTERY	REMEDIATION
Diggory, Cedric	MASTERY	MASTERY	MASTERY	MASTERY	REMEDIATION
Evans, Lily	MASTERY	MASTERY	NEAR MASTERY	MASTERY	REMEDIATION
Finnigan, Sean	NEAR MASTERY	MASTERY	NEAR MASTERY	MASTERY	NEAR MASTERY
Granger, Hermione	MASTERY	MASTERY	MASTERY	MASTERY	REMEDIATION
Greengrass, Da…	NEAR MASTERY	NEAR MASTERY	NEAR MASTERY	MASTERY	NEAR MASTERY
Henderson, Dustin	NEAR MASTERY	MASTERY	MASTERY	NEAR MASTERY	NEAR MASTERY
Krum, Victor	REMEDIATION	REMEDIATION	NEAR MASTERY	REMEDIATION	MASTERY
Longbottom, Ne…	MASTERY	NEAR MASTERY	MASTERY	MASTERY	NEAR MASTERY

Figure 3.13 MasteryConnect data demonstrating need for individualized student goals.[47]

Each student is going to have different individual goals. Hannah doesn't need to work on the first standard, RL6.1, nor does Lavender. Sirius, however, does need help. He will need to meet with you to get that help. Will also struggles, but he could receive assistance from resources online or from students who have already mastered RL6.1.

Each of these students will need to set a different learning goal. Hannah probably won't have goals for RL6.1 or RL6.4 because she has mastered them. Instead, you will need to look at her data for the standards that are near mastery to determine what she needs help with. Once you understand the help that she needs, you can conference with her to determine the activities she will need to complete to fill the gaps in her understanding. You can also find the projects or assessments she will use to illustrate that the gaps have been filled. The last goal you will set with her during this conference would be to establish a timeline for completing her goals. The next chapter will talk more about creating personalized goals for students that need more than data to guide their goals.

Here are the essential data talking points in an individual goal setting conference.

- Where is the student currently?

- Where does the student need to go?

- What can help the student get there?

- How can the student illustrate that he or she is there?

- How quickly can the student complete the plan?

- When does the student need to illustrate increased performance?

In addition to helping students determine individual goals, you can work with students to set group goals. At times, you benefit from having groups of students work together. Using the data for Hannah, Sirius, Lavender, and Will, we can imagine ways in which groups of students may want to work together (see Figure 3.13).

Based on this data, you might choose to have all four students work together on RL6.2 and RL6.3. This would allow Sirius to help Hannah, Lavender, and Will with RL6.2, and allow Lavender and Will to help Sirius and Hannah with RL6.3. Once the students have agreed to work together on these standards, you could conference with the entire group to establish the same kind of plan you would for an individual student.

Here are the essential data talking points in a group goal setting conference.

- Where is each student currently?

- Where does each student need to go?

- How can each member of the group help each other get there?

- What instructional activities or resources can help the students get there?

- What project can let students demonstrate that they are all where they need to be?

- How quickly can the group complete the project?

- When does the group need to illustrate increased performance?

- When will the group work on various aspects of their project(s)?

- How will group contributions be reported and observed?

When meeting with groups, you need to make sure that all students understand their responsibilities within the group. In a group where everyone has the same level of mastery, this is relatively easy. Each member is responsible for learning and then contributing their newly acquired knowledge to the group's work. When students have different levels of understanding among them, negotiating group roles can be more complicated. Let's look at the data for Hannah, Sirius, Lavender, and Will again (see Figure 3.13).

Student Groupings

There are essentially three strategies that can be used when grouping students based on performance data:

Homogeneous groups consist of students who are all at the same level. This can include students who are all at mastery and will be working on enrichment activities, students who are near mastery and need to work on the same activities together to get to mastery, and students who are in remediation and need to meet with you.

Heterogeneous groups are made up of students who are all at different levels. This usually includes a mixture of students who are at mastery and near mastery working together to improve their understanding of the materials. The mastery students learn the material better by teaching the near mastery students, and the near mastery students from the small group tutoring.

Mixed groups combine homogeneous and heterogeneous groups to personalize instruction. This is common in station rotations where some groups may work together, while other groups complete online learning activities or meet with you.

working on the standard that he and Hannah are near mastering (RL6.3). His project with Hannah would be guided by Lavender and Will. In the group conference, both you and the students would need to decide what Hannah would be doing since she would have to be focused on completing both projects. The group would also have to determine how they would demonstrate understanding of the standards once the projects are finished. Would there be individual assessments? Would the group present the project as a whole? Would each group member present the project individually? Some members of the group would possibly have to complete multiple assessment strategies if one is not enough to fully demonstrate understanding.

Conferencing & Goal Setting
Video 3.5 (2:24) http://bit.ly/btb-v203

Watch on YouTube

Video 3.6 (2:15) http://bit.ly/btb-v223

Watch on YouTube

As a secondary teacher you are focused not only on helping students achieve learning standards, but also on helping students feel college and career ready. Your school has the added responsibility of helping students to set meta-goals like getting into a private or state university, going into the military, or obtaining a job or a union membership.

College and career goals should not stop there, however. Faculty and staff need to help students see how specific classes will help them meet their larger goals. If you mentor students in this regard, you will need to help them set achievement, pacing, and time goals for these classes, so that their meta-goals can inform their day-to-day goals. This can also be accomplished through your school's student mentoring program where selected teachers mentor specific groups of students, through one-on-one meetings with counselors or through meetings with appointed goal-setting support staff. These staff help answer the question, "Where is the student currently?"

Check out these videos to see how one school is making this work. (Your school might not be ready for this kind of systemic transformation yet, but it is something you could start working towards by following the advice in this book.)

Video 3.7 (3:32) http://bit.ly/btb-v250

Watch on YouTube

What to Look For: These teachers list several strategies for helping students know where they are and where they need to go. Look for strategies that you could use in, or modify for, your classroom.

3.3.2 Improving and Informing Learning Activities

It is probably most common for you to use patterns in student data to inform the nature of future student learning activities. In your analysis of data patterns, you will identify individual students or groups of students who have trouble with specific SLOs. Often the recommended activities will fall into one of three categories: student-teacher activities, student-student activities, and student-content activities.

Student-Teacher Activities involve the most valuable and limited resource within the classroom—you the teacher. In a blended classroom you want to use your time and skills to the maximum potential. This means doing what you do best, which often involves (1) diagnosing and remediating specific learning challenges and (2) encouraging and motivating your students. You encourage and motivate students when setting and following-up on student learning goals (see 3.3.1) among other things. When you identify an individual student or small group of students who need remediation (red) in a mastery gradebook, it is often effective to conduct a one-on-one or small group tutoring session because you can diagnose more nuanced challenges than software can.

Video 3.8 (1:30) http://bit.ly/btb-v381

Watch on YouTube

What to Look For: Listen to how teachers have a plan for helping students progress from getting help from content, then from peers, then finally from the teacher.

You can also use data like that shown in Figure 3.14a to identify specific problems that your student or group of students is struggling with. The specific problems that were missed might be selected and used in a one-to-one or small group tutoring session.
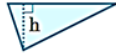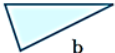
Video 3.9 (0:59) http://bit.ly/btb-v258

Watch on YouTube

What to Look For: Listen to how teachers develop independent learning rotations with "teacher time" for students below 50% mastery.

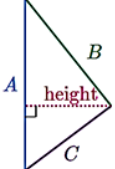Figure 3.14a. Khan Academy data that allows teacher to see which questions were missed.[48]

Peer Tutoring
Video 3.10 (2:56) http://bit.ly/btb-v364

Watch on YouTube

What to Look For: Notice the relationship between students in this peer tutoring example.

Video 3.11 (2:53) http://bit.ly/btb-v302

Watch on YouTube

What to Look For: Listen to how the teachers decide how to group students based on data.

Student-Student Activities involve options such as peer tutoring, small group peer teaching, and collaborative projects. Peer tutoring and small group teaching activities work best when students are near mastery (yellow) but probably do not work as well when they are in need of remediation (red). These types of student-student activities not only help the student who is near mastery but also help the peer tutor develop 21st Century Skills (see the 4 Cs in section 1.0), such as communication and collaboration. Peer tutoring or small group work can even keep students on-task if they are paired with the right peer. You can then use student data to select an appropriate peer tutor who has already mastered the SLO and who is well behaved.

Video 3.12 (1:54) http://bit.ly/btb-v312
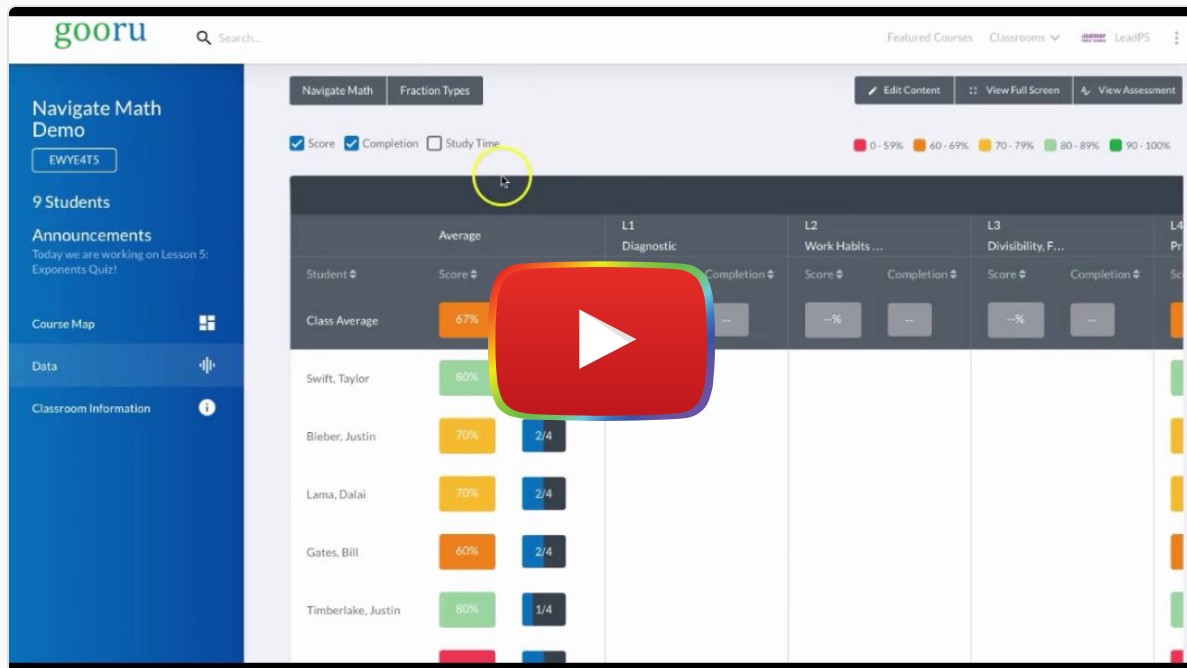
Watch on YouTube

What to Look For: Observe how the teachers use student performance data to decide how to manage daily small group instruction.

Student-Content Activities are activities students complete from a teacher-curated playlist or activities recommended by an adaptive learning software program (see 4.4.1 for more on creating playlists). Some software makes it easy for you to recommend learning activities based on student needs. For example, Figure 3.14b shows how Khan Academy allows you to manually assign practice problems to students in each skill area based on the student's needs.
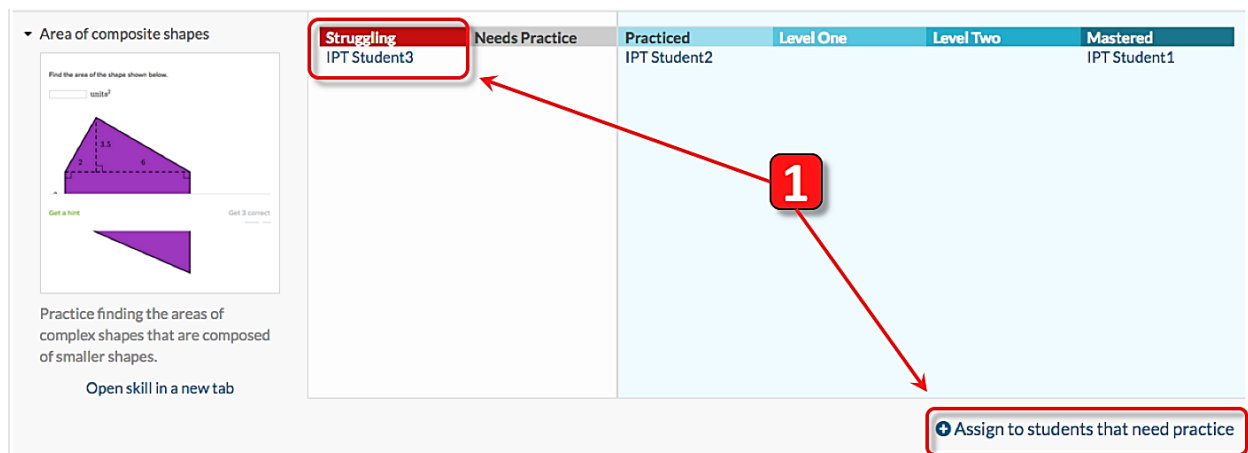
Figure 3.14b Khan Academy allows instructors to assign practice items to individual students or groups of students.[49]

(yellow) and just need a little more practice to achieve mastery.

3.3.3 Improving and Informing Assessments and Learning Materials

Identifying patterns in student data can lead you to recommend different kinds of learning activities as outlined in section 3.3.2. As shown in Scenario 3 (Figures 3.12d-e), data might also lead you to discover weaknesses in your assessments or learning materials. Looking at assessment data that shows what students are missing and what they are getting correct can also give you clues about concepts that might be missing or unclear in the instructional materials. Figure 3.15 shows an example of data from a simple quiz question in Canvas. This data reveals that most students don't understand the answer to the question. Because of this, you may need to update either the question itself or the instructional materials.
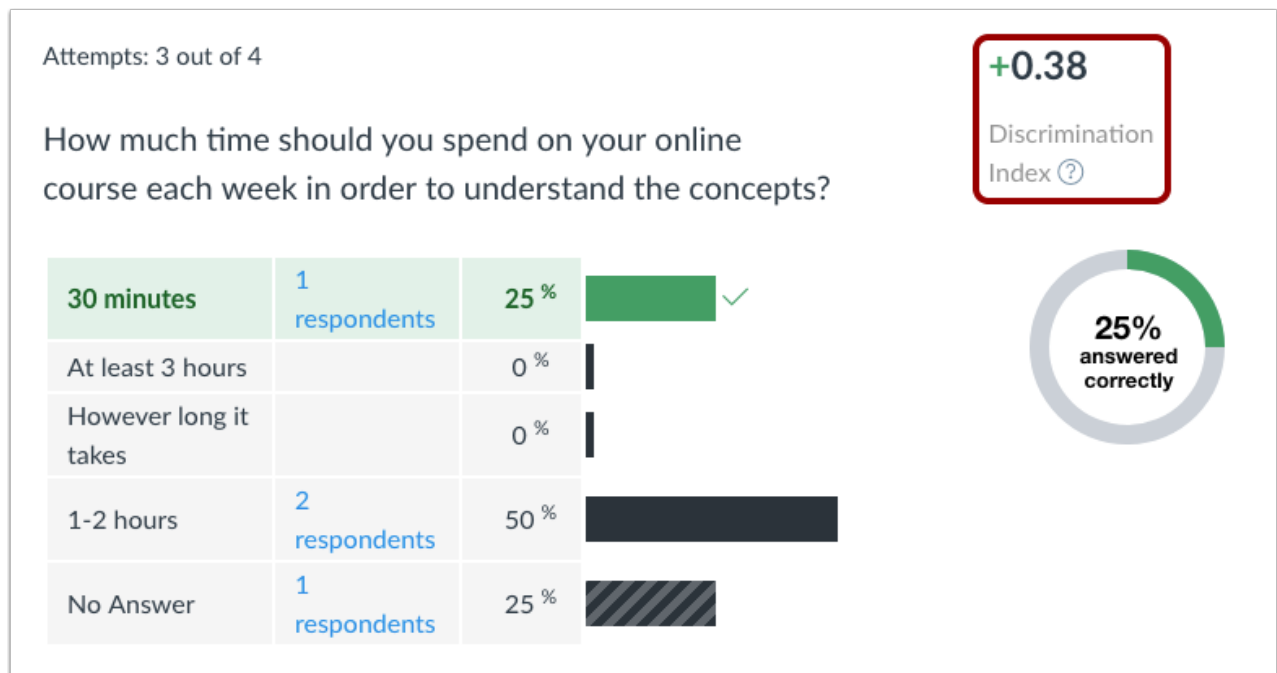
Figure 3.15 Canvas student data by quiz item.[50]

Some ways that you might act to improve assessments or learning materials based on data include the following:

- Altering items;
- Adding/eliminating questions from **question banks**;
- Redesigning rubrics;
- Finding better learning resources to use in activities or playlists;
- Clarifying written instructions.

students (3.3) and to evaluate and improve assessments and instructional materials (3.3).

Challenge 1

Review a previous assessment that you have given and gather some data about student performance. Which items tested well, and which did not test well?

Challenge 2

Use assessment data for one student from either a class assessment or a state standardized assessment to brainstorm some goals that you might encourage that student to set.

Challenge 3

Use section 3.3 of the Blended Teaching Roadmap to plan the grouping strategy that you will use with your students as well as the activities that students can complete at each level of mastery (remediation, near mastery, mastery, and exceeding mastery). (http://bit.ly/BTRoadmap)

Check your Understanding

Check your understanding of the concepts in the chapter by taking this chapter quiz. (http://bit.ly/K12-BTQuiz)

Go for the Badge

Complete Section 3 of the Blended Teaching Roadmap to plan and outline your strategies for gathering and using student data to improve student mastery in your classroom. (http://bit.ly/MyBTRoadMap-Ch3) (See two examples of a completed Roadmap in Appendix C.)

This content is provided to you freely by EdTech Books.

Access it online or download it at https://edtechbooks.org/k12blended/data_practices.

4

Personalizing Instruction
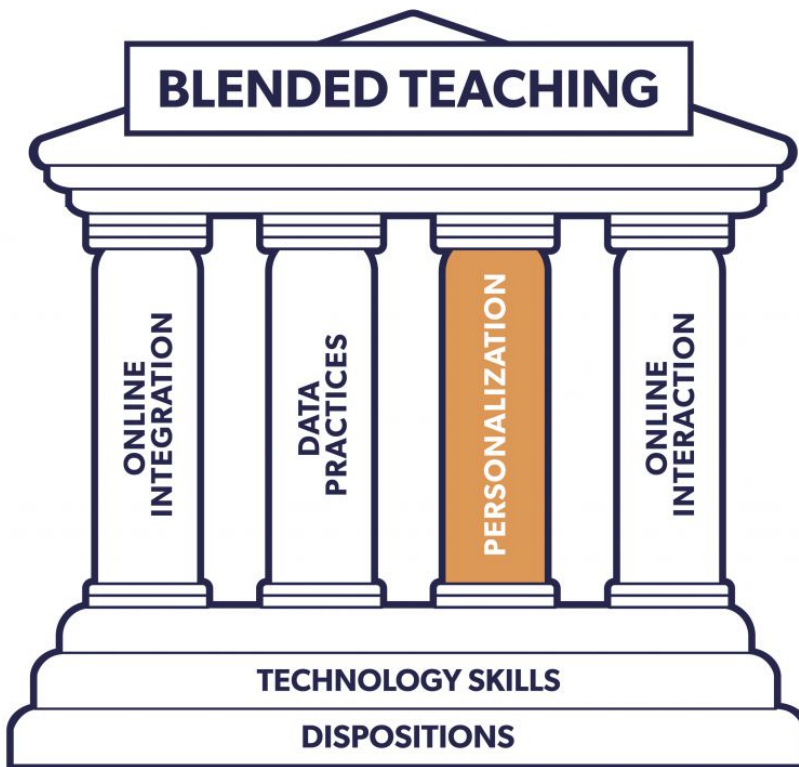
"Personally, I'm always ready to learn— although I do not always like being taught." –Winston Churchill, To the House of Commons, 4 Nov. 1952

Core knowledge and skills around personalization are essential to effective blended teaching. By the end of this chapter you should be able to meet the following objectives:

- I can identify what personalization is (4.1).
- I can develop a personalization plan for my class (4.1).
- I can develop a guide for personalizing students' learning goals (4.2).
- I can develop strategies for personalizing assessments (4.3).
- I can develop strategies for personalizing learning activities (4.4).

4.0 Introduction - Making Learning About the Students

All learning is personal. How you learn something, when you learn something, and what you decide to do with what you learn are all ultimately up to you. This is because you have different interests, wants, and goals than we do, and you probably have different interests, wants, and goals than the teacher next door. Like leading a horse to water, a teacher can lead students to a textbook (or software program, or learning activity, etc.), but no one can force them to read it, much less learn from it. **Personalization** consists of a system of mindsets and practices that allows teachers to increase a student's chances of engaging with learning materials, mastering learning materials, and applying learning materials to the real world based upon the student's own interests, wants, and goals.

But what does personalized teaching look like in today's K-12 schools?

Schools have always been about students. They may be run by adults, and guided by policies written by adults, but schools are not for adults. Walk into any K-12 school, and it is apparent that it is a place for students. The students often outnumber the teachers, administrators, and support staff by up to a 30:1 ratio. Twenty-first century teachers face the challenge of making learning personal for 20 to 40 students at a time.

Blended teaching allows us to shift from teacher-led practices — in which the teacher determines what should be learned, when it should be learned, and how it should be learned — to more student-centered practices that give students power over their own learning journeys.

This is not to say that teachers should let students run freely throughout the hallways. Teachers are still leading a school, not monitoring a playground! (Though they sometimes do that as well.) Personalization gives students more power, not ultimate power. Teachers are usually best suited to make decisions that guide learning. Personalization simply allows teachers to emphasize what we have always known — learning is personal.

Technology has made it easier than ever to make learning personal. Through the integration of online learning programs or learning management systems (see Chapter 2) and the use of data (see Chapter 3) you can help students learn in ways that matter most to their specific interests, wants, and goals. Blended learning allows you to give students some freedom to choose when, where, how, and how quickly they learn.

Test Your Readiness: Personalization http://bit.ly/K12-BTR

You can use the link above to obtain some feedback concerning your preparation for personalizing in a blended environment. How ready are you?

We introduce the concept of personalization (see Video 4.1) in this chapter because blended classrooms increase the ease of personalizing various instructional activities (developing learning goals, assessing outcomes, and completing learning activities) through the integration of online activities (see Chapter 2). Personalization, however, is not new to blended learning, nor is it new to the 21st century.

Basic Personalization Practices
Video 4.1 (2:27) http://bit.ly/btb-v356

Watch on YouTube

What to Look For: Notice how personalization changes the experiences of students.

Additionally, personalizing a particular aspect of education does not necessarily mean it is better than a non-personalized aspect of education. In order to craft a learning plan for your classroom, you need to know what constitutes personalization and how to make those practices effective.

4.1.1 What is personalization?

The term **personalization** is being used with increased frequency by teachers in K-12 settings. It can easily be confused and conflated with terms like differentiating or individualizing learning, which have been around for a long time and have similar meanings. In fact, the term personalization and the ideas that it encompasses continue to evolve. Table 4.1 shows some of the current definitions of "personalization" courtesy of the Office of Educational Technology, part of the U.S. Department of Education.

In this chapter we use a definition of **personalization** that involves two core ideas:

1. **Customization:** Tailoring/customizing the learning experience to the individual student's needs and interests.
2. **Student Control:** Giving students some element of control over their own learning experience.

it typically involves the teacher controlling the significant decisions about goals, time, place, pace, and path of the learning experience, rather than giving that responsibility to the student (see Table 4.2 for examples).

Figure 4.1 Five dimensions where personalization can occur.[51]

An effective blended classroom will mix these two practices—differentiation and personalization. (See Web Resource 4.1.) When you incorporate personalization into your classroom, you will not leave students to make all decisions on their own. Rather, you will guide them in making their personalization decisions.

Table 4.1. Various definitions of personalization terms.

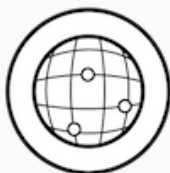| Source	Definition
U.S. Department Education's 2016 National Educational Technology Plan (NETP) and 2017 NETP Update	"Personalized learning refers to instruction in which the pace of learning and the instructional approach are optimized for the needs of each learner. Learning objectives, instructional approaches, and instructional content (and its sequencing) may all vary based on learner needs. In addition, learning activities are made available that are meaningful and relevant to learners, driven by their interests and often self-initiated."
The District Reform Support Network (District RSN)	"Personalized learning emphasizes student-driven instructional objectives, content, pace and sequencing. Ideally learning activities are frequently student-initiated, meaningful, and relevant to the learner. Personalized learning often includes the use of technology to facilitate student ownership of learning and to provide tools for individual pacing and more efficient assessments to inform and tailor instruction."
International Association for K-12 Learning Online (iNACOL)	"Personalized learning means tailoring learning for each student's strengths, needs and interests–including enabling student voice and choice in what, how, when, and where they learn–to provide flexibility and supports to ensure mastery of the highest standards possible."
LEAP Learning Framework for Personalized Learning	"Personalized learning occurs when all learning is focused on, demonstrated by, and led with the learner, and connected meaningfully with mentors, peers and the community."

Table 4.2. Differences between differentiation and personalization.

TEACHER controls or makes decisions (Differentiation)	STUDENT controls or makes decisions (Personalization)

(WHAT outcomes to focus on)	class that all students will work towards (for example working towards achieving state standards).	students are allowed to develop some personal goals related to their interests that they can choose to spend time on.
TIME (WHEN instruction takes place)	• Teacher chooses when the whole class will participate in an instructional activity. • Teacher determines when an individual or group of struggling students will conference with her.	• Students can make choices about how to spend their time working towards different goals. For example, one student may choose to spend flex time working on a science project while another chooses to work on reaching the next math level.
PLACE (WHERE and with WHOM instruction takes place)	• Teacher selects project groups and assigns groups based on perceived needs of students. • Teacher determines where remediation will take place and whether it will be using adaptive software, 1-1 tutoring session, small group instruction, etc.	• Classroom has flexible workspaces, and students can choose where and with whom to work towards goals. • Students may choose to work on some goals within the classroom and others in a virtual space while at home.
PACE (HOW quickly a student progresses through instruction)	• Teacher determines when the class begins and ends working on a lesson or unit. • The teacher may give extra time for students who are struggling.	• Teachers may establish minimum pacing guides and students can choose to accelerate their pace of learning according to interest and goals. • Playlists are provided that allow students to proceed through activities at their own rate.
PATH (HOW a student progresses through learning activities)	• Teacher determines the sequence of activities that everyone in the class will complete. • Teacher determines what additional activities certain students need in order to achieve mastery and assigns those activities to the students.	• Students work towards mastery by choosing activities that match their learning preferences (e.g., working independently or on a team). • Students choose from among a list of activities that will help move them towards mastery. • Students choose some activities based on their talents and interests.

Personalization or Differentiation or Individualization?
Web Resource 4.1 https://bit.ly/btb-v378-1

What to Look For: Check out this resource to see how some people view the differences between personalization, differentiation, and individualization. Do you agree with their distinctions?

On the next few pages are four "See it in Action" examples (two elementary and two secondary) where teachers are trying to implement a personalized learning approach with their students. For each example there are several videos that highlight different dimensions where personalization is occurring.

See full Blended Teaching Case at http://bit.ly/btb-3sia1
(Web Resource 4.2)

TIME- Teacher chooses learner pathway with rotations that include "teacher time" for students below 50% performance—student has control over when to go to "teacher time" rotation.
Video 4.2 (0:58) http://bit.ly/btb-v258

GOAL/PATH- During "genius hour" students choose a "passion project" that they want to focus on.
Video 4.3 (1:59) http://bit.ly/btb-v320

PATH- Students have an "opportunity hour" where they choose from among eight topics of interest outside the traditional curriculum.
Video 4.4 (1:20) http://bit.ly/btb-v440

PLACE/PATH- Students have choices in how they demonstrate mastery of a concept. Choices include tests, projects, teaching a lesson, etc. Flexible seating arrangements also allow students to choose where they will do their work.
Video 4.5 (2:09) http://bit.ly/btb-v496

See full Blended Teaching Case at http://bit.ly/btb-3sia2
(Web Resource 4.3)

PATH- Students are able to request in-person help through 1:1 teacher consultations, teacher-led seminars, or student mentors.
Video 4.6 (1:04) http://bit.ly/btb-v421

PACE-Students progress at their own pace and move beyond grade level based on assessment data.
Video 4.7 (1:34) http://bit.ly/btb-v483

PATH/PLACE- Students are given a "menu board" of activities that can help them move towards mastery. Students also choose where and with whom they work.
Video 4.8 (2:36) http://bit.ly/btb-v403

PATH- During independent work time, students choose what outcomes and software to work on.
Video 4.9 (1:01) http://bit.ly/btb-v486

See full Blended Teaching Case at http://bit.ly/btb-3sia3
(Web Resource 4.4)

GOALS - Students look at data with teacher, set SMART goals, and determine how to progress towards goals.
Video 4.10 (2:00) http://bit.ly/btb-v489

PATH - Students have assignments (required) and extension activities (optional) on playlists.
Video 4.11 (3:13) http://bit.ly/btb-v388

PLACE - Students are able to make choices about where and with whom they work with to reach their goals.
Video 4.12 (1:10) http://bit.ly/btb-v416

See It in Action #4: Leadership Public Schools Richmond - Richmond, CA

See full Blended Teaching Case at http://bit.ly/btb-3sia4
(Web Resource 4.5)

GOALS/PATH/PACE-Students take a diagnostic assessment and then choose learning resources to pursue to meet areas of deficiency. Students can adjust pace by skipping assessments based on diagnostic results.
Video 4.13 (3:00) http://bit.ly/btb-v491

PATH/PACE- Software recommends learning resources that students can choose to pursue to correct misunderstandings.
Video 4.14 (1:58) http://bit.ly/btb-v417

GOALS- Students set goals around completion, performance, or habits/mindsets about learning.
Web Resource 4.6 http://bit.ly/btb-v318

Personalization can be done without a reliance on digital technologies. However, digital technologies can help you facilitate personalization in a way that is more efficient or that is not possible without technology. Below are some of the roles that technology plays in personalizing the learning experience for students:

- **GOALS**— Technology can provide an efficient way to create, share, and track student goals as well as tie them back to performance on learning outcomes.
- **TIME**— Technology allows students to work independently (with feedback) while teachers are working 1-1 and in small group teaching sessions; technology can support students working on different tasks at different times where a teacher can only be one place at a time.
- **PLACE**— Technology can be used to give access to learning resources both in and outside of the classroom.
- **PACE**— Technology can provide efficient tracking of individual student mastery, which makes it practical to allow students to work at different paces.
- **PATH**— Technology can recommend or help teachers recommend targeted learning resources or pathways for students to follow; software can provide data that helps students and teachers make more informed decisions about future learning activities.

4.1.3 Bringing Personalization into Your Classroom

There are many frameworks that suggest how to implement personalized learning in the K-12 classroom. Our goal for this section of the chapter is to present an overview of some of these frameworks, providing you with three steps to follow in creating an implementation plan for personalization that works for you. While there are nuances within these frameworks that differ, most of them have much in common. All personalized learning frameworks are founded in increasing opportunities for students to practice their agency as part of their educational journey. The implementation of personalization is all about helping students control the time, place, pace, and/or path of their own learning experiences.

Before we get to the students though, it is important that we discuss your role in personalization and what you need to do to be prepared to implement personalized learning.

Step #1: Don't do it alone.

In July of 2018, Forbes[52] jumped on the latest education bandwagon by publishing the seven ingredients needed to create a personalized learning program. Because their list focuses on developing a personalized learning program that can be sold to educators, like Khan Academy or Imagine Learning, many of their seven ingredients for a successful personalization system may not apply to teachers seeking to implement a personalization pedagogy. Their first ingredient, however, is one worth noting—personalization requires a huge library of materials. While there are certainly dimensions of personalization that can be implemented without a huge library of materials, having such a library can make it easier to personalize elements such as pace or path. This is why it is beneficial to establish a professional learning community to help you begin implementing personalization practices.

You are off to a good start by using this book to help you, but this book alone may not be enough. Its authors can't be in the classroom to help you manage blended activities. They can't help you gather the resources needed to teach important concepts in your content area. And they can't help you arrange your LMS to meet the needs of your students. They can only point you in the right direction. But if you work together with your peers, you will be able to alter your classroom activities to foster personalization, get help finding or creating instructional resources, and then housing such resources in a place that makes them accessible to students. Personalization in education is all about working together. So, work with both your peers and your students to find learning activities that appeal to a wide audience of students.

Getting started with Google Forms to create your own learner profile survey.
Web Resource 4.6 http://bit.ly/btb-v341

This list of Learner Profile Tools offers a variety of learner profile resources based on age groups.
Web Resource 4.7 https://bit.ly/btb-v394

The Vermont Department of Education offers a blank template to use as a learner profile as well as a completed example.
Web Resource 4.8 Template http://bit.ly/btb-v307
Web Resource 4.9 Example http://bit.ly/btb-v315

Step #2: Get to know your students.

If your end goal is to create a learning atmosphere that is student-centered, you first need to know how to connect with your students as individuals. While nothing should replace having getting-to-know-you conversations with students, perhaps the easiest and most efficient way to learn about large numbers of students is by asking them to complete a learner profile. What you learn can also help to better inform your personal conversations with students. While learner profiles can be paper-and-pencil based surveys, we find that it is better to use electronic surveys because they can more easily be accessed, updated, and tracked. Parents are impressed when you can show them the growth of students' performance scores, but imagine how impressed they will be when you can also show them the changes in their students' interests over time.

Multiple choice questions. When creating learner profiles, it is important that the questions you ask allow for students to really express themselves. A multiple-choice question that asks students whether they like music, reading, sports, or technology more might be a good start for helping students find extracurricular activities to join, but in the classroom, this question may not help you make the instructional decisions you need to make. Instead, use multiple-choice questions for options about the learning environment that have widely applicable answers. For example:

- Do you prefer to learn in a quiet environment, one with some noise, or one with lots of noise?
- Do you prefer to listen to music when you learn?
- Do you most prefer to work with others, by yourself, or equally with others and by yourself?
- Do you think you learn best in the morning, right before lunch, right after lunch, or at the end of the day?
- When you get stuck do you most like to ask the teacher for help, try to figure it out on your own, or ask a friend for help?

These kinds of multiple-choice questions allow you to know students' preferences for learning. For more detailed data, you could even allow students to rank their choices. With answers to these questions you can know if Alexander gets distracted by noisy students around him, if Clara prefers to work with others when solving problems, if Francis learns best right before lunch, and if Milton is asking you for help because that's his go to method of help-seeking or if he's likely already asked a friend or tried to work it out on his own. Understanding your students' learning preferences can help direct your actions as a teacher. You can now know whether you need to move Alex in the seating chart, whether

additional help. You can also use this information to create student groups so that students who like to work together are all in a group, or students who like to listen to music are in a group. You can also look at this data to identify trends in your classroom. If most students learn best in the morning, then maybe that's the best time to introduce that difficult weather unit, or for junior high and high school students, maybe you need to understand that a student's weakest subjects should be scheduled for the morning hours.

Open-ended question. While multiple choice learner profile questions provide you with lots of valuable data, open-ended questions should also be used to highlight student interests that vary widely. For example, "What is your favorite TV show?" is a great question for kids who watch TV, but not all might. It is better to ask questions such as:

- What are your favorite hobbies?
- What do you do in your free time?
- Are you involved in any extracurricular activities? If so, what are they?
- Do you have a favorite musical artist, TV show, sport, movie, video game, or book? If so, what is it?
- Who are your friends in this class?
- What is your spirit animal?
- What do you want to be when you grow up? (Elementary)
- What career do you want to pursue? (Jr. High/Middle School)
- What do you plan to do after you graduate? (High School)

You may not want to use all of these questions, but you could pick a few to ask your students. Remember that the learner profile survey should be accessible to students so they can easily update it often. The student who likes one band this week might discover a new band over the weekend; likewise, yesterday's astronaut might want to be a video game developer today.

When you ask elementary students questions like, "What do you want to be when you grow up?" you should expect some creative answers. They don't have to identify careers. You might get answers like a princess, a superhero, or an astronaut. You might also have students who give you answers like primatologist or paleontologist. In either case, you can use these interests to guide younger students. Table 4.3 considers how you might teach a small-group math lesson to a group that contains two princesses, two superheroes, and a paleontologist.

For this example, we have chosen a Common Core Math standard and then adapted it to meet student interests. In practice, we would meet with a small group of students and use their interests to help determine the context of the problems. In a group of 5 students that has two princesses, two superheroes, and a paleontologist, we would share at least one problem for each kind of interest.

Table 4.3. *Elementary occupational interests*

Occupational Interest	Standard	Application
Princess	CCSS.Math.Content.2.MD.C.8 Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately. Example: If you have 2 dimes and 3 pennies, how many cents do you have?	In the princess's royal piggy bank vault there is 5 dollars, 2 quarters, 1 dime, 1 nickel, and 2 pennies. How much money does the princess have in her vault? Can she buy a tiara that costs $5.86?

Superhero	[CCSS.Math.Content.1.OA.C.5](#) Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).	superhero has 1 sidekick. If there are 10 groups of heroes (1 hero and 1 sidekick) at the meeting, count by 2 to determine how many heroes there are total.
Paleontologist	[CCSS.Math.Content.3.NF.A.1](#) Understand a fraction $1/b$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size $1/b$.	At a dig site you found a single rib bone of a stegosaurus. If a stegosaurus has 32 rib bones, what fraction of rib bones have you discovered?

The examples in this chart represent both personalization and differentiation. They are personalized because the students have had some choice in selecting the topic of the problems, but they are also differentiated because the teacher has chosen the actual problems, modifying them to match student interests.

As students reach their middle school years, you can begin to focus learner profile responses toward having a greater level of critical thinking. For example, unless you're Meghan Markle (the American-born actress who married Prince Harry, Duke of Sussex, in 2018), you probably can't become a princess. However, you can still have lots of people who work for you and be at the top of the social ladder if you're a CEO, so let's explore that career choice. As students reach high school, you want to make sure that your questions are helping you understand their college and career readiness goals. Are students planning to go into the military, straight into the workforce, go to trade school, community college, a public university, or a private university? Each of these students will need an education that prepares them in slightly different ways. You can also ask secondary students to report things like their reading levels, grade point average, and standardized test scores. These performance scores are usually available via your district's student information system (SIS), but it can still be valuable to have students report them so you and they can (a) know what their scores are, (b) understand what their scores mean, and (c) track their scores over time.

Once you understand students' learning preferences and interests, you can begin to make sure that your instructional materials and activities are more student-focused.

Step #3: Give students more control.

If you have ever talked at length with teachers, you know that a goal of nearly every educator is to create lifelong learners. This is difficult to do if you train students to believe that learning is what happens when a teacher is available to present a lesson, provide practice, and then assess learning. When you give students more control over choosing, tracking, and assessing their learning, you are providing them with the skills they need to become lifelong learners. Now, this doesn't mean it's all right to hand students a textbook then recline at your desk checking social media, following scores of the local sports team, or catching up on the news. As a teacher in a blended environment, your role is to guide students in making the best choices for their learning.

WARNING

Giving students more control can be intimidating because they likely don't understand the standards they need to meet, AND because it may make classroom management more difficult, AND because there is a lot of uncertainty around students' self-direction, but we know YOU CAN DO THIS!

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control is the most essential step in creating personalized learning. A 2018 iNACOL survey of K-12 schools found that 40% of schools have a moderate level of student-led classrooms and 20% have a moderate level of student-demonstrated classrooms.[53] This suggests that in implementing personalization in your own classroom, it may be best to start by adding more student-led practices. This means finding ways to allow students to do the following:

- Co-design their learning experience
- Articulate their interests, strengths, and needs
- Assess, monitor, and reflect on their own progress
- Partner with you in setting their learning goals and plans
- Advocate for needed support from you, peers, technology, and/or other sources.

Many of these practices can be easily implemented through using learner profiles, conducting student conferences, and teaching students to be self-directed learners. Student-led practices begin to provide students with various ways to choose their own time, place, pace, and path for learning. See Web Resources 4.11-4-12 for examples. After adding some Student-led practices to your classroom, you can begin to build student-demonstrated practices into your classroom, which provide students with even more opportunities to control the time, place, pace, and path of their learning.

LEAP Learning Framework - Learner Led Strategies
Web Resource 4.11 http://bit.ly/btb-v390b
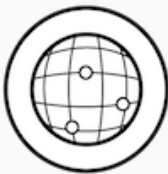
What to Look For: Explore these strategies for learner led practices if you want more information. Which strategies do you think you could use?

These practices include allowing students to:

- Begin at a level appropriate for their prior knowledge and learning needs
- Engage in productive struggle
- Progress at a pace that meets their learning needs
- Demonstrate competency when ready
- Demonstrate evidence of learning in multiple ways
- Receive recognition based on competency, not on seat time.

4.12
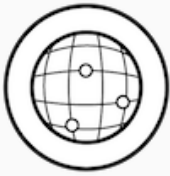
What to Look For: Check out some of these strategies for learner led practices. Which do you think you could use?

Most of what we have looked at so far focuses on teacher-led or teacher-centered approaches to learning and injecting those approaches with personalization adrenaline. However, there are also student-centered approaches that may make it easier to personalize learning for students. Check out the call out boxes on the following pages to learn more about these approaches.

Guided Inquiry Design replaces the steps traditionally used in planning teacher-centered instruction that tends to focus less on providing students with choice and more on direct instruction and teacher modeling that students then repeat and mimic. Traditional lesson plan steps tend to look like this:

Gagne's 9 Events	**Madeline Hunter Lesson**
- Gain Attention - Introduce Learning Objective - Stimulate Prior Knowledge - Present New Information - Provide Guidance - Elicit Performance - Provide Feedback - Assess Performance - Assist Retention and Transfer	- Anticipatory Set - Display Learning Objective - Input New Information - Model New Understanding - Check for Understanding - Guided Practice - Independent Practice - Closure

Guided Inquiry Design, on the other hand, can guide you through a series of steps to develop a student-centered lesson, providing students with more choice and opportunities to personalize their learning:

1. **Open**: The teacher attempts to get students interested in the general topic. This phase is only focused on big ideas and concepts. For instance, a teacher might start a unit on WWII by leading students in a discussion/debate about what's worth fighting for.
2. **Immersive**: After students are interested in the topic, they are engaged in an immersive experience that introduces students to the actual topic. For instance, a teacher might invite a WWII veteran to speak with students and/or watch a documentary or movie about WWII.
3. **Explore**: Students explore a variety of resources to learn more about the subject. Teachers curate a variety of resources for students to explore such as images, books, videos, etc.
4. **Identify**: Students identify a specific topic and question(s) to guide their research. Teachers can prompt them by asking them questions such as "What are you wondering about?" Teachers can also help students identify an authentic audience for their work by asking students to consider who else also cares about their research question(s).
5. **Gather**: Students begin to gather resources to answer their research question. The teacher guides them along this process and teaches them how to identify and evaluate materials.
6. **Create**: Students create materials that answer the question in authentic ways and have the potential to help others.
7. **Share**: Students package and share/present their materials to others in authentic ways.
8. **Evaluate**: Students evaluate their projects and the process they followed to create them.

For more information about guided inquiry check out the resources at https://guidedinquirydesign.com/ (Web Resource 4.13)

Another way that you can create student-centered lessons is by incorporating project- and problem-based learning into your lessons. These two instructional methods are similar; in fact, some groups, such as the Buck Institute for Education,[54] view problem-based learning as a kind of project-based learning. Both approaches allow students to be at the center of instruction and require students to become more active in the learning process.

Both of the approaches include:

- Open-ended questions or tasks that don't have a single "correct" answer,
- Authentic applications of content and 21st century skills,
- A focus on student inquiry, choice, critical thinking, collaboration, and communication skills,
- A final presentation, where students present or share their project or solution with others, and
- The possibility of longer, more multi-faceted planning than traditional instructional activities or assessments.

Project-based Learning

Driving Question · Brainstorm · Learn · Develop · Peer Review · Revise · Presen

Problem Based Learning

Problem · Examine · Explore · Evaluate · Solve · Share

Step #4: Choose your blended model.

In Chapter 2, we introduced several different models of blended teaching. All of these models are conducive to personalizing your instructional practices. Often the personalization comes during the online portion of blend. Later in this chapter you will be introduced to tools such as choice boards, playlists, and adaptive learning software, which can provide a structure for facilitating personalization in the different models.

Step #5: Strike a balance

It is important for you to find the right balance between structure and flexibility in your classroom. An increasing number of research studies have found that students don't perform as well in classes where they are given total flexibility in when, where, and how they learn. Children and adolescents simply do not have the self-regulation and metacognitive skills to thrive in learning environments where they are provided with total flexibility. Furthermore, if all students are working on different tasks at any given time, meaningful collaboration and discussion are almost impossible. As a

Competency: I can develop a personalization plan for my class (4.1).

Challenge 1

Plan an increase in one aspect of student control over time, place, pace, and/or path for one of your in-class units/activities.

Challenge 2

Create a survey, worksheet, or guide (either physically or using something like Google Surveys) for students to create a learner profile that they can easily and frequently access, update, and track.

Challenge 3

Brainstorm ways that you can increase student control over goals, time, place, pace, and/or path, and choose the dimension where personalization will occur.

4.2 Personalizing Learning Goals

In creating lesson plans, you usually need to plan for three different parts of the plan. First, you plan or outline the goals for your lessons—what it is that you want students to be able to illustrate or understand at the end of the lesson, instruction, or unit. Next, you plan the assessments that will tell you how well students are able to meet these goals. Last, you plan activities that will prepare students to successfully complete the assessments you have planned.
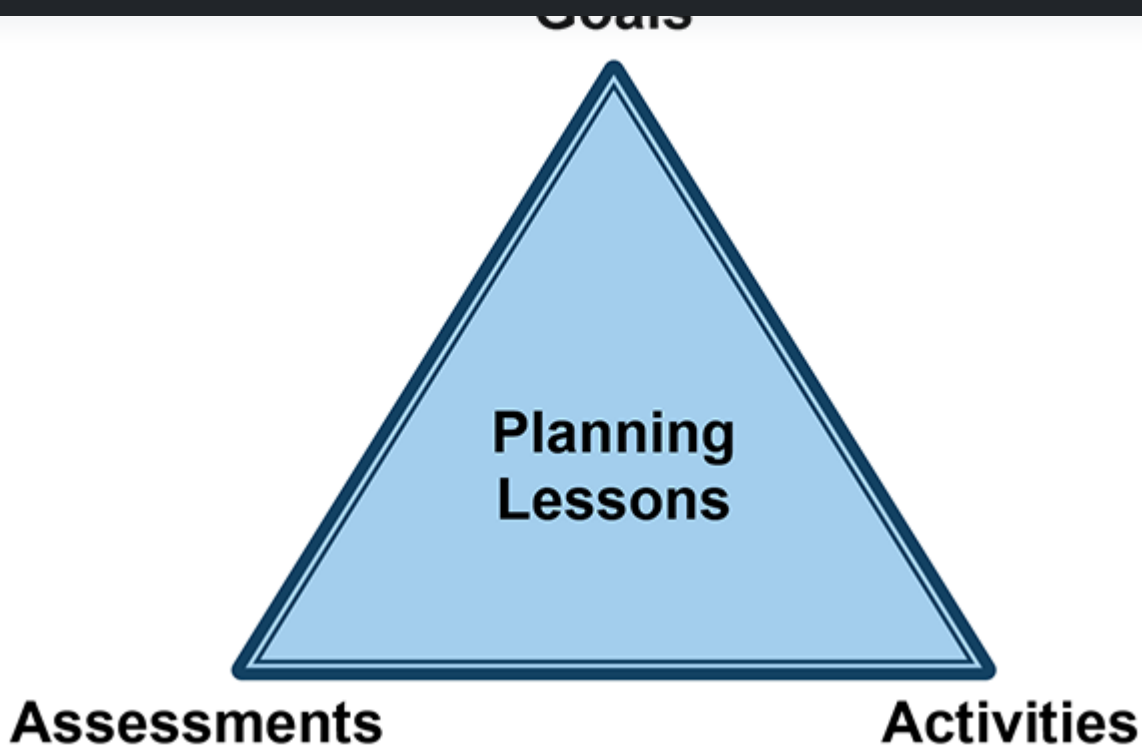
Figure 4.2 Three basic elements of planning blended lessons.[56]

As a teacher, you don't often get a lot of say in the educational goals for your students because the standards that you must use for teaching are given to you by some education authority. You often, however, do have more freedom in deciding how you meet those standards. You can work together with your students to co-create how learning standards will be met, enabling you to personalize learning objectives. This collaboration with students can be a lot of work, but it is worth it because giving students ownership over their learning outcomes can increase student engagement, retention, and achievement.

4.2.1 What it looks like

You know what is best for your students. You should guide students to set goals for themselves that you know will help them reach their fullest potential. This is usually done through having students complete guided surveys or worksheets that help them create learning goals and conferencing with individual students about these goals. The goals that you help students set, track, and review can be related to learning objectives, 21st century skills (the 4Cs), and/or classroom behaviors.

Setting goals: In setting and tracking students' goals, both you and your students must have access to some kind of performance data. If data is not available, then the first goal should always be to generate data (see Chapter 3). Once you have performance data for your students, you can sit down with them to help them establish goals or set new goals. These goals may be to improve upon previous learning standards or to begin working on new learning standards. It is best to save these goals in a folder (whether electronic or physical) that gives students easy access to them. Goals should be visible to students so they can easily remember and track them. When setting goals, we recommend using something like the SMART goal framework (See Figure 4.3).

Figure 4.3 Five elements of SMART goals

The following are examples of SMART learning goals:

- Be able to complete 20 of 20 single digit multiple choice questions in less than 3 minutes by the end of this week. I will study for this once a day during math time to practice my skills (elementary).
- Over the next two weeks, create a slide presentation with 8-10 slides that describe the religious beliefs of ancient Egyptians. I will use the textbook and YouTube as resources. The presentation will follow the guidelines on the "Egypt Presentation" rubric (middle school/junior high).
- Write a 3-5-page lab report describing the methods, findings, and applications of the lab completed in class. The report will be completed over a three-day timeline, which starts after completing the lab. The organization of the lab report will follow the template and rubric we were given in class and will be formatted in APA style (high school).

The above examples are specific by detailing how many problems the student is expected to complete, how many slides the student needs to create, or how many pages the student needs to write and in how much time. They are measurable in that the student can know whether the completed problems are correct or incorrect or if the projects follow rubric guidelines. They are achievable because they all have a plan that details how goals will be completed (by studying, by researching, or by following examples). They are also realistic because they represent goals appropriate to the skill levels of the students. Lastly, each goal has a timely due date, as opposed to taking all month or semester, etc. Note that SMART goals allow for learning goals to be personalized by changing the time, place, pace, or path in which the goal will be achieved.

Tracking Goals: After goals are established, you and your students can use goal tracking sheets to track progress and success in meeting the goals. For elementary students these are often simple reports with scaled ranking systems consisting of 1-3 smiley faces, stars, or some other visualization of progress. Older students can fill out more detailed and reflective tracking sheets. They can answer questions like "What do you think impacted your success today?" or "How can you do better tomorrow?" Additionally, older students can track numerical data to show whether they are doing better or worse today than yesterday.

You and your students can both fill out the tracking sheets, or students can use them to complete a self-reflection. We would suggest doing a bit of both and finding what works for you. Allowing students to track their own progress increases their sense of ownership over their learning. Each aspect of a SMART goal can be assessed, such as "Did you complete your achievable plan for today?" or "Are you getting closer to meeting your specific goal?" Tracking sheets can also be used to track time on task and other behaviors important to meeting learning goals. (See Video 4.14 for examples of setting SMART goals.)

previous elementary example), it is time to have students complete another guided goal tracking document. Then, have another student conference to review both their new goal and their previous goal. In this meeting, you will help students determine if they need to revise their previous goal to make it more or less ambitious or decide together if students are ready to move on to a new goal.

Competency: I can develop a guide for personalizing students' learning goals (4.2).

Challenge 1

Find or create a **goal setting** template for your students to use in setting and achieving an academic goal.

Challenge 2

Outline a goal setting conference with your students and determine how you will help them set and track SMART goals.

4.3 Personalizing Assessment

Assessments can be personalized along the dimensions of time place, pace, and path in the same way that goals can be. During your 1-1 conference with students, you can determine how students want to show you that they have met their goal. This is written into the goal as something Specific, Measurable, Achievable, and Time-based. The decisions you and each student make for how to show mastery change each student's learning path. Additionally, each student (with your guidance) may choose a different time, place, or pace to complete the assessment.

The kinds of assessments that students can choose to complete vary greatly. Students may choose to complete a standardized or traditional quiz or test, fill out an assigned outline, work in groups or alone, create a product for presentation to the class or a small group, create a product to share with only you, do something in the community, teach other students, etc. The most important thing to keep in mind is that students are free to choose for themselves how they want to show mastery. They may either choose from a list of previously collected options or come up with something on their own with your approval.

So how do you know what kind of assessment is best for each student? It all goes back to data. You can look at a student's performance data to know whether they perform better on traditional quizzes and tests or if they are better suited to creating something to show their understanding. Additionally, you can look at a student's learner profile to determine how they like to learn and demonstrate that learning. Maybe they prefer being alone in the hallway to read and take a test, or maybe they prefer watching a video with a group and doing a project. The learner profile helps us lead students to assessment decisions that promote their success.

In a best-case scenario, you would look at both performance data and the student's learner profile to help match them to the assessment that is best for them. In cases where students want to work in groups, you can use both sets of data to find group members that will either support or challenge each other based on students' needs. This can mean matching a student who has mastered material with a student who is near mastery to challenge the first student and support the second, but it also can mean matching students based on interests and letting the students work together

section 4.1.3, Step #3).

Competency: I can develop strategies for personalizing assessments (4.3).

Challenge 1

Create a list of assessment options for one of your units.

Challenge 2

Align a list of assessment options to various student interests or preferences.

Challenge 3

Create personalized assessment options for your students, complete with descriptions of how and for whom the assessments will work best.

4.4 Personalizing Learning Activities

One of the most common ways teachers implement personalized learning is by giving students flexibility in the paths they take through learning activities. In this section we focus on three different ways of personalizing learning activities:

- Creating playlists and choice boards
- Using software with adaptive pathways
- Grouping students strategically

4.4.1 Creating Learning Playlists and Choice Boards

Learning playlists and **choice boards** are common ways that teachers allow students to choose their path through a group of learning activities related to a specific concept or skill. Both of these approaches provide students with a limited range of options focused on a specific learning outcome.

Definition: Learning Playlist

Much like a music playlist, a learning playlist is a group of learning activities ordered in a linear sequence.

A graphic organizer, typically in the form of a table or grid, with one activity in each cell. Students choose among the activities as they work towards learning a particular concept (sometimes called a *menu board*).

Figures 4.4 and 4.5 are examples of learning playlists. Playlists are most often curated by the teacher around a specific learning outcome. However, sometimes students are given the ability to create their own playlists from a pool of activities (see Video 4.16). Digital learning playlists almost always provide the teacher with options for personalizing around time, place, or pace. Some playlist options allow personalization around path. Some common options for student progression through a **learning playlist** include:

- Students complete all activities in the playlist in a specified order without a specified timeline (path is not personalized).
- Students complete select activities in a list based on pre-assessment performance data (path is differentiated but not personalized).
- Students complete all activities in the playlist but may choose the order of completion (path is personalized).
- Students complete required activities and have other activities that they can choose to do for additional review, practice, or enrichment (path is personalized).
- Students can choose the number and sequence of activities they complete until they reach mastery on the assessment (path is personalized).

Video 4.16 (3:12) http://bit.ly/btb-v388

Watch on YouTube

What to Look For: Look at how these teachers create, use, and support playlists in their classrooms. How could you use some of these ideas to implement personalized playlists in your class?

Figure 4.4 Example of a high school playlist created in Canvas.[58]

Figure 4.5 Example of a playlist from Lindsay High School that displays the objectives and activities students need to master by the end of the year.[59]

based on learning preferences while rows are organized by difficulty (see examples in Figure 4.6 and 4.7).

Choice 1 *Due Date: (Fri) 11/18/2016* *50 points*	**Choice 2** *Due Date: (Tue) 11/29/2016* *100 points*	**Choice 3** *Due Date: (Fri) 12/2/2016* *150 points*
US CONSTITUTION From my **Screencast on the US Constitution** take Cornell Notes for the first three sections (1. Constitution, 2. Legislative Branch, 3. How a Bill Becomes a Law) Take Cornell Notes using the **template** or on a separate sheet of paper	**BILL OF RIGHTS** Watch one of the three videos on the Bill of Rights and write out your thoughts on each of the first 10 amendments to the US Constitution (don't forget to label each amendment as well). **Video1** **Video2** **Video3** Access **link** here	**SUPREME COURT** Write a response to the EQ: Should Supreme Court Justices continue to have lifetime terms? Use the **article on the US Supreme Court** Access **response link**
US CONSTITUTION Using the textbook (pages 144-149 take Cornell Notes for the first three sections (1. Constitution, 2. Legislative Branch, 3. How a Bill Becomes a Law). Take Cornell Notes using the **template** or on a separate sheet of paper	**ASSESSMENT** You have the option of either creating a **Kahoot Quiz game** of at least (8-10 questions) on the Bill of Rights **OR** the US Constitution	**SECOND AMENDMENT** Listen to the article promoting the Second Amendment titled **"Gun Safety and Kids"** and write a response using the response template Access **response link**

Figure 4.6 Examples of a high school history class choice board.[60]

The choice board table contains:

		Solve the three problems below using the Virtual Manipulatives app, fraction bars, or fraction magnets to prove your answers! 1. How do you know that 2 1/2 + 3 2/3 > 6? 2. Emily says the answer to 7/9 - 2/6 is 5/3. Is Emily correct? If not, help her understand her mistake? 3. Show the sum of ⅔ + ⅚ using a number line?	*What do you know about grizzly bears?* Bears can typically consume 7 pounds each month before hibernation. Bears hibernate approximately September-April. If a large grizzly named Leroy ate 15 3/4 pounds of blackberries along with 11 7/8 pounds of green plants, and he was preparing to hibernate, how many more pounds should he try to eat in that day to be ready when winter comes? Research facts about bears and based on what you know, create and solve two addition/subtraction fraction problems!
_____ Small Group _____ Conference _____ Checkpoint Score	Watch the following video on adding fractions with different denominators using fraction bar models. Complete a graphic organizer! Create and solve your own sample problem!		
_____ Small Group _____ Conference _____ Checkpoint Score	Watch the video on adding mixed numbers and complete a graphic organizer. Retell the strategy in your own words.	When adding 7/12 + 3/12, why do you add the numerators but keep the denominator the same? When adding ⅞ + ¾, why can you not add the numerators but keep the denominators the same? Explain your thinking in pictures!	Ringling Bros. and Barnum and Bailey Circus are transporting their circus animals by train. However, they have encountered a problem and cannot proceeds as planned. They can put most of their animals in trucks. They have rented 10 ton trucks for the elephants. Which elephants can travel together? How many trucks would be needed to take all the elephants? **BONUS:** After researching, the circus found alternate trucks to use. Use the chart to determine the least expensive way to transport the elephants!
_____ Small Group _____ Conference _____ Checkpoint Score	Select any of the videos from the list that you would like to review more. Complete a graphic organizer and write a reflection on what you learned. Read your reflection to a friend!	Create a visual poster or presentation to explain how to add and subtract fractions! Be sure to include examples and have a partner view it and solve your practice problems!	Write a letter to your relative preparing a holiday meal. Explain how you would add fractional measurements together for their recipes in order to prepare enough for the family. (ex. combine all the butter for different recipes, how would you add them together?)

Figure 4.7 Example of a 5th grade math choice board from Charlotte-Mecklenburg Schools?[61]

4.4.2 Using Software with Adaptive Pathways

Personalization can also happen with students using adaptive learning software. Most adaptive learning software determines the learning path for the students based on individual needs and performance. This is a kind of differentiation that would be very difficult and time consuming for a teacher to do for every student in the classroom. When students use the learning software, they are typically able to make other personalization choices about pace as well as time or place of learning.

Definition: Adaptive Learning Software

Adaptive Learning Software uses computer algorithms to deliver a customized path through learning activities for students based on their needs and past performance.

The use of adaptive software in classrooms is becoming increasingly common. Adaptive software often provides data dashboards regarding student activity and performance to teachers so that they can provide additional support to students with 1-1 tutoring or small group instruction sessions. A few examples of K-12 adaptive learning platforms are listed in Table 4.4. Video 4.17 shows how an adaptive platform works.

Table 4.4. *Examples of adaptive learning platforms.*

ALEKS

https://www.aleks.com

ALEKS is a Web-based, artificially intelligent, educational software originally developed by a team of cognitive scientists and software engineers at the University of California, Irvine, with major funding from the National Science Foundation. ALEKS uses Knowledge Space Theory and adaptive questioning to teach mathematical concepts.

Imagine Learning

https://www.imaginelearning.com/

Imagine Learning offers online lessons in Literacy, Spanish, and Mathematics. It offers thousands of learning activities that are standard-aligned, challenging, and engaging. The learning activities utilize a gamified system, allowing students to earn currency that can be used to customize their avatar and unlock in-game features.

DreamBox

http://www.dreambox.com/

DreamBox is an elementary and middle school math software that uses standards-aligned activities and actionable data to adapt to individual students. Its integrated assessments and instruction routinely measure students' understandings in order to guide them through a personalized learning program.

Adaptive software for teaching math
Video 4.17 (2:45) http://bit.ly/btb-v368
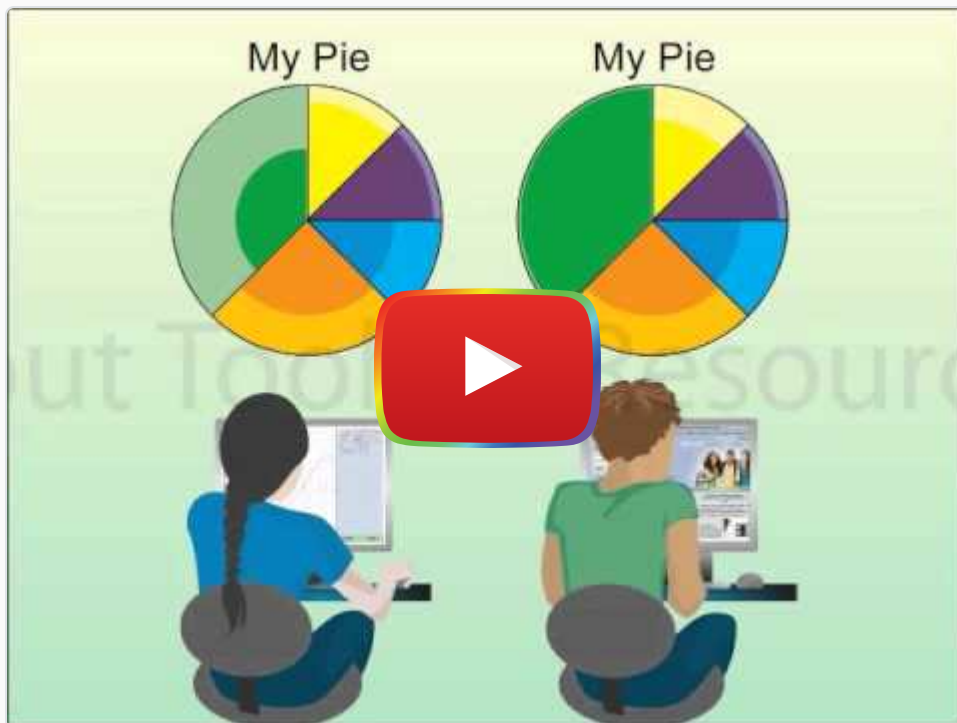
Watch on YouTube

What to Look For: Observe how the software customizes the learning path for students and how students can use the software at their own pace, time, or place.

When envisioning what personalization looks like, it is easy to only think of students working independently with technology. It is important to remember that personalized learning is not the same as independent learning. In fact, determining ways to help students work together and support each other can be motivating for them, as well as helping them to develop other important 21st century skills such as the 4 Cs (Critical Thinking, Creativity, Collaboration, and Communication).

Part of personalizing around place is allowing students some choice over where and with whom they will learn. As a teacher you can make these decisions (differentiation) and/or you can teach students how to make these decisions and give them opportunities to make some of the decisions (personalization). Even if you make the grouping decisions for your students when working on projects, you can still give them opportunities to choose their roles within the group.

Increasing Autonomy in Group Choices
Video 4.18 (1:36) http://bit.ly/btb-v338

[Watch on YouTube](#)

What to Look For: This video shows how teachers counseled with students about their choice of who to work with.

Table 4.5 contains some common strategies that might be used to help with choices around student grouping. Ultimately using a variety of grouping strategies rather than always using one strategy will likely yield the best outcomes.

Table 4.5 Grouping strategies.

Grouping Strategy	Description

Heterogeneous Grouping

- A greater diversity of ideas within the group
- Greater opportunities for peer teaching
- Strengthening connections among higher and lower performing students that might not already exist
- Promoting a greater understanding of people with different interests or viewpoints

Grouping students who have similar abilities and/or interests. Strengths of this strategy include:

Homogeneous Grouping

- Leadership opportunities for both high and low performing students
- Supporting others with similar interests
- Providing students with opportunities to grow alongside others
- Making it easier to target small group instruction

Giving a student the opportunity to be a mentor to another student who is near-mastery. Or, giving a student near mastery the ability to request or choose someone in the class who has achieved mastery to help him with the last steps towards mastery. (Note: As explained in Chapter 3, it is probably not wise to allow peer mentoring on outcomes where students need remediation and are not near mastery. This is best left for the teacher.)

Peer Mentor

Strengths of this strategy include:

- Additional enrichment for students who "get it"
- Leadership opportunities for students who "get it"
- 1-on-1 tutoring for students who need help
- Focused growth concerning 21st century skills such as the 4 Cs

---

Competency: I can develop strategies for personalizing learning activities (4.4).

Challenge 1

Develop a plan for how you feel most comfortable personalizing the learning activities in your class. (Consider all three aspects: playlists/menu boards, adaptive software, and student grouping.)

Challenge 2

Plan and create activities to use in a playlist that students can follow or choose from to personalize pace, time, place, and/or path.

Review the concepts in the chapter by taking this chapter quiz. (http://bit.ly/K12-BTQuiz)

Go for the Badge

Go for the Badge! Complete Chapter 4 of the Blended Teaching Roadmap. (http://bit.ly/MyBTRoadMap-Ch4) (See two examples of a completed Roadmap in Appendix C.)

This content is provided to you freely by EdTech Books.

Access it online or download it at https://edtechbooks.org/k12blended/personalizing_instruction.

5

Online Interaction
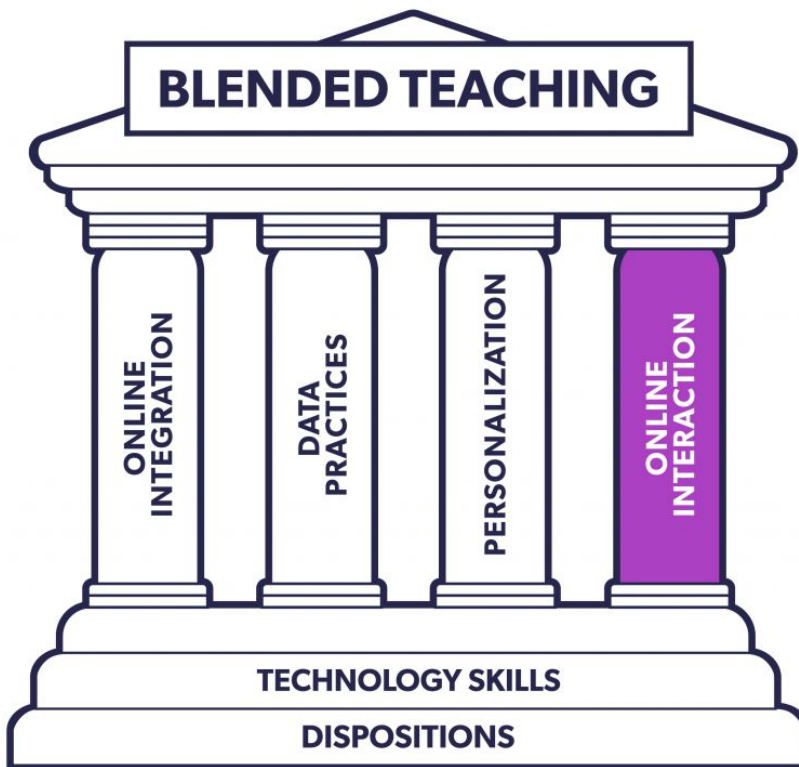
"Much unhappiness has come into the world because of bewilderment and things left unsaid." –Fyodor Dostoyevsky, Critical Articles: Introduction

Core knowledge and skills around online interaction are essential to effective blended teaching. By the end of this chapter you should be able to meet the following objectives:

- I can identify the benefits of different modes of interaction that occur within blended teaching (5.1).
- I can use asynchronous technologies in my classroom practices (5.2).
- I can create effective online discussions (5.3).
- I can create a plan for facilitating online discussions (5.3).
- I can use asynchronous technologies to create effective feedback (5.4).

5.0 Introduction - Let's Start Talking

Whether it's conveying our needs, sharing our thoughts, or collaborating with others, communication is a key component in our lives. Much of what we do when we exchange information with one another is a form of learning. In the traditional classroom, communication takes place in a number of ways. For example, we communicate through class discussion, questions and answers between and among students and teachers, and feedback written on assignments.

Figure 5.1 Elementary school students waiting to ask questions.[62]

Sometimes teachers don't see a need to communicate online if students have the opportunity to do so in-person. However, there are advantages and disadvantages to both in-person and online communication. Take a moment to look at the photo of a whole-class discussion above. What do you notice? Perhaps the first thing that you noticed was that several students were raising their hands. Clearly these students are excited to participate! Whatever is being discussed engaged many in the class. That can be a great feeling as a teacher. In-person discussions tend to be fast-paced and dynamic, where you can quickly and easily keep the discussion flowing by asking and answering questions.

A closer examination of the students in the above photo can highlight some common limitations of in-class discussions. First, notice at least three of the hand-raisers are using their other arm to prop up the raised arm. It's likely that they have been raising their hands for some time and have yet to be called on. Time is a major limitation of in-person interaction. Given the bell schedule, time for a robust discussion is limited and not every student gets to participate at the level they'd wish to. Also, it can be common for some students to dominate the conversation, which further limits the available time for others. Obviously, this photo is only a moment in time, and we don't want to read too much into it, but it highlights some other drawbacks to in-person discussions. Notice that some students seem to have disengaged from the discussion. It could be that some of those students were raising their hands earlier and gave up after not being called on. Others may be more introverted and may not feel comfortable sharing their ideas in front of

what is being said or formulate comments fast enough to participate. Other students may have special needs that make participating in in-person discussions especially challenging. Some of these challenges might be alleviated by creating smaller groups of students to increase student participation but doing so makes it difficult to monitor each group's discussion.

If teachers only engage students using in-person discussions, time, timidity, difficulties with the language, and other classroom dynamics may not allow all students the opportunity to fully express their thoughts. In the blended classroom, there are many options for increasing and enhancing communication. Online discussions can be one way to address participation concerns within the in-person setting. The challenge is leveraging the advantages of both in-person and online interaction and figuring out strategies for how to capitalize on the best of both worlds.

> ### Test Your Readiness: Online Interaction http://bit.ly/K12-BTR
>
> You can use the link above to obtain some data for yourself! How do you measure up on being ready to use online interactions in your own blended classroom?

5.1 Types of Interaction

The term "interaction" means different things to different people. In 1989, Michael Moore defined three different types of learning interactions: (1) student-content, (2) student-instructor, (3) student-student (see Figure 5.2).[63] Moore explained that each type of interaction contributes to a quality learning experience.
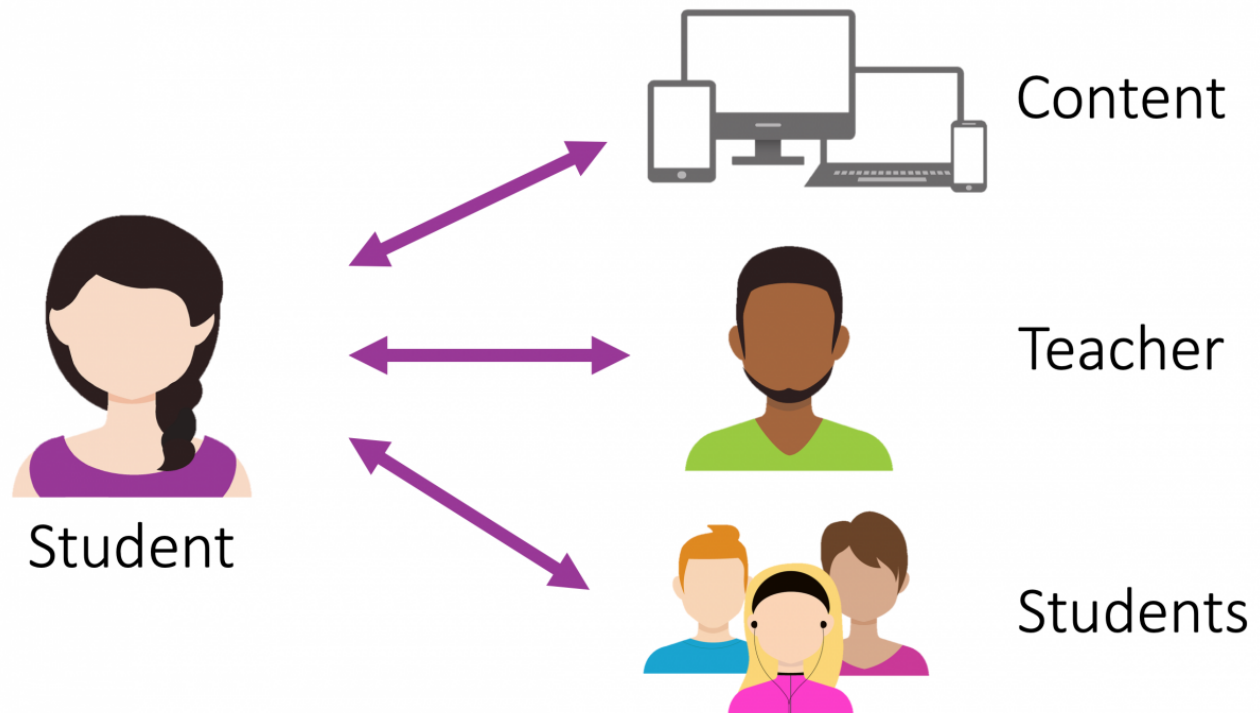
Figure 5.2 Three types of interaction with students.[64]

Student-content interaction occurs when students engage with learning materials through reading, listening, watching, and/or reflecting. Student-instructor interaction occurs when students have opportunities to apply what they have learned from their content interactions, demonstrate new knowledge, and receive feedback from the teacher as the "expert." Finally, student-student interaction occurs when students can engage with one another and share their understandings, building on what they have learned.

One of the major interactions that can happen in an online setting is the use of discussions. The advantage of online discussions is that they are one of the few online activities that can combine all three types of interactions. Students usually read or view materials to prepare for the discussion (student-content interaction), then share their thoughts with their peers (student-student interaction) in a forum that is moderated by the instructor (student-instructor interaction). As a result, online discussions can be critical in helping students achieve course outcomes because they provide students with a variety of interactions.

However, online student-instructor and student-student interactions have different place, time, and fidelity dimensions than in-person interactions. Both place and time can vary in blended courses, from a low degree of flexibility (everyone communicating in the same place and time) to a higher degree (everyone communicating at different times and different locations). As a class you can share the same physical space while having a discussion, but this provides little to no flexibility in where students learn. The same is true for time. Discussions can be **synchronous**, or happen in real-time with low lag time, or **asynchronous**, meaning that they occur at different times, and the time between posts or responses may take longer. **Fidelity** refers to how many communication cues are present. It can range from low fidelity, or mostly text-based with no communication cues, to higher fidelity with many communication cues. In-person interactions have the most communication cues, but online video communication can also contain many of the communication cues that we are used to having in-person. Video 5.1 explains more about the dimensions of interaction and discusses the advantages and disadvantages to different types of interaction in various learning environments.

Video 5.1 (4:29) http://bit.ly/btb-v452

Asynchronous Text

Space	High Flexibility (virtual/distributed)	Low Flexibility (live physical/face-to-face)
Time	High Flexibility (asynchronous and long lag time)	Low Flexibility (live synchronous/very short lag time)
Fidelity	High (rich all senses)	Low (text only)

Graham, C. R. (2006). Blended learning systems: Definition, current trends, and future directions. In C. J. Bonk & C. R. Graham (Eds.), *Handbook of blended learning: Global perspectives, local designs* (pp. 3–21). San Francisco, CA: Pfeiffer Publishing.

Watch on YouTube

What to Look For: Observe how the 4 types of communication discussed vary in terms of time, space, and fidelity.

5.1.1 Considering Synchronous, Asynchronous, and In-person Communication

One of the important aspects of blended learning is for the teacher to decide when and how to leverage the advantages of one form of communication over another. While some classroom discussions will be better suited for in-person dialogue, others can allow additional flexibility in time, place, and depth of reflection in an online, asynchronous setting. It is therefore important to understand the strengths and limitations of each form of interaction and how each can be used to benefit overall student learning.

Most online communication is via text, so let's compare the strengths and weaknesses of asynchronous, online text-based discussions to those that occur in a traditional in-person classroom. Take some time to read Table 5.1. As you do, consider how some of the weaknesses of online text discussions are the strengths of in-person discussions and how the weaknesses of in-person discussions are the strengths of online text discussions.

Synchronous communication is communication that occurs in real-time (e.g., phone conversation, video conference, or in-class discussion).

Definition: Asynchronous Communication

Asynchronous communication is communication that does not happen in real-time (e.g., email thread, online discussion board, most texting is asynchronous unless the back and forth communication is immediate).

Table 5.1 Strengths and weaknesses of text-based and in-class discussions.[5]

	Computer-Mediated Environment (Asynchronous Text-Based Discussion)	In-Person Environment (In-Class Discussion)
Strengths	• **Flexibility:** Students can contribute to the discussion at the time and place that is most convenient to them. • **Participation:** All students can participate because time and place constraints are removed. • **Depth of reflection:** Students have time to more carefully consider and provide evidence for their claims and provide deeper, more thoughtful reflections (Mikulecky, 1998; Benbunan-Fich & Hiltz, 1999).	• **Human connection:** It is easier to bond and develop a social presence in a face-to-face environment. This makes it easier to develop trust. • **Spontaneity:** The setting allows for the generation of rapid chains of associated ideas and serendipitous discoveries (Mikulecky, 1998).

| Weaknesses | • **Spontaneity: The setting** does not encourage the generation of rapid chains of associated ideas and serendipitous discoveries (Mikulecky, 1998).
• **Procrastination:** There may be a tendency toward procrastination (Benbunan-Fich & Hiltz, 1999).
• **Human connection:** The medium is considered to be impersonal by many (Benbunan-Fich & Hiltz, 1999), which may cause a lower satisfaction level with the process (Haytko, 2001). | • **Participation:** Not all students can participate, especially if there are dominating personalities.
• **Flexibility:** Time is limited, so you may not be able to reach the discussion depth that you would like. |

Competency: I can identify

Challenge 1

Plan an increase in one aspect of student control over time, place, pace, and/or path for one of your in-class units/activities.

Challenge 2

Create a survey, worksheet, or guide (either physically or using something like Google Surveys) for students to create a learner profile that they can easily and frequently access, update, and track.

Challenge 3

Brainstorm ways that you can increase student control over goals, time, place, pace, and/or path, and choose the dimension where personalization will occur.

5.2 Online Communication

Online text communication can foster higher levels of critical thinking because it affords students with additional time to reflect before having to engage. Another advantage is that students can also read over their messages and make changes before sharing their thoughts. They can also easily refer back to and re-read conversations.

Asynchronous video is another online communication option. Similar to text, asynchronous video affords students and instructors time to reflect between exchanges, but video can make the communication feel more authentic and descriptive. The added communication cues in videos can also help the instructor assess students' dispositions and attitudes toward content and allow the teacher to convey encouragement through facial expressions and voice intonations. However, these benefits also come with some drawbacks. For instance, video is not easily edited and can be less convenient to create, view, and re-visit.

Asynchronous online tools allow for the greatest flexibility in student contributions, allowing for variation in space and time. A number of online tools can be used to foster online communication and interaction. They are described in Table 5.2.

Discussion Platforms for Young Learners
Video 5.2 (8:03) http://bit.ly/btb-v411
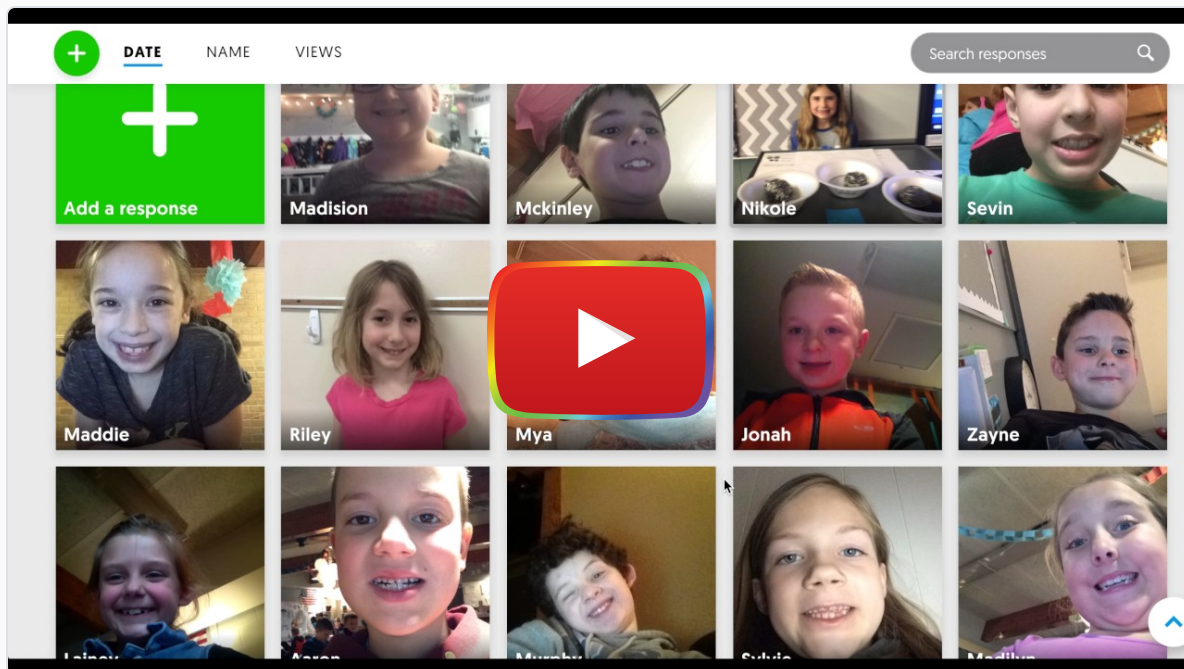
Watch on YouTube

What to Look For:

How well does Flipgrid allow the second-grade students in two different classrooms to communicate their understanding through audio and video?

Table 5.2 A range of asynchronous communication tools used in education.

Source	Definition
Text-based Discussion Boards	Discussion boards are the most common and versatile tool for threaded discussions. They are the best tool to use if you want groups of students to participate in extended discussions. Interaction takes place over a period of time. However, it may take longer to manage and provide feedback. Most, if not all, Learning Management Systems (LMS) have a discussion tool built in. However, there are outside discussion platforms available such as Disqus. (http://disqus.com)
Blogs	Blogs are an effective means for sharing writing and ideas online. Similar to discussion boards, blogs allow students to post their thoughts and share them with others who can then post short comments. Although they have similar affordances, blogs tend to be more student-directed and

sharing ideas, but discussion boards tend to be best when a teacher wants to facilitate a student discussion on a specific prompt. Some LMS have an integrated blog tool, but external sites can also be used, such as Google's Blogger. (https://www.blogger.com/)

VoiceThread

VoiceThread can combine direct instruction with student comments. VoiceThreads are created by uploading images, PowerPoint sides, and/or videos to create a multimedia slideshow. Instructors and students can then post comments using text, audio, or video. (https://voicethread.com/)

Flipgrid

Similar to VoiceThread, Flipgrid is a discussion tool that allows students to post and reply via short videos. Because it has a robust mobile app, it's easy for students to use cell phones or tablets to record their posts. Teachers have the ability to moderate posts, provide feedback, and track student progress. This tool can be powerful for elementary students who have limited literacy skills and find text-based discussions too challenging. (https://flipgrid.com/)

Padlet

Padlet acts like a digital cork board that allows students and teachers to post comments anywhere on the page for others to see and reply to. It also allows students and teachers to share photos, videos, audio recordings, or screen recordings. Like Flipgrid, Padlet can be a powerful tool for elementary students with limited literacy skills. (https://padlet.com/)

In addition to asynchronous communication tools allowing students to have flexibility in how and when they communicate, they can also provide students with opportunities to communicate with a wider audience and build global awareness. While students will most commonly communicate with their teacher and classmates, online communication tools can allow them to communicate with others in their community and around the world. The following are a few of the ways that students can interact with a global audience.

Mystery Skype

Microsoft uses Mystery Skype[65] to connect classrooms from around the world. Students then ask the class they connect with yes-or-no questions in order to deduce where the other classroom is located. In Video 5.3, a 5th grade teacher, Scott Bedley at Plaza Vista Elementary School, shares why he uses Mystery Skype and gives us a glimpse into what it looks like in his classroom.

Video 5.3 (1:58) http://bit.ly/btb-v438

Watch on YouTube

What to Look For: How do you think you could use Mystery Skype in your own classroom?

WildEarth Safaris and Scuba Dives[6]

WildEarth[66] (https://wildearth.tv/) is a live wildlife broadcaster provides students with the opportunity to ride on a live African safari or go underwater with scuba diving marine biologists. Classes can drop in during a live safari or scuba dive, but if they sign up early, they can actually ask safari guides or marine biologists questions and have direct communication with them.

"As a culmination to our ecosystem science unit, students participated in a WildEarth safari broadcast from the Djuma Reserve in South Africa. WildEarth has a live-feed YouTube channel available to the public but we planned ahead and signed up on for an interactive learning experience. My students were excited that they actually got to ask the guides questions and hear them say our school's name. Students were also thrilled to be 'up close and personal' with elephants, lions, giraffes, zebras, hippos, and a variety of other wildlife. I could also relax knowing that the educational safari was student-friendly and wouldn't show any kills or mating during our scheduled safari. Not only did students learn about the animals, but I used it as an opportunity to practice communication skills because students used Padlet as a tool to organize our questions for the guides. After the classroom safari, a link is made available for students to watch at their own pace and place. Without technology, this would not have been possible! Our end of the year reflection showed that this authentic virtual learning opportunity was very memorable for our students."[67]
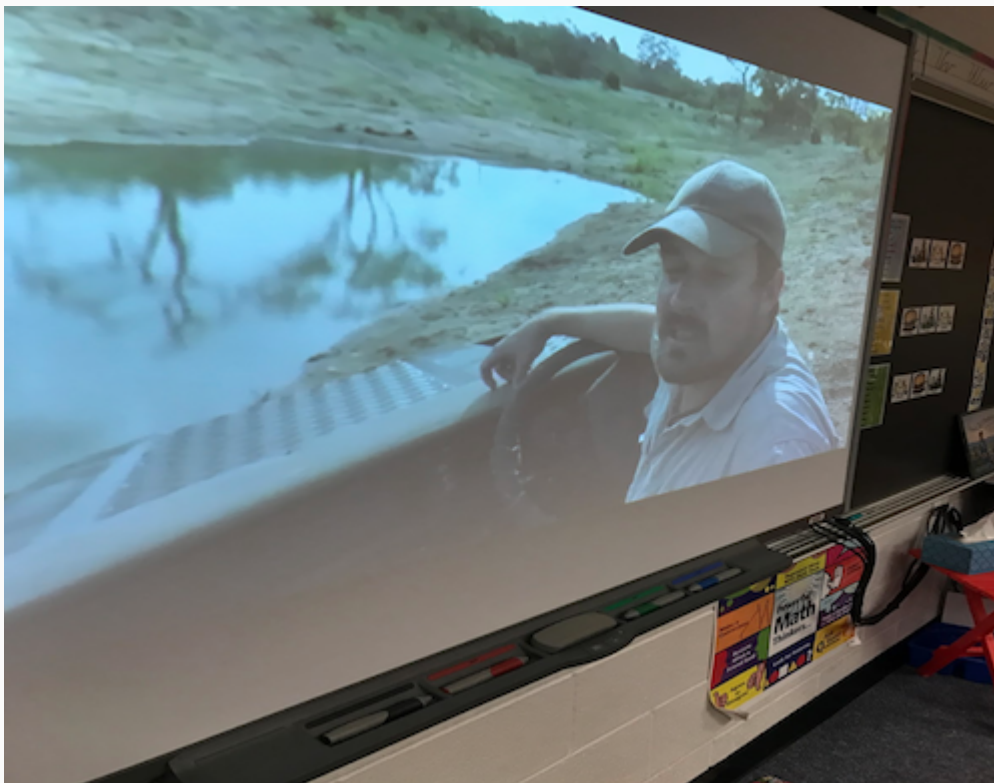
VoiceThread Guest Speakers

Guest speakers can have a powerful impact on students. However, they can be difficult to arrange. Live video communication tools allow you to broaden your search to those who live outside of your area. However, coordinating schedules can still be difficult, especially if you have multiple classes. One solution is for students to interact with others asynchronously using a tool such as VoiceThread.[68] In this example, 4th grade students wrote letters as if they were living in a Japanese internment camp. They then recorded their letters on VoiceThread. Finally, actual Japanese internment camp survivors responded to some of their letters. In Video 5.4 below, you can hear one of the internment camp survivor's comments.

Video 5.4 (1:28) http://bit.ly/btb-v415

Watch on YouTube

What to Look For: How do you think you could use VoiceThread in your own classroom?

Competency: I can use asynchronous technologies in my classroom practices (5.2).

Challenge 1

Choose an asynchronous tool, and plan how you will incorporate it into one of your lessons or learning activities.

Challenge 2

Outline the "netiquette" for your classroom. What are the expectations you have for your students when they communicate online? Are the expectations the same for emails, blogs, discussion boards, etc.?

5.2.2 Building Community and Setting Expectations

One of the key elements to being able to leverage the advantages of blended learning is the ability to create a positive, supportive, and safe space—not only in the physical classroom—but in the online space as well. Just as students must

You may wish to co-develop an agreement with students about the expectations for appropriate interactions. This includes following "**netiquette**"—a set of agreed upon conventions for how to behave in the online space. The **THINK System** in Figure 5.4 is an example of how to communicate expectations for civil online communication

Figure 5.3 Think System is an example of how to make communication expectations explicit.[69]

The THINK acronym has several elements for fruitful discussion about the appropriate nature of posts. For example:

- **True** — Do I have factual evidence to support the claims I'm making?
- **Helpful** — Does your post help drive the discussion forward?
- **Inspiring** — Does your post add helpful information? Does it inspire others to push their thinking or consider a different perspective?
- **Necessary** — Does your post need to be shared? Has it already been said?
- **Kind** — Are you posting in a way that is respectful, courteous, and kind to others?

In addition, directions for participating in an online discussion will likely need to be quite explicit, especially when beginning. You will want to model the nature of the posts you are expecting. This can include a number of factors such as length, style of writing, any specific formatting conventions you want students to follow, references if required, expectations for number of replies, who will respond to whom, and when initial posts and response posts are due. You can group these aspects into categories of structure, content, flow, and timing. Each aspect of these categories is described in Table 5.3.

Web Resource 5.1 & 5.2
http://bit.ly/btb-v442
http://bit.ly/btb-v472
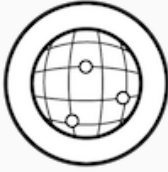
What to Look For: How can you help your students give and receive better peer feedback in online discussion forums?

Table 5.3 Characteristics of online posts.

| Category	Factor	Description
Structure	Length	
		How long should posts be? Can you include a range of the number of words expected? Should the post be a certain number of sentences or paragraphs?
	Style	
		How formal do you expect the language to be? While it might be more conversational, the tone should still be academic in nature. Helping students strike this balance is important to model in online discussions.
	Formatting	
		Are there any guidelines you want students to follow when posting, such as a specific title for the subject line? Should students use a greeting and a closing in their responses?
Content	Requirements	
		Are there sources/references that students need to connect to or cite in their responses? What ideas must students present in their posts?
Flow	Replies	How many posts/replies are required to adequately participate in the discussion? How will students know who to respond to?

Time	Due Dates	
	When are initial posts due? When are response posts due? Do students have enough time to understand the material or discussion before contributing?	

Competency: I can use asynchronous technologies in my classroom practices (5.2).

Challenge 1

Choose an asynchronous tool, and plan how you will incorporate it into one of your lessons or learning activities.
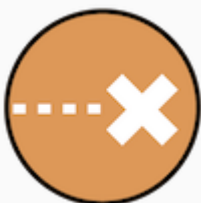
Challenge 2

Outline the "netiquette" for your classroom. What are the expectations you have for your students when they communicate online? Are the expectations the same for emails, blogs, discussion boards, etc.?

5.3 Designing and Managing Online Discussions

Much as you are an architect of in-class discussions, so too must online discussions be crafted and planned. It takes careful thought and preparation to create an effective online discussion. Once you have established guidelines, you must figure out how online interaction can extend student learning. It's helpful to keep in mind what you want students to know and take away from the online discussion. You might want to communicate this rationale with students, highlighting what you hope they will gain out of their participation.

Once you have determined your objective(s), consider how you are going to make sure that students meet them. It takes planning to formulate an effective online discussion. You may want to think about the source material students will need to read or watch prior to participating, how the online discussion will inform in-person discussions, and whether the discussion will be started, continued, or finished in the online setting to best meet your goals.

Discussions can take any number of formats. Some may seek to build consensus among students while others could aim to get students to consider different perspectives. Others could work to have students synthesize information or analyze and defend varying viewpoints. Consider the example prompts presented in Table 5.4 that were provided by University of Oregon Teaching Effectiveness Program. These prompts can help guide you in creating discussion prompts that either build consensus (convergent), consider different views (divergent), or analyze and defend a stance (evaluative).

Convergent Thinking	Divergent Thinking	Evaluative Thinking
Usually begin with: • Why • How • In what ways…	Usually begin with: • Imagine • Suppose • Predict… • If…, then… • How might… • Can you create… • What are some possible consequences…	Usually begin with: • Defend • Judge • Justify… • What do you think about… • What is your opinion about…
Examples: • How does gravity differ from electrostatic attraction? • How was the invasion of Grenada a modern day example of the Monroe Doctrine in action? • Why was Richard III considered an evil king?	Examples: • Suppose that Caesar never returned to Rome from Gaul. Would the Empire have existed? • What predictions can you make regarding the voting process in Florida? • How might life in the year 2100 differ from today?	Examples: • What do you think are the advantages of solar power over coal-fired electric plants? • Is it fair that Title IX requires colleges to fund sports for women as well as men? • How do you feel about raising the driving age to 18? Why?

5.3.1 Creating Strong Discussion Prompts

Another way to classify discussion prompts is whether they are structured to be teacher-led, student-led, or reflective. Teacher-led prompts pose a specific, direct question while student-led prompts provide students with some control over their topic and format. A reflective discussion might employ the use of "**LAW**"—what you Learned, how it Applies to you, and what are you Wondering.

Incorporating Online Discussions in the Classroom
Web Resource 5.3 http://bit.ly/btb-v461
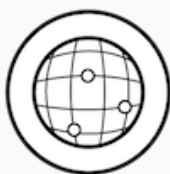
What to Look For:

This article offers some helpful tips for bringing online discussions into the traditional in-person classroom. Which of their strategies might be helpful to you?

A helpful resource for adding these kinds of asynchronous discussions to your blended classroom comes from Eric Brussel and Elizabeth Aldertonin in an Edutopia article.[71] They suggest planning ahead and thinking strategically about the prompts you create and use with students. As they note, "Well-crafted (open) questions led to more responses that exhibited higher-level thinking, while closed questions (an obvious right answer) stifled discussion." This means that if you want a prompt with lots of room for discussion, you should create a **divergent prompt**—a prompt that could have multiple correct responses, instead of a **convergent prompt**—a prompt that really has only one correct response (see Table 5.4).

questions can take a variety of forms, similar to any in-class discussion. As Davis (2009)[72] described, you might consider asking the following types of questions:

- **Exploratory questions:** probe facts and basic knowledge
- **Challenge questions:** interrogate assumptions, conclusions or interpretations
- **Relational questions:** ask for comparisons of themes, ideas, or issues
- **Diagnostic questions:** probe motives or causes
- **Action questions:** call for a conclusion or action
- **Cause-and-effect questions:** ask for causal relationships between ideas, actions, or events
- **Extension questions:** expand the discussion
- **Hypothetical questions:** pose a change in the facts or issues
- **Priority questions:** seek to identify the most important issue(s)
- **Summary questions:** elicit synthesis

These question types can be mapped to Bloom's Taxonomy[73], ranging from those that focus on factual information such as exploratory questions, to others that require more in-depth synthesis and evaluation.

Take a look at Video 5.5 which addresses the issue of convergent and divergent discussion questions in addition the use of Bloom's Taxonomy in considering what level of thinking the discussion questions elicit.

Watch on YouTube

What to Look For: Make note of the tips that are provided for creating divergent prompts instead of convergent prompts.

Open-ended, thought-provoking questions encourage students to use higher order critical thinking skills, including application, analysis, synthesis, and evaluation. Follow-up replies to students' posts from both you and fellow classmates can encourage students to push their thinking forward.

Take a look at Tables 5.5 - 5.7 that illustrate good and bad examples of the structure, flow/timing, and assessment of discussion prompts. The tables provide a range of examples related to how you might structure a discussion prompt in terms of (1) group size, (2) peer feedback structure, and (3) meaningful roles.

Table 5.5 Structure – Discussion group size

Structure—Discussion Group Size	
Not good	In the class (20-30 people) discussion page, describe what you felt upon reading the article from the Washington Times. FEEDBACK: Too big of a group means they won't read everyone's ideas.
Better	In your reading partner's (2-3 people) discussion page, describe what you felt upon reading the article from the Washington Times.

Best	In your group's (5-7 people) discussion page, describe what you felt upon reading the article from the Washington Times. FEEDBACK: A perfectly sized group allows for diversity of thought within a manageable number of posts.

Table 5.6 Structure – Who gets peer feedback.

	Structure—Who Gets Peer Feedback
Not good	In your group's discussion page, describe what you felt upon reading the article from the Washington Times. Then, respond to a peer's ideas. FEEDBACK: Only one response? Also, they will likely only reply to a friend or popular kid, leaving others out.
Better	In your group's discussion page, describe what you felt upon reading the article from the Washington Times. Then, respond to 2 peer's ideas to whom you have never responded before. FEEDBACK: Several students still may not receive a response.
Best	In your group's discussion page, describe what you felt upon reading the article from the Washington Times. Then, respond to the two people who posted just before you. (If you are the first to post, reply to anyone you want later on.) FEEDBACK: Guiding students to post to specific people, seemingly set at random, should allow all students to receive responses.

Table 5.7 Structure – Meaningful roles.

	Structure—Meaningful Roles
Not good	In your group's discussion page, describe what you felt upon reading the article from the Washington Times. Then, respond to the two people who posted before you. FEEDBACK: What are students supposed to respond to their peers about?
Better	In your group's discussion page, describe what you felt upon reading the article from the Washington Times. Then, respond to the two people who posted before you, with at least two things that you like about their post and one thing that you disagree with and why. FEEDBACK: What if they don't disagree about anything? Does stating what they liked really create a meaningful conversation?

Best	In your group's discussion page, describe what you felt upon reading the article from the Washington Times. Then, respond to the two people who posted before you, playing the role of "devil's advocate" by arguing counter to their ideas, challenging their viewpoint. For example, if the person stated that they feel that college is helpful in obtaining a job, discuss how trade school can also help people obtain meaningful employment without as much debt.
	FEEDBACK: A clear role in the response has been created that will stimulate a meaningful dialogue between the students.

Table 5.8 provides a range of good and bad examples of establishing the timing between initial post and student peer responses.

Table 5.8 Timing/flow – Time between initial post and replies.

Timing/Flow—Time between initial post and replies	
Not good	In your group's discussion page, describe what you felt upon reading the article from the Washington Times. Then, respond to the two people who posted before you, playing the role of "devil's advocate" by arguing counter to their ideas, challenging their viewpoint.
	FEEDBACK: When is this due? When should the students post their responses?
Better	Before class, in your group's discussion page, describe what you felt upon reading the article from the Washington Times. Then, respond to the two people who posted before you, playing the role of "devil's advocate" by arguing counter to their ideas, challenging their viewpoint.
	FEEDBACK: There isn't enough time for students to create meaningful responses after the posts have been created.
Best	By Tuesday at midnight, in your small group's discussion page, describe what you felt upon reading the article from the Washington Times. Then, before noon on Thursday, respond to the two people who posted before you, playing the role of "devil's advocate" by arguing counter to their ideas, challenging their viewpoint.
	FEEDBACK: There are now clear guidelines for responses, and enough time has been given for responses to be planned, written, and posted.

Table 5.9 provides a range of good and bad examples of clearly establishing expectations for contribution to the discussion.

Table 5.9 Assessment – Clarity of expectations.

Assessment—Clarity of Expectations

Not good	who posted before you, playing the role of "devil's advocate" by arguing counter to their ideas, challenging their viewpoint. FEEDBACK: What is meant by how they felt? Should they state whether they agree or disagree? Should they write about their feelings and emotions? How long should their initial post and response be? How will they be graded?
Better	By Tuesday at midnight, in your small group's discussion page, in 6-7 sentences, describe the 3 main ideas from the Washington Times article about the importance of college. Include a paragraph of at least 5 sentences outlining your personal opinion on the issue backed up by evidence. Then, before noon on Thursday, respond to the two people who posted before you, playing the role of "devil's advocate" by arguing counter to their ideas, challenging their viewpoint in at least 6 sentences. FEEDBACK: Students still don't know how they will be graded.
Best	By Tuesday at midnight, in your small group's discussion page, write 6-7 sentences describing the 3 main ideas from the Washington Times article about the importance of college. Include a paragraph of at least 5 sentences outlining your personal opinion on the issue supported by evidence. Before noon on Thursday, respond to the two people who posted before you, playing the role of "devil's advocate" by arguing counter to their ideas, challenging their viewpoint using at least 6 sentences. See the rubric below for how points will be assigned. FEEDBACK: Students should now understand the specific evaluative criteria for their posts including: time, length, and content.
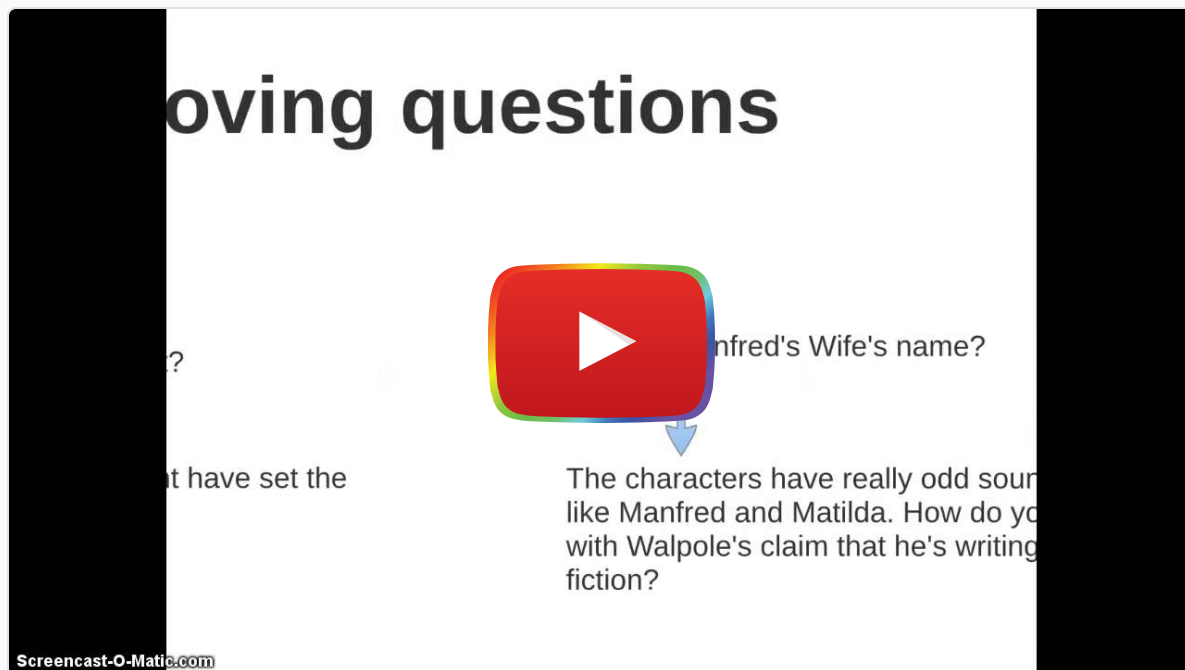
Watch on YouTube

What to Look For: Observe how this video addresses three important criteria for writing discussion prompts: (1) open-ended questions, (2) question focus, and (3) eliciting higher-order thinking.

5.3.2 Managing Discussion Groups

One of the mistakes that teachers who are new to blended learning often make is using their LMS to create whole class discussion activities. It can be okay to have a class discussion board for sharing general ideas about class or asking general question, but these are not ideal for creating student-student interactions. If the discussion group consists of more than 10 members, it becomes very difficult for each member of the group to read all of the posts and know what has been said and what hasn't been said. Additionally, large discussion groups make it more difficult to create a sense of community; whereas members of a small group have a better chance of getting to know one another.

For managing discussions, breaking your class into smaller groups can be helpful. You might consider creating groups with between 4 and 6 members (certainly fewer than 10). If you want all students to get a sense of the discussion happening throughout the class as a whole, groups can have their discussion and then report out to the entire class with a synthesis activity. Another strategy is to assign specific roles within the small discussion group to focus students' contributions. Over a series of weeks, these roles can rotate so that each student has an opportunity to fulfill each role. Several possible roles are described in Table 5.10 (adapted from University of Colorado Denver Online Blog for Faculty[74]).

Table 5.10 Discussion Roles.

Role Name	Timing/Flow—Time between initial post and replies

Facilitator	discussion stays on topic, or publicly recognizes the importance of a "tangent" if one occurs. She also makes sure the group focuses on the most important issues and does not get caught up in extraneous details.
Devil's Advocate	The Devil's Advocate raises possible counter-arguments in a respectful manner. He introduces alternative explanations and solutions based on credible evidence.
Connector	The Connector looks for connections between the current discussion and past topics, discussions, or overall themes. She may also find and highlight connections between what other classmates have said within the discussion.
Explorer/ Innovator	The Explorer/Innovator works to uncover new potential, encourages imagination, and/or contributes new and alternative perspectives and ideas to explore new areas of inquiry.
Summarizer	The Summarizer provides a summary of the discussion for other students to approve or amend at a specified interval.

5.3.3 Facilitating Online Discussions

Starting with effective discussion prompts and roles is important, but so is striking a balance in terms of teacher interaction. Too little teacher interaction and students can feel like no one is listening. Too much and you run the risk of dominating the discussion which can limit or hamper students' interactions, both in terms of quality and quantity.

Strategies to Facilitate Online Discussions
http://bit.ly/btb-v441

The following suggestions are from Edutopia's Guide to Mastering Online Discussion Board Facilitation.

- Structure online discussion board activities carefully and provide clear guidelines for posting material, how often to post, how long the post should be, what information needs to be included (e.g., specific references to content such as readings or videos).
- Establish clear netiquette guidelines and acceptable behavior policies at the very beginning. Monitor discussion boards regularly and address any issues with students privately if inappropriate posting occurs. Be prepared to remove posts or individual students from discussion boards if necessary.
- Give students clear expectations about online discussion requirements, deadlines, and grading procedures. Provide structure for students to post to threads. A good structure lessens the frustration of what to write.
- In your own posts, model ways to support arguments and cite references to support a particular position.
- Provide a schedule for students of upcoming discussion board deadlines. Give as much notice as possible.
- Use small group activities to help build community and establish peer communication and connection.
- Make yourself visible in the discussion. Students will be more likely to engage in the discussion if they see you as being a part of it.

You will also want to establish guidelines for giving students credit for discussion board participation, and provide ways to allocate points for posting regularly, responding to classmates' posts, staying on topic, and responding in a thoughtful manner. Assessing the quality as well as the quantity of the students' online posts is important. Using rubrics

> ### Competency: I can create effective online discussions (5.3).
>
> **Challenge 1**
>
> Write a discussion prompt that includes divergent thinking and has detailed content, structure, flow, and timing instructions.
>
> **Challenge 2**
>
> Divide your class into discussion groups that have 4-6 students in each group. Create a discussion prompt where each student has a specific role to play in the discussion.
>
> **Challenge 3**
>
> With your professional learning community (PLC), create an example of a discussion board that models both great discussion board posts (those that follow your guidelines) and not-so-great discussion board posts (those that do not follow your guidelines).

5.4 Blending Feedback

Feedback and instruction are closely related. In fact, you can view feedback as a type of instruction, but there is an important distinction—feedback comes as a direct "consequence" of student performance and is focused on improving that performance. In his seminal synthesis of over 800 meta-analyses on student achievement, John Hattie[75] found that feedback had one of the most powerful impacts on student learning. However, Hattie also found that "some types of feedback are more powerful than others" (p. 174) As a result, simply increasing the amount of feedback is not enough. If you are going to impact students' learning, you must increase the right kinds of feedback that you provide to students. Furthermore, Hattie recognized:

> The greater the challenge, the higher the probability that one seeks and needs feedback, but the more important it is that there is a teacher to provide feedback and to ensure that the learner is on the right path to successfully meet the challenges. (p. 24)

As a result, as teachers implement more mastery-, project-, problem-, and inquiry-based learning those same teachers need to reconsider how and when they provide feedback.

Assigning grades or scores is not the same as providing feedback. Teachers often provide students with grades or points with generic comments rather than providing them with quality feedback. This leaves students wondering how the teacher decided on their grade and may cause a perception that the teacher is randomly assigning points without truly assessing their work.

Video 5.6 (2:00) http://bit.ly/btb-v493

Watch on YouTube

What to Look For: Clearly teachers don't actually grade like Mr. D (at least we hope not) but this funny video shows how some students feel teachers grade when they only receive a score and general comments. As you watch, think about how you can make your grading procedures and decisions more transparent to students.

So, what constitutes powerful feedback? The simple answer is that feedback is powerful when it is applied by students to improve performance. However, how can teachers help to ensure that happens? Considering the amount of time teachers spend providing feedback, the answer to that question is surprisingly under-researched. Michael Eraut (2006) said it best, "We need more feedback on feedback" (p. 118).[76] In our review of the existing research we found three elements of effective feedback: content, timing, and delivery.
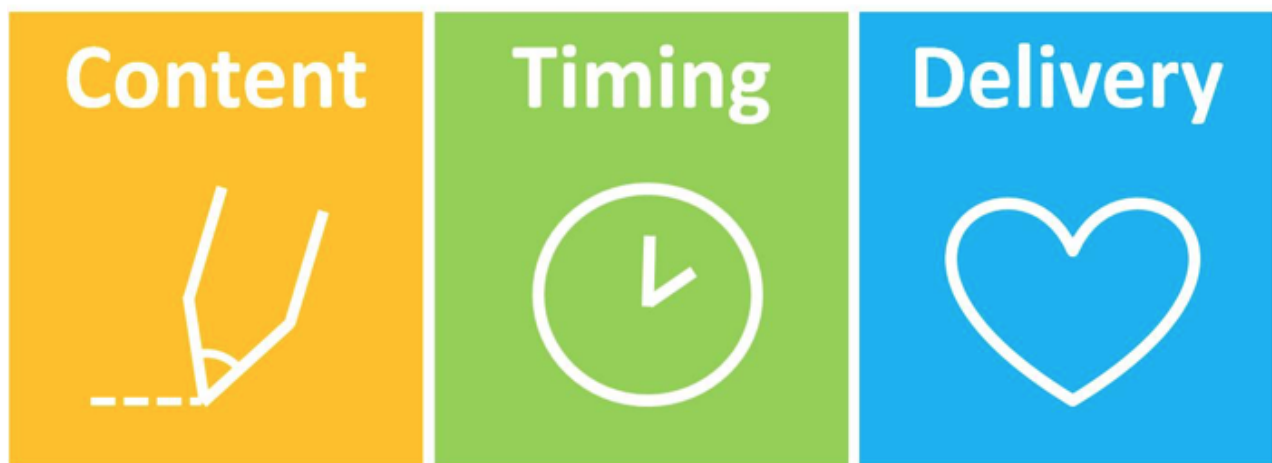

Figure 5.5 Feedback Elements.[77]

provide feedback that is specific to student performance. You should also provide students with the information that they need to narrow the gap between their current and desired performance. In fact, some have changed the term "feedback" to "feedforward" to emphasize that the feedback should focus on improving future performance.

- **Timing** refers to when students are provided with feedback. Timing is especially important because students tend to ignore feedback when it is not prompt.
- **Delivery** refers to the manner in which you provide feedback and how it is perceived by students. Although feedback should correct student performance, you should provide it in a respectful manner that motivates students to improve. In fact, research has found that feedback is "an important component for building a strong student-instructor connection" (Boling et al., 2012, p. 121).[78]

5.4.1 Are We Physicians or Coroners?

When providing feedback, you should act more like a physician than a coroner. A physician and a coroner both examine the body and make judgments based on assessments. They also both provide reports. However, the content, timing, and delivery of those reports are very different:

- **Content:** The physician describes what is going wrong and provides a specific plan for fixing it if at all possible, whereas the coroner simply describes what went wrong.
- **Timing:** The physician needs to provide a report quickly for it to have a meaningful impact on the patient's health, whereas the coroner's report is much less urgent and can take months before it is shared.
- **Delivery:** The physician needs to have a good bedside manner, share what is going wrong, and prescribe treatment with extreme care. Having a good bedside manner is much less important when a coroner shares a report.

Too often teachers act like coroners by conducting autopsies of students' projects without prescribing timely feedback that allows students to achieve their potential in a way that motivates students to act.

5.4.2 The Feedback Burger

We use the metaphor of a cheeseburger to discuss strategies for providing effective feedback. We chose this metaphor because it can show you how timing, content, and delivery all come together to form effective feedback. There are specific elements that make a cheeseburger, and they are typically organized in a specific way. Feedback is the same way—there are elements that are best organized a specific way.

- **The Bun** (Relationship Building): You should remember to greet the student by name. Also, using a little small talk can be helpful to make them feel at ease. These are small actions that can have big impacts on how students interpret and use your feedback.
- **The Cheese** (Specific Praise): Next, you should give specific praise that focuses on students' projects.
- **The Meat** (Needed Corrections): Next, you should provide specific corrections.
- **The Lettuce** (General Praise): You don't want to end with corrections so it's good to follow them up with some general praise.
- **The Bun** (Support): You then want to end with offering support to the student.

1. Bun — Relationship Building
2. Cheese — Specific Praise
3. Meat — Needed Corrections
4. Lettuce — General Praise
5. Bun — Support

Figure 5.6. Feedback Burger.[79]

Remember that no one wants to eat a soggy, or dried out, cold burger. We can't emphasize this enough. Just as you would likely not serve a cold, soggy hamburger, your students are not likely to make full use of feedback that's provided weeks after it was submitted.

5.4.3 From Burgers to Blenders

The blended classroom presents some interesting challenges and opportunities in regard to providing feedback. For instance, in blended environments, it's more likely that students will submit their projects online. Their projects can also be complex and created in formats (such as a video or website) that don't lend themselves to attaching comments as you would in a word processing document that has built-in tracked changes and comment features. At the same time, learning management systems and other online communication tools can make it much easier to provide students with a high degree of feedback efficiently. The following strategies will help you to fulfil this important responsibility:

but also help to clearly communicate assignment expectations to students at the start of the project. It is also important to note that rubric scores should not replace feedback comments that are specific to students.

- **Feedback Templates**: Feedback should be personal to each student and his or her performance. However, you may often see mistakes or areas for improvement that are the same, or at least similar, across multiple students. In those times, you may be able to save some time by creating a feedback template that can be modified to meet students' specific projects.

- **Strategically Providing Video and Audio Comments**:[80] Blended teachers have the ability to communicate with students in a variety of formats, including via in-person, written, audio, or video comments. Rather than asking, "Does the feedback for this project need to be [in-person, written, audio, or video]?" it's better to ask, "Is this specific student, on this specific project, best served with an in-person, written, audio, or video comment or some combination of these?" For instance, when the required feedback is complex, it can be easier for you to communicate that feedback in a screen recording. You may also ask students to come talk to you in-person once they have watched the video feedback comment. (For an example of video feedback, see Video 5.8.)

- **Peer Feedback**: It's possible for teachers to spend their time more effectively if students receive feedback from their peers before receiving instructor feedback. For instance, you can implement a three-before-me policy that requires students to receive feedback from three peers before actually submitting the project to you for feedback. John Hattie's[75] review of research found that 80% of feedback that students receive actually comes from their peers. Unfortunately, 80% of that feedback is incorrect! As a result, you should help students learn how to provide quality feedback to their peers. For instance, you can create specific rubrics and then help students understand how to use those rubrics while providing feedback.

Video 5.8 (2:58) http://bit.ly/btb-v495
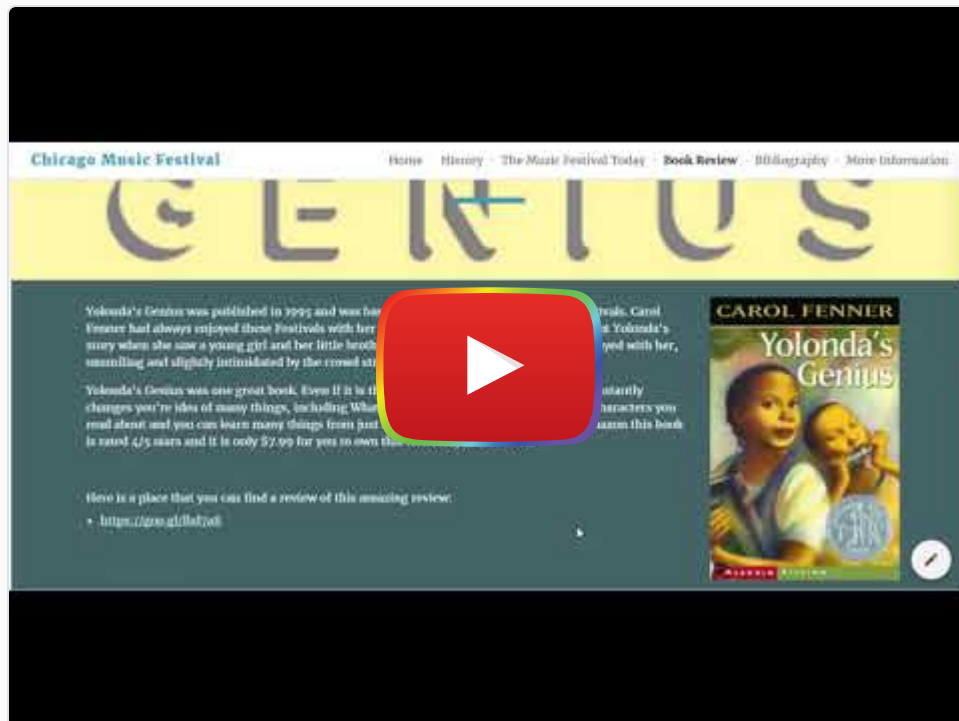
Watch on YouTube

What to Look For:

Chrissy McLaughlin, the 6th grade teacher whose Flipgrid comments we highlighted earlier, uses project-based learning extensively with her students. Commonly students create complex online products. For instance, when reading historical fiction her students create websites using Google Sites to expand on the historical setting of the book. Chrissy provides them with feedback in-person, in text, and via screencast recordings. One advantage of the screencast feedback is that she can be very specific in her comments. The recording also provides students with a permanent resource that they can refer back to when making revisions. This is one of the feedback comments that Chrissy provided to her students. We removed the first portion of the comment because it contained students' names.

5.4.4 Accepting Feedback from Students

While we are focusing on you providing students with feedback, students providing feedback to you can be especially powerful and impactful on their learning when you apply that feedback to improve instruction. Again, John Hattie's seminal synthesis of over 800 meta-analyses relating to student achievement highlights the need for student provided feedback. Hattie explained, "the most important feature was the creation of situations in classrooms for the teacher to receive more feedback about their teaching" because it created a "ripple effect back to the student" (p. 12).[75] Online communication can actually help students provide you with meaningful feedback because their comments can be anonymous. It can also give students the opportunity to provide you with feedback at any time. For instance, you could create an anonymous feedback survey using Google Forms that they link in the sidebar of a course website that students can access while they are working on assignments. (See Web Resource 5.4 for ways to help yourself and students give and receive feedback.)

Web Resource 5.4 http://bit.ly/btb-v453
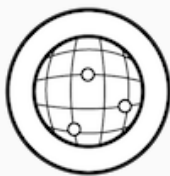
What to Look For:

We often focus on giving feedback, but how good are you and your students at receiving feedback?

Competency: I can use asynchronous technologies to create effective feedback (5.4).

Challenge 1

Practice using various types of communication to provide effective feedback (e.g. electronic rubrics that you've created in an LMS, text-based feedback, and video feedback).

Challenge 2

Create a space or way for students to provide helpful feedback regarding learning activities or units. For example, it could be a Google Form or a public forum in your LMS.

Check your Understanding

Check your understanding of the concepts in the chapter by taking this chapter quiz. (http://bit.ly/K12-BTQuiz)

Go for the Badge

Go for the Badge! Complete Section 5 of the Blended Teaching Roadmap. (http://bit.ly/MyBTRoadMap-Ch5) (See two examples of a completed Roadmap in Appendix C.)

6

Blended Design in Practice
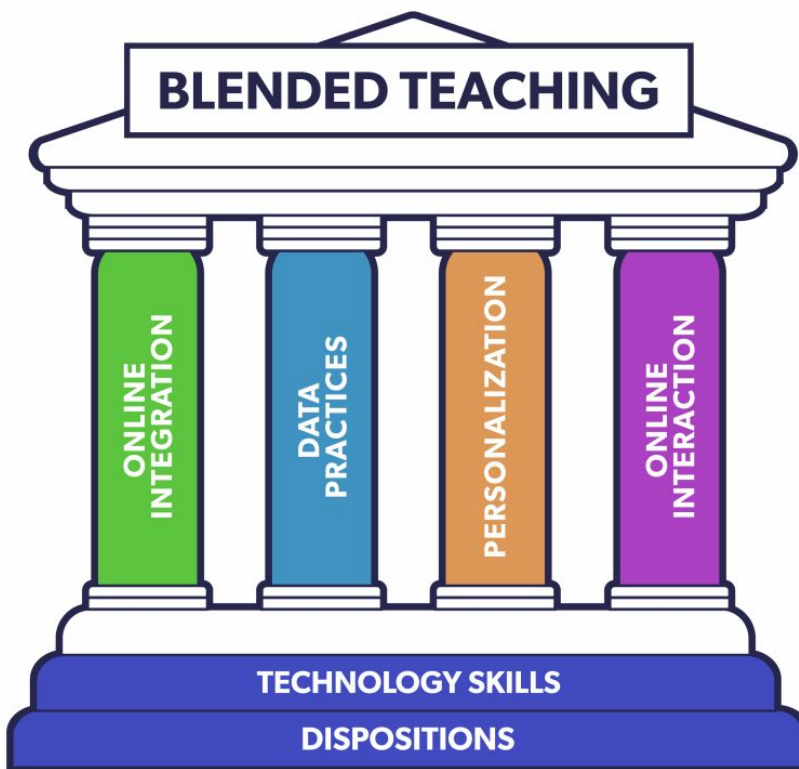
"Alone we can do so little. Together we can do so much."--Helen Keller, Helen and Teacher

Core knowledge and skills that bring all elements of blended teaching together are essential to effective blended teaching. By the end of this chapter you should be able to meet the following objectives:

Competency Checklist

- I can curate online content to support student learning (6.1).
- I can plan the scope and sequence of a blended lesson (6.2).
- I can support my reasons for using a blended lesson (6.3).
- I can reflect upon and revise my blended teaching practices (6.4).

As an effective blended teacher, you need to be able to integrate online and in-person learning, use data practices, personalize instruction, foster online interaction and combine all of these skills into one seamless practice. This chapter is designed to help you put all of the pieces from the previous four chapter together to form one seamless blended teaching lesson. (See Figure 6.1.)

We begin by providing an overview of the role content curation plays in blended teaching.

Figure 6.1 All of the pieces coming together.[81]

6.1 Curating Content

Teachers have long been perceived as guardians of knowledge. They stood guard at the vault door, protecting the knowledge that lay beyond it. Each day, students came to the vault to receive a bit of knowledge. The teachers opened the door enough to let a little bit of knowledge out, so that students could absorb a bit of what it had to offer. They soaked in this little bit of knowledge and information offered by their guardian teachers then returned again the next day to soak in a little more.

While teachers are important curators of knowledge and are essential in making sure that knowledge is passed on to new generations, the guardians of knowledge approach presents students as passive students whose learning is dependent upon how wide their teachers wish to open the door to the vault of learning. Blended teaching presents a better system. Plutarch said "the mind is not a vessel to be filled, but a fire to be kindled"[82] and the blended teacher personifies this mantra. Your role as a teacher in a blended learning classroom is to give students the key to the vault, so they can take as much or as little knowledge from it as they want (while you as the teacher always push students to take a little more). Throughout the previous chapters, we have discussed using the online space to house learning activities, assessments, data, learner profile information, and opportunities for interaction; however, we have not fully

6.1.1 Content Types

It can be somewhat overwhelming when you think about all of the different types of content that instructors can use in their courses. We have created a framework to help simplify the landscape. The graph below (Figure 6.2) plots types of content based on two variables: richness and responsiveness.

- **Richness**—varies according to the number of senses that students use when interacting with the content.
  - Low: Text such as books or online readings.
  - Medium: Audio recordings such as podcasts.
  - High: Multimedia presentations such as video that contain visual and auditory elements.
- **Responsiveness**—varies according to the content's ability to adapt to student needs and actions.
  - Low: Text and video allow students to learn at their own pace but are static, and the actual message doesn't change based on the students' behavior or needs.
  - Medium: Some types of content may not automatically adapt to students, but it can provide students with a lot of choice and exploration opportunities. For instance, online environments such as virtual chemistry labs[83] allow students to experiment in ways that would be too dangerous in real life. Similarly, desktop observatories such as Stellarium,[84] or virtual worlds such as Google Earth,[85] allow users to see and explore areas that would be difficult or impossible to do in-person.
  - High: Some types of content will actually recognize students' level of understanding or ability and change what is presented to the student based on students' needs. For instance, adaptive learning software continually assesses students and allows students many opportunities to practice skills with less and less support until they reach mastery and move forward to more difficult concepts. Similarly, educational games are highly responsive by providing a student with the ability to make choices and then instantly adapts according to the student's action.
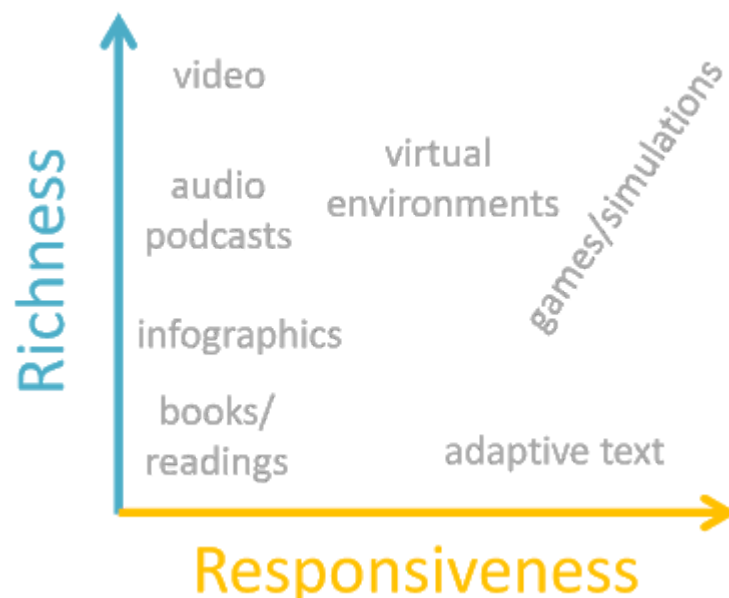
Figure 6.2 Richness and responsiveness of content.[86]

Please note that this graph is not measuring value. In other words, text (low levels of richness and responsiveness) is not less valuable to student learning than a simulation (high levels of richness and responsiveness). Each type of content has its own affordances and is valuable for different reasons. At the risk of being overly simplistic, static content is usually used to absorb and think deeply about information and dynamic content is used to apply, practice,

6.1.2 Using Existing Content Ethically and Fairly

There is an enormous amount of content already made specifically for you as a teacher to use. Many vendors sell content directly to school districts—often at a high price. Others focus on selling affordable materials directly to teachers, including Teachers Pay Teachers[87] which allows teachers to sell materials to other teachers. There are also lots of materials that are free to use. However, when using materials that you find online you need to make sure to protect student data and follow copyright law and fair use guidelines.

6.1.3 Protecting Student Data

There are countless educational apps and websites that can be used for free. However, these free tools can collect student data that they may or may not use responsibly. As a result, it's important that teachers understand issues surrounding student data privacy. There is a good chance that your school district has a list of apps and websites that have been vetted and approved for student use. If you find a tool that has yet to be vetted by your school district, we recommend that you read its terms of service and privacy policy to answer the following questions provided by Connect Safely:[88]

1. Do students have to make an account in order to start using that app? If so, did students have to provide personal information (email, name, age, etc.)? Who has access to students' email and other information once they've created that account?
2. Does the app require parental permission?
3. Does the app developer share student information with others?
4. Does the app collect additional information such as location or contacts?
5. Does the app have an age requirement?

You may wish to check with your school or district administration regarding approval for classroom use.

6.1.4 Copyright and Fair Use

Online videos, images, and articles are easily accessible online. You can also use any online materials so long as you follow copyright laws and fair use guidelines. Copyright laws protect authors and creators from others taking their works. Copyright is automatically granted to the authors of original works. However, there are limitations to copyright protections. For example, *Fair Use* allows teachers and students to incorporate media into their instruction and projects even without permission from the copyright holder as long as you follow these guidelines:[89]

- The media that are being used were not created specifically to sell to schools/students.
- You are not negatively impacting the commercial value of the work.
- The media are being used for an educational purpose.
- The media were legally acquired.
- The copyright holder is cited properly.
- Only a portion of the work is being redistributed and/or used as follows:
  - 10% or three minutes of a video, whichever is less;
  - 10% or 1,000 words, whichever is less;
  - 10% or 30 seconds of music, whichever is less;
  - Entire images can be used but you should only use five works per artist and 10% or 15 images from one published work, whichever is less.

Fair use guidelines apply in any educational setting but online teachers also need to follow the guidelines in the TEACH (Technology Education and Copyright Harmonization) Act[90]. Basically, the TEACH Act says that the teacher should take precautions to ensure they are only distributing materials to students in their class. This is one reason why educators are encouraged to use password protected learning management systems (LMS) such as Blackboard or Canvas.

Creative Commons[91] is a growing movement that allows creators to easily remove some or all of the constraints that copyright and fair use guidelines have placed on others wanting to reuse, redistribute, revise, or remix their work. In a TEDxNYED presentation, Dr. David Wiley argued that the open movement "is really about sharing, about being generous with other people, and about giving. . . . and overcoming the inner two-year old in you that screams, 'Mine! Mine! Mine!'"[92] Whatever people's motivation for sharing their work, it's important that you are aware of what Creative Commons licenses are so that you can benefit from it and possibly contribute yourself.

Not all Creative Commons licenses are the same and some are more restrictive than others so it's important to know what the different symbols mean. On a side note, this book is licensed under Creative Commons Attribution Share Alike (CC BY SA) license. This means that people like you can share it by copying and redistributing it and adapt it by remixing or revising it to suit your needs. You could even use this book to create your own book, professional development seminar, conference presentation, or lectures series so long as you provide attribution to this work and its authors, and also license your new work using a CC BY SA license.

The Creative Commons website contains lot of information that you can explore. We've pulled out what we consider to be the most helpful if you are interested in learning more:

- https://search.creativecommons.org/ allows you to easily search for Creative Commons material.
- https://edtechbooks.org/-qi provides you with information on the different types of licenses.
- https://edtechbooks.org/-iP allows you to create a Creative Commons license to include as part of the materials that you create.

The following infographic (Figure 6.3) provides additional information on the concept of Creative Commons and the different licenses that are available.
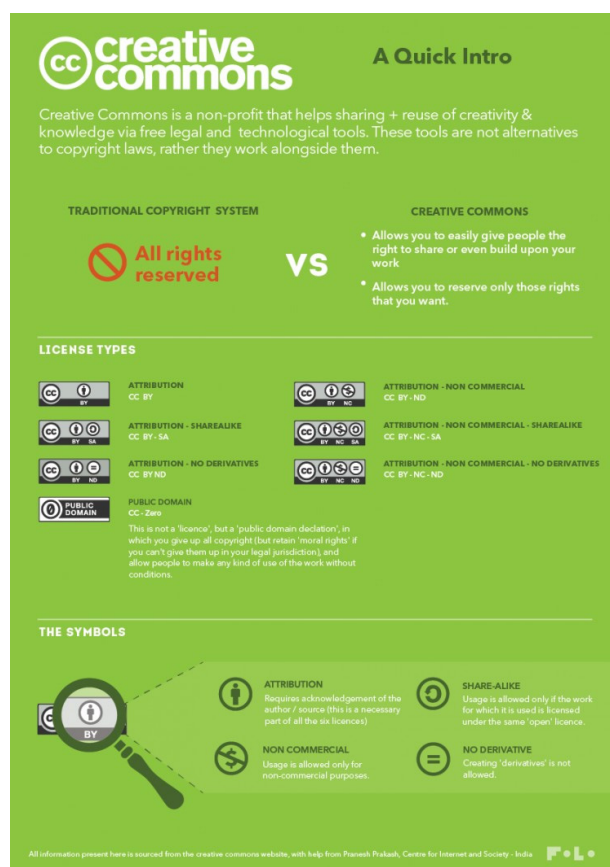

Figure 6.3 Creative Commons Licenses.[93]

Teachers have always created learning materials, and blended teachers are no different. Creating online content can seem intimidating, but it has actually become very doable and is a practical solution if you want more customized content for your students.

Every day it seems that there are new tools available for creating content. Because the companies that create these tools want teachers to use their materials, they have made their tools as intuitive as possible and commonly provide helpful tutorials for those who need a little extra help. What's difficult is creating online content well. In this section, rather than focus on specific tools for creating online content, we will focus on some guiding principles for creating quality online content. While we are focusing on teachers creating content, all of the examples shared in this section could also be used by your students as a way for them to demonstrate their understanding and skills authentically.

6.2.1 Creating Videos

There are three common types of videos that teachers create: edited, screencast, and animated videos.

- **Screencast Videos**: Screencasting software allows you to record whatever is seen on your screen with accompanying voice narration. You might use screencasting tools to create video lectures so that students can see presentation slides while listening to your lecture. Additionally, you might use screencasting tools to provide video tutorials or demonstrations of software you want students to learn how to use. At times, these videos will also include a small webcam recording window in the corner of the screen so that the students can actually see the teacher while she is talking to them. Tablets can also allow you to include handwriting and drawings while you talk. In fact, Khan Academy (https://www.khanacademy.org/) is built on these simple screencasts (for an example video, see https://youtu.be/uzkc-qNVoOk).
- **Edited videos**: Edited videos can include video, images, titles, transitions, and music that help grab students' attention. These added features also make creating edited videos much more time consuming than creating screencasting videos. Edited videos are best when they show students places and events that would be difficult to see in the classroom.
- **Animated Videos**: Typically creating animated videos requires a lot of time and talent. However, there are now tools that allow you to quickly create animated videos even if you struggle drawing stick figures. Animated video editing tools commonly have a free account for teachers. However, carefully review the limitations to the free account because if teachers or students exceed length limitations or use premium animations they will be unable to render their video without upgrading to a paid account. Powtoon (https://www.powtoon.com/) is perhaps the most popular animated video editor. However, it is also has one of the most restrictive free accounts. Moovly (https://www.moovly.com/) is another option that doesn't have the same length restrictions on their free account— for now. Video 6.1 was created using Powtoon and provides an example of what an animated video can look like while sharing examples for how it could be used in the classroom.

Video 6.1 (1:11) http://bit.ly/btb-v534

Watch on YouTube

What to Look For: Notice how you could use animated videos in your own classroom.

Watch the video examples (6.2 and 6.3) to see the difference between screencast and edited videos. The screencast video records a PowerPoint presentation and the accompanying teacher lecture. While there are many boring video lectures, this one is actually pretty interesting because the slides are visual, and the teacher used custom animation and humor. The same teacher also created an edited video teaching the same material. Rather than recreating a lecture that she could have given in class, she took students out into the community to show them examples. Notice that she also carefully chooses background music and title fonts that matched the subject.

Video 6.2 (4:59) http://bit.ly/btb-v588

Watch on YouTube

What to Look For: Look for benefits and downsides of teaching with a screencast video.

Video 6.3 (4:53) http://bit.ly/btb-v512

Watch on YouTube

What to Look For: Notice the benefits and downsides of teaching with an edited video.

6.2.2 Guidelines for Creating Engaging Videos

What type of video will students watch? Research that examined nearly 7 million video views on 862 videos identified the following best practices:[94]

- Videos are best when they are shorter than 6 minutes.
- Videos that combine video of the instructor with PowerPoint slides are more engaging than videos with only narrated PowerPoint slides.
- Narrated screen recordings that show the instructor writing and drawing are more engaging than those that show static PowerPoint slides.
- Videos are more engaging when instructors speak quickly and with enthusiasm.
- Videos are more engaging when they show the instructor in personal settings.

6.2.3 Creating Content Pages

Most school districts have adopted a learning management system (LMS) that allows you to easily create pages with course content. There's no formula for creating great content pages. However, there are some general guidelines that we recommend you follow:

- **Use bullet points** when presenting lists or steps.
- **Use bolding strategically** to draw attention to important terms or phrases. You should also avoid using blue text because students may confuse it with a hyperlink.
- **Shorten the line length**. When text is too long, it takes longer to read because your eye has to cover more ground going from the left of the screen to the right. This is why newspapers use columns. However, online pages don't use columns. Instead, you can shorten the line length by creating tables with text in one column and images or videos in the other column.
- **Left-justify text**. When text is centered it can make it difficult for students to read because it's a little harder to find the line where the sentence continues. As a result, it's much better to left-justify all paragraph text.
- **Use images, symbols, and icons purposefully**. Images can be a powerful teaching tool that engages students. However, not all pages need to have an image and too many images can be distracting—especially when they're not closely related to the content. Icons and symbols can also be repeated to signify certain tasks/activities.
- **Embed videos**. Rather than linking out to videos, embed them directly into the page unless viewing the video is optional.
- **Embrace headings and white space**. Try to break up long paragraphs into shorter ones. Headings can also help cue students to topics. White space between topics can also help to break up the information.
- **Avoid small text**. Text should be at least 12-point type and larger if you have younger students.
- **Use intuitive navigation**. Ensure that there is a sense of flow in your course navigation. You don't want students to feel lost in your course. You also don't want them not knowing what to do next. Starting each page with an introduction and ending with a description of and link to what's next can be helpful.

6.2.4 Accessibility

We need to ensure that our courses do not discriminate against students with disabilities. As a result, it is your responsibility to ensure that the educational materials and activities in your course are accessible to *all* students. Although school districts would never construct a building without proper accommodations for those who use wheelchairs or who are blind, many online materials are not accessible to students with disabilities.

Although we need to make all aspects of our courses accessible, we wanted to take a moment to talk specifically about videos. Videos can be the most time-consuming thing to make accessible because we need to add captions for our students who may have difficulty hearing or who are learning English. Thankfully YouTube has made it much easier to do just that. When you upload a video, YouTube will use voice recognition technology to automatically add captions to your video (sometimes it takes a couple days). While YouTube captioning can be pretty bad at times,[95] they have gotten much better the last couple of years. However, they are not perfect and should only be used as a starting point. We were curious how long it would take to make corrections to the automatic captions on one of our videos, so we tested it out. The video was 5 minutes and 39 seconds long and it took us about 10 minutes to caption it correctly. For longer videos, services such as Rev.com can provide captions for about $1 per minute of video.

6.3 Sequencing Your Blended Lesson

At this point you have read a lot about blended teaching and completed your blended teaching road map. However, the thought of designing and developing a blended unit may still seem intimidating. One thing to remember is that there are three basic elements that make up a course:

smaller activities, it's a good idea to break down a learning standard into smaller goals that can be accomplished during a single activity. Learning goals typically start with the phrase "At the end of this activity, students will be able to…" (sometimes called SWBAT for short). The learning goals are the vehicle that drives the course assessments/activities and content.

- **Assessments**: Procedures used to measure students' knowledge and ability and determine if students have met the learning goals and standards. These can include traditional (e.g., text, quizzes, essays) performance (e.g., student projects, demonstrations), formative, and summative assessments.
- **Activities**: Learning activities help prepare students for assessments and aren't typically graded, or students are awarded points largely based on participation. Examples include listening to a lecture, reading a book, or participating in a discussion.

It's important that your learning goals, assessments, and activities are aligned as seen in Figure 6.4.
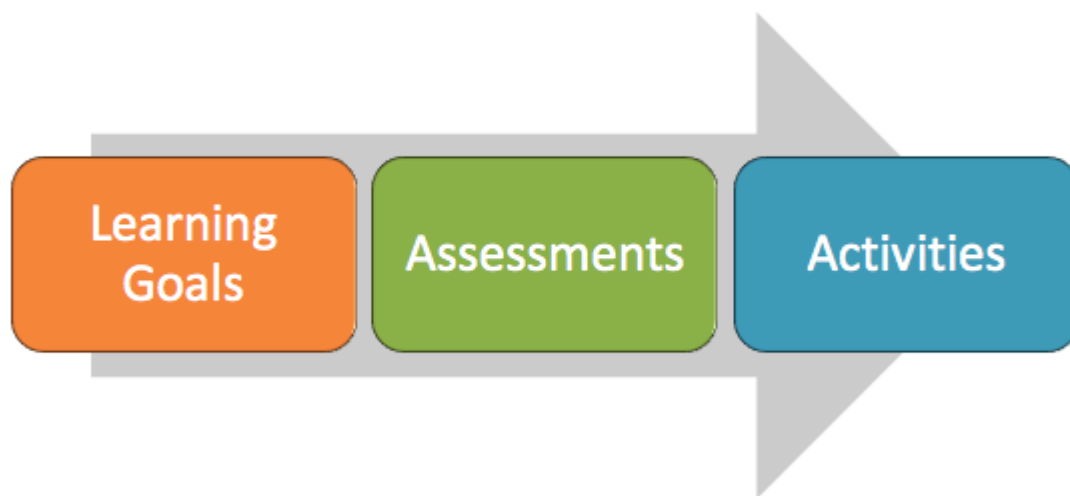
Figure 6.4 Aligning learning goals, assessments, and activities.[96]

We recommend planning your lessons using a table that aligns each of the three elements. Tables (like the one in Web Resource 6.1 below) also allow you to easily recognize patterns in your unit design.

Alignment Table
Web Resource 6.1 http://bit.ly/btb-v521
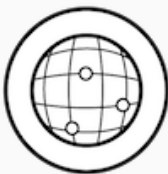
What to Look For:

This Google Doc is an example of a sheet you may want to use to align the three elements of a unit—objectives, assessments, and activities.

It's also important to remember that throughout your reading of this book, you've been creating objects and reflections that you can use in your unit design. Take some time to review the following:

- From Ch. 4 — Personalization Plan and Activities and Assessments
- From Ch. 5 — Online Discussion Prompt

Once you've developed an overall unit alignment, you can start planning the lesson sequence, or the ways that the learning activities will be organized for students. For instance, an online discussion could occur before, between, or after in-person activities. Discussions could also start in-person and then move online or vice versa. It's also good to remember that blended learning can be more flexible in the learning structure than traditional instructional units. The nature of blended learning gives students some flexibility in how and when they participate in learning activities. Teachers should also plan on using data frequently to adjust learning sequence to meet student needs—both individually and collectively.

There is no "wrong" sequence and how you decide to order activities can depend largely on your goals for the blend (remember the 7Ps & 4Cs from Chapter 1) and the dimension you have chosen for personalization (see Chapter 4).

6.4 Creating the Rationale to Support Your Blended Lesson

When you began planning your blended lesson, you should have chosen some reasons for blending. The reasons should have included improving student outcomes and may also have included increasing flexibility for students or decreasing costs of lesson materials. We hope you included at least one of the seven P's, or one of the 4 Cs identified in Chapter 1 in your rationale. Once you began developing your blend, however, these reasons may have changed. You might have originally decided to blend to allow students to have increased *participation* in class. However, once you chose your blended teaching model and standard, and began to develop assessments and activities using them, you might have shifted away from your focus on participation to a focus on allowing students to come to class *prepared*, so they can have more time for classroom-based activities. As experienced instructional designers, we understand that plans for designs often change or evolve during the development process.

Because the reasons for a design can change during development, it is important to revisit the goals you had for students when you began planning your blend. If the goals remained the same, you should check to make sure you are meeting those goals. If the goals have changed, you should check to make sure that your new goals are still student focused. It is okay to shift from focusing on allowing students to receive practice with feedback (one of the seven Ps) to a focus on collaboration (one of the four Cs). However, it is unproductive to shift from a goal that's focused on increasing student learning outcomes or engagement to a goal of increased convenience for you. Convenience is not one of the four Cs! Blending might make presenting and teaching content more convenient, but it should not be the reason that fuels your blend.

Once you understand the goals for your blended lesson, you should make sure that the way in which you have sequenced your lesson meets these goals. If an administrator, parent, or other teacher comes to you and asks you why you have chosen to blend your lesson, you should be able to readily explain how it is increasing opportunities for your students. Reviewing the seven Ps and four Cs from Chapter 1 and the PICRAT matrix from Chapter 2 will help you explain how your blended lesson attempts to increase student opportunities and engagement. You should be able to map each part of your blended lesson to one of your reasons for blending.

The following is an example of how your sequence of activities can be supported using your goals for blending and the PIC-RAT matrix. Bolded words refer to PIC-RAT, the seven P's, or four C's. This lesson rationale is for a third-grade math standard focused on estimating and measuring liquid volume. The lesson takes place over a one-week span of time using 45 to 60 minutes per day and relies on a lab rotation model.

Here is the sequence of activities:

Monday	Pre-Assessment through the LMS, Begin the Volume Measurement and Esti
Tuesday	Introduce discussion board in class and allow time to work on posts 1 and 2 Volume Measurement and Estimation Activities
	30 minutes for reading and responding to discussion board posts,
Wednesday	Introduce Bonus: Mystery Volume Question for early finishers,
	Students continue Volume Measurement and Estimation Activities
	Conclude discussion board in class and use it to transition to the day's lab,
Thursday	1 hour for the Lab Assignment,
	Early finishers continue Volume Activities
Friday	Final Assessment

Here is the teacher's rationale:

In addition to using my LMS to organize this unit, some of the learning activities also happen through the learning module. For example, the lessons for Monday and Tuesday both have videos that explain concepts essential to the objective. Because these videos are mostly passive (they do ask students to answer some questions, making them **a little interactive**), we have supported the videos with interactive games. These games help students better understand the essential concepts behind using graduated cylinders and liquid volume measurements.

I am also using a discussion board on Tuesday and Thursday to allow students to interact with each other's ideas. This increases students' **participation** in class discussions. We do not have enough time in class to allow everyone time to share, and some of the more introverted kids rarely share anyway. The discussion board gives everyone the opportunity to share their ideas and have people respond to them. This practice **amplifies** students' opportunities to share their ideas with others. The discussion is book-ended with in-person class time that introduces and concludes the discussion.

Lastly, the lab assignment is provided through the LMS so students can **collaborate**, and work at their own **pace** to understand the water displacement method. While students are working at their own paces, I rotate around the room to help those who need more instruction. This practice increases **personal interaction**, allowing me to provide each student with the help he or she needs. For students who finish their work more quickly than others, I have included a bonus problem to work on within the module. The bonus problem reinforces ideas from the lab and helps **personalize pace** by providing students with additional instructional activities.

6.5 Implementing Your Blend

When working with teachers, we commonly challenge them to follow the adage, "Think big, start small, but most of all start." If implementing an entire blended unit is overwhelming, there are many ways to start small and then ramp up your blended teaching efforts. For instance, you could start by:

1. Introducing blended learning routines and procedures such as the station rotation model (see chapter 1). Then you could…
2. Gather performance data and use it to direct another learning activity. Then you could…
3. Blend a student discussion. Then you could…
4. Create learning profiles for personalized learning goals.

Small implementation goals will help you become familiar with the concepts shared in this book and increase your confidence to take on an entire blended unit.

As you implement blended activities, it's important that you take note of wins (teacher wins, individual student wins, and class or group wins) and opportunities for improvement. After each day and unit, take the time to reflect on the following questions:

- Which activities worked? Which didn't?
- What assessments helped? How did you use data?
- Do you need to increase or decrease the level of student agency (personalization)?
- Did the online interaction go as planned? Were the prompts divergent and rubrics helpful?

blended teaching the first time you try it. At times we hear teachers say something similar to, "I tried blended teaching once, and it doesn't work." That's similar to a teacher saying, "I tried face-to-face teaching, and it doesn't work." It's likely that lessons will not go as well as you hoped the first time, but that doesn't mean that the format itself doesn't "work." In fact, when teachers and students try something significantly different, it's common for their performance to drop temporarily before they master the new ways of teaching/learning; however, performance then recovers and even surpasses the previous performance. This phenomenon is called the "J curve" as shown in Figure 6.5.
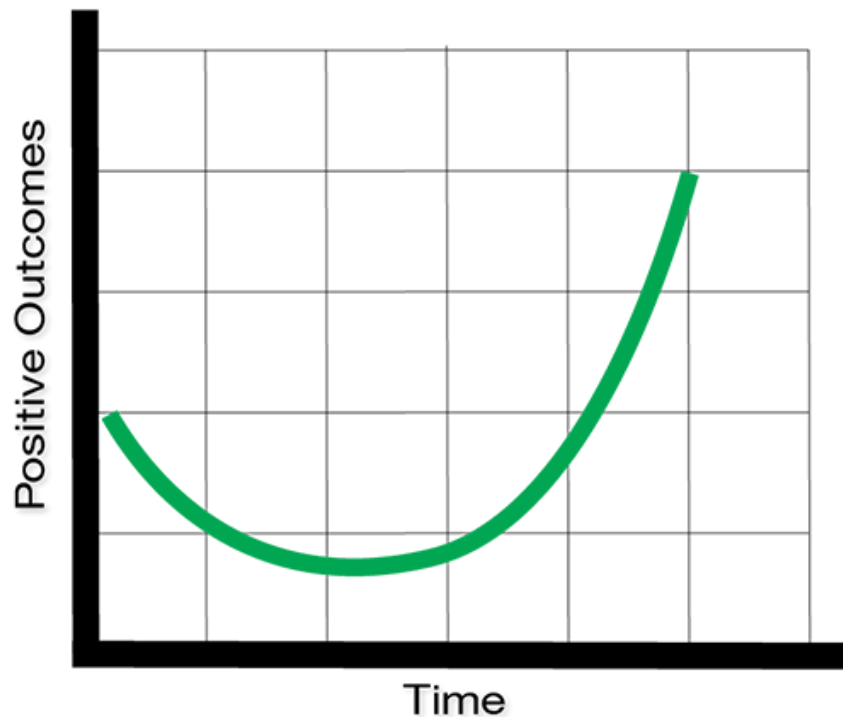

Figure 6.5 The J-Curve of blended teaching[97]

A post on an Evergreen Education Group blog explains it this way,

> *Experienced teachers are comfortable with their current teaching methods. Changing to a new approach is not only going to require substantial effort, but it is also likely to result in an initial reduction in results and satisfaction—that's the initial part of the "J." Only after time, effort, and support does the teacher move through the initial downward part of the curve, and reach the upward portion, which results in improved student outcomes and, often, increased satisfaction among teachers.* [98]

Implementing blended teaching practices for the first time will be challenging. We hope that the resources and strategies in this book will help you along your journey. We are confident that you and your students will be successful if you are thoughtful, intentional, and persistent.

Check your understanding of the concepts in the chapter by taking this chapter quiz. (http://bit.ly/K12-BTQuiz)

Go for the Badge

Go for the Badge! Complete Chapter 6 of the Blended Teaching Roadmap. (http://bit.ly/MyBTRoadMapCh6) (See two examples of a completed Roadmap in Appendix C.)

This content is provided to you freely by EdTech Books.

Access it online or download it at https://edtechbooks.org/k12blended/all_together.

Glossary

3Ms

See Media, Method, and Modality

AAA process

a process for working with data that includes Ask, Analyze, and Act.

activity data

Data that are indirect measures that often help explain student learning patterns such as participation, effort, engagement, and activity levels.

adaptive software programs

this software uses computer algorithms to deliver a customized path through learning activities for students based on their needs and past performance.

assessment validity

An assessment of whether a specific assessment is accurately measuring what it is intended to measure and is appropriate for the students it is given to.

asynchronous

Technology-based interactions that happen at different times (e.g., a discussion that can be completed at the student's own pace). Examples include email, discussion boards, etc.

Blended Learning

the strategic combination of online and in-person learning. A common K-12 definition adds that the blend needs to provide students with some control over time, place, path, and/or pace.

a resource in this book (Appendix C) that is used to help teachers and administrators plan and implement blended teaching.

Bloom's Taxonomy

a hierarchy of assessment that evaluates the level of students' understanding with the lowest level being "remembering," and then progressing upward through "understanding," "applying," "analyzing," and "evaluating," with "creating" being the highest level.

choice board

a graphic organizer, typically in the form of a table or grid, with one activity in each cell. Students choose among the activities to learn a particular concept.

choice boards

graphic organizers, typically in the form of a table or grid, with one activity in each cell. Students choose among the activities to learn a particular concept.

clamshell technique

when students are using laptops and the teacher needs to provide instruction, students close the laptop to a 30-degree angle so their attention is focused on the teacher.

competencies

knowledge and skills needed to master a content or ability.

conferencing

meeting with a student one-on-one, or in small groups, to set goals or discuss progress toward meeting goals.

convergent prompt

discussion prompts meant to build consensus.

course and a half syndrome

online components are simply added to a fully in-person class, students then feel like they must complete a course (the in-person activities) and a half (the online activities).

cross-curricular life skills

a description of skills or abilities that are not content-specific such as creativity, collaboration, critical thinking, and communication.

a tool that helps you visualize student data in real-time; charts are updated instantaneously as new student data is added to the system.

differentiated learning

the act of changing the order of learning activities, or the activities themselves, based on student needs or performance.

digital learning playlist

A learning playlist maintained digitally that typically allows options for personalizing path or pace.

dispositions

the core values, beliefs, and attitudes that influence the way you teach.
- Student Ownership and Agency: allowing students to take on more responsibility for making decisions about the time, place, pace, and/or path of their learning.
- Mastery Learning Orientation: allowing students to move forward based on their mastery of a specific concept, rather than moving from one subject to another according to a timeline.
- Value of Data-Driven Decisions: relying on data to guide instructional decision-making.
- Growth Orientation: having a willingness to try new things and fail because failure is seen as part of the improvement process.
- Emphasis on Life Skills: seeing value in using online technologies to enable the development of cross-curricular life skills like creativity, collaboration, critical thinking, and communication.
- Value of Online Learning: valuing online learning as a core, essential part of the classroom blend due to its various benefits, such as the 7Ps.

divergent prompt

discussion prompts that encourage students to consider different views, or arrive at different conclusions.

dynamic groupings

placing students in groups that can change based on changing student interests or performance.

explainer

a teaching role that focuses on explaining how to solve problems upfront as opposed to intervening when students cannot find a solution.

Facilitator

a teaching role that focuses on leading students to and through learning experiences as opposed to presenting them with learning experiences through presentations and lectures.

the amount of communication cues that are present, e.g., low fidelity is mostly text-based with no communication cues and high fidelity has many communication cues such as tone of voice, facial expressions, and body language.

fixed groupings

placing students in groups that are not meant to change.

flex model

a majority of a students' learning takes place online with in-person support.

flipped classroom

before students come to class, they receive direct instruction via online videos and activities.

formative assessments

typically shorter, frequent, and diagnostic assessments used to see what students still need to learn.

four core competency

he four core competency areas used in this book to organize blended teaching knowledge and skills: (1) Online Integration, (2) Data Practices, (3) Personalizing Instruction, and (4) Online Interaction.

generalist

a teaching role in which teachers are more generally proficient in various topics as opposed to being specialists in one specific content area.

Imagine Learning

an adaptive learning platform that offers online lessons in Literacy, Spanish, and Mathematics.

in-person interactions

face-to-face interactions that take place in the same place and time between a student and a teacher or a student and other students.

individualized learning

a structure of learning that uses mastery data to provide students with learning opportunities tailored to their own individual levels of understanding and/or ability.

a teaching role in which the teacher provides assistance to students at the exact moment that they need help as opposed to explaining everything upfront.

lab or whole-group rotation model

students rotate through stations in the classroom as a whole group, such as having the whole class move from in-person instruction to online learning.

LAW

what students have Learned, how it Applies to the topic or content, and what students are still Wondering about.

learner-content interaction

students engage with learning materials through reading, listening, watching, interacting, creating, and/or reflecting.

learner-instructor interaction

students share what they have learned from their content interactions, demonstrate new knowledge, and receive feedback by communicating with the teacher as an "expert."

learner-learner interaction

students share what they have learned, experienced, or believe by communicating with their peers as other learners.

learning playlist

a group of learning activities ordered in a linear sequence.

lecturer

a teaching role focused on providing students with learning opportunities through presentations and lectures.

mastery gradebooks or trackers

tools that allow you to quickly and easily see how well a student has mastered each SLO.

mastery-based progression

students move forward in the curriculum once they have mastered a concept.

one of the 3Ms with an indirect impact on student learning, used to identify the tools teachers use to provide instruction to their students, such as textbooks, whiteboards, tablets, and laptops.

method

the most important of the 3Ms because it has a direct impact on student learning, used to describe the teaching strategies and pedagogies that teachers use to provide learning opportunities.

modality

one of the 3Ms with an indirect impact on student learning, used to describe the environment in which instruction takes place such as in-person, online, or blended.

netiquette

a set of agreed upon conventions for how to behave in an online space.

online interactions

online learning activities that include learner-learner or learner-instructor communication.

pedagogical

relating to teaching or instruction.

performance data

Data that are direct measures of student learning, such as how students have performed on assessments

personalization

system of mindsets and practices that allows teachers to increase a student's chance of engaging with learning materials, mastering learning materials, and applying learning materials to the real world based upon the student's own interests, wants, and goals. This system has an emphasis on customization (tailoring/customizing the learning experience to the individual student's needs and interests) and student control (giving students some element of control over their learning goals, time, place, pace, and path).

PIC

a framework for evaluating students' use of technology.
- Passive (P): Technology is presented to students in a one-size-fits all approach that is meant for student consumption with no requirement for response.
- Interactive (I): Technology is responsive to student performance and behavior.
- Creative (C): Students use technology to produce original materials.

used to determine the students' relationship to technology (passive, interactive, or creative) and whether their use of technology replaces, amplifies, or transforms traditional activities and classroom practices.

printed growth chart

a hard-copy of a chart showing a student's growth in a particular class or concept; unlike the data dashboard, this chart is not updated instantaneously.

question banks

groups of questions used in formative and/or summative assessments that allow for random questions to be selected for each attempt or assessment.

RAT

a framework for evaluating the relationship between online or technology-based and traditional offline activities as well as classroom environments:

- Replaces an activity (R): technology is used to make an activity more efficient or accessible, but the activity itself does not change in any meaningful way.
- Amplifies an activity (A): technology allows the teacher or students to do the same activity with some improvements that would be difficult or impossible without technology, such as receiving immediate feedback.
- Transforms an activity (T): technology is used to reimagine the learning activity and to do something completely different that would be difficult or impossible without technology, such as communicating with people outside of the classroom.

- Replaces the classroom (R): technology allows a class meeting to take place online without having to come to the same location, such as the brick and mortar school.
- Amplifies the classroom (A): technology provides more class time for activities that the teacher wouldn't normally have time for, such as doing a lab, mock debate, or writer's workshop.
- Transforms the classroom (T): technology has become the primary method for delivering instruction, resulting in a great change of roles for teachers.

remediation

when a student falls below an established "near mastery" threshold and requires more extensive coaching in a concept.

screen-time/face-time technique

when it is more important to see students' screens than their faces, have the students turn their backs to the teacher, but when it is time for face-to-face instruction, have the students turn around to face the teacher.

seat time

the amount of time a student has spent in the classroom.

the extent to which students are able to project their own personalities, interests, beliefs, and culture in an online space.

specialist

a teaching role in which teachers focus on one specific content area or set of skills as opposed to being able to move between more general content areas or skills.

stakeholders

the various parties and people concerned with student success: students, parents, other teachers, administrators, the community, etc.

station rotation

the act of having students rotate on a schedule or at the teacher's discretion from one station to the next to complete various learning activities (see Station Rotation Model).

station rotation model

stations set up in the classroom so that students can rotate on a schedule or at the teacher's discretion to complete various learning activities.

student information systems (SIS)

management information system for education establishments to manage student data.

student learning outcome (SLO)

measurable and verifiable knowledge, skills, abilities, and/or attitudes that students should obtain by the end of a unit, program, or project. These generally make up larger standards or general instructional objectives.

summative assessments

usually given at the end of a unit, course, or school year and may be created by someone other than the teacher.

synchronous

activities that happen in real-time with a low lag time.

teacher-centered learning activities

technology focused on making it easier for teachers to lecture.

teachers using technology to support their current practices.

The Four C's

important 21st century skills including Communication, Collaboration, Critical Thinking, Creativity.

The Seven P's

possible benefits from quality blended teaching including: Participation, Pacing, Personalization, Place, Personal Interaction, Preparation, Practice with Feedback.

THINK system

a system that can help make online communication expectations explicit: Is it true? Is it helpful? Is it inspiring? Is it necessary? Is it kind?

time-based progression

students in a class move forward in the curriculum based on a timeline, allowing student performance on a concept to vary.

Appendices

Appendix A: Chapter Resources
Appendix B: Chapter Notes & Sources
Appendix C: Blended Teaching Roadmap
Blended Teaching Readiness Survey Resources

Appendix A: Chapter Resources

Chapter 1

ID	Title	Bit Link
Video 1.1	Media, Method, Modality	http://bit.ly/btb-v010
Video 1.2	Blending vs. Tech Integration	http://bit.ly/btb-v092
Video 1.3	High Quality Blending	http://bit.ly/btb-v020
Video 1.4	The 6 Ps of Blended Teaching	http://bit.ly/btb-v005
Web 1.1	Blended Learning Models	http://bit.ly/btb-v032
Video 1.5	Shifting Teaching Roles	http://bit.ly/btb-v035

Chapter 2

ID	Title	Bit Link
Video 2.1	Is This the Latest Technology?	http://bit.ly/btb-v136
Web 2.1	Blended Teaching Models	http://bit.ly/btb-v149
Video 2.2	The Flipped Classroom	http://bit.ly/btb-v187
Video 2.3	Elementary Station Rotation	http://bit.ly/btb-v185
Video 2.4	Secondary Station Rotation	http://bit.ly/btb-v151
Video 2.5	Whole Group Rotation	http://bit.ly/btb-v194

Video 2.6	Flex Model	http://bit.ly/btb-v129
Video 2.7	Using Technology Effectively	http://bit.ly/btb-v127
Video 2.8	Too Much Technology?	http://bit.ly/btb-v158
Video 2.9	PICRAT	http://bit.ly/btb-v123
Video 2.10	Systems and Procedures for Blended Learning Part 1	http://bit.ly/btb-v113
Video 2.11	Systems and Procedures for Blended Learning Part 2	http://bit.ly/btb-v130
Video 2.12	Station Rotation Organization	http://bit.ly/btb-v173
Video 2.13	Station Rotation Transition Signals	http://bit.ly/btb-v111
Video 2.14	Using the Launch Approach	http://bit.ly/btb-v170

Chapter 3

ID	Title	Bit Link
Video 3.1	Building Student Skills through Mastery-Based Curriculum	http://bit.ly/btb-v208
Video 3.2	Examples of Mastery-based Learning - Elementary	http://bit.ly/btb-v224
Video 3.3	Examples of Mastery-based Learning – Secondary	http://bit.ly/btb-v274
Video 3.4	Helping Students Understand Data and Set Goals	http://bit.ly/btb-v275
Video 3.5	Conferencing & Goal Setting	http://bit.ly/btb-v203
Video 3.6	Customized Credit Maps	http://bit.ly/btb-v223
Video 3.7	Using Data Trackers	http://bit.ly/btb-v250

Video 3.8	Multiple Levels of Student Support	http://bit.ly/btb-v381
Video 3.9	Learner Pathways	http://bit.ly/btb-v258
Video 3.10	Peer Tutoring	http://bit.ly/btb-v364
Video 3.11	Flexible Groupings	http://bit.ly/btb-v302
Video 3.12	Daily Group Decisions	http://bit.ly/btb-v312

Chapter 4

ID	Title	Bit Link
Video 4.1	Basic Personalization Practices	http://bit.ly/btb-v356
Web 4.1	Personalization or Differentiation or Individualization?	http://bit.ly/btb-v378
Web 4.2	See it in Action #1 - Full Blended Teaching Case	http://bit.ly/btb-3sia1
Video 4.2	See it in Action #1 – TIME	http://bit.ly/btb-v258
Video 4.3	See it in Action #1 – GOAL/PATH	http://bit.ly/btb-v320
Video 4.4	See it in Action #1 – PATH	http://bit.ly/btb-v440
Video 4.5	See it in Action #1 – PLACE/PATH	http://bit.ly/btb-v496
Web 4.3	See it in Action #2 - Full Blended Teaching Case	http://bit.ly/btb-3sia2
Video 4.6	See it in Action #2 – PATH	http://bit.ly/btb-v421
Video 4.7	See it in Action #2 – PACE	http://bit.ly/btb-v483
Video 4.8	See it in Action #2 – PATH/PLACE	http://bit.ly/btb-v403
Video 4.9	See it in Action #2 – PATH	http://bit.ly/btb-v486

Web 4.4	See it in Action #3 - Full Blended Teaching Case	http://bit.ly/btb-3sia3
Video 4.10	See it in Action #3 – GOALS	http://bit.ly/btb-v389
Video 4.11	See it in Action #3 – PATH	http://bit.ly/btb-v388
Video 4.12	See it in Action #3 – PLACE	http://bit.ly/btb-v416
Web 4.5	See it in Action #4 - Full Blended Teaching Case	http://bit.ly/btb-3sia4
Video 4.13	See it in Action #4 – GOALS/PATH/PACE	http://bit.ly/btb-v491
Video 4.14	See it in Action #4 – PATH/PACE	http://bit.ly/btb-v417
Web 4.6	See it in Action #4 – GOALS	http://bit.ly/btb-v318
Web 4.7	Getting started with Google Forms	http://bit.ly/btb-v341
Web 4.8	Learner Profile Tools	https://bit.ly/btb-v394
Web 4.9	Vermont Department of Education Learner Profile - Template	http://bit.ly/btb-v307
Web 4.10	Vermont Department of Education Learner Profile – Example	http://bit.ly/btb-v315
Web 4.11	Charlotte-Mecklenburg Schools Learner Profile	http://bit.ly/btb-v324
Web 4.12	LEAP Learning Framework – Student Led Strategies	http://bit.ly/btb-v390
Web 4.13	LEAP Learning Framework – Student Demonstrated Strategies	http://bit.ly/btb-v362
Web 4.14	Goal Setting/Tracking - 1	http://bit.ly/btb-v363
Web 4.15	Goal Setting/Tracking - 2	http://bit.ly/btb-v346
Video 4.16	Using Playlists	http://bit.ly/btb-v388

Video 4.17	Adaptive Software for Teaching Math	http://bit.ly/btb-v368
Video 4.18	Increasing Autonomy in Group Choices	http://bit.ly/btb-v338

Chapter 5

ID	Title	Bit Link
Video 5.1	Dimensions of Interaction	http://bit.ly/btb-v452
Video 5.2	Discussion Platforms for Young Students	http://bit.ly/btb-v411
Video 5.3	Mystery Skype	http://bit.ly/btb-v438
Video 5.4	Voicethread	http://bit.ly/btb-v415
Web 5.1	Facilitating Engaging & Effective Online Discussions	http://bit.ly/btb-v471
Web 5.2	Feedback - 1	http://bit.ly/btb-v442
Web 5.3	Feedback - 2	http://bit.ly/btb-v472
Web 5.4	Incorporating Online Discussions in the Classroom	http://bit.ly/btb-v461
Video 5.5	Discussion Prompts and Questions	http://bit.ly/btb-v455
Video 5.6	Discussion Prompts and Questions	http://bit.ly/btb-v445
Web 5.5	Strategies to Facilitate Online Discussions	http://bit.ly/btb-v441
Video 5.7	Effective Feedback?	http://bit.ly/btb-v493
Video 5.8	Using Blended Feedback – A Teacher Example	http://bit.ly/btb-v495
Web 5.6	Helping Students (and yourself) React to Feedback	http://bit.ly/btb-v453

ID	Title	Bit Link
Video 6.1	5 Ways to Use Powtoon in the Classroom	http://bit.ly/btb-v534
Video 6.2	Screencast Lecture Example	http://bit.ly/btb-v588
Video 6.3	Edited Video Example	http://bit.ly/btb-v512
Web 6.1	Alignment Table	http://bit.ly/btb-v521

Appendix B: Chapter Notes & Sources

Preface

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Chapter 1

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4. [Section 1.1, Figure 1.2] "K-12 Blended Teaching Models" obtained from *K-12 Blended Teaching Readiness: Phase 1 Instrument Development* located at https://edtechbooks.org/-VaQ

1. [Chapter 2] Winkler, I., Chartoff, R. (Producers), & Avidsen, J. G. (Director). (1976). *Rocky* [Motion Picture]. United Artists.

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8. [Section 3.2.1, Figure 3.7] Imagine Learning (https://www.imaginelearning.com/) is an adaptive learning software that focuses on language/literacy, Spanish, and Math.
9. [Section 3.2.1, Figure 3.8] "Mastery Gradebook Comparison" remix of various mastery gradebook screenshots
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    b. Canvas found at https://edtechbooks.org/-ZTX
    c. PowerSchool found at https://edtechbooks.org/-Wkr
10. [Section 3.2.1] The software MasteryConnect (https://www.masteryconnect.com/), Canvas LMS (https://www.canvaslms.com), and PowerSchool SIS (https://www.powerschool.com/) provide mastery gradebooks that use streetlight color coding schemes. Google Sheets (https://edtechbooks.org/-goR) can be conditionally formatted so that a cell automatically change color based on the value. This tutorial page shows how to create conditional formatting in Google Sheets: https://goo.gl/z6xdLA
11. [Section 3.2.1, Figure 3.9a] "Example of Data Dashboard from ImagineLearning" remix of a student data dashboard from ImagineLearning found at https://edtechbooks.org/-AXH
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2. [Section 4.1.3] Greene, P. (July 16, 2018). The seven requirements to launch a personalized learning program. Obtained from https://edtechbooks.org/-AXa

3. [Section 4.1.3] Gross, B., Tuchman, S., & Patrick, S. (2018). *A National Landscape Scan of Personalized Learning in K-12 Education in the United States.* iNACOL, Vienna, Virginia. Obtained from: https://edtechbooks.org/-KoH

4. [Section 4.1.3] The Buck Institute for Education provides rich resources that can help you to plan and facilitate project based learning: http://www.bie.org/

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2. [Section 5.1] Moore, M. G. (1989). Editorial: Three types of interaction. *The American Journal of Distance Education*, *3*(2), 1–6.
3. [Section 5.1, Figure 5.2] "Three Types of Interaction" created by Jered Borup is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License
4. [Section 5.2.1] Additional information regarding Safari Live, including scheduling information and previous safari videos can be found here: https://wildearth.tv/schools/
5. [Section 5.2.1] Image of Safari taken and provided by Katie Talbot
6. [Section 5.2.1] Additional Mystery Skype resources can be found at https://edtechbooks.org/-mnh
7. [Section 5.2.1] VoiceThread has curated the following library of example lesson plans and VoiceThreads: https://edtechbooks.org/-uw
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10. [Section 5.3.1] Brunsell, E. & Alderton, E. (March 2, 2012). Blended learning: Adding asynchronous discussions to your F2F classroom. *Edutopia*. Obtained from https://edtechbooks.org/-HRp
11. [Section 5.3.1] Davis, B. G. (2009). *Tools for teaching*. San Francisco, CA: Jossey-Bass.
12. [Section 5.3.1] There are lots of great resources that align question stems to Bloom's Taxonomy. One of our favorites is an image created by Enokson that is the Creative Commons CC BY-NC-ND 2.0. You can access the image on flickr: https://edtechbooks.org/-LxA
13. [Section 5.3.2] North, S. (May 3, 2017). Using "roles" in your online discussions. Blog post published in the University of Colorado Denver's Online Blog for Faculty. Obtained from https://edtechbooks.org/-qVc
14. [Section 5.4] Hattie, J. (2009). Visible learning: A synthesis of over 800 meta-analyses relating to achievement. Routledge, New York.
15. [Section 5.4] Eraut, M. (2006). Feedback. *Learning in Health and Social Care*, *5*, 111–118. https://edtechbooks.org/-HUaC
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16. [Section 5.4.2, Figure 5.5] "Feedback Burger" created by the George Mason University's College of Education and Human Development Online Teaching Initiative is licensed under CC BY SA
17. [Section 5.4.3] Providing video feedback can be somewhat challenging initially. We recommend reading the following article for some practical guidelines that will make creating video feedback comments more effective and efficient: http://rdcu.be/tRrA
18. [Section 5.4.3] Hattie, J. (2009). Visible learning: A synthesis of over 800 meta-analyses relating to achievement. Routledge, New York.
19. [Section 5.4.3] Hattie, J. (2009). Visible learning: A synthesis of over 800 meta-analyses relating to achievement. Routledge, New York.

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3. [Section 6.1.1] VirtualChemLab: http://chemlab.byu.edu/
4. [Section 6.1.1, Figure 6.2] "Richness and Responsiveness" created by the George Mason University's College of Education and Human Development Online Teaching Initiative licensed under CC BY SA
5. [Section 6.1.1] See https://stellarium.org/ This software is free and open source. Students can zoom in to explore the planets and stars within the universe. It also allows students to modify time to see events take place that would take much too long to view in the natural sky.
6. [Section 6.1.1] See https://www.google.com/earth/ This software is free and allows users to explore anywhere in the world.
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15. [Section 6.2.4] See https://youtu.be/7MuDgfX9C2w for an example of how well the YouTube captioning did with a Taylor Swift song.
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Appendix C: Blended Teaching Roadmap

To access the Roadmap, follow the links to the Google Doc below or at the end of each chapter, and then click File > Make a copy. This will allow you to edit your own digital copy of the Roadmap.

Blended Teaching Roadmap Templates

- **http://bit.ly/BTRoadmap**
- **http://bit.ly/MyBTRoadMap-Ch1**
- **http://bit.ly/MyBTRoadMap-Ch2**
- **http://bit.ly/MyBTRoadMap-Ch3**
- **http://bit.ly/MyBTRoadMap-Ch4**
- **http://bit.ly/MyBTRoadMap-Ch5**
- **http://bit.ly/MyBTRoadMap-Ch6**

Elementary Education Roadmap Example

- **http://bit.ly/BTRoadmap-ElEd-Example**

Secondary Education Roadmap Example

- **http://bit.ly/BTRoadmap-ScEd-Example**

Blended Teaching Readiness Survey Resources

Blended Teaching Readiness Survey - http://bit.ly/K12-BTR

This is a quicklist of resources related to each of the blended teaching competencies.

Chapter 1 - Foundations

Blended Teaching Dispositions focus on the teacher's beliefs and attitudes about blended teaching and learning.

Basic Technolgy Skills focus on important technology skills for successful blended teaching.

Chapter 2 - Online Integration

Online Integration focuses on the teacher's ability to make and implement decisions related to selecting when and how to effectively combine online and in-person learning as part of core instruction.

Below are a few video resources from the chapter.

Integrating Online and In-person Teaching

- Blending Holistically - http://bit.ly/btb-v133

Blended Models

- Elementary Station Rotation - http://bit.ly/btb-v185
- Secondary Station Rotation - http://bit.ly/btb-v151
- Lab Rotation - http://bit.ly/btb-v194
- Flipped - http://bit.ly/btb-v187
- Flex - http://bit.ly/btb-v129

Management Systems and Procedures

- Part 1 - http://bit.ly/btb-v113
- Part 2 - http://bit.ly/btb-v130

Chapter 3 - Data Practices

Data Practices focus on the teacher's ability to use digital tools to monitor student activity and performance in order to make informed choices about interventions to help all students progress.

Below are a few video resources from the chapter.

Mastery-based Teaching Examples

- Mastery-based Curriculum - http://bit.ly/btb-v208
- Elementary - http://bit.ly/btb-v224
- Secondary - http://bit.ly/btb-v274

Data Trackers

- Using Data Trackers - http://bit.ly/btb-v250

Goal Setting

- Data informs goals - http://bit.ly/btb-v275
- Conferencing with students - http://bit.ly/btb-v203

Data Informs Learning Activities

- Learner Pathways - http://bit.ly/btb-v258
- Peer Tutoring - http://bit.ly/btb-v364
- Flexible Grouping - http://bit.ly/btb-v302
- Small Group Instruction - http://bit.ly/btb-v312
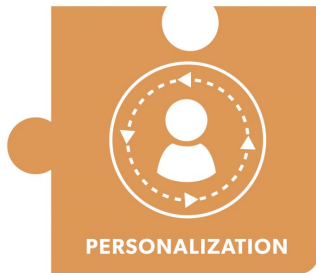
Chapter 4 - Personalization

Personalization focuses on the teacher's ability to implement a learning environment that allows for individualized curriculum, pacing, and/or instructional methods and support.

Below are a few video resources from the chapter.

Personalized Learning

- Basic Practices - http://bit.ly/btb-v356
- Student Perspectives - http://bit.ly/btb-v354

Examples

- See 13 "in action" video examples of personalization from 4 schools in the chapter.
- Playlists - http://bit.ly/btb-v388
- Adaptive Software - http://bit.ly/btb-v368

Chapter 5 - Online Interaction

Online Interaction focuses on the teacher's ability to facilitate online interactions with and between students.

Below are a few video resources from the chapter.

Dimensions of Interaction

- http://bit.ly/btb-v452

- FlipGrid - http://bit.ly/btb-v411
- VoiceThread - http://bit.ly/btb-v415
- Video Feedback - http://bit.ly/btb-v495

Creating Effective Discussion Prompts

- Effective Discussion Prompts - http://bit.ly/btb-v455
- Asking Good Questions - http://bit.ly/btb-v445