

Thriving Online: A Guide for Busy Educators

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A GUIDE FOR BUSY EDUCATORS

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- 30.** What's Next?
William J. Hunter and Robin H. Kay

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Accessibility Statement

Dr. Kay and Dr. Hunter, supported by eCampus Ontario and Ontario Tech University (UOIT), believe that education should be readily available to everyone, which means supporting the creation of accessible, open, and free educational resources. Wherever possible, the *Thriving Online* open textbook adheres to levels A and AA of the Web Content Accessibility Guidelines (WCAG 2.0, 2.1) of perceivable, operable, understandable, robust, and conformance (<https://www.w3.org/TR/WCAG21/>). Pressbooks was chosen for its commitment to built-in accessibility, outlined at <https://pressbooks.org/accessibility/>. Further, we completed Coolidge et al.'s (2018) Checklist for accessibility during the final editing phase of book construction (available upon request).

PART I

OVERVIEW

This section consists of two chapters. The first chapter, *Introduction to Thriving Online*, provides the three main pillars that guide and supports teaching and learning practices in the book: Garrison's (2011) Community of Inquiry (CoI) Model, Fullan's (2013) Deep Learning (DL) approach, and Collaborative Learning. The second chapter, *Instructor's Guide for Online Learning*, offers a general set of guidelines for online instructors grounded in many years of practice and research. If you have limited time, this is a good starting point.

Introduction to Thriving Online

WILLIAM J. HUNTER AND ROBIN H. KAY

INTRODUCTION

OVERVIEW

The Faculty of Education at Ontario Tech University has been offering fully-online synchronous programs since 2009. Over the years, we have learned quite a bit about successful and unsuccessful online learning experiences. While we are still learning, we are excited to share our guidelines, strategies, insights, activities, and wisdom in *Thriving Online – A Guide for Busy Educators*.

There are many good books on Online Teaching and Learning (refer to the end of this chapter for an annotated list). Many focus predominantly on asynchronous learning (Bonk & Zhang, 2008; Conrad & Donaldson, 2004; Lehman & Conceição, 2014; Means et al., 2014; Pallot & Pratt, 2009; Stein & Graham, 2014). Others concentrate on practical suggestions and strategies (Boetrxher & Conrad, 2021; Fisher et al., 2020; Nilson & Goodson, 2018; Schank, 2001). A few online learning books target more specific topics, such as problem-based learning (Savin-Badin, 2007; Savin-Baden & Wilkie, 2006), small group instruction (Darby & Lang, 2019) and student perceptions of the online learning experience (Veletsianos, 2020). Some books target research and the science of online learning (Dabbagh et al., 2018; Kosslyn, 2020; Rudestamd et al., 2021; Tokuhama-Espinosa, 2021). Finally, several books combine extensive research on online learning with concrete suggestions for success (Boetrxher & Conrad, 2021; Hockenbary, 2021; Lemov, 2021; Nilson & Goodson, 2018).

Our book is different. While founded on evidence-based practice and solid theory, we have deliberately written and designed each chapter for the busy educator. Chapters are concise, typically eight to ten pages, so that they can be used and digested in a relatively short time. Each chapter consists of a brief introduction, general guidelines, online activities, and general resources. Suggested activities are not theoretical – they have been tested and revised over many years. Finally, we have also relied on the real-world experience of over 25 professionals who have taught and experienced numerous synchronous online courses for thousands of students for over a decade. We are grateful that eCampus Ontario provided us with this extraordinary opportunity to develop this comprehensive guide for secondary school and higher education instructors.

COVID OUTBREAK AND A PARADIGM SHIFT IN TEACHING AND LEARNING

For many teachers and professors who suddenly found themselves required to teach online due to COVID-driven school, college and university closures, it indeed seemed as if their professional world had changed overnight. Skills developed in university and honed through years of classroom experience were challenging to transfer to environments that separated learners and teachers and relied on a different set of technical and interpersonal skills. In reality, though, those technologies and skills emerged over several decades as some instructors moved to online work voluntarily.

The development of technologies to support computer-to-computer and networked communication over the last 60 years (e.g., Leiner et al., 1997) led to those technologies being used by some educators for the delivery of courses in the 1980s and expanding to others with the emergence of the World Wide Web in the early 1990s. At the beginning of the new millennium, Harasim (2000) described the nascent shift to online educational delivery and identified three *modes* of delivery: the adjunct mode (in which networks were used to enhance face-to-face or distant education, a mixed-mode (in which networking constitutes a *significant portion* of learning) and the totally online mode. Today, the first two modes have combined, and we talk about *blended* and *fully online learning*. Before COVID, there was steady growth in online technologies to support teaching and learning until recently.

Exact figures on participation in online courses vary by jurisdiction, level of schooling, and various demographic characteristics (e.g., Reimers et al., 2020). In that report, Reimers et al. (2020) focus on adult training, but its recommendations are telling:

- develop basic digital skills to support lower-skilled adults in accessing online learning;
- motivate online learners to improve retention and completion rates;
- develop effective testing methods and certificates to ensure that online learning is valuable in the labour market;
- broaden the range of online courses to include more blue-collar occupations;
- train online teachers to raise the quality of online courses;
- establish quality assurance mechanisms for online learning to ensure that online courses provide participants value for money/time; and
- strengthen the digital infrastructure and use teaching methods that minimize infrastructure needs.

However, it is useful to note that Statistics Canada (2022) reported that between 2018 and 2020, the percentage of people 15 plus years who engaged in some formal online rose from 15 to 25. The informal online educational experience percentage declined slightly from 26% to 24% for the same time.

In early 2021, the COVID pandemic thrust thousands of high school teachers and post-secondary instructors worldwide into an unanticipated immersion in online teaching methods and practices for which most were either unprepared or ill-prepared (Trust et al., 2020). The term *Remote Emergency Teaching* (Hodges et al., 2020) was coined to capture the difference between this teaching environment and the more considered practices of faculty who had experience with online teaching before the pandemic. For many teachers and students, the transition was challenging. Indeed, the adaptation consisted primarily of posting readings online and preparing video lectures that students could view in a browser or a learning management system (LMS). The scope and nature of these early changes to education were extensive (Li & Lelani, 2020). Some of the biggest challenges in this sudden and unanticipated transition have been:

- inadequate network connections—especially true in developing nations but also an issue in parts of

Canada (VanNuland et al., 2020);

- insufficient home conditions (e.g., only one device for family and that device needed by parents working from home); and
- lack of experience or training in the use of technology.

For a fuller perspective, Gallagher-McKay et al. (2021) have reported on a wide range of COVID effects in the context of Ontario K-12 schools. Some examples are long and short-term school closures, imposed virtual learning, spacing and capacity limits.

Teacher educators and faculty development specialists quickly responded to the need for support and advice. For example:

- Learn at Home [Doc.] — resources prepared by Dr. Diana Petrarca and Ontario Tech B.Ed. students in early April of 2020;
- Global Partnership for Education — practical advice for teachers in trying circumstances internationally; and
- International Baccalaureate [PDF] — advice for system adaptation and teaching support.
- Organization for Economic Cooperation and Development [PDF] — annotated resources for online teaching.

However, after two years of experience with COVID, it seems to us that it is crucial to recognize that online teaching skills are likely to remain an essential part of the teachers' toolkit, at least for secondary and post-secondary teachers. The next big challenge may or may not be a disease, but the teaching workforce should be prepared to move online when circumstances demand it. We need to replace *remote emergency teaching* with something like *skilled alternative teaching*. And if the next crisis turns out to be many years in the future, we hope to show that online methods have significant value even when schools are fully open for in-classroom teaching.

READING GUIDELINES

The chapters in this work provide practical guidance that will assist classroom teachers, and post-secondary instructors develop the online skills that will enable them to conduct truly engaging online activities. Each chapter will provide a general introduction to the issues it will deal with and provide concrete examples of activities that illustrate how to approach online teaching for the purposes and the content dealt with in the chapter.

This chapter will present a brief overview of the research and theory that have guided our work overall. Specifically, we will address:

- The Community of Inquiry (CoI) model developed by Randy Garrison and his colleagues (Garrison, 2011)
- Michael Fullan's Deep Learning (DL) approach to more engaged learning (Fullan, 2013).
- Collaborative Learning (CL)

COMMUNITY OF INQUIRY

The Col was defined and developed based on the idea of Communities of Practice (Wenger, 1999)–working groups in which learning was a fundamental purpose and function. The Community of Inquiry model extended the Communities of Practice model by focusing on groups in which teaching and learning were the primary functions and objectives of the group. The critical components of the Col are:

- **Social Presence (SP)** consists of communications that convey the participant’s personhood (e.g., humour, courteous) and which contribute to the social development of the group by stressing affective concerns.
- **Cognitive Presence (CP)** is characterized by critical inquiry and reflection of the type associated with academic thinking or writing. Some examples are questions regarding data analysis, research methods, questions of logic, and the nature of evidence (e.g., Garrison et al. (, 2001). They regarded CP as a key to learning in the Col, and it has since been the focus of extensive research on what exactly CP is, how it is promoted in online learning, and how it is assessed.
- **Teaching Presence (TP)** pertains to the instructional component of online learning. Garrison et al. defined three elements of TP: instructional management, building understanding, and direct instruction. Instructional leadership includes matters like “setting curriculum, designing methods and assessment, establishing time parameters, and utilizing the medium” (Garrison et al., 2000, p. 1010). Simply put, it is what the instructor does to build the learning environment. Building understanding “is concerned with productive and valid knowledge acquisition” (p. 101) and includes contributions by both instructors and learners that are designed to support collaborative meaning construction. Direct instruction is concerned with feedback that critically assesses learner contributions and promotes elaboration and dialogue.

It is essential to note the technological limitations when the Col was developed. Although video conferencing technologies existed, they were expensive, hardware-intensive, and cumbersome to use. Consequently, the kind of classroom interactions that the Col described and analyzed (and the model’s dimensions) was shaped by the available technologies. The focus was mainly on asynchronous text-based discussion forums of the type frequently found in learning management systems like Blackboard, Canvas, Moodle, and Desire2Learn. Such systems are still widely used, and the lessons learned from the Col model are still of great value, but we hope to move beyond that in at least some of what this book presents. Valverde-Berrocoso et al.’s (2020) recent systematic review of literature on online learning concluded that the “Community of Inquiry (Col) emerges as the most relevant theoretical framework...” (p.6) in the studies they examined.

One particular example of moving beyond Col is the Fully Online Learning Community (FOLC) model, developed by Roland van Oostveen and colleagues at Ontario Tech University (e.g., van Oostveen et al., 2016). As the name implies, FOLC focuses on fully online (as opposed to blended) learning communities. Still, it is also noteworthy that it includes a strong emphasis on problem-based collaborative learning and the use of video. One consequence of these foci is that FOLC does not have a teaching presence component since the method stresses a more egalitarian approach in which all participants are both teachers and learners.

DEEP LEARNING

The concept of deep learning has its origins in artificial intelligence and neural network research on pattern recognition in things like speech recognition and handwriting recognition. That is, deep learning is an element of some machine learning algorithms. It seeks to improve the performance of algorithms by using data from

the algorithm's performance to make adjustments to variables in the algorithms. Hence, it is like feedback for performance improvement in human learning terms. The idea emerged from work on *gradient-based learning*, as illustrated in an article by some deep learning pioneers (LeCun et al., 1998).

At roughly the same time, the concept of Deep Learning was also emerging in the education literature. Warburton (2003) provided a good overview of the idea and traced it back to Entwistle et al. (1981). In Warburton's model, the critical elements in learning are *motivation to understand* and *engagement with the topic*, shaped by the learning environment, the course content, and individual factors like prior knowledge and metacognitive abilities. High levels of motivation and engagement accompanied by instructional focuses on either *holistic* comprehension or *serialist* methodical learning (see Pask, 1976) defined the conditions in which deep learning could occur.

Warburton (2003) discussed deep learning in the context of sustainability and environmental education. Yet, the work is a rich source of practical advice on promoting interest and engagement, two vital elements of deep learning as Warburton saw it.

As described in Warburton (2003), deep learning involves a complex and nuanced combination of learning principles; for example, he advocated a blending of mastery learning and discovery learning (often thought to be opposing concepts):

Discovery learning emphasizes self-directed learning by students, with the teacher as a facilitator (Bruner, 1960; Rogers, 1969). The curriculum should facilitate mastery learning (through considerations of planned sequence, essential content, learning materials and format) while providing opportunities to benefit from discovery learning through curiosity, independence and enhanced personal meaning. (p. 48)

In addition, he recognized the value of advance organizers as a way of getting learners to connect prior learning to new lessons:

Since knowledge and understanding are both essential for educational progress, the curriculum should be based on firmly established anchoring ideas that relate to personal experience as far as possible— advance organizers (Ausubel et al., 1978). It is essential to provide a clear structure, logical progression, and unifying themes and indicate these at the outset. However, surprises, problems, and variety should also be built in to appeal to intuitive holistic and serialists (Entwistle, 1981). (p. 48)

Other principles in Warburton's (2003) description of deep learning included focusing on principles and conceptual analysis in the learning process. The Warburton paper concluded:

Deep learning strategies cannot be externally imposed and must be interest-led. Interest can be stimulated by placing less emphasis on curriculum content and more on contextual interpretation... students must be allowed adequate time. The challenge for educational institutions is not simply to teach concrete facts... but to create an active, transformative process of learning... These activities are not well served by packed timetables or large class sizes. They are enhanced through small group discussions, with tutors or lecturers providing guidance and encouragement as needed. (p. 54. Ellipses used to remove text specifically targeting sustainability education)

More recently, Fullan et al. (2013) depicted the current state of education as a *crisis* and extended the deep learning concept to provide a kind of road map for re-envisioning education in the light of the demands of the 21st century. In particular, Fullan and his colleagues have focused on connectivity and the importance of engagement (Fullan et al., 2017), concepts that are also critical in what we mean by *thriving online*. This view of DL seeks to improve education through a focus on six global competencies (Fullan et al., 2019, p. 17):

- **Character education**
 - Learning to learn.
 - Grit, tenacity, perseverance and resilience.
 - Self-regulation, responsibility, and integrity.
- **Citizenship**
 - Thinking like global citizens.
 - Considering global issues based on a deep understanding of diverse values and worldviews.
 - Genuine interest and ability to solve ambiguous and complex real-world problems that impact human and environmental sustainability.
- **Collaboration**
 - Working interdependently and synergistically in teams.
 - Interpersonal and team-related skills.
 - Social, emotional, and intercultural skills.
 - Managing team dynamics and challenges.
 - Learning from and contributing to the learning of others.
- **Communication**
 - Communicating effectively with various styles, modes, and tools, including digital.
 - Communication is designed for different audiences.
 - Reflection on and use of the process of learning to improve communication.
- **Creativity**
 - Having an *entrepreneurial eye* for economic and social opportunities.
 - Asking the right inquiry questions.
 - Considering and pursuing novel ideas and solutions.
 - Leadership to turn ideas into action.
- **Critical thinking**
 - Evaluating information and arguments.
 - Making connections and identifying patterns.
 - Problem-solving.
 - Constructing meaningful knowledge.
 - Experimenting, reflecting, and taking action on ideas in the real world.

In this view of deep learning, the task is to build a system that enables learners to acquire and act on these six competencies (referred to in the model as *the 6 Cs*). This view is a big *ask* of global educational systems, but it is worth noting that the deep learning literature that has emerged over the last decade has even more demanding expectations regarding the nature of the changes needed in education. Given these demands, it is also important to stress that the subtitle of the Fullan et al. (2017) book is: *Engage the World Change the*

World. The work is filled with anecdotes about schools from seven countries with ongoing deep learning projects. The New Pedagogies for Deep Learning (NDPL) website indicates seven more countries with ongoing projects.

COLLABORATIVE LEARNING

Educators could be forgiven for confusing the ideas of cooperative learning and collaborative learning. Loes et al. (2017) indicate that:

Although these phrases are often used synonymously in the teaching and learning literature, many scholars studying these techniques have suggested that cooperative learning and collaborative learning are indeed distinct instructional approaches. Specifically, it has been argued that cooperative learning is a more structured instructional approach that requires a greater level of facilitation by the instructor than collaborative learning. (p. 3)

This observation helps to explain why *cooperative learning* tends to be used more often in K-12 settings, and *collaborative learning* tends to be used in post-secondary contexts (Loes et al., 2017). That difference might also have to do with the earlier focus on these methods based on a landmark meta-analysis (Johnson & Johnson, 1989) which found that instruction involving cooperative or collaborative methods resulted in significantly better student achievement than instruction focused on individual performance and competition. While that work is often cited as a starting point for collaborative and cooperative learning, the studies included in the meta-analysis went back about a century and earlier work from Johnson et al. (2017). They began by pointing to historical precedents from early Christianity, Roman philosophy, and the Talmud and tracing allusions through the Renaissance to the modern age. That work also contains this concise statement of the value of cooperative methods:

Cooperation is working together to accomplish shared goals. Individuals seek beneficial outcomes for themselves and all other group members within cooperative activities. Cooperative learning is the instructional use of small groups so that students work together to maximize their own and each other's learning. In cooperative learning situations, there is a positive interdependence among students' goal attainments; students perceive that they can reach their learning goals if and only if the other students in the learning group also reach their goals. (p. 3)

ACTIVITY 1: A COMMUNITY OF INQUIRY EXAMPLE:

Overview

The lesson uses an asynchronous online discussion forum to engage students in examining instructional models based on cognitive psychology.

Description

Students are given a link to the Hurontario College [Doc.] case study, which asks them to design a program for establishing expert learning and metacognition as the modus operandi for a new college.

Small groups within the class are asked to prepare short proposals to address the problem formulated in the case study and to post these proposals to the class discussion forum (in this case, in the Canvas learning management system). All class members are encouraged to provide feedback to the other groups about the proposals they have posted.

Possible Challenges

The formation of working groups can be a challenge. When a class is accustomed to the method, choosing their groups usually works well. In our experience with graduate students, most class members see the value of working with a different group for each new problem. Still, novices may fall into bad habits like 1) always working with the same people 2) seeking to form groups with only the *smart* people in them. In such instances, instructors may assign group membership randomly or according to strategies designed to ensure diversity (which adds value to the discourse).

Not everyone knows how to respond to the work of others constructively. To address this problem, instructors might want to prepare some recommendations regarding writing discussion posts, like this tip sheet [Doc.].

Instructors new to online learning or asynchronous discussions may be tempted to either 1) avoid participating in the process for fear they will dominate the discussion and thus reduce the potential for cooperative learning or 2) respond to every post in hopes of promoting engagement. In our experience, neither of these approaches is productive. Novice instructors would do well to read the above discussion tips and to try to

1. Respond to posts that genuinely engage your thinking by expanding on what the student (or group) has said. For example, they might pose a question for further thought, point out an example of something that would be a challenge in the group's plan, or provide a link to a reading that came to mind as they read the group's post.
2. Let students know that they will NOT respond to every post, but they will comment if requested.
3. Look for ways to respond to multiple posts with a single reply, e.g., "I noticed that several groups mentioned Johnson & Johnson (1989) and the value of cooperative learning methods. You might also find value in their 2017 book [PDF], which both provides some interesting historical context and updates their earlier work."

ACTIVITY 2: UNITED NATIONS SUSTAINABILITY LESSON

Overview

Grade 12 students in an Ontario school were encouraged to find ways to inform people about the UN Sustainability Goals.

Description

The students chose the goal they would focus on and their methods to spread the news and encourage others. They developed plans to share information, raise funds and implement those plans. They used social media to inform others about the work they were doing and to solicit further support. Fullan et al. (2017) indicate there was ample evidence of the 6Cs in how students collaborated, in their excitement and engagement about what they were doing, and the real-life impact of their work.

Possible Challenges.

Instructors interested in engaging students in projects intended to promote and support social change will need to do substantial groundwork to ensure that they support their school administration and, for younger learners, the support of parents. It is also likely that the instructor will need to have prior experience with at least some of the agencies the students are likely to encounter as they carry out their projects.

Resources

Local community agencies like food banks, museums, and even schools themselves may be the best place to get started with small projects. Other social agencies like the Canadian Mental Health Association or the John Howard Society may also be good partners. Another option might be to get involved with one of the 150 or so ongoing projects that constitute iEARN, a program that affects thousands of teachers and millions of students worldwide.

OTHER USEFUL ONLINE TEACHING AND LEARNING BOOKS

- *Creating Online Learning Experiences – Open textbook (2018)*: A guide to online courses ranging from small to massive and open.
- *Distance Learning Playbook, Grades K-12 (2020)*: A wide range of evidence-based, concrete strategies for online learning with videos.
- *Empowering Online Learning: 100+ Activities (2008)*: A good place to find meaningful and engaging asynchronous activities.
- *Learning Online: the Student Experience (2020)*: A helpful lens into online learning from students' perspectives.
- *New Virtual Classroom: Evidence-Based Guidelines for Synchronous E-Learning (2007)*: A bit older, but the evidence and strategies stand the test of time. Dives deeply into learning science
- *Online Learning Idea Book (2011)*: A wide range of practical strategies for teaching and learning online actually tested by teachers.
- *Online Teaching at Its Best: Merging Instructional Design With Teaching and Learning Research (2021)*: An in-depth, research-focused look at online teaching and learning
- *Online Teaching Survival Guide: Simple and Practical Pedagogical Tips (2021)*: Provides an ideal mix of theory, evidence and concrete suggestions for online teaching
- *Teaching in a Digital Age – Second Edition – Open textbook (2019)*: A foundational look at the underlying principles for educators teaching with technology.

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Instructor's Guide for Online Learning

ROBIN H. KAY

INTRODUCTION

I have read many books and articles on online learning, and few explicitly address guidelines to help instructors new to teaching in this medium (Boettcher & Conrad, 2016). When I first started teaching online in 2009, even though I had over ten years of teaching experience, I felt like a first-year teacher: anxious, vulnerable, and a bit lost. I really could have used some advice, guidance, and encouragement. This chapter humbly provides said insights.

The general guidelines discussed in the introduction focussed on creating a community of inquiry by developing social, cognitive, and teaching presence (Garrison, 2016). Furthermore, the chapter advocated deeper learning in online classes by explicitly referring to the *Deep Learning* concepts of citizenship, character, collaboration and critical thinking (Fullan & Langworthy, 2013). Throughout the chapter, insights move from broad to more specific, concluding with examples of opportunities for you to build community and enhance deep learning opportunities.

GENERAL GUIDELINES

1. **Culture.** Before you design your course, you need to think about the culture you want to create in your online classroom — the set of rules and guidelines to ensure good digital citizenship (Fullan & Langworthy, 2013). For example, you need to decide whether cameras should be on, how the chat will work, who will monitor the chat, background images when cameras are on, how breakout groups will be assigned, and how to promote respectful dialogue. Ideally, you would work with your class to create the rules for your class with your students. The Read-Set-Go chapter provides more details on this process.
2. **Student First-Teacher Second.** I like in-person teaching partially because of the students' reactions to what I say, the jokes I might make, the blank stares when I am losing the crowd. You can lose this personal connection online, especially if students turn cameras off. That feels quite odd at first, but it helped me realize, more than ever, that my students come first. Teaching presence (Garrison, 2016) is different online and shifts you to the role of *sage on the stage*. I talked much less than I would in person and allowed students to interact more in small breakout groups.
3. **Communication.** Clear, concise, prompt communication is critical for online learning. Clarity can be a challenge, especially with written messages, so I send short videos sometimes to improve both

social presence (Garrison, 2016) and communication for learning (Fullan & Langworthy, 2013). I also respond very quickly to students, usually within an hour, because online learning can feel quite disconnected. To develop a strong teacher presence (Garrison, 2016), you need to be there when your students need help.

4. **5- to-10 Minute Rule.** Do not lecture online, and by lecture, I mean talking for more than 10 minutes at a time. A long presentation through a trusted slide deck will significantly reduce cognitive presence (Garrison, 2016). There will likely be no cognitive presence, and students will quickly tune out and start engaging in other activities: email, texting, shopping, checking the sports scores. If you feel that students need content, create videos ahead of time and develop a flipped-classroom approach. Within a class, you have about 5-10 minutes to address a topic, and then you need to have some activity. For example, ask a question for students to respond to in the chat, conduct a poll, have a small breakout discussion, have a large group discussion, solve a problem, check for knowledge. The knowledge will not stick if students do not interact with it.
5. **Personal Learning Networks** are an integral part of online learning, supporting the development of social networks and a sense of community (Downes, 2007). You can find several colleagues teaching online and meet with them semi-regularly to discuss strategy, challenges, new tools, and management issues. Similarly, you could join an active Facebook group or Twitter community and ask questions. It takes much more time if you try to teach online, alone. Collaborating is more time-efficient and effective (Hargreaves & Fullan, 2012), especially when starting. Also, ask your colleagues if you can observe one of their classes — you would be startled at how much you can learn.
6. **Feedback.** What saved me when I taught my first class was soliciting anonymous **feedback** after each class. I know that might seem excessive (you could collect it every 2-3 weeks), but regular feedback helped guide my teaching practice and improve the course's overall quality. Consistent feedback from your students throughout an online course is essential for success. This feedback also establishes a more substantial teacher presence (Garrison, 2016).
7. A **growth mindset** is not limited to students; it's also an asset for educators. I would strongly advise that you leave your ego at the entrance to your virtual classroom and open yourself to making mistakes and learning more. With regular feedback (Item 6 above), you can continue learning and growing. Making your learning transparent to students can help create a healthy classroom culture for learning (Fullan & Langworthy, 2013).
8. **Organization** is critical for any teaching format but especially important for online teaching and learning. It is harder to repair and pivot online than in a face-to-face classroom, particularly when technology is involved. Unanticipated problems can eat up significant time in an online class. Of course, you cannot anticipate all issues, but organization and preparation are vital in an online format.
9. **Self-Care.** Online learning, especially when you are new, can be challenging and tiring, especially with increased screen time and the flow of emails at any time of the day or night. In Item 3 above, I responded to emails very quickly, but you need to set boundaries with your students to maximize your health. It would help if you also took frequent screen breaks. I have used short videos to reduce the number of emails, especially before assignments are due. I create a video explanation of the assignment ahead of time, so students do not need to consult me when working on a last-minute project. Finally, go for a walk regularly — fresh air helps to clear your mind, especially when you are in front of a computer all day.
10. **The right technology** can save you time and stress. When teaching online, you need an excellent Internet connection to ensure a consistent, stable to your virtual classroom — slow, choppy internet connections severely and negatively affect teacher presence (Garrison, 2016). It would be best to

have a good headset with a clear microphone. If students cannot hear you, they will likely be unable to learn. Finally, it would help if you had a large screen and preferably two to engage in and take advantage of the many available tools. Shifting from tab to tab in a small laptop computer is painful to watch and can interrupt the flow of your virtual class.

11. **Time.** My experience is that teaching activities often take more time online — providing clear instructions, placing students into groups, making sure they have the correct technology. I typically add 25% more time to an online activity than a face-to-face one. Also, use a timer — it is very easy to get distracted and lose track of time in an online environment. One technical problem for one student can significantly sabotage your careful planning.
12. **Read.** Finally, I advise you to find one good book on online teaching and read it cover to cover. There are so many good ideas available. Two books that I have found particularly helpful are *The Online Teaching Survival Guide* (3d Ed.; Boettcher & Conrad, 2021) and *Online Teaching at Its Best* (Nilson & Goodson, 2018). If you do not have time (few of us do), check out the online resources at the end of this chapter (or the rest of the book, of course).

SUGGESTIONS

SUGGESTION 1: GET THE RIGHT TECHNOLOGY

Overview

This step is relatively straightforward — you should invest in technology that enhances your ability to teach online because it will save you time and reduce stress. If you have a poor internet connection, a small monitor, and/or a poor microphone, you will struggle to establish a strong teaching presence (Garrison, 2016) in a virtual or synchronous class. Suppose your connection is dropped or lagging during a virtual class. In that case, you are taking too much time fiddling with or searching on your small screen, or your voice is distracting to students because you are using a poor laptop microphone, you will quickly lose connection with your students. Please consult the Technology Chapter for full details on technology, including screen recording tools and essential software suggestions.

Description

Key areas to focus on include internet speed, your microphone, and your monitor. Review the Technology Chapter for more in-depth guidance. For now, I will provide you with a few quick suggestions.

- **Internet Speed.** You need to focus on bandwidth here — Download and upload speed. Download speed is how fast information (e.g., videos, images and text) is loaded onto your computer when you click a link. As of 2022, I recommend at least 50 Mbps per person in your house. If you are going wireless (which most people do), you could be competing with others in your household. You will need at least 2 Mbps to use your webcam for upload speed. Otherwise, you could struggle to keep a stable connection with your students.
- **Microphone.** There are several good headsets out there ranging from CAD\$30 to \$125 (I'm sure you could pay more). Logitech is a brand that has worked well for me with a \$30 to \$60 price tag. If you want to sound like a radio announcer, Plantronics (CAD\$100) is wonderful. If you do not like the very attractive over-your-head headphones look (smile), you might consider a Blue Snowball (CAD\$50) Yeti StandAlone microphone (CAD\$130). Another option is a Mac Computer which is very expensive

but has decent built-in audio and video (but a small screen).

- **Monitors.** I prefer one or two 27" monitors. Yes, I may have spoiled myself, but I am more efficient with all that screen space. You could connect a monitor to your laptop — that would give you more space. I have conducted an online class with a relatively small laptop, and trying to negotiate multiple screens is exceedingly slow and awkward. You want to focus on your teaching, not the technology you are struggling to use

Possible Challenges

You will experience at least two challenges here: cost and the time spent searching for a suitable device. As for cost, I consider the hours saved with good technology more than compensates for the upfront expense. Plus, the students get a much better experience. Avoid searching around for technology by consulting our Technology chapter. Keep in mind — there is no best technology — pick a decent one and move on. You can always ask a few colleagues and save yourself searching time. Don't go on a Google search — you might never return with the range of options available.

SUGGESTION 2: WELL-ORGANIZED LESSON PLANS

Overview

One of the best decisions I have made regarding online teaching is to create a detailed lesson plan for each class that includes learning goals, activity descriptions and estimated times, and asynchronous or home activities. This strategy allows students to see what they will be doing ahead of time, to anticipate workload and guide me during an online lesson. The lesson plan also helps me keep on track with time, a persistent challenge for me in an online learning environment.

Description

- My lesson plans include the key learning goals addressed in the class, a detailed list of activities with time estimates and resources as required, a break time marker, and a very detailed list of asynchronous or home activities. I create them as Google Docs to edit them on the fly so that students can comment or ask questions. Here are several examples of lesson plans that I used: Lesson Plan 1 [Doc.], Lesson Plan 2 [Doc.], and Lesson Plan 3 [Doc.].
- I post my lesson plans on a website (e.g., Technology and the Curriculum); however, they could quickly be posted on the learning management system (e.g., Desire to Learn, Google Classroom, Canvas) of your choice.

Possible Challenges

1. **It takes time.** Creating these lesson plans takes time and requires a fair bit of planning. I would argue that it is time well spent because online learning needs to be thoroughly organized. It is more challenging to repair distractions and technological issues that can quickly derail a class. If you teach the course more than once, the possibility of repurposing/updating your plan can both save you time and encourage you to engage in constant improvement.
2. **Workload** for secondary school teachers. The other challenge would be the workload for secondary school teachers who need to create daily instead of weekly lesson plans. In this case, you might try

making shorter lesson plans or a weekly lesson plan summary.

3. **Getting off track.** Finally, lessons do not always proceed as expected, so you have to make decisions during the class about skipping activities and still achieving the intended learning goals. Sometimes activities need to be postponed to the following class, which can have a rippled effect on future lesson plans that you may have created ahead of time.

SUGGESTION 3: CHAT WITH STUDENT HELP

Overview

Many students choose not to use their camera or raise their hands and ask questions in an online virtual classroom. At first, I admit, this is quite disconcerting — you feel like you are teaching in a virtual void. However, students still seem willing to use the chat feature. The challenge is that an instructor cannot monitor the chat and focus on the lesson. To address all chat comments, you need a monitor. I am suggesting that you student volunteer each class. It has been my experience that students love doing this.

Furthermore, a monitored chat increases student focus and cognitive presence (Garrison, 2016) when the instructor is interrupted. That might seem counterintuitive, but students shift their attention when a new voice suddenly appears. Then they pay attention to the question asked. Think about listening to a good podcast. Conversations are much easier to follow than monologues.

Description

The process for soliciting a student volunteer to monitor the chat is relatively straightforward.

- **First**, explain to your class that you understand that chat is a primary form of communication online and that you need their help making sure all voices are heard.
- **Second**, note that you will ask a student to volunteer at the beginning of each class to monitor the chat and interrupt the teacher when there is a question or concern. For example, they might say, “Sorry, Robin, Amir has a question,” or “Robin, a class member has asked if you give an example of how that would work.”
- **Third**, you may want to set a few ground rules about when a student can interrupt you. I treat it like a face-to-face class. If a hand went up, I would answer it immediately. Therefore, if a student posts a chat question, I want to respond immediately.

Possible Challenges

The number of chat postings can be overwhelming at times, even with a small class. It would help if you worked with your students to develop the most effective way to post comments and questions in the chat. You might ask students to refrain from posting personal messages during a lesson (before a lesson is fine to create a social presence). You might ask them to add the keyword “Question or Comment” at the front of their chat message to make it easy for the student chat monitor to address. I would work this process out with my class at the beginning of the course and involve them in the process. Students are more likely to follow the rules or systems they create.

Another possible challenge is *private chat* or students texting each other during class. You could turn the private chat off, but I prefer to allow students to choose their learning path and approach. Texting other students in private chat is one way to increase social presence and engagement, regardless of whether it is relevant to the content at hand.

SUGGESTION 4: RECORDING YOUR LESSONS OR NOT

Overview

Recording secondary school virtual classes are challenging because you deal with minors — I would probably advise against it. Instead, create short videos to support content or procedural knowledge. Higher education students regularly ask that you record virtual classrooms when they miss a class or want to review material. However, there are several challenges that you need to consider when deciding whether to record your class.

- **First**, does it make sense, particularly if you have created a highly interactive environment involving small group discussions? The recording will not be particularly effective because you are not giving a lecture, and breakout rooms are not recorded.
- **Second**, when sections of your virtual class involve long presentations (consider the 5-10 minute rule, please), a recording might be helpful.
- Third, reflect on whether recording a virtual class will discourage students from turning on their cameras and participating in discussions. They may not want themselves recorded.
- **Fourth**, consider the time and privacy issues required to share your recording.
- **Fifth**, turn on closed captioning to increase accessibility if you do record.
- **Finally**, monitor the actual use of your recorded classes. I discovered that no students were watching the video of our 1-2 hour class. I think it comforts students to know it is there, but the idea of watching a rather dull 60-120 minute video of a full class may be daunting to students who are typically unwilling to watch instructional videos for more than 6 minutes (see the optimal video length article).

GENERAL RESOURCES

- Coursera – Learning to Teach Online: Highly rated, a free, comprehensive source on learning to teach online.
- Effective Online Strategies to Improve Your Online Teaching contains articles, reports, resources, seminars, programs, courses on teaching and learning online.
- Effective Teaching and Learning Practices – UBC Centre for Teaching and Learning is an excellent site that offers a combination of written and video support in numerous aspects of online teaching and learning.
- Strategies for Teaching Online: A good list of strategies for teaching online, divided into helpful sections (e.g., EDI, student well-being, discussions).
- Teaching Remotely – Harvard University: Very comprehensive site focusing on getting started, best practices, video and audio, learning from colleagues and technology tools.
- Teaching Strategies of Award-Winning Online Instructors: Five insights on virtual instruction by

examining the techniques shared by top-rated online instructors.

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PART II

STARTING OUT

This section focuses on five key areas (chapters) that an educator needs to consider when starting an online course, including:

- *Essential Technology for eLearning*
- *Anticipating Diversity: Online Course Structure and Organization*
- *Course Outlines in Online Learning*
- *Pre-Course Activities for Online Learning*
- *Ready, Set, Go – Your First Week Online*

These insightful chapters will help you anticipate potential challenges and prepare for your online course.

Essential Technology for eLearning

MORTILAINÉ RILEY; MIKE PRASAD; AND ROBIN H. KAY

INTRODUCTION

We maintain that strong social, cognitive and teaching presence are critical to the success of an online course (Garrison, 2011). We also assert that deep learning, focusing on citizenship, character, collaboration, communication, creativity and critical thinking is essential for optimal online teaching and learning experience (Fullan, 2013). However, poor technology can completely derail any online course, no matter how well it is designed (Gillett-Swan, 2017; Kauffman, 2015; Wingo et al., 2017). Consequently, this chapter ensures that you have the right technology to teach in an online learning environment. It will also assist you in addressing unexpected challenges. Specifically, we focus on four areas: internet connection, hardware, software and specific strategies to address common technology-related issues.

In a synchronous or virtual classroom, having a stable, high-speed internet connection is critical for success. In addition, making the right choices about hardware and software will greatly enhance the online experience. Finally, understanding and anticipating possible technology problems can prevent an online class from being significantly derailed. Having good technology does not guarantee success, but having poor technology will inevitably lead to failure.

GENERAL GUIDELINES

OVERVIEW

Selecting the right software can be a daunting task. Quite frankly, there are far too many options and opinions for the average instructor. The best general advice is to find your expert, the person you can rely on to provide quick, sound advice. While you may have a pretty good understanding of hardware and technology, finding someone who lives and breathes technological solutions can save you many hours.

Choosing the right software is a completely different task. You need an expert in both pedagogy and technology, so you need someone who has considerable online teaching experience. I suggest that you ask around to see who the experts are in your field. Everyone knows them, and there is almost always one in any school setting.

You also have to adhere to the constraints of your educational system. For example, I could recommend that you use Google Workspace (e.g., Google Docs, Sheets, Slides, Drive), but if your institution does not permit its use, you will need to consider other tools. Your school will often have a set of support tools, and I would start there first. Below, we offer general guidelines and suggestions for the tools you will need to teach online in 2022.

Internet

- **Service provider.** When purchasing your Internet service, don't simply check the cheapest package. Make sure that you have good customer support with your provider. Call your service provider if there are connection issues (and there will be).
- **Checking your Internet Speed.** I have used Speedtest to check my internet speed for years. Very reliable.
- **Download Speed.** Download speed is how fast information (e.g., videos, images and text) is loaded onto your computer when you click a link. I recommend at least 50 Mbps per person in your house. If you are going wireless (which most people do), you could be competing with others in your household, so you may need a faster download speed, especially if other inhabitants are playing video games.
- **Upload Speed.** In practical terms, upload speed is the rate at which your audio and video are uploaded to virtual classroom software. If you want others to see and hear you, I recommend at least 2 Mbps and maybe more if others in your household are using the Internet.

Restarting the Modem.

As a rule, I have found that unplugging my modem for 30 seconds, then plugging back in. This type of reset is good to do every few weeks.

Hardware

- **Microphone.** There are several good headsets out there ranging from CAD\$30 to \$125 (I'm sure you could pay more. Logitech is a brand that has worked well for me with a \$30 to \$60 price tag. If you want to sound like a radio announcer, Plantronics (CAD\$100) is wonderful. If you do not like the "headphones over your head" look, you might consider a Blue Snowball (CAD\$50) Yeti StandAlone microphone (CAD\$130). Another option is a Mac Computer which is very expensive but has decent audio and video (but a small screen).
- **Monitors.** I would suggest at least one large (27" or more). I have conducted an online class with a relatively small laptop, and trying to negotiate multiple screens is exceedingly slow and awkward. If you want a smooth learning experience, a large monitor (and ideally two – I am spoiled) is the way to go.
- **Webcam.** If you have a laptop, usually the webcam is just fine for online learning/ If you have a desktop computer, you will have to buy a separate WebCam to mount on top of your monitor. Logitech webcams have worked well for me.
- **Mouse.** I would not spend too much money or time selecting a mouse, but I strongly recommend purchasing one if you use a laptop computer. The mouse will allow you to interact with your computers quickly and smoothly. You can use the laptop touchpad, but it is awkward and can slow you down. You want to focus on learning, not repeated attempts to click the right area of the screen.

Software

The number of software tools available seems endless, so we will provide some general suggestions of tools that work particularly well in online learning, followed by a few essential resources to explore in more depth. We make these suggestions based on our practical experience teaching online for over a decade.

- Learning Management System (LMS)
- Word Processing
- Spreadsheet
- Presentations
- Polling
- MindMaps
- Screencasting
- Surveys
- Websites

STRATEGIES FOR DEALING WITH PROBLEMS

STRATEGY 1: PLANNING AND KEEPING CALM

The Problem

Murphy's Law (anything that can go wrong will go wrong) applies to teaching online, especially with synchronous classrooms. Perhaps I am overstating the case, but you can count on technology issues when teaching online. Unfortunately, they are often unexpected and sometimes can completely change the flow of a class. Problems that I have encountered over the years are:

- login issues for students just before class;
- students not knowing how to do a particular technology-related task;
- very slow computers not designed for online learning;
- internet connections slowing down to a halt or completely dropping mid-class;
- audio or video suddenly not working;
- distorted audio;
- virtual classroom software suddenly freezing;
- intended software tools are not available or do not work;
- freezing screens;
- links not working;
- students not being able to access specific sites;
- viruses.

Description

Addressing a wide range of unexpected issues is a daunting task, particularly if you are not tech-savvy. I advise you to follow two essential strategies: Plan and Keep Calm. Figure 1 offers suggestions for addressing the most common technology problems.

Figure 1

Common problems and solutions

Problem	Possible Solution
Login Issues	<ul style="list-style-type: none"> • Provide a short “how to login” video before class • Ask students to use the “Guest” option • Share contact who solves password problems • Have a pre-course online practice session
Not Knowing How to Use Software	<ul style="list-style-type: none"> • Refer students to “introductory” video(s) before class so that they can prepare
Slow Computer	<ul style="list-style-type: none"> • Provide students with a checklist of minimum required technology • Ask students to restart their computer • Ask students to close other software tools that may be open
Poor Internet Connection	<ul style="list-style-type: none"> • Check the speed at Speedtest – If your upload speed is less than 2Mbps, you may need to upgrade your service • Ensure students are near Internet Hub in their house or use a wired connection • Make sure that multiple users in the house are not slowing down the Internet • Turn off video connection
Distorted Audio	<ul style="list-style-type: none"> • Provide a list of good quality headsets or microphones required to participate in the course • Laptop audio (except on Macs) is often poor • Have a pre-course online practice session to test the audio quality
Audio and Video Connection Poor	<ul style="list-style-type: none"> • Have pre-course online practice session to test audio and visual and correct before class
Software Does Not Work	<ul style="list-style-type: none"> • Provide students with a list of required software technology well ahead of the class and tell them to check if it works • Have students work in teams with one person sharing their screen • Use commonly available, easy to use tools (e.g., Google Workspace)
Freezing Screens	<ul style="list-style-type: none"> • Restart your computer • Ask students to close other software tools that may be open • Check the speed at Speedtest – If your upload speed is less than 2Mbps, you may need to upgrade your service
Links Not Working	<ul style="list-style-type: none"> • Double-check all your links before you start class • Ask your students to test links before class
Viruses	<ul style="list-style-type: none"> • Provide students with a list of good virus protection tools before they start a course
Any Major Problem Where Technology Prevents students from attending a class	<ul style="list-style-type: none"> • Record the class • Have a Plan B where students can achieve the goals of the lesson asynchronously

Even when you plan for technology problems, and I do, they occur – often at the worst moments. So you need to be a calm leader in the virtual classroom. Here is a quick plan:

1. Take a long breath.
2. Reassure students that these problems happen.
3. Humour or empathy works very well.
4. Calmly suggest a few quick solutions (e.g., turn off their camera, try to login again, restart their computer),
5. Do not get into the weeds of solving an individual student's technology problem during the class.
6. Assure all students that if they cannot participate in a class for technology-based reasons, you will record the course or give them a set of asynchronous tasks (Plan B) to achieve the class learning goals.

STRATEGY 2: CONSULT SUPPORTIVE RESOURCES

Description

As part of preparing for an online course, it's essential to consider and consult the available support resources.

To start, I would list the following key support contacts and have their contact phone, website and email noted. I would encourage you to keep this list readily available and make it available to your students.

Key Support Contact List

- IT Services department and Help Desk (also find the hours of operation)
- Teaching and Learning department
- Learning Management System (LMS)
- Internet Service Provider

General Guidance

- **LMS.** Once you have established which Learning Management System (LMS) or platform you will be using, I would first check with your institution's IT department or Teaching and Learning department for instructions to best use the system. Each institution may have customizations to the system, and it is essential to know how to access, navigate and use the system effectively and efficiently.
- **Videos.** Your institution may have text-based or video tutorials on using the system from an instructor and a student view.
- **IT Service Website.** It's best to check the support website of your IT Services Department. These online platforms will typically have a "what's new" section or blog site with details of the new features and recent updates.
- **Planned Outages.** There will be both planned and unplanned outages as with any technical system. Planned outages will be handled by your IT department or 3rd party vendor to upgrade, improve, and maintain the system.
- **Unplanned Outages.** Unplanned outages occur when unexpected outside. Examples include wide-

spread power outages, broad Internet connectivity outages, system attacks or other natural disasters. While you cannot control unplanned outages, it's best to make yourself aware of any planned outages. Also, if an unexpected outage does occur to your online classroom system, it's crucial to have a plan B.

Possible Challenges

As mentioned, technology will fail or intermittently stop working.

- **Plan ahead.** As an instructor, it's best to know in advance what to do if something happens and whom and how to contact. It's advisable (if possible) to have a secondary computer or tablet device that you could use if your main computer stops working during a class.
- **Support students.** It's also a good idea to share the best course of action and support with your students, should something happen with the technology during a class. If a student's laptop stops working during a class, they may connect to their class with a smartphone or tablet device.

STRATEGY 3: BASIC HARDWARE GUIDELINES

Description

It's critical to have a computer system with sufficient hardware capabilities to run a current operating system. While there are many different types of computers and brands, there are a few key important factors to consider, regardless of what you use.

Audio: In practice, it's more important to give your students a listening experience with high-quality audio. The human ear is very sensitive to audible crackles and pops, and it can be very distracting for listeners if the instructor uses a low-quality microphone.

If you are using a laptop, we recommend using an external microphone. It's a personal preference whether you use a headset-style or desktop-style microphone. Either one will significantly improve the built-in microphone on the laptop. Be sure to review the setup instructions for any external microphone, as they all have different settings.

As students may not have access to an external microphone, they may have earbuds that often come with smartphones. I would encourage students to use this as it again significantly improves audio quality if they are required to speak in the class.

Video: The reality is that most modern webcams built into laptops have sufficient resolution and low light capability. If your class is during daylight hours, and if possible, you can improve your video lighting by setting up your workspace so that you are directly facing a window. By having the window light "fall" onto your face, you will be evenly lit, making for a more pleasing look.

If you're interested in getting higher quality lighting and video, an external USB webcam and external lighting can significantly improve your production value. Note that this may introduce additional complexity for some users.

Hard drive: Regarding the hard drive specifications, we recommend a solid-state (SSD). Past hard drives used spinning platters, which are incredibly slow. Using a computer with an SSD drive increases the overall speed of the computer, which means booting up and opening and closing applications is incredibly fast.

RAM: One of the most common questions regarding computer specifications is about RAM and how much to get. RAM is your computer's *short-term memory* and is used to handle all open and active tasks and software applications. How much RAM you need then will depend on your type of work and your budget.

- If you're going to be using mainly web-based applications and sites, light word processing and email, then a lower amount should be sufficient.
- If you like to have many applications open at once, including browser tabs, and perform more intensive tasks such as video or photo editing, then more RAM is recommended.
- As a general guideline and at the time of this writing, 16GB RAM would be a good starting point for Windows-based computers.
- For Apple computers, 8GB RAM would be a good starting point.
- If you use a Chromebook, 4GB RAM will work, but eight is recommended.
- For most newer laptops, one thing to keep in mind is that the amount of RAM may not be upgradeable after your purchase. Some laptops have the RAM directly soldered onto the main system board. If possible, buy the most RAM you can reasonably afford at the time of purchase.

Monitor: In terms of displays or monitors, we recommend getting at least one external monitor, at least 24" – 27". Having an extra monitor while conducting an online will make it easier to have a few key documents or sites open. Having another external display will also make it easier for you have to share or present your screen to the class. If you're in a position where your institution or school provides you with a laptop or desktop computer to use, there may be an opportunity to customize the way you work with it.

Keyboard/Mouse: If you use a laptop, we suggest purchasing an external mouse and keyboard for comfort and efficiency.

Network/Wi-Fi: Having a fast, reliable Internet connection is critical to a successful online class. Ideally, you want to be as close to your Wi-Fi access point or hub as possible. Better yet, if you can plug in an Ethernet cable to your laptop and connect directly to the Internet Hub/Router, that will give you the fastest and most reliable connection.

STRATEGY 4: CREATE STUDENT GUIDE

Overview / Description

When you use technology in the classroom, you ensure that students have access to and can use the technology. A common mistake among educators is assuming that students already know how to use the technology or learn on their initiative. While students may be surrounded by technology in their homes, it is unwise to assume they know how to use the technology for learning purposes. Most students still need some guidance to navigate digital tools for learning and collaboration effectively. Therein lies the importance of creating student guides.

Student guides can take various forms, including instruction manuals, handouts, course outlines, frequently asked questions (FAQ), audio-visual instructions, infographics, web pages. They assist the instructor in the course delivery, and they help students be comfortable with the way technology is used to aid their learning.

Possible Challenges/Solutions

Many educational institutions will have a dedicated IT department to support students' various technologies. These departments typically create training guides that students can access. However, there may be instances where the institution does not support technology. For example, an instructor may try a new or alternative technology that could add more creativity and relevance to the learning experience. In such cases, instructors still have a responsibility to ensure that students have the guidance they need to utilize the technology effectively. Here are some guidelines on how to create effective student guides that add value to the learning experience:

- **Make use of existing resources:** Don't reinvent the wheel. Before creating a custom guide, research what resources are available and re-purpose them. For example, most software vendors will already have a knowledge base or user manuals hosted on their websites. You could share those resources with students instead of creating something entirely new.
- **Have a planned communication in place:** Include and organize only the relevant information for students.
- **Structure guides in a user-friendly style:** Use simple, clear and precise sentences, as well as friendly, conversational tones. Also, use inclusive language. Write in a way that is gender-balanced and racially sensitive.
- **Use multimedia:** For written guides, use images and charts to condense information where possible. Additionally, create alternatives to written directions. For example, you could use video tutorials.
- **Test what you produce:** Mirror how your students would use the guide and track how the information flows. Make adjustments as needed if you identify errors or inconsistencies.
- **Provide opportunities for students to ask questions:** This is especially important if technical terms are used in the guide.

STRATEGY 5: MAXIMIZE INTERNET SPEED

Overview

Without sufficient bandwidth (Internet Speed), you cannot run an effective online synchronous class. The problem is that Internet speed can be affected by multiple and unexpected influences. For this strategy, I offer practical steps that can help ensure the connection you need when teaching your class.

Description

We have collected a number of straightforward strategies to address Internet connection problems that you might have, including:

1. **Check your speed.** Measure your Upload and Download Speed using Speedtest. Upload Speed should be at least 20 Mbps (one user), Download Speed should be at least 2Mbps. After you do most of the following steps, you need to go to Speedtest to check if they worked.
2. **Unplug.** Unplug your modem (the box where your Internet connects to outside your house) for 30 seconds, then plug it in again and check your Internet.
3. **Move.** If you have a wireless connection, make sure your computer is close to your modem.

4. **Wired is best.** If possible, connect your computer directly to your modem with a blue Internet cable (Cat 6). Being wired is the safest and best solution to maintain your connection. It may not be realistic – I understand.
5. **Sharing slows you down.** If you are at home and multiple people are sharing the Internet, your speed will slow down. You may have to negotiate time slots when you are teaching to ensure maximum Internet speed.
6. **Internet provider.** Make sure that your internet provider offers excellent customer support. You can pay less, but you may not get the service you require when you need it most.
7. **Your computer.** Make sure that you have a relatively new computer, and by relatively new, I mean less than three years old. Yes, you can get away with an older computer, but you will likely experience more problems.

STRATEGY 6: CHECKING AUDIO AND VIDEO CONNECTIONS

Overview

Getting audio to function seamlessly can be one of the biggest challenges when teaching with technology. During a classroom session, you may encounter numerous issues affecting your audio input devices or your audio output devices. Audio input devices allow users to send audio signals to a computer for processing, recording, or carrying out commands. The most common devices for audio input are microphones. Microphones are used to input a person's voice into the computer and can be internal (built-in) or external (peripheral) to the device. Audio output devices are the hardware equipment used to get the information from the computer in audio formats. These include headphones, speakers, sound cards, etc. Together, your audio input and output devices form the key components of your audio system.

Having an audio system that works is a priority when designing an engaging and fulfilling learning experience for students. However, audio issues can sometimes get in the way of the learning experience, causing students to feel disengaged, confused or frustrated. Below is a list of possible audio challenges when teaching and tips to avoid, mitigate, or rectify these challenges.

Possible Challenges & Solutions

No Audio/Sound. In this scenario, the audio simply does not work, and there is no sound coming in or going out. Whatever you do, do not panic. Here are some possible solutions:

- Where you have no sound, first check to ensure your computer speakers are connected and that the sound is turned up.
- Where there is no sound going out, check to ensure the microphone is connected and check that the microphone sensitivity isn't turned down too low.
- If you are using a headphone or a microphone, try swapping either device with a spare to see whether it's a hardware problem.
- If these troubleshooting steps do not work, one final step could restart your device. Simply turn your device off and on again.

Echoing or Distorted Audio. In this scenario, audio is coming through, but the quality is poor, garbled or has echoing feedback. Here are some possible solutions:

- In an online or hybrid classroom, ensure microphones are turned off except for the person who is speaking. In a session where there are multiple participants using speakers, there is a possibility that you will hear an unwanted echo. It is best to use headsets to avoid such echoes.
- When the audio is garbled or delayed, this is typically due to hardware problems with the microphone or interruptions in the Internet connection. To check for hardware issues, try changing your headset or microphone or adjusting your settings.
- If poor audio is due to interruptions in Internet connectivity, the system will typically show some type of notification. To resolve, stop unnecessary audio or video and limit other computer activities/tasks while in the session. Additionally, delay or halt the activities of other computers that are on the same network. Those additional computers may be using a lot of resources or performing heavy downloads or uploads, which could cause interruptions to your audio performance.

Asynchronous Audio-Visual Quality. Sometimes, remote teaching may require recording asynchronous content. It is still important to prioritize making sure you can be heard in such scenarios, even though your sessions may not be live. Clear audio will help your students follow along. Conversely, distorted, muffled or garbled audio will make it hard for your students to understand what you are saying. Here are some tips for producing asynchronous recording:

- Consider investing in an external USB mic for asynchronous recording. USB mics are available at a wide range of price points, from relatively inexpensive to professional grade. The choice should be driven by your preference and the guidance of your IT department. This point is only a recommendation, as some computers come equipped with great in-built microphones.
- Find a quiet space where you will be free of possible aural distractions, such as vehicle horns, beeps and engine noises; talking by other people; pets sounds; noise from electronics, dangly earrings and necklaces, etc. These unwanted sounds can be distracting and can affect your overall sound quality.
- Avoid busy background visuals if there will be video recording accompanying the audio. Busy background visuals may distract students from the material.
- Be mindful of your digital privacy and security. Avoid having photos or objects in your recording that would allow someone to find you or your loved ones and potentially compromise your security online.
- Playback and edit as needed. View playback recordings before uploading.

STRATEGY 7: PRACTICE AHEAD OF TIME

Overview

Preparation is crucial for any teacher attempting to integrate technology into the classroom experience. A significant part of this preparation entails practicing ahead of time to familiarize yourself with the technology first. There are many ways to practice, including scripting, storyboarding, or trial sessions with the prepared content. Using these strategies can alleviate some of the complexities of online teaching. Here are some specific insights applicable to both synchronous and asynchronous teaching.

Possible Challenges & Solutions

Run trial sessions with content and technology. To get yourself more comfortable and familiar with the technology you will be using, play around with it before class to determine what will work best. This step is crucial if you have a complex class flow. Running a trial session helps make sure you can segue seamlessly from one idea to the next.

Where possible, try to replicate the exact teaching scenario in your practice. For example, if you set up an online assessment or lesson, access the assessment or lesson precisely as your students would and create practice versions for students. This review lets you make sure students fully understand your expectations.

If you plan to incorporate an unfamiliar or new technology, set up a practice session with a colleague or friend. By doing so, you will learn where your material needs more clarity. This practice session may require some time and effort. But can prove quite beneficial in the long run. Firstly, you will feel less stressed and nervous if you're already comfortable with the technology before class time rolls around. Secondly, you will be more equipped to identify and troubleshoot any technical issues that might arise for students.

Scripting and storyboarding. Scripting produces a "written" account of how you intend your lesson to flow. Scripting is especially useful for asynchronous recordings. Writing a script before capturing audio and video will ensure that the communication is clear and concise. Scripting also helps you to remain focused as you choose your best words and devise your most coherent explanations.

A storyboard provides a shot-by-shot sketch of how a video, interactive experience, or sequence of graphics will unfold. You do not need to be a graphic designer or artist to create an effective storyboard. You can use paper and pen or slides. Pre-built storyboarding templates are also available online.

STRATEGY 8: PREPARE FOR A PLAN B

Overview

No matter how well prepared you might be, there are no guarantees when teaching with technology. Things may not go according to plan, and other items may occur outside your control and preparation. For example, there could be instances where the major technology fails, and no amount of troubleshooting can help. Other times, you might not solve problems yourself and may need to call on a tech support team, which may not respond as quickly as you may hope. Having a Plan B, where you are ready for the unexpected, is a smart way to navigate such instances.

Possible Challenges/Solutions

Have an emergency communication plan in place. In situations with severe challenges, you must contact your students with guidance. Consider having a couple of preset template emails ready to send.

- Email to students: This email lets your students know that you or the class are unavailable and could contain links to alternative activities for students.
- Email to an assistant or colleague: This email could contain links to your lessons and the names of other teachers or administrators they could reach out to with questions. It might be helpful also to include a checklist of procedures and a class meeting schedule.

Create a backup lesson plan with alternative activities. You may have prepared your lesson a particular way, but nothing seems to work on the day of class. Having alternative lesson plans and activities helps in such cases. When planning your lessons, look ahead and prepare for all you need to do, and how else you could do these things if one or multiple components fail. For example: having an alternative meeting tool in place if your preferred platform fails. You could switch to Zoom in place of Google Meet or vice versa if most students have difficulties accessing it. You could also convert an entire lesson or a lesson activity from synchronous to asynchronous if your internet connection becomes very unstable.

Opt to use a secondary device – When hardware or software challenges begin to impede class time, you can opt to use another available device. Being prepared means having the primary software you used installed on multiple devices. This way, you can jump from a laptop to a phone or tablet if one device is not functioning as it should.

STRATEGY 9: PROVIDE VIDEO SUPPORT

Overview

Collating a well-organized list of support videos can save you and your students considerable time in online learning environments. This type of video can significantly reduce the number of emails you receive and shift student attention to learning, not administrative challenges. These videos can:

- provide administrative support on how to use an LMS;
- show students how to use a software tool;
- explain how to solve a specific technical problem;
- walk students through the process of submitting an assignment;
- help students navigate a website or resources;
- offer advice about hardware or software to provide.

You will often find these videos in your Teaching and Learning Support centre – most secondary schools and higher education institutions have a central hub of resources. I advise you to review and share them with your students.

Description

If you are looking for a short video on how to do an administrative task:

- Consult local resources provided by your educational institution.
- Search Google, but take time to find a concise, clear support video.
- Create your video own in minutes using Screencast-O-Matic to answer particular questions promptly

The following is a sample list of resources offered in most educational settings:

1. LMS Support – For example, Learning with Canvas.
2. Virtual Classroom Support – Zoom Playlist [3:24].
3. Software Tool Support – Teaching and Learning with Mentimeter.
4. How to Use Google Apps – Playlist[~14:30].

5. Hardware Support – Interactive Whiteboards.
6. Designing a Course: Instructional Design Support.
7. General Online Learning Support: How to Thrive in an Online Environment [3:50].

GENERAL RESOURCES

- Ditch That Textbook
- Teachers Guide to Technology

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Anticipating Diversity: Online Course Structure and Organization

LORAYNE ROBERSTON; DIANE TEPYLO; AND BILL MUIRHEAD

INTRODUCTION

This chapter represents our collective experience of 40+ years with online course design, structure, organization, and evidence-based practice. We note that developing an online course takes considerable time and effort. The design of an online course requires the consideration of available technology combined with a mindset of intentionally focussing on deeper learning and accessibility. Technology affordances and constraints need to be considered while creating the course structure and purposefully connected to research, theory, and practice (Nilson & Goodson, 2018).

EQUITY, DIVERSITY, INCLUSION AND DECOLONIZATION

Equity, Diversity, Inclusion and Decolonization (EDID) is essential for online course design. Equity is fairness and thoughtful consideration of what students need in this activity to be successful citizens in the academy. Diversity is a characteristic of Canadian society; careful anticipation of diversity is a cornerstone of course planning. Inclusion is a skill set used to design learning environments where all students are represented and can engage in learning successfully. Decolonization is a process of recognizing that education and knowledge systems of the past had a narrower scope of defining knowledge and ways of knowing. According to Zidani (2021), course designers should select readings and concepts carefully to include pluralized voices. Instructors should not rely on one academic canon that has had a single, authoritative voice (e.g., European and male) and view difference as “a vital asset” (Zidani, 2021, p. 973). When EDID is deliberately included, we create safe learning spaces for critical, counter-cultural discourse in their courses (Smith et al., 2021; Zidani, 2021).

HOW MUCH STRUCTURE IS ENOUGH?

When designing a course, instructors must consider how much structure is required because it will impact student learning. A moderate level of course structure is not only supportive of students of diverse learning backgrounds, but it has a significant impact on closing the gap for first-generation students and other groups who have been historically less successful in the academy (Eddy & Hogan, 2014). With this in mind, we recommend a moderate degree of structure in the course outline.

DEEPER LEARNING

If instructors want students to understand and apply new learning beyond the course, then the learning needs to be deeper (rather than superficial or content-based). We know that we cannot educate using traditional content-based approaches because students need deeper learning to live, work and interact in a knowledge-based economy.

Dede (2014) organizes deeper learning into three dimensions. The first dimension, *Cognition*, includes knowledge, creativity, critical thinking, innovation and literacy. The second dimension, *Intrapersonal (self) dimension*, involves skills such as metacognition, work ethic, flexibility, initiative and appreciation of diversity. The third dimension, *Interpersonal*, contains critical skills such as teamwork, collaboration, communication and leadership. In a similar vein, Fullan (2014) has identified key competencies associated with deeper learning: Citizenship, Character, Collaboration, Communication, Creativity and Critical Thinking (Fullan, 2013). We consider both of these views on deeper learning in this chapter on course structure.

GENERAL GUIDELINES

We offer eight general guidelines to help educators address the themes of technology, EDID, levels of structure and deeper learning in courses, based on Bloom's (1956) and Krathwohl's (2002) taxonomies of educational objectives:

1. Know the architecture of the online course.
2. Align everything with the learning outcomes.
3. Design the course ecosystem.
4. Plan for interaction and collaboration.
5. Distribute and scaffold student learning.
6. Universal Design for Learning (UDL).
7. Structure in accountability.
8. Reflect for continuous improvement.

1. KNOW THE ARCHITECTURE OF THE ONLINE SPACE

The digital teaching platform is a newer type of classroom or learning environment with affordances that allow for deeper learning (Dede, 2014). Still, instructors need to take advantage of these affordances for deeper learning to happen. An online course is housed in a learning management system or LMS, which will impact course design because an LMS offers affordances but is also a bounded system. For example, the LMS may automatically produce a temporal calendar of assignment deadlines to enable students to plan their time, but it may not easily integrate other software. Course designers need to consider both the affordances and the interoperability of the LMS and peripheral technologies that can be added to support learning. Increasingly, LMS systems integrate with other external tools; however, some tools are not integrated.

Our preference is to publish all the course information in advance to allow students to view the entire course at a glance. We use Canvas as the official LMS, and we use other peripheral technologies such as Google G-suite for collaborative student authoring and the Zoom platform for synchronous classes. In a recent review of an online program, students reflected that too many technology tools could negatively impact their ability to learn online. No matter how good the technology is, there is always some learning before students

can easily use the tool. We look at the cost/benefit of tech tools that complement the LMS and their affordances, as these affordances are central and not peripheral to instruction. For example, Zoom and Canvas allow instructors to create videos of the slides for class with a voice-over and a headshot of the instructor speaking. When videos of the weekly class topics are provided to students in advance of the class, students can view the scope of the upcoming class. Providing students with the materials in advance of the course prepares them for learning and supports diverse learners.

Not only should the teacher know the architecture of the online space, but it is also helpful to communicate this structure to students so that they can find the information when they need it. We have found that a short (> 5-minute video) highlighting the instructor's logic in organizing the course helps students. These organizational considerations are based on the instructor's understanding of the technology and subject areas. This expert organization scheme may not be evident to novice learners. Learners benefit from understanding the expert's organization of the subject and technology (Ambrose et al., 2010). A short video of the instructor navigating the LMS with voice-over can be completed and posted within 15 minutes and pays dividends later in the course when students can find materials independently.

2. ALIGN EVERYTHING WITH THE LEARNING OUTCOMES

Think of a course through the metaphor of the Guggenheim museum in New York that uses an open center and a circular design. Visitors to the museum travelling up the rows of the Guggenheim are constantly returning to the center, where the light streams into the museum as they move up the floors. In the same vein, in a course, students need to continuously keep in mind the central concepts of a course under the instructor's guidance. Creating a short video highlighting the learning outcomes can help all students, especially those who may be first-generation, to understand these learning goals often hidden in the long legal document that is the syllabus (Fuentez, Zelaya & Madsen, 2020).

Learning online takes more time than face-to-face learning (Nilson et al., 2018), so we need to be critically aware of the course's cognitive, interpersonal, and intrapersonal learning goals. As instructors make critical decisions about learning materials, activities and assessments, they need to articulate the key learning concepts at the center of the course. These key concepts are *the big ideas* or *enduring understandings* (Wiggins & Michtighe, 2005) that students will remember after the course. They are the conceptual understandings of the content area. Skills acquired in a course requiring deeper thinking, problem-solving and academic skill development are priorities in a knowledge-based economy where the shelf life of knowledge becomes shorter each year. These are ideas that students will retain for life and apply to other courses and other content. Instructor-designers need to keep these key core learning outcomes at the center of course design decision-making.

Here is an example of the key concepts from a Social Justice in Education course (Figure 1). Readings, activities, discussions and assignments need to link to these concepts, and instructors can help by bringing students back to them in a straightforward way, much like the design of the Guggenheim.

Figure 1.

Key concepts' Big Ideas' in a Social Justice in Education Course

1. Human rights.
2. Educational inequality and social inequality.
3. Individual identity and group identity: social identity theory.
4. Critical pedagogy, Hegemony, and Alternative ways of knowing.

5. Agency, responsibility and empowerment.

Once the instructor determines the course's key concepts relative to the course description, the next step is to create student learning outcomes that align with the program's learning outcomes. If, for example, an essential course concept is human rights, then the instructor looks to see how that matches the program and degree outcomes. Another way of saying this is, "What is learned in this course leads to growth in the program and the degree." Helping students understand this helps them see that everything in the course is linked to the program degree or certificate. Clarifying this alignment shows students that each activity or reading has a purpose. It also gives students a clear idea about what they are expected to know, value, and do by the end of the course. The course learning outcomes are also the basis for assessing student learning.

Generally, three to five learning outcomes are reasonable for a 3-credit course. Within the course design, each course element should connect to the learning outcomes explicitly. The table below provides a planning model that an instructor can use. If the learning outcomes are aligned with all aspects of the course, this helps students focus and understand the purpose behind the readings, the learning activities and the assignments. A sample plan to articulate alignment is shown in Figure 2.

Figure 2.

Sample Learning Activity Chart

	Learning Activities	Readings	Assessment task(s)
Learning objective #1			
Learning objective #2			

Note that each of these key learning objectives may have several activities and readings associated with their development.

The syllabus should provide a clear statement of commitment to EDID at the outset (citation). The statement alone is insufficient without deliberate and specific design elements to structure the learning for all students. Here is the statement from a Serious Games and Simulations course which includes a faculty statement and a course-specific statement:

In keeping with the university's values statement, which underscores our commitment to honesty, inclusivity, and equity, the Faculty of Education is committed to acknowledging and addressing the multiple ways in which hegemonic perspectives have shaped course content and privileged some learners over others. To that end, we strive to ensure that the courses in all of our programs include opportunities to engage with themes related to inequity and marginalization in Education.

In Serious Games and Simulations, this will include:

- multiple strategies for learning new content,
- examining the representations of other cultures in games and simulations (or the lack of),
- multiple ways of demonstrating learning, and
- creating class norms and routines to support all learners.

The concept of alignment in course structure is associated with deeper learning (MacPhail, 2021). It helps if the instructor can articulate the key concepts in a course before instruction and then build understanding, application and reflection on these key concepts through the readings, learning activities and assessments. During instruction, students need to be able to connect knowledge about these concepts and the *know-how* –

or how to apply these concepts (MacPhail, 2021). Enduring understandings or big ideas (Wiggins & McTighe, 2005) are those concepts that can transfer easily to other contexts and subjects. Students can also be supported in learning to transfer knowledge and skills to new contexts (Fisher et al., 2020).

3. DESIGN THE COURSE ECOSYSTEM

Students need to be engaged so that their learning is memorable. Deeper learning is significant learning that students remember and apply in their life. A lecture where students passively receive information does not allow them to actively engage with the content or discuss it with other students. Social e-readers (such as PerusAll) allow students to interact with the text and their peers' comments and questions to co-construct deeper understandings. Instructors can discuss these comments in class. Another strategy is to provide a guide for reading and ask students to complete it before class. These types of strategies encourage student engagement.

Increasing the level of the course structure in this way has the effect of increasing the perceived value of the course (Eddy et al., 2014), but course structure should not be confused with teacher presence. Instructors vary in the degree of teacher presence that they provide in courses. In some courses, the instructor is a facilitator guiding the students from the side. This facilitation stance allows students to problem-solve and engage in academic discourse with instructor support.

Before class: In the flipped classroom model, the information and readings are given to students ahead of the class. Students prepare for class by watching videos (with closed captioning), analyzing readings and completing assignments. Including closed captioning in videos assures that the material is accessible to diverse learners. When they come to the full-group class, they are more prepared for discussion or in-class activities.

In the flipped classroom, the instructor spends less time providing information and class time can be dedicated to applying the knowledge and evaluating it through collegial, academic discussion. The application can take many forms, such as problem-solving or responding to multiple-choice questions and discussing responses. Hogan and Eddy (2014) found that moving the information transmission to before class freed up 34.5% more time for reinforcing major concepts, higher-order thinking and study skills.

There are multiple EDID advantages to providing the content before the course. First, students who need more time to understand the material can better prepare for the course. Secondly, research has shown that engaging students in preparing for the course in advance of the course promotes academic achievement and is significantly helpful for first-generation post-secondary students (Eddy & Hogan, 2014).

A word about readings – the online world has provided us with an overabundance of readings. After assuring that there is a tight alignment between readings and the course learning outcomes, focus on the reading comprehension level of the students. We also recommend offering pre-class preparation in various formats, including readings, videos, activities, and serious games. Tools such as PerusAll will also read compatible pdfs aloud.

Additionally, our LMS contains videos on using free text-to-speech tools such as Google Read and Write to read web materials and texts. Instructors and designers must also be cognisant of the reading load (amount, complexity and relevance) of readings included in courses. The ease in which readings can be included or assigned in an online course and just-in-time references may lead to a state of overload where excess references and resources can overwhelm even the academically competent student. Thus, we suggest instructional designers be aware of the potential for *content creep*.

Online learning environments offer opportunities for purposeful design to include visualization of crucial concepts and ideas in any design process. Numerous programs allow instructors and designers to create visualizations of key concepts which help to link and represent diverse connections between concepts and ideas in a manner from which visual learners can draw meaning. Content creation tools allow for drawing, expressing ideas, using colour and adding shapes as well as brainstorming ideas to assist in reducing complexity while increasing interconnectedness of knowledge with theory. Some processes are better represented through graphic depictions. More recently, graphing software can imbed other modalities such as video, audio and hyperlinks to create a rich hyperlinked learning environment for students to explore. As these tools become more user-friendly, instructors and designers can begin to revisit notions of relying upon the text as the primary learning resource online and explore newer learning concepts in what some have called multimedia learning theory (Mayer et al., 2005). Learning is enhanced through adding multimedia resources.

Since we do not know the backgrounds of all of our students, it goes without saying that if any of the reading materials or videos contain sensitive information, it is vital to provide trigger warnings before they read, view or listen to sensitive material.

Student-to-student discussion can happen either in the whole class format or in small groups during a class. In whole-class discussions, live transcription can help students process and understand language and follow the conversation. Encouraging speakers to use their cameras provides another information channel for students to read lips and facial expressions.

One strategy for an online class is to organize breakout rooms and a guided discussion. Accountability here is critical. Groups can post their collective findings on the discussion board in the LMS, or they can present their results from the small group discussion to the entire group as an exercise to consolidate the learning. Students can be engaged in activities leading toward a group assignment. One reminder is that not all students gain energy from the group setting (Eddy & Hogan, 2014), and they may need different amounts of time for individual meaning-making. For these reasons and others, encouraging students to choose a group and allowing some variation in group size is essential. Students may also suggest alternative ways to construct collective knowledge.

Everyone wants the course ecosystem to be student-friendly and safe. One easy way to ensure the online environment is safe is to ask questions that scaffold toward the key concepts but are open-ended. An example would be: "In your view, are the outcomes of schooling equally available to all populations? Why or why not? Can you draw on your experiences to help others understand this concept?" Questions like these do not have a single correct answer, but they allow the students and instructors to revisit the course's key concepts during discussion.

A second way to build more safety is not to assume that students have all the skills they need to succeed in a course. This false assumption may be especially true for first-generation students or students whose primary and secondary education did not encourage group work and collaboration. Students who have had mostly teacher-centric learning may not know how to work within a group in a way that promotes positive interdependence (Johnson et al., 1984). The development of interdependence in the course is helpful for first-generation students in higher education (Eddy & Hogan, 2014). Before assuming that students have group skills and know-how to contribute successfully, these skills may need to be developed or reviewed. Students may require additional information and guidance to take advantage of different learning activities. One way to build these skills is through a quick instructional video or initially structure the course format with supervised group discussions. In the orientation program to our fully-online BA in Educational Studies program, small groups analyze good resources for working collaboratively in an escape room format before the students need these skills in their classes.

One area where students tend to feel anxious is around assignments. Some anxiety can be relieved by providing a fulsome explanation of the assignment in the LMS accompanied by a quick video. It helps both the instructor and the students have a clear explanation of how the assignment will be assessed and how the assignment leads toward the learning outcomes of the course. Our students value the video descriptions of assignments.

4. PLAN FOR INTERACTION AND COLLABORATION

Freire (2018) was critical of courses where the instructor provides knowledge to the students without considering their prior experience. He called this the banking model of education, which does not consider the reality that students have diverse experiences and knowledge that they bring to courses. It is imperative to design learning activities where students interact and share knowledge.

As discussed in other chapters in this book, students in online courses work to build a social presence. Social presence online is supported through the visual and auditory affordances of the software and the users' interactions. Lombard and Ditton (1997) describe presence as the perceptual illusion of non-mediation – in other words, the perception that the computer-mediated environment is *real*. This sense of *real* can be enhanced by encouraging personalization and immediate feedback. Social presence, which is linked to presence, is defined by Garrison (2011) as “the ability of participants to identify with the group or course of study, communicate purposefully in a trusting environment and develop personal and affective relationships progressively by way of projecting their individual personalities” (p. 34).

In some cases, where the software allows for breakout rooms, the students in the breakout room will turn off their cameras and microphones and work in silence to write responses to discussion questions in a google app. This practice can be a *teachable moment* where the instructor can help students understand that social presence is crucial to deeper cognitive engagement, critical thinking, and student success. When students are not using cameras, the instructor can gently investigate this with them outside of class. In some cases, it can be a bandwidth issue or cost factors. There are other particular circumstances, such as the necessity to participate in class from the family kitchen or the need to combine child care and study. These cases reinforce the need for personalized approaches for individual students.

5. DISTRIBUTE AND SCAFFOLD STUDENT LEARNING

Readers of this chapter may be familiar with cramming – likely we have all tried this strategy at one point in our academic life- we waited until the last minute to cram material for an exam and hoped that we would be successful. Distributing learning is the opposite of this. It is a deliberate element of course design that encourages students to look at key concepts more than once. As Carpenter (2020) explains, distributed learning (also called the spacing effect) is a research finding that better learning occurs when the learning opportunities are spaced apart rather than happening close together. When learning is spaced apart, it is more likely to have the student's attention, which is more likely to be connected to different contextual cues. Distributed learning means that students spread out the time they spend on a concept with pre-reading activities, in-class assignments, and post-class reviews. This strategy helps students spread out their study time and directly impacts how well they perform in the course (Eddy & Hogan, 2014). One way to space out the learning process is to consider how long the information needs to be remembered. Retention for longer periods requires longer spacing in the course (Carpenter, 2020). Distributing the learning also allows the students to cycle back to the key concepts in a course frequently (or in a circular fashion like the Guggenheim experience).

Another way to scaffold and distribute learning is to design cumulative assignments in a course. For the first assignment, students provide their learning plan for the full assignment and have opportunities early in the course for rich, detailed feedback. This approach helps build a student's sense of safety that they are *on the right track*. The second assignment builds on the first, and the final assignment is a culmination of their learning in the course.

One of the affordances of information and communication technologies is the means to provide rich feedback in multiple formats, including digital handwritten annotations to assignments, text comments within a document/assignment, and video or voice feedback to assist students in exploring and completing assignments. Rich asynchronous feedback with synchronous discussions between the instructor and student that mimic the established *office hours* of old create an environment where instructor and students are engaged in a context of learning together and exploring in unison.

Another strategy to support diverse learners in online courses is to scaffold the use of new tools, not assuming that all students will be familiar with the features needed for the learning activity. As mentioned above, our students collaborate extensively in Google Drive, but we can't assume that all students know how to share and organize in this versatile tool. Students find links within the LMS to good how-to-sites helpful; the careful naming of these links can even raise awareness of features that the students did not know existed. Our online program also has started events where students share their favourite tools and how to use them.

Where critical thinking skills are essential, an *Analysis Guide* can support developing these skills. Similar to reading guides, these guides offer prompts to help focus student attention when undertaking activities such as playing serious games and simulations. The course learning outcome, "Actively participating in learning games and simulations and critically analyzing the experience," is challenging for education students without much experience with games. The Analysis Guide helps them apply concepts from readings and viewings to the games. As additional scaffolding, the analysis guides are first completed collaboratively before individuals are required to analyze independently.

6. UNIVERSAL DESIGN FOR LEARNING

Universal design is an approach that begins with the assumption that human diversity is ordinary and expected. It is a broad approach meant to support all learners. Although some have viewed it as accommodation for certain learners, UDL is more appropriately viewed as a design that helps all students. For example, recording the slides for a course in advance allows all of the students to see what is coming up in the next week or module, but it is especially helpful for those students who need more time to process and prepare for the lesson. Universal design considers students' needs and nurtures creativity, collaboration and divergent approaches to learning.

Dalgarno (2014) connects the polysynchronous affordances in online learning with deeper student engagement. While earlier models of online learning did not allow opportunities for real-time collaboration, the advances of technology now make it possible to share dialogue, images and video in real-time and make new pedagogical approaches possible. Newer affordances also allow students to participate in multiple communication channels (such as a chat feature to ask clarifying questions without disturbing the dialogue). Polling tools and games (e.g., Socrative) allow instructors to check for misconceptions as they emerge. Apps like Google's G-Suite enable students to collaborate in real-time or asynchronously. There are also, as Dalgarno explains, quasi-synchronous forms of chat such as WhatsApp, which would allow participants to respond right away or with a short delay. Innovation continues unabated! As the software and hardware for virtual

reality become more affordable, new spaces for collaboration and the development of social presence are emerging (Robertson et al., 2022). New technology affordances provide innovative avenues for implementing UDL. UDL is best approached by the instructor asking some key questions. Here are some examples:

1. How do I, as an instructor, provide multiple means of representation of the information to students? How do I provide for students' different levels of language ability? Can I present the information using other modalities (e.g., audio and visual)? How can I show patterns in the course design, such as highlighting the big ideas and key concepts?
2. How do I provide students with multiple means for action and expression of their learning in the course? Do I encourage students to respond in different ways to assignments? How do I support students in setting goals, planning and managing their time?
3. How does my course provide multiple means of engagement? Have I considered that students have different interests and different attention spans? Do students have opportunities to connect their learning to real-life and real work to build relevance? How can I structure the course to foster collaboration?

Ultimately, UDL is about designing a course or a program that uses the space and the technology affordances to promote student security and safety. Ideally, attention to UDL will provide students with the ultimate flexibility in accessing and demonstrating their learning. For expanded insights, feel free to visit the UDL chapter.

7. STRUCTURE IN ACCOUNTABILITY

Eddy and Hogan's (2014) research on course structure finds key linkages among structure, accountability and student success. When assignments outside of class time (preparing for class) are moderately structured, student performance is positively impacted. Increasing the course structure helps students to view the course more as a community, and as a result, they take more risks to solve problems and challenges. The design of assignments outside of class (such as providing a guide for a reading) results in more students doing the readings and moving into a knowledge acquisition stage. When students come to class prepared by the readings, they can better connect the readings and their experiences. Surprisingly, it can also impact how students value the course (Eddy & Hogan, 2014). An interesting finding from the implementation of increased course structure was that when students increased how much time they prepared for the course each week (4-7 hours), they tended to view the preparatory assignments as necessary.

8. REFLECT FOR CONTINUOUS IMPROVEMENT

Likely everyone reading this chapter has had the experience of teaching the same course twice in the same semester to different groups of students. These opportunities to teach the same material to different cohorts allow for just-in-time reflection regarding what worked and didn't work. Even if you don't teach two cohorts in a semester, courses seem to run more smoothly the second and subsequent times you teach them. This improvement comes through a process of continuous reflection and continuous improvement.

The reflective process can be supported by seeking student feedback during the course in safe and anonymous ways. It helps keep the questions focused on the course structure and what is working (or not) for them. Students are individuals, and their needs differ. Some prefer quiet study to speaking in front of the class or group. Others rely on live transcription of videos or posted transcriptions and videos of synchronous courses. Still, other learners want their learning to be connected to what they view and hear online and how they learn in their out-of-school practices. It can be challenging for instructors today to structure courses to meet these diverse needs.

Our goal in designing this chapter was to provide readers with suggested *tried and true* strategies to address challenges with course structure and organization. We conclude with two activities that readers may want to try with their classes.

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Course Outlines in Online Learning

JIA LI

INTRODUCTION

Developing an effective course outline is critical to designing any course and for online courses in particular. The course outline helps teachers develop a structured curriculum including instructional strategies and material while guiding students' expectations about learning outcomes and workload. A typical outline encompasses the following

- the overarching targets of the course,
- a timetable of lesson plans; objectives,
- classroom and home learning activities, and
- assignments that are in line with the expected learning outcomes.

There are myriad issues involved in course outline development. This chapter will focus on a few critical aspects of online course outlines leading to higher student engagement and learning outcomes.

The design of a course outline should enable teachers to teach and students to learn effectively by nurturing a community of inquiry (Garrison, 2011) and promoting deep learning (Fullan, 2013). Both goals require a social, cognitive, and teaching presence, high quality and meaningful collaboration, and communication so that students can learn subject content knowledge and skills in a holistic educational environment (Huang & Kinshuk, 2012). In addition, a good course outline can encourage a strong sense of citizenship and character, stimulate creativity and promote critical thinking skills (Garrison, 2011; Fullan, 2013).

Designing a course outline may be easier for in-person learning, given the setting's advantages in building an interactive and constructive learning environment with a teacher's personal touch and attention to individual students. While I am optimistic that future technology, such as Augmented and Virtual Reality, may project life-sized students and teachers in 3D, enabling us to teach and learn as we would in a physical classroom. The limitations of current online instructional platforms cannot support some pedagogical strategies implemented in the physical classroom. In other words, many effective strategies in face-to-face instruction are not transferable to online settings. Therefore, we need to develop innovative pedagogical approaches when designing online courses to bridge these gaps.

I have been teaching online courses with synchronous and asynchronous platforms in Zoom, Adobe Connect, Knowledge Forum, Blackboard and Canvas for 12 years. This chapter pinpoints a few key issues in online course design for graduate and undergraduate students. Many of the basic principles could also apply to secondary school classrooms. The following section explains several principles underlying my design philosophy and my rationale based on evidence-based teaching and learning theories.

GENERAL GUIDELINES

Instructors have often heard student feedback about online course(s), such as:

- there was not enough involvement,
- my teacher was not quite there — I was mostly left on my own,
- I could not present myself well online, and
- I cannot learn much from my peers in online classes.

These diverse comments illustrate the significant challenges in developing online courses: creating a good social presence, focusing on cognitive engagement, and providing students with a rewarding, seamless learning experience. Based on three teaching and theoretical learning models, I will describe my approaches to address these challenges.

- **Social presence and community.** To engage students effectively throughout the term based on authentic learning (Lombardi, 2007), design your online course to bring a strong social presence to the learning community (Garrison, 2016). This approach can include the following elements:
 - Engaging students' lived experiences to stimulate their intrinsic learning motivation (Fitzsimmons & Lanphar, 2011).
 - Focusing on real-world problems to enable student-centred learning, inspiring open-ended inquiries by examining and referencing multiple resources, and developing critical thinking skills (Callison & Lamb, 2004).
 - Developing authentic group learning activities to provide students with collaborative opportunities to gain a constructive learning experience (Herrington et al., 2003, Rule, 2006).
- **Cognitive presence.** To direct students' attention to learning-centred activities with sustained, meaningful engagement—cognitive presence (Garrison, 2016) — a few strategies can help to enhance deep learning (Fullan, 2013):
 - A well-structured course syllabus includes lesson units that outline their objectives and explicit expectations for each learning activity and assignment.
 - A learning infrastructure is created through instructor and faculty guest lectures, plus presentations by student groups and individuals. In this way, students are exposed to diverse perspectives and the academic skills necessary to analyze, interpret, and organize content. This infrastructure enables them to reflect on their understanding, convey their ideas, and develop relevant skills.
 - A community of inquiry is built through teacher modelling of constructive feedback and opportunities for student collaboration in learning tasks and completing assignments.
- **Engagement.** To sustain high-quality student engagement, design learning activities and assignments to balance challenges with the cognitive load of the tasks and students' background knowl-

edge, skills and prior experiences, also known as *schemata* (Samuels, 2013). When designing your outline, minimize intrinsic and extraneous cognitive load and maximize germane cognitive load (Paas et al., 2003). Strategies to address cognitive load include:

- Provide step-by-step instruction for incremental learning growth to decrease intrinsic cognitive load—the inherent difficulty of complex academic skills. For example, in an academic or professional online writing course, we may teach students paraphrasing skills using a reading-to-write procedure, providing effective writing techniques to avoid patchwriting (Li & Mak, 2022).
- Multimedia learning materials are provided mainly for the introduction of content. Videos help students to develop initial interest in content, decreasing their intrinsic and extraneous cognitive load and enabling them to ease into complex learning materials and make connections with prior knowledge (Mayer & Moreno, 2003).
- A disciplined approach to course content development is critical to avoid overburdening students and enhance their confidence in and appreciation of the online course while establishing a proper level of cognitive puzzlement to challenge students. The course outline should include a clear description of required readings and assignments that students can complete to satisfy the course requirement. The learning resources presented in the course outline, whether in text, audio, or video, should be well-organized by learning module or weekly theme, with explicit annotation. Therefore, while providing students with rich resources to learn, we also have to filter out irrelevant information and repetition (Levitin, 2014) to reduce students' extraneous cognitive load.
- Using case studies and integrating personal and professional experiences to make real-world connections are effective ways to help students develop an in-depth understanding of new knowledge through making connections with their schemata—germane cognitive load. This type of mental effort can help students achieve long-term retention of newly learned knowledge and skills (Paas et al., 2003).
- Research has also reported that students' long-term memory can benefit from the project- and problem-based inquires (Wilder, 2015) and experiential learning activities (Bohon et al., 2017). These activities, which provide students with opportunities to gather original data and information, exercise their judgement, and make choices, often make a more profound cognitive imprint, and develop high levels of cognitive skills, such as synthesizing and analyzing.

ACTIVITIES

ACTIVITY 1: VIRTUAL FIRESIDE CHATS

Overview

The course covers instruction in certain types of professional writing during the term, such as narrative, academic persuasive and expository writing, news stories, features, commentaries, business reports, technical reports, and content writing. To help students gain an in-depth understanding of the characteristics, conventions, and readership awareness of different types of professional writing, I invite writers who are experienced in various fields to develop case studies using multimodal content relevant to students' lived experiences. This approach includes a series of one-hour virtual fireside chats with each writer, hosted by

two student volunteers interested in the writer's field. A week before a conversation, an introduction to the specific type of professional writing is provided to students, who are required to examine the corresponding case study and a couple of sample works by the writer.

- These video-recorded fireside chats take place via teleconferencing using Adobe Connect or Zoom.
- Students host the interviews with questions proposed by the class and the writers.

Description

Below, I provide a sample of a virtual fireside chat for the lesson unit on journalism writing to describe this activity in detail. After reviewing the case studies, many students expressed an interest in journalism writing,

The virtual chat started with the guest's introduction, including reviewing their career and involvement in other forms of writing (literary translation and history), followed by an extensive Q and A and an open conversation with the whole class. Some sample questions included:

1. What is journalism; what are the main characteristics of a *journalistic writing style*?
2. How did the journalistic style evolve?
3. Why is it beneficial to learn how to write this way?
4. How did you get involved in journalism?
5. Can you give us some examples of the role journalism plays in society?
6. How has the IT revolution affected journalism, and what are the implications for the future?
7. Do you have any final words of advice?

Fireside chats created an excellent learning experience, and the class embraced the activity. Conversation with an experienced journalist, which included understanding his journey in becoming a professional journalist, brought a more robust social, cognitive, and teaching presence to the class (Garrison, 2011). Students were provided with an intimate venue to learn about the critical aspects of different types of journalism writing (i.e., news, feature, and commentary). Student feedback on this activity was highly positive; they reported that gaining practical knowledge about journalism writing conventions from an experienced journalist in a relaxing, communicative environment was very helpful (Mayer & Moreno, 2003). The interactions occurred during the chat among the guest, students, instructor and teaching assistants via video conferencing and texting messages. The discussions involved their shared lived experience in real-world issues (Callison & Lamb, 2004; Fitzsimmons & Lanphar, 2011), for example, the impact of the Covid pandemic on higher education.

In addition, the fireside conversation between an experienced writer and students can benefit students' significantly in the following aspects:

- This chat created many powerful, deep learning moments that promoted citizenship, character, and critical thinking (Fullan, 2013). It nurtured students' interest, passion, and understanding about journalism through Edwards' recounting of interesting vignettes during his career as a professional journalist. Students gained an understanding that a true journalist assumes a strong sense of social responsibility to the community, which requires strength and perseverance in often challenging circumstances to seek truth and reflect critically on current affairs.
- This activity facilitated collective inquiry by the class (Garrison, 2011). The interactions delivered a strong social and cognitive presence to the valuable, enjoyable teaching space through video conferencing and text messages between Edwards and the class and peers. Students gained a better

understanding of the conventions of journalism writing, including readership awareness and editors' expectations, which are difficult to grasp for university students who do not have experience as journalist interns.

- The discussions about why what, and how we write dissected the complex writing process and related complex and abstract concepts (Paas et al., 2003). Many aspects of the chat, similar to the thinking-aloud techniques used in writing research to contextualize writing goals and analyze writing strategies, had the potential to enhance students' writing skills.

Possible Challenges

Particular challenges might arise when completing this kind of activity, but can be overcome with proper preparation and instructional strategies as described below:

Challenge 1: Students may not complete the required learning materials before the chat. **Instructional strategies include:**

- The teacher can start a thread of asynchronous discussion as a small assignment and ask students to post their questions to the guest writer, focusing on his works and specific questions on the topic.
- A week before the chat, the teacher can organize small group discussions in class that focus on the professional writer's work and specific genres.

Challenge 2: Students may hesitate to ask the writer critical questions or follow up with further questions that lead to deep learning. **Instructional strategies include:**

- Before the chat, teachers can encourage their students to ask questions and assure them that any question is good.
- Teachers can model how to ask sincere and critical questions and craft an open question to lead to a productive conversation.
- Teachers can help the students who will host the chat to organize the questions they collect from the class and coach them with creative interview techniques to build a cordial and collaborative learning environment during the fireside chat.

Resources

We used open multimedia resources and three video clips to develop case studies to teach students journalism writing in three genres (news, feature, and commentary):

- Bianca Andreescu Defeats Serena Williams to Win US Open 2019 [2:41].
- Why the House is moving so quickly on Trump impeachment inquiry | PBS NewsHour [8:30].
- Sea, ice, snow ... it's all changing': Inuit struggle with warming world | Canada | The Guardian.

ACTIVITY 2: DESCRIPTIVE ACTIVITY

Overview

While most students appear to be competent in creative/narrative writing—the genre most innate to our communication nature—many struggle with the academic writing required for university and college assignments. Research has shown writing skills between these two types of writing are transferable. Thus, the first-course assignment asked students to write a narrative story on a topic of their choice, either fiction or non-fiction, based on their personal experience or imagination. The students well-received this activity. It boosted much-needed confidence in their writing and helped them identify the strengths and weaknesses in their general writing ability.

Description

This activity (assignment) required each student to write an 800–1000-word narrative essay that told a story and made a point that would impact an audience. Students could write a personal narrative story based on their own experience, other people's experience, observation of others, or a fictional narrative story based on their imagination. Before the assignment, I introduced students to well-known Canadian writers and short fiction and non-fiction narrative writing samples. These included annotated stories, such as "The Diamond Necklace." The instructions for writing both fictional and non-fictional narrative stories were posted on Canvas, in addition to narrative stories written by the instructor and teaching assistant: "Grandmother," "Poor John," and "The Night of the Eagle." In a class meeting, I provided students with detailed instructions about the content and structure of a narrative story and important writing tips. This approach of contextualizing instruction by using creative narrative writing was effective in engaging students in learning writing skills in the following ways:

- **First**, having students write a narrative story and comparing its differences from academic (expository or persuasive) writing served as a springboard for them to perceive the writing course in a different light—interesting and fun. The process enhanced students' motivation to learn writing and confidence in mastering academic writing skills (Fitzsimmons & Lanphar, 2011).

The students reported that they enjoyed the course and considered it a great learning experience. Students' feedback reflected the enjoyment in an anonymous survey collected by the university at the end of the term: "This is a great course... I find this course also helps me improve my writing for other courses." "The course itself gave me the opportunity to be a strong writer, which I haven't realized."

- **Second**, students learned about their writing strengths. They could connect what they knew better—narrative writing—and what they needed to learn—academic writing. They were able to distinguish the characteristics of academic writing from a comparative perspective (Paas et al., 2003). One student said, "I can actually enjoy writing, even writing for schoolwork, after your feedback pointing out the connections between my story and the papers other profs assigned."
- **Third**, through this assignment, the instructor and teaching assistant got to know students individually, which helped to customize instruction to be relevant to each student.
- **Finally**, students demonstrated a more substantial commitment to learning and writing practice during the term. They improved more than previous student cohorts who did not have access to this assignment and its related learning activities.

Possible Challenges

Challenge 1: Students have difficulties differentiating fiction and non-fiction narrative works. Instructional strategies:

- I provided instruction in class and analyzed writing samples of fiction and non-fiction narrative stories. The characteristics of both types of narrative writing were also posted in Canvas.
- Some samples of fiction and non-fiction narrative stories were also annotated and posted in Canvas.

Challenge 2: Some students tended to write narratives in a book-keeping manner and failed to convey a message or create a powerful emotional effect. Instructional strategies:

- Before the assignment, student group discussions can be organized to respond to these questions: How do you feel after reading the story, for example, “The Diamond Necklace”? Why do you feel this way? What is the meaning behind the story, or what does the author want to tell us? How does the author achieve this effect and deliver his message? These discussions, along with the instructor’s feedback, can be effective in helping students explore deeper and focus on exciting and meaningful ideas. They can hone the relevant writing skills from the sample writings.
- During a narrative writing workshop, the instructor can discuss the assignment with individual students and brainstorm ideas that help them describe interesting characters, incidents, and settings within tense plots. These qualities work together to create a powerful emotional impact and convey a solid message to readers.

Resources

- Escaped_annotated.docx
- The Diamond Necklace_annotated.docx

GENERAL RESOURCES

- Designing an Online Course: Numerous tips on designing an online course.
- Designing Online Learning – University of Toronto: A systematic approach to designing an online course with many resources.
- Sample Course Outlines
 - Sample Outline 1: Advanced Research Methods [Doc.].
 - Sample Outline 2: Analysis and Design of Web-Based Learning Tools [Doc.].
 - Sample Outline 3: Technology and the Curriculum [Doc.].
 - Sample Outline 4: Fundamentals of Professional Writing [Doc.].

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Pre-Course Activities for Online Learning

ROBIN H. KAY

INTRODUCTION

None of the 15 books I consulted focusing on online learning emphasized or suggested the practice of engaging in pre-course activities. However, considerable research indicates that pre-course activities can significantly improve the quality of the learning experience (Edwards, 2012; Gay, 2016; Gesielt, 2016; Ma, 2020; Perkins, 2010). Many students, especially those new to online learning, benefit from pre-course information to reduce anxiety. I have found pre-course activities and information helpful for at least ten reasons.

1. **Intro Video.** An instructor video introduction helps build teacher presence early (Garrison, 2011).
2. **Overview video.** A short course overview video helps students understand the big picture of a course.
3. **Course outline.** Making the course outline available before class starts offers a detailed understanding of a course.
4. **Review assessment.** Asking students to review how they will be assessed (e.g., assignments and/or tests), especially when I add video descriptions, saves considerable time in the first class. Instead of walking through each assessment, we can focus on learning.
5. **Background survey.** With a background survey, I can gauge student interests, address their individual needs, and build social presence and community (Garrison, 2011).
6. **Previous knowledge survey.** With this survey, I can prepare for and adjust learning outcomes and strategies to improve cognitive presence (Bransford, 2000; Garrison, 2011) and stimulate critical thinking (Fullan, 2013).
7. **Learning outcomes survey.** In this step, I ask students what they wish to learn in the course. I can then adjust learning goals to meet the community's needs, thereby building social and teaching presence (Garrison, 2011).
8. A **technology survey** can ensure that students have the right technology and software to be successful.
9. **LMS tutorial video.** A series of short videos showing students how to use the Learning Management System (LMS) can reduce cognitive load (Pass et al., 2003) before starting a course. Instead of being overwhelmed by how to use the LMS, they can focus on learning.
10. **Content/procedure videos.** Providing students with a playlist of content or procedure videos to

support learning helps students plan. It can also develop teacher presence (Garrison, 2011) if the instructor creates the videos and reassures students that scaffolding is available (Vygotsky, 1978).

GENERAL GUIDELINES

I offer ten suggestions to develop valuable pre-course materials or activities for online learning courses.

- **Instructor Introduction.** Online courses, particularly if they are asynchronous, can be impersonal. Creating a video, infographic, or written introduction helps students understand who the teacher is. I prefer video introductions as they convey more information.
- **Course Introduction.** Creating a big picture video of a course is an excellent idea to help students understand what they will be learning and whether they want to take the course (if they have a choice). Adding information about how typical class runs helps reduce anxiety, especially for students who have never learned online.
- **Course Outline.** Providing a clear course outline (see Course Outline chapter) helps students acquire a detailed understanding of a course. Adding a scavenger hunt (e.g., filling in a Google form) would likely engage students more and ensure that they reviewed essential information.
- **Assessment.** Most students are anxious about evaluations and want to know how they will be assessed in a course. Providing a clear description of all assessments (I include a video description), associated learning outcomes, their value, and due dates help students (a) understand what is expected and (b) make an informed choice about whether they wish to take a course.
- **Background Survey.** Asking students to fill in a background information form is especially helpful for addressing individual needs. For example, in my Master of Education class, I ask students their primary area of focus (e.g., Elementary, Middle, or Secondary School) to create viable learning groups and maximize flexibility in assessment and instruction. I also ask students about their strengths and areas of growth. Ask anything that might be relevant to student success.
- **Knowledge Survey.** In certain courses (e.g. statistics, math, science), I send out a pre-course survey to understand what students know and areas I may need to review, especially in the first few weeks.
- **Learning Outcomes Survey.** Most courses have pre-set general learning outcomes. However, some flexibility may exist regarding the details. Surveying students about their learning expectations in a course is a great way to customize general learning goals to meet their needs. Additionally, students feel that they are involved and control their learning.
- **Technology Check.** Sending out a checklist of technology requirements is essential to effective participation in a course. If a student does not have the right technology or software, the first week can be stressful. Spending substantial time working through individual student technical issues is not ideal for starting a course. If you are using any specialized software or apps (e.g., a wiki, a blog site, webpage creator), you can invite students to practice with these tools before class begins.
- **Learning Management System (LMS).** Like technology, it is wise to send information and perhaps simple support videos to ensure students know where to go and how to access essential learning materials for the course. Preparing students ahead of time helps them focus on learning in the first class, not administrative issues.
- **Support Material.** When teaching online, many teachers use videos to support learning. I like to create a playlist and share it with the students. Even if I have not made all the videos, students quickly get a sense of content, my teaching approach, and my willingness to offer support.

ACTIVITIES

ACTIVITY 1: BACKGROUND SURVEY

Overview

Understanding students' interests, goals, and background is essential to designing a meaningful, robust online course. For example, I like to group students with similar teaching backgrounds for certain activities in my courses. Having this teaching background information ahead of time helps me create more purposeful and effective breakout room activities.

Description

To conduct a background survey, identify critical information that will help design and run the online classroom. Send out this survey using Google Forms or another simple survey tool. Alternatively, I have tried another approach that worked particularly well with my higher education students.

- I used a shared Google Sheet where every student can add their information AND see the response from other students.
- I try not to ask personal questions so no one would feel embarrassed, and I leave the option of not responding.
- Here are the key questions I ask students:
 - Name
 - Area of Focus/Expertise
 - One or two passions/interests
 - Main strengths
 - Areas for growth.

With this approach, the teacher and students get a sense of the entire learning community. Sometimes we go over this information in the first class to help build a social presence.

Possible Challenges

The main challenge for conducting a background survey is selecting the right questions based on specific course content and the student population. You would likely ask different questions for secondary school than you would for higher education students. Balancing questions that bring out the community's personality and aren't too revealing is tricky. Using a survey helps reduce this risk because the information gathered is only known to the instructor.

ACTIVITY 2: KNOWLEDGE SURVEY

Overview

Understanding how much your students know before a course helps adjust learning outcomes and teaching approaches. It is best not to assume that all students have the same knowledge base because you will have to modify your teaching on the fly. A pre-course knowledge survey helps (a) focus on required per-course knowledge and (b) ascertain whether students have this knowledge. You may even send this survey well ahead of time, with instructional resources to guide and support less-knowledgeable students.

Description

I follow four steps to develop a prerequisite knowledge survey:

1. **Reflect on the key concepts** and learning goals in a course and the essential pre-knowledge required to succeed.
2. **Itemize this list, create a survey and send it to students.** If possible, send this survey out well ahead of time. You could also send a diagnostic quiz to assess prerequisite knowledge.
3. **Summarize responses** and identify areas of weakness.
4. **Focus on prerequisite areas in the first few weeks** (in-class or as home activities) or send support videos for students to review

Possible Challenges

The biggest challenge could be knowing the course subject area well enough to understand the requisite knowledge required by students to succeed. Some courses may not have a straightforward solution to this challenge, so instructors will be stuck with a trial and error approach. A second challenge might be not having enough time to address students' knowledge gaps. I would suggest that support videos could be beneficial, but students will be required to look at them early in a course or fall behind quickly.

ACTIVITY 3: LEARNING OUTCOMES SURVEY

Overview

Most secondary school and higher education courses include pre-established learning goals, often articulated in a general format. The specific sub-goals and learning activities selected to reach the broad learning outcomes are more flexible. Based on the description, one community-building exercise is to send a pre-course survey asking students what they would like to learn in the course. Collecting student responses and explicitly including them in the course overview helps students feel control over their learning.

Description

Creating a Learning Outcomes Survey is relatively simple. Include the course title and course description and ask students what they would like to learn in the course. Organize the list of specific learning goals identified by students and integrate them with the general learning outcomes. That way, students will see their input incorporated into the course. Some student-identified learning goals may not follow within the purview of the

course. Explain to students that while you will not be pursuing these specific learning outcomes as a class, they could pursue these goals through independent study or extensions of their assignments. In summary, gathering desired learning goals helps students feel part of a learning community.

ACTIVITY 4: TECHNOLOGY CHECK

Overview

Students and instructors need the right technology to participate in an online course. If they have a poor internet connection, a small monitor, and/or a poor microphone, they will not fully participate in a virtual classroom. Moreover, students with technology challenges during class will slow down learning for the entire class – I've seen it happen many times. Sending out a required technology checklist before the first class is a good preemptive step to ensure a smooth start to the course.

Description

Determining the right technology and software on the technology/software checklist will partially depend on the course content, but here are a few good starting items to consider.

- **Internet Speed.** Focus on bandwidth here – Download and upload speed. Download speed is how fast information (e.g., videos, images and text) is loaded onto a computer when you click a link. As of 2022, I recommend at least 50 Mbps per person in your house. If you are going wireless (which most people do), you could be competing with others in your household.
- **Microphone.** There are several good headsets out there ranging from CAD\$30 to \$125 (I'm sure you could pay more. Logitech is a brand that has worked well for me with a \$30 to \$60 price tag. If you want to sound like a radio announcer, Plantronics (\$100) is wonderful. If you do not like the clunky headphones-over-the-head- look, consider a Blue Snowball (CAD\$50) Yeti StandAlone microphone (CAD\$130). Another option is using a Mac computer, which is very expensive but has decent audio and video (but a small screen).
- **Webcam.** Usually, the webcam from a laptop will work well, but students need to ensure that it works.
- **Lighting.** Remind students that they require sufficient lighting, usually located in front of them so that others can see them.
- **Monitor.** While not essential, I would suggest at least one 27" monitor. That will allow students to open multiple screens during class. That said, a relatively large laptop screen will suffice.
- **Mouse.** If students have a laptop, I strongly suggest purchasing a wireless mouse for efficiency and agility.
- **Google Tools.** Students need to sign up for a Gmail account to have access to the Google Workspace tools (e.g., Google Drive, Google Docs, Google Sheets, Google Slides, Google Sites) is critical to the success of most well-run online courses. This set of tools is invaluable for collaborating inside and outside the virtual classroom.
- **Screen Recording Software.** Students will likely need a software tool for creating videos. Screencast-O-Matic, Snagit for Education, Screencastify, and Quicktime are good options.

GENERAL RESOURCES

- 10 Steps to Create The Perfect Teacher Introduction Video: Clear guidelines to help you create a solid introduction video.
- Create a Get to Know You Student Survey (University of Guelph): A good base for creating a pre-course survey
- Distance Learning Survey for Students: Tips & Examples: A good set of ideas to build your pre-course Technology Check Survey.
- Helping All Learners: Readiness: Good general guidelines for addressing student readiness for learning.
- Online Learning Readiness Questionnaire for Students: A 30 item checklist for students to assess their online readiness – misses some areas, but a good starting point.

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Dr. Kay is currently the Dean of and a Full Professor in the Faculty of Education at Ontario Tech University in Oshawa, Canada. He has published over 160 articles, chapters, and conference papers in pedagogy, technology in education. He taught computer science, mathematics, learning and development, and educational technology for over 25 years at the high school, college, undergraduate, and graduate levels. Current projects include research on laptop use in higher education, BYOD in K-12 education, web-based learning tools, e-learning and blended learning in secondary and higher education, video podcasts, scale development, emotions and the use of computers, the impact of social media tools in education, and factors that influence how students learn with technology. Dr. Kay received his M.A. in Computer Applications in Education at the University of Toronto and his Ph.D. in Cognitive Science (Educational Psychology) at the University of Toronto.

Ready, Set, Go - Your First Week Online

ROBIN H. KAY

INTRODUCTION

Your first week in an online course is critical to

- Establishing a community (social presence in Garrison, 2016),
- Creating a meaningful connection between you and your students (teaching presence in Garrison, 2016),
- Presenting a coherent *big picture* over of your course (cognitive presence in Garrison, 2016),
- Developing a culture of behaviour and collaboration (character, citizenship, communication in Quinn et al., 2019), and
- Engaging in at least one meaningful, creative, team activity (creativity and critical thinking in Fullan & Langworthy, 2013).

COMMUNITY

While we want to promote independent learning, we recognize collaboration's important role in learning. Creating a strong community helps students connect and engage with their peers (Conrad & Donaldson, 2004; Lehman & Conceicao, 2014) while providing emotional support when students are challenged (Veletsianos, 2020). Also, a community creates a foundation for deeper learning (Quinn et al., 2019; Savin-Baden, 2007), and sows the seeds for effective collaborative learning (Johnson & Johnson, 2009; Nilson & Goodson, 2018).

INSTRUCTOR-STUDENT CONNECTION

Garrison (2016), in an extensive review of the research, argued that teacher presence is essential to effective online learning; however, this does not mean that the teacher needs to be the star of the show. On the contrary, many online instructors are more effective when creating effective learning environments where students take a lead role in their learning (Boettcher & Conrad, 2021; Dabbagh et al., 2019; Savin-Baden, 2007). Furthermore, because there is a tendency to feel disconnected in an online environment, even if it is synchronous, teachers need to make an extra effort to convey their identity, credibility, and establish themselves as approachable, caring, accepting and supportive (Fisher et al., 2021; Johnson, 2013; Lemov, 2020).

BIG PICTURE

Understanding the *big picture* structure of any course is critical to communicating learning outcomes, articulating how concepts/themes might interact, and connecting the course framework to previous student knowledge (Arnold & Mihut, 2020; Hattie, 2012; McTighe & Thomas, 2003; Thomas & Rieth, 2011). The use of concept mapping, mind maps, advanced organizers and visualization is particularly effective at communicating the overall structure of any course (Hattie, 2015).

CLASSROOM CULTURE

Developing a clear set of rules for behaving, communicating, and collaborating early in an in-person or online learning environment is essential for creating a productive, thriving learning environment (Fisher et al., 2021; Lemov, 2020). Instructors new to online teaching and learning might not anticipate the distractions that can derail a class, such as inappropriate chat comments, not turning off microphones, turning the camera off and being absent from the room, and indecent background images. Therefore a set of classroom rules should be developed, ideally as a class, so that students understand the boundaries and expectations to support fruitful learning (Hattie, 2015; Lemov, 2020). In addition, a positive list of helpful behaviours can be identified, such as turning on cameras, raising a virtual hand when you wish to participate and engaging in effective listening.

LEARNING CULTURE

During your first class/week, introducing at least one creative activity in your online class that leads to critical thinking and evaluation helps set the norm for the rest of your course (Boettcher & Conrad, 2021; Dabbagh et al., 2019; Savin-Baden, 2007). Ideally, this activity should be interactive, collaborative and productive (Hattie, 2015; Johnson & Johnson, 2009; Nilson & Goodson, 2018). Throughout your course, you should employ a variety of learning activities (Boettcher & Conrad, 2021; Dabbagh et al., 2019) to maintain student interest and engagement, but you want to establish a strong culture of learning right from the start.

GENERAL GUIDELINES

Based on numerous articles and books on pedagogy and online learning, as well as over a decade teaching online virtual classes, I offer the following general guidelines or suggestions for starting your first class or week:

1. **Add at least 25% to your anticipated time for any activity.** Online teaching and learning simply take longer, and you don't want to create a rushed feeling in your class.
2. **Establishing a calm and friendly atmosphere** takes time, but you want to help anxious students relax. If there are problems with technology, stay calm and relaxed. That will help everyone relax. If you feel stressed and unsure, students will quickly recognize it.
3. **Come clean.** Tell your students if this is the first time you have taught online or are trying something new. Encourage a growth mindset and the idea of play and learning from mistakes.
4. **Greet students.** Just as you would in a face-to-face environment, greet students in a friendly way when they first enter your virtual classroom. Welcome them by name and ask them a fun question in the chat.
5. **Post an agenda** for students to understand your intentions and expectations. You may even wish to provide a more detailed lesson plan link to engage students who arrive early.

6. **Take time to establish community.** Make it your main priority, even if it takes more time than you had planned. Establishing solid connections will save you time in the long run.
7. **Introduce yourself in a personable way.** Students want to know that you are credible, but they also need to know that you are an actual human.
8. **Organization and planning are critical.** It is risky to *wing it* in an online class. Disorganization online is not pretty and not how you want to start a course. When something goes wrong, and it will, it can take quite a bit of time to get everyone back on track. Presenting the big picture, then communicating a clear idea of your lesson with estimated times will help you proceed more smoothly. Have a plan for the
9. **Consolidate your lesson.** Setting aside time after your first lesson/week to consolidate your class, communicate expectations for home activities and prepare students for the next class is essential for an online course. Online learning can feel disconnected for students, so you need to summarize and set clear expectations. Students like to know what to expect – what is coming next.
10. **Get feedback early.** After my first online course, I asked students for anonymous feedback to determine whether the class was effective. This simple act was instrumental and helpful in addressing any problems early on.
11. **Backup Plan.** Sometimes well-thought-out plans do not work because the technology fails, so it is crucial to have a backup plan. For example, you may want to articulate a contingency plan to your students if the internet connection drops: assign a co-host ahead of time lead the class while you are trying to re-connect, set up your phone so you can send an email to the students with directions, and have a careful lesson plan (see number 8 above) so that students could continue on their own without you. Your backup plans will vary depending on the course content and the age of your students.

ACTIVITIES

ACTIVITY 1: IDEAL TEACHER INTRODUCTIONS

Overview

I must admit that I struggle with personal introductions. I oscillate between communicating the credible, knowledgeable side and the more personable fun side. Based on numerous lukewarm introductions, I decided that credibility and fun are both important. I also realized that students could get to know me over time, so I did not have to oversell myself. Ultimately, online teaching is about my students and their learning, not about me.

Description

Ultimately, my goal is to communicate that I am credible, approachable, caring, accepting and supportive (Fisher et al., 2021; Johnson, 2013; Lemov, 2020). That is a big ask in an introduction. There are many creative ways to introduce yourself – I have chosen probably the least creative way, slides, simply to reduce the amount of class time focussed on me.

Credible Slide. I first present a slide on my teaching and academic background. Here is an example slide. In the slide, I include a professional-looking picture and some key background information that could change depending on the nature of the course. I also share my social media and website link if they want to learn more about me.

Fun Slide. I then present a fun slide on my interests and hobbies. Here is an example slide. This slide consists of engaging pictures that introduce a side of me that students are unlikely to know or expect. My experience is that students quite like this slide and are more engaged than they are on my credible slide. To be honest, I am more engaged too. Again, I take no longer than 1-3 minutes – my course is not about me!

Possible Challenges

You would think a simple introduction would be relatively easy to execute, but I managed to find a few challenges. Here are a few suggestions to address these challenges:

1. **Keep your introduction tight**, no longer than a minute. Otherwise, you risk losing your students right from the start.
2. **Visuals are better than words.** Keep text to a minimum. Visuals are much more engaging. No one wants to see a slide filled with words.
3. **Professional look.** Try to make your slide look professional – this is your credibility side.
4. **Add information links** if you feel it is beneficial. Link your appropriate online presence and allow students to check you out on their own time.
5. **Social Media links.** Be careful about sharing social media links, especially with secondary school students. Please, do not share personal social media accounts.
6. **Have fun with your fun slide [Doc.]**. I quite enjoy sharing the non-academic side of myself. Try not to get too carried away, as going off-script can erode student attention.

Resources

There are many creative ways to introduce yourself, but you need to consider your context and audience, their desire to get to know you, and the time you want to focus on yourself.

These teacher introduction resources are intended to stir up your curiosity.

- Fun Video Introduction Template [1:26]
- Getting to Know You: 7 Creative Ways to Introduce Yourself to Your New Class
- 27 Unique Ways Teachers Can Introduce Themselves to Their Students
- Why and How to Create a Self Introduction Video

ACTIVITY 2: ENGAGING STUDENT INTRODUCTIONS

Overview

Creating community and social presence is extremely important in forming the foundation of an online class (Conrad & Donaldson, 2004; Lehman & Conceicao, 2014). Organizing student introductions is an essential starting point to forming a solid community. There are several approaches you might take, depending on your student population.

If your students are in secondary school, they may not be receptive to formal introductions, so you may want to use ice breakers (see activity six below). Higher education students are typically older and want to know their peers, so the type of formal introduction I describe below could be more appropriate. Keep in mind that older students and adults like fun icebreakers as well.

Students of any age can easily create short, introductory videos using their phones, favourite screencasting software (e.g., Screencast-O-Matic), or FlipGrid. The multimedia introduction can be used in an asynchronous course or larger class where there is not enough time to introduce 60-150 students,

Once students start working together on collaborative activities or assignments, they will get to know each other better over time, naturally, provided you have set up a safe learning environment.

Description

The activity that I have used most often with 25 to 30 students is conducted in two formats. First, I post 3-4 questions for each student to answer. I provide a model answer to the question first, and then each student takes no more than a minute to introduce themselves. Sample questions might be:

1. Where are you connecting from today?
2. What do you do for a living (or outside of school)?
3. What are you passionate about?
4. What is a key strength that you bring to the classroom?
5. What is something you want to work on in this class?
6. What is the main reason for taking this course?

This activity takes 25 to 30 minutes, so I sometimes have students break out in smaller, more intimate groups of no more than four to discuss these same questions. I then give students 15 minutes in a breakout room to chat, and I rotate around the rooms to listen. The advantage of this activity is that we spend less time on passive introductions and students are more likely to turn their cameras on. The disadvantage is that we do not hear all student introductions.

Possible Challenges

Here are some of the challenges that I have experienced with student introductions:

1. **Cameras off.** Students may not turn on their cameras, limiting their social presence while fostering student distance and disconnection. Encourage students to tune on cameras, especially when they come into class. If a few students do it, then others often follow.

2. **Time.** Some students talk for a long time, extending the student introduction time to 45 minutes. None of us are very good at passive listening. That is one reason I shifted to breakout rooms. The other option is to introduce a show and tell feature like a pet, so the audience is more engaged.
3. **Self-conscious students.** Some students, especially at the secondary school level, may feel self-conscious and do not want to participate or be put on the spot, which is why small group introductions or ice breakers may be more effective. Alternatively, you could ask students to introduce themselves with a few lines of text in a shared Google Doc or the virtual classroom chat.
4. **Technology problems.** Sometimes the technology works well, and student audio or video is unstable. Students can put their information on the chat, but that feels far less personal. Anticipate technology problems ahead of time by sending a set of instructions and tips to students before they come to their first class (see Technology chapter).

Resources

Here are a few resources that might offer ideas for your student introductions:

- 7 Tips for Successful Student Introductions in an Online Class
- Course Introductions from the Center for teaching and Learning (Charlotte)
- How to introduce yourself in an online class
- Three Different Options for Online Student Course Introductions

ACTIVITY 3: BIG PICTURE GRAPHIC

Overview

Offering a big picture perspective for a student at the befitting of a course helps them cognitively prepare for their learning. It also provided a framework that they can refer to throughout your course (Arnold & Mihut, 2020; Hattie, 2012; McTighe & Thomas, 2003; Thomas & Rieth, 2011). My approach is relatively straightforward – I present a fairly colourful yet straightforward overview of my course through a short video.

Description

After introductions, I introduce and discuss the key themes for my course using a graphic I create in Google Drawings. You can use any tool you wish – I like that students can add comments or questions to my graphic. Here are three examples: Example 1 [Doc.], Example 2 [Doc.], and Example 3 [Doc.]. I'm not particularly talented at creating these graphics (as you may have noticed), but they do the trick and serve my students well. I present them each week to show what we have covered so far and what we need to cover in the future. It provides a sense that we are progressing through the course and making progress. I also get a chance to re-articulate connections among topics.

Another area where I have used a big picture graphic is to talk about assessment throughout the course, affording students to visualize expectations and how assignments are connected. Here is an example of a big picture assessment graphic. Notice that I was far more creative in this graphical representation.

Finally, I often add a brief video describing the big picture for my course. Here is an example [0:51]. The video is helpful for students trying to decide whether they wish to enroll in my course or students who have missed the first class.

Possible Challenges

Besides being challenged to create visually appealing graphics, I have not experienced any serious difficulties providing the big picture for a course. Sometimes the direction of the course changes, so I have to make revisions. Some instructors work with students to create a big picture profile for a course, which can work quite well as the first activity.

Resources

Here are a few resources for creating a more engaging *big picture* graphic for your course

- Free templates from Canva to create big picture graphics
- Mindomo or Mindmeister for creating Mind Maps
- Visme Infographic Templates

ACTIVITY 4: POSTING A REGULAR AGENDA

Overview

Providing an agenda before class starts seems like a relatively simple activity, perhaps not worth mentioning. However, my experience is that students need and appreciate this simple act before class to help them focus (Arnold & Mihut, 2020; Hattie, 2012; McTighe & Thomas, 2003; Thomas & Rieth, 2011). Essentially the agenda offers key information to ensure they are prepared to start the class, helping students remember to hand in an assignment. Further, it can help student and educator communication, especially if they have missed a task and are behind schedule. Advance access can also help students prepare for a class activity or connect with a team member before class begins.

Description

I offer a one or two slide agenda (using Google Slides so that students can add comments or questions) that includes critical resources students will need for the class, what students should have done before class, key learning goals or topics that will be covered in class. Here are some examples of agendas I have used: Agenda 1 [Doc.] and Agenda 2 [Doc.].

Possible Challenges

1. **Forgetting to post.** One challenge with posting an agenda is remembering to do it. Starting an online virtual class can be a bit hectic with negotiating the technology and making sure that everything you planned is working and ready to go. Sometimes, posting the agenda can be overlooked unless it is a routine. Recently, I have combined this strategy with posting a link to my lesson plan (see Activity 5 below).
2. **Format.** Another challenge is choosing the format to display your agenda. I use a link to a Google

Doc to make last-minute changes, and students can add questions and comments.

ACTIVITY 5: SHARING AN ONLINE LESSON PLAN

Overview

One of the best decisions I have made regarding online teaching is to create a detailed lesson plan for each class that includes learning goals, activity descriptions and estimated times, and asynchronous or home activities. This strategy allows students to see what they will be doing ahead of time, to anticipate workload and guide me during an online lesson. The lesson plan also helps me keep on track with time, a persistent challenge for me in an online learning environment.

Description

A regular lesson plan helps create a shared culture of learning and class structure for students (Fisher et al., 2021; Lemov, 2020) and a consistent connection with the big picture and course learning goals (Arnold & Mihut, 2020; Hattie, 2012; McTighe & Thomas, 2003; Thomas & Rieth, 2011).

My lesson plans include the key learning goals addressed in the class, a detailed list of activities with time estimates and resources as required, a break time marker, and a very detailed list of asynchronous or home activities. I create them as Google Docs to edit them on the fly so that students can comment or ask questions. Here are several examples of lesson plans that I used: Lesson Plan 1 [Doc.], Lesson Plan 2 [Doc.], and Lesson Plan 3 [Doc.].

I post my lesson plans on a website (e.g., Technology and the Curriculum); however, they could easily be posted on the learning management system (e.g., Desire to Learn, Google Classroom, Canvas) of your choice.

Possible Challenges

1. **It takes time.** Creating these lesson plans takes time and a fair bit of planning. I would argue that online learning needs to be thoroughly organized because it is more challenging to repair distractions and technological issues that can quickly derail a class. I create a template and then fill it in as I am planning.
2. **The workload for secondary school teachers.** The other challenge would be the workload for secondary school teachers who need to create daily instead of weekly lesson plans. In this case, you might try making shorter lesson plans or a weekly lesson plan summary. When I was a secondary school instructor, I created daily lesson plans to keep me organized and on track.
3. **Getting off track.** Finally, lessons do not always proceed as expected, so you have to make decisions during the class about skipping activities and still achieving the intended learning goals. Sometimes activities need to be postponed to the following class, which can have a rippled effect on future lesson plans that you may have created ahead of time.

Resources

Lesson plan design is personal and partially dependent on your experience, subject area, confidence level and teaching approach. Some teachers, like me, need more structure, while others prefer a more open-ended, free-flowing format. Here are a few resources that might be helpful to create lesson plans:

- 7 Lesson Plan Templates to Use In Your Online Lessons
- Canva lesson plan templates
- Daily and weekly lesson plan templates for Word and Google Docs
- Google Doc lesson plan templates

ACTIVITY 6: ICEBREAKERS CAN BE FUN

Overview

Full disclosure. I think icebreaker activities are helpful for student relaxation and engagement while building a social presence and community. However, I do not use them regularly because I like to communicate the content and learning goals as soon as possible. Consequently, I do not spend enough time building connections. I rely on collaborative classroom activities to develop a social presence. I believe this is a mistake.

Many students come to an online class, possibly feeling anxious, isolated, and intimidated. Starting things off with a friendly, fun, and safe icebreaker activity helps students relax. In a more relaxed state, they may focus and learn more effectively.

Description

Most of the icebreakers I have used are pretty traditional and probably a bit dull (e.g., Two Truths and a Lie, If you were an animal, what you be). However, I have found a few that I think are engaging and helpful (please see the resources section for an extended list of icebreakers to choose from). Some simple and effective icebreakers include:

- **Collaborative resumé.** This icebreaker helps give the group a quick idea of education, work backgrounds, skills sets, hobbies and interests. These could be posted on a Google Slide template to share with the class as a whole.
- **Share a photo.** Students take a picture of their current environment or select an image and describe its significance. These pictures can be posted on a Google Slide for the entire class to peruse.
- **Accomplished goals.** Ask students to share a goal they have achieved in the last year (it does not matter how small) and how that made them feel. The shared achievements can be posted on a Google Slide to share with the class.
- **What do you want to learn?** Students work in teams to articulate what they want to learn in the course on a Google slide. I understand this may not be the most exciting icebreaker, but it can bring small groups of students together by focussing on a specific topic. When Google Slides are used, the desired learning outcomes can be shared with the entire class at the end of the icebreaker or break-out session.

You can also ask ice breaker questions (see The Only List of Icebreaker Questions You'll Ever Need). Some favourites of mine are:

- Do you love working/studying from home, or would you rather be in the office? Is there a balance of both that you like best?
- If you could learn one new skill, what would it be?
- If a movie was made of your life, what genre would it be? Who would play you?

- What's one of the best pieces of advice you've ever been given?
- What would your superpower be and why?
- If you could live anywhere in the world for a year, where would it be?

Possible Challenges

Here are a few of the challenges/decisions you might have to deal with:

1. **Small or large group.** You need to decide whether you want a larger or small group icebreaker. Both can work well. A large group involves using chat and can be fun depending on your questions. Small group icebreaker activities are more elaborate and should consist of groups no larger than four students. With larger groups, students feel rushed and perhaps a bit self-conscious.
2. **Too much time.** Icebreakers can lead to more extensive small group discussions that could throw the timing of your class off. If that happens, the chances are that your icebreaker activity is working well at increasing social presence and community. Allow extra time for your first icebreakers, but do not let them take over the entire lesson.
3. **Self-conscious students.** Some students feel uncomfortable with icebreaker activities – the questions might make them feel vulnerable or exposed. Therefore, select innocuous and safe activities and always offer the option of passing. Make sure that everyone is clear that they do not have to participate and that passing is a perfectly acceptable option.

Resources

Numerous online resources can provide novel ideas for icebreaker activities. Some sites that I have found helpful are:

- 10 Essential Icebreaker Activities for Any Online
- 21 Free Fun IceBreakers for Online Teaching
- 35 Best Icebreakers for Your Virtual and Hybrid Meetings – Chat Questions
- 36 Ridiculously Fun Icebreaker Ideas
- The Only List of Icebreaker Questions You'll Ever Need

ACTIVITY 7: ESTABLISHING ONLINE CULTURE/RULES

Overview

Developing a vibrant, safe classroom culture that supports learning is essential to any classroom face-to-face or online (Fisher et al., 2021; Lemov, 2020). The tricky part about online teaching and learning is that educators have less experience and a somewhat limited understanding of the challenges that might arise. We simply have difficulty anticipating online classroom behaviours that we have never experienced before. Some examples include:

- Students who post inappropriate comments in the chat.
- Distracting or offensive backgrounds.
- Microphones left on providing unexpected noise.

- Students exiting class well before it is over.
- Students logging on but not participating in class.
- Weak internet connection preventing participation.
- Students not having the right software to participate in an online class.
- Students vaping during class.
- Students laying in bed while participating in class.

Instead of ignoring these potential distractions, you would be wise to develop and agree upon a clear set of online classroom rules.

Description

The simplest way to establish a safe structure for your course is to present a clear set of guidelines, easily accessed on your web page and LMS. You would go over these rules in your first class. The type of rules you establish should match the needs of the age group you are teaching. Rules for secondary school students will likely be different from those designed for higher education students.

Here are a few guidelines that I have used in my virtual classroom:

- Try to come to class 5 minutes early, so you can review the agenda and lesson plan and make sure you are ready to start the class.
- If you cannot attend class, please send a notification as soon as possible because I may need to re-arrange teams for breakout room activities.
- Turn cameras on when you are working in small breakout rooms to facilitate conversation.
- Keep your comments respectful in the chat – if you wish to express a strong opinion, please raise your hand and use your microphone.
- Try not to add comments in the chat that distract other students from learning.
- Raise your virtual hand if you wish to ask a question.

The other good option is to make *online classroom rules* an activity for students. They can create and hopefully abide by the rules they develop. Reviewing the suggested rules listed in the resource section below can be a good starting point for the activity, and having students create their own rules helps them take control of their learning environment.

Possible Challenges

Here are some potential challenges that you might encounter:

Too many rules. You want to be careful not to present too many guidelines as it might convey a controlling tone to your students. Ideally, student discussions can guide the development, review, and revision of the guidelines so that they feel control over the process. Students are more likely to adhere to a set of rules they create.

1. **Not turning on cameras.** Students might resist using cameras, even in breakout rooms, so you may want to explain why cameras help build connections and support the learning process. Students who do not use their cameras are generally less involved. Note that cameras can be off in large lectures,

so students are afforded the option.

2. **Follow through.** You will need to follow up immediately if a guideline/rule is broken. If you do not support your guidelines, there is no point in setting them up in the first place. I'm not saying the process is easy, but follow-through is critical.

Resources

- 7 Rules for Online Etiquette
- 10 Online Classroom Rules For Your Virtual Classroom – for secondary school students
- 10 Netiquette guidelines every online student needs to know
- The ABCs of Online School Etiquette

GENERAL RESOURCES

- The Online Learning idea Book (Vol. 2): There is a seemingly endless list of strategies to use in your online classroom, including those for your first week. These strategies are collected from actual instructors who have used them.

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PART III

DIFFERENTIATED LEARNING

Differentiated learning is often neglected in online learning, so we purposely included this section early in our book. Reaching all online learners is critical. Consequently, three chapters addressed this critical area:

- *Equity, Diversity and Inclusion Online*
- *UDL in Online Learning – One Size Doesn't Fit All*
- *Accessibility in Online Learning*

What is unique about these chapters is that the authors have extensive research, practical, and personal experience in EDI, Universal Design for Learning and Accessibility.

Equity, Diversity and Inclusion Online

ROBYN RUTTENBERG-ROZEN AND ALLYSON EAMER

INTRODUCTION

Online learning has the potential to be a learning space centred on justice and equity. Researchers have identified practices that can transform online learning into areas that support equity, diversity, decolonization, and inclusion principles. Caruthers and Friend (2014) label this type of space a *thirdspace*. A *thirdspace* is where all members of the class share authority and the instructor actively and purposefully supports each member's strengths and growth potential. Teaching and designing a *thirdspace* requires an iterative approach with much thought and reflection throughout a course's design, implementation, and post-teaching. A course director constantly reflects on their position in relation to their students and asks questions about authority and growth:

- How am I sharing my authority in the classroom?
- Do students have opportunities to share their strengths?
- How am I becoming aware of the strengths of my students?
- How can I help my students to navigate difficult conversations?
- How do I encourage productive discomfort within a respectful context in classroom discussions?

Before COVID 19, there was scant research regarding using EDI principles to teach critically in online spaces. With COVID 19, there has been more interest in this type of research. We note a new publication edited by Erin Mikulec and Tania Ramalho (2022) entitled *Best Practices in Teaching Critical Pedagogy Online*. We refer the reader to our chapter in this book (Ruttenberg-Rozen et al., 2022) for a detailed practice-based example about using critical pedagogy in online spaces.

GENERAL GUIDELINES

Practically, Guthrie and McCracken (2010) recommend four design components to support an EDI teaching framework. The first design component, planning for community and discussions, is foundational to the other three design components: planning for critical inquiry engagement, planning for autonomy and planning for implementation. In what follows, we share Guthrie and McCracken's (2010) design components with recommendations for implementation and consideration with certain groups of students.

PLANNING FOR COMMUNITY AND DISCUSSIONS

Class discussions and course content with embedded themes of equity, diversity and inclusion often evoke trepidation within both students and instructors. Fear of misspeaking, being ‘called out’ or ‘cancelled’ for using incorrect terminology or being oblivious to one’s privilege can inhibit meaningful dialogue within learning communities. Focusing on ‘intent’ and ‘growth’ will minimize polarizing forces. While one’s choice of words may reveal knowledge gaps, considering the contributor’s intent can influence whether others respond by educating or punishing the offender. For example, when someone says “I don’t see colour,” they could mean “I don’t believe one’s race impacts their life opportunities” or “I have relationships with people of many diverse backgrounds.” A punitive approach would involve calling that person out for not recognizing their white privilege or the power structures that drive racialization. Yet, we could also take an educative approach by exploring the political implications of being racialized. Then, we can discuss why persons of colour do not have the privilege of claiming not to see race. The same is valid for focussing on growth. By approaching EDI content and discussions with a shared understanding that ‘all of us in our learning community will get some things wrong, the instructor fosters a sense of commitment to helping each other learn/grow.

Students will require explicit instruction about what Callan (2011) calls ‘good faith contributions’ tied to a presumption that each of our peers is competent and trustworthy and sincerely seeking to advance the common pursuit of truth. In civil discourse, our demeanour tells the people we’re interacting with that we are willing to assume they are competent and trustworthy. Suppose a person’s contribution to a discussion appears to be untrustworthy. In that case, instructors need to be prepared to distinguish between offensive comments that require calling out (using authority to silence hate speech) and those that require calling in (reasoning openly with a student who makes more muted discriminatory remarks). Callan cautions instructors to be mindful that minoritized students have the right to expect protection within the classroom, so failing to deal with overt discrimination sends the message that students may not be safe.

Collaboratively established discussion guidelines can become the higher authority to which anyone in the class can appeal if they feel the discussion has become uncivil. These guidelines should not eliminate productive discomfort (where learning takes place) but should ensure a respectful exchange of ideas. Arao and Clemens (2013) and Ravitch (2020) have put forward a brave space pedagogy model that calls for participants to acknowledge that it can feel difficult and risky to talk about social justice issues and that it requires bravery to engage in these discussions. They recommend developing a set of ground rules along the following lines:

1. Agree to Disagree.
2. Own your intentions and your impact.
3. Challenge by choice and with reflection.
4. Respect with an awareness of various cultural understandings of respect.
5. Challenge – don’t attack.

There are myriad examples of community conversation guidelines that we can use as models for establishing the ground rules for the classroom. The Truth and Reconciliation Conversations Initiative [1:18], for example, proposes five commitments: Compassionate Empathy, Courageous Listening, Painful Conversations, Social Reckoning and Spiritual Reconciliation. Other models include the Crucial Conversations Model, whose tenets are: Master my Stories, Start with Heart, State my Path, Make it Safe, Learn to Look, Seek Mutual Purpose, Explore Others’ Paths, Move to Action). Regardless of the approach taken (commitment, action, mindset or covenant guidelines), this must be a collaborative effort involving student input. In developing the ground rules, all voices must be honoured to ensure that all voices are honoured in the following discussions.

PLANNING FOR CRITICAL INQUIRY ENGAGEMENT

The design component of critical inquiry engagement represents both interrogation and action. The first part of this component, critical inquiry, “invites the process of naming, identifying, and interrogating belief systems, practices, policies, and systematic structures as a means of dismantling and transforming” (Medina, 2020, p. 118). Community is integral to critical inquiry because, to dismantle and transform, students need to feel that they are in a safe space. The second part of this component, engagement, is active and infers active verbs such as passion and curiosity (Groccia, 2018). When we engage students in critical inquiry, we want them to be active learners- actively thinking deeply about systemic issues- actively naming and identifying barriers- actively interrogating belief systems.

In planning for this type of active critical inquiry engagement- the first step is to create a moment of surprise that initiates a revisiting and challenging of what students think they know. A student progresses through levels of awareness once they encounter a moment of surprise (Hadzigeorgiou, 2014; Ruttenberg-Rozen, 2020).

1. First, students challenge their previously held beliefs. They begin to wonder if what they know is as accurate as they think it is.
2. The wondering propels students to want to learn more.
3. As students explore new understandings, they accept that new ways of viewing the ideas are possible.
4. Students begin to make connections between ideas.

Many different teaching approaches can create that moment of surprise, although they all take careful planning. One teaching approach for provoking surprise is reading (academic, blog posts, or newspaper articles). Then after students complete the reading, ask critical and penetrating questions that generate surprise. Another example we have previously written about (Ruttenberg-Rozen et al., 2022) is to develop an activity in which students encounter their previous beliefs in surprising new ways. We then ask students to write a post-reflection to reflect on their surprise and new understanding. The Power Flower activity below is an example of this type of activity. Quick activities in class that provoke surprise might be showing a video or asking a provocative question and then having students go into small groups to do a think/pair/share. In a think/pair/share:

1. Course instructors first ask a question, then
2. Students are asked to think about an answer, then
3. After students think about the question, they go into small groups to share their thoughts.

PLANNING FOR AUTONOMY

For learners to feel part of a community, they also need to feel autonomy and agency in that community. Learner autonomy is about taking ownership of one’s learning, and learner agency is about proactively engaging with learning. The competencies proposed by the Ontario Ministry of Education (which draw on those developed by the Council of Ministers of Education Canada) include a series of skills related to learner autonomy. Within the competency named “Learning to Learn” are the following descriptors (Ministry of Education, 2016, p. 56):

- learns the process of learning;
- believes in the ability to learn and grow;

- perseveres and overcomes challenges to reach a goal;
- self-regulates to become a lifelong learner;
- reflects on experience to enhance learning;
- cultivates emotional intelligence to understand self and others;
- adapts to change and shows resilience to adversity; and
- manages various aspects of life – physical, emotional, spiritual, and mental well-being.

Teaching skills of learner autonomy enables learners to have agency in their learning. Educators can facilitate the development of learner autonomy through the way we structure assignments (scaffolding assignments so that each builds on the previous) and provide feedback/feedforward to ensure personalized growth. Furthermore, a social constructivist approach in the classroom and access to digital tools for self-directed learning contribute to learner autonomy.

PLANNING FOR IMPLEMENTATION

The final design component is intentional in planning learning that centers around community, critical inquiry engagement and autonomy. It is not enough to plan for only one design component because all components work together. There is no autonomy without community, and there is no challenging the system without autonomy. Likewise, there needs to be a safe communal space to challenge the system. Planning for implementation, then, is about ensuring and being intentional that activities, assignments, discussions and lectures include opportunities for all the design components and that all the design components are present in every class. We have shared examples of activities that support the design components and can be included in your course design descriptions. However, we also encourage you to think about the activities you currently use in your courses and how they can be modified and leveraged to purposefully include opportunities for community, critical inquiry engagement and learner autonomy.

ACTIVITIES

ACTIVITY 1: PROBLEM TREE ANALYSIS

Overview

We initially found the problem tree activity when exploring lesson plans to support our teaching of the United Nations' Sustainable Development Goals (SDG). A problem tree activity aims to identify critical issues within more significant complex social problems and then think critically about the causes and effects. By identifying critical issues, students take a large, often seemingly insurmountable, problem and deconstruct it into smaller parts. Students can then brainstorm ideas about the smaller parts. The learning benefit of using this activity lies in the acts of deconstruction and analysis. If you do a quick Google search on *problem tree activity*, you can see that many organizations have used the activity in different ways, all to support critical thinking around important and complex issues. Below, we share our adaption of the activity for post-secondary students (undergraduate and graduate students) in our courses. The main design components of this activity are planning for community and discussions and planning for critical inquiry engagement of the activity for post-secondary students (undergraduate and graduate students) in our courses. The main design components of this activity are planning for community and discussions and planning for critical inquiry engagement.

Description

This activity works well for introducing complex ideas drawing on prior knowledge, and consolidating the class. In our graduate courses' second to last class, we will often use this activity to summarize the course's big ideas and use the problem tree as a springboard for thinking about the *so what's* part of the course.

- We set this activity up on Jamboard, where each group of students can work on a slide. It is essential to have 1 or 2 Jamboards with slides for groups to do the gallery walk later.
- Before introducing the activity, we share previous problem trees as examples. We discuss the problem trees, their purpose (identify and analyze issues embedded in more significant complex social problems), and their construction.
- We then share that our students will identify an issue tied to what we are learning in the course and want to explore further.
- Break students into groups. The size of the groups varies depending on the class size, but we find groups of 2-4 students are best in both our undergraduate and graduate classes.
- Either ask each group to draw a tree (roots, trunk and branches), or you can set up each slide with a tree template beforehand.
- Here are the instructions on our PowerPoint slides (Figure 1).

Figure 1.

PowerPoint Slides for the Activity Problem Tree

Activity Problem Tree

- Breakout Rooms (20 mins)
 - Jamboards
 - In groups of 2-4, please create a problem tree
 - Think about an issue we discussed in class that you would like to analyze further.
 - What are the main problems?
 - What are the roots of the problems?
 - What are the effects of the problems?
 - Gallery Walk
 - Regroup and discuss
-
- As students complete the problem tree activity, we hop in and out of the rooms to interact and help push student thinking and analysis.
 - At the 20 minute mark, we ask students to do a 'gallery walk.' In a gallery walk, students learn from what other groups have created through visiting the Jamboards of other group members. We ask students to think about their takeaways from the other problem trees as they see each other's work.
 - We then regroup for a class discussion.

Possible Challenges

Possibly, something identified as a root cause of a problem may also be the effect of the problem. For example, social attitudes may be both one of the causes and one of the consequences of a given situation. This problem can be a source of confusion if the activity is not sufficiently well introduced or introduced too early

in a course before students have explored a problem from all angles. It will be equally essential to ensure that students feel comfortable voicing their opinions within their groups (smaller is better!). There will undoubtedly be differences of opinion regarding how significant or relevant a particular cause or effect is.

Resources

There are not many resources required for this activity. Examples of problem trees can be found online and help students visualize and understand what is being asked. While we use Jamboards, any online platform for collaboration would work. The key to using the platform is ensuring everyone has access so the logistics are not time-consuming (everyone choosing their platform would entail sharing multiple addresses so you can have a gallery walk). Finally, you could use a template of a tree if you wish. We have done both in our courses and find there is minimal difference in output.

ACTIVITY 2: POWER FLOWER

Overview

Students will identify their membership in various social groups associated with their identity markers in this activity. They will relate their identity components [assigned (sex, race, age), chosen (religion, education, place of residence) and developed (personality, body type, languages spoken)] to the dominant/hegemonic social identities within a larger context (the school, community, city or country). They will consider which aspect of their identity affords them specific privileges and insider status and which characteristics mark them as outsiders.

The power flower is an excellent example of self-directed activity despite the collaborative component. The learner is motivated to integrate peer perspectives within their understanding of self and relate their identity markers to those of the dominant culture. The activity lends itself to a great deal of reflection and gives learner autonomy. The learner is prompted by the visual cues, which the power flower provides, to take ownership of the questions that arise through completing the activity: Why have I never noticed how racially homogenous my environment is? Why have I only seen the lack of diversity when I am the one whose under-represented faith, culture, gender, and race? Why does my group get minoritized even when we are not in the minority numerically? The associated design components for this activity are planning for community and discussions and planning for autonomy.

Description

This activity takes a social constructivist approach to identity development. Students decolonize the knowledge they take for granted through exploring hegemonic and normative values (Tsoetsi & Omodan, 2020).

Students are provided with a template of a flower consisting of an inner circle surrounded by two concentric circles made up of petals. See here for a template. Students write down their identities in the first circle of petals using the social identity categories listed within the inner circle (e.g. race, place of birth, first language, sex, social class, education level). In consultation with group members, they use the second circle of petals to write down the corresponding identities of the larger context- typically: the class, school, city or country demographics. In their groups, they then consider the following questions:

How many identity markers do you have that are different from the dominant identity? Are there any forces at work to compel you to change one/some of your identity markers? Which components of your identity could be changed? What would be involved in making that change? What normative processes are at work to establish a particular identity as dominant/normal? How are other identities subordinated or oppressed?

This activity serves as an introduction to identity as multi-faceted and intersectionality, serving as a visual representation of how their various identity markers situate them on spectrums of privilege and oppression.

Possible Challenges

It will be essential to ensure students understand that they are not obligated to reveal any aspect of their identities that they are not comfortable sharing. It may be advisable to leave the category labels in the inner circle blank and invite students to enter whichever categories they choose to share about themselves. Some may choose superficial labels (dog lover/cat lover; first child/middle child), while others may include more personal details such as gender or sexual orientation identities.

Resources

This activity is best completed with pen and paper. A flower power template can be downloaded from the internet, or the instructor can draw one. Copies will need to be distributed to students. Students can download the template through video conferencing or the LMS platform if the class meets virtually. If desired, students can also colour code the petals (e.g., with coloured pencils) to indicate the areas where their identities line up with the dominant identity and where they don't.

ACTIVITY 3: TWO TRUTHS AND A LIE

Overview

In this community-building activity, students, in small groups, share the assumptions and stereotypes that influence their thinking when considering the criteria for membership in various social groups. By assessing the integrity of a peer's identity statements, they become self-aware regarding how salient, and visible identity markers are associated with specific social groups in their minds and the societal context. This activity draws on Positioning Theory, asking, "What does our membership in various groups allow us to do or prevent us from doing?" The main design elements of this activity are planning for community and discussions and planning for critical inquiry engagement.

Description

This community-building activity is rooted in Vygotsky's sociocultural theory (Nardo, 2021) and uses the Harkness method of student-centred, discussion-based pedagogy (Smith, 2016). It is best done early in a course before students know each other well. Students break into small groups of 4 or 5 and make three statements about themselves: two of which are true and one of which is false. The statements can be experiential ("I like to dance"), but the activity works best if the statements can be related to privileges or disadvantages. For example, "I skydive regularly" signals disposable income since it is an expensive hobby. The groupmates attempt to identify the lie and explain their rationale for the choice to the speaker. The process allows students to think aloud about their assumptions based on salient and visible markers of identity and chal-

lenge each other's assumptions based on discussion guidelines provided by the instructor. The instructor should give an example about their own identity to help students understand how the activity will unfold. The instructor may say:

1. I once had a bank account balance of zero.
2. English was not my first language.
3. I am a timid person and feel awkward in social situations sometimes.

Students would then be invited to guess which statement is false and rationalize their thinking. Guesses might sound like the following:

- "You're a professor, so you can't ever have had a bank balance of zero."
- "You don't have an accent, so English **MUST** be your first language."
- "You're a teacher/professor, and you talk all day, so you can't be shy."

As students sort through the information and visual cues that influence their conclusions, they will be required to relinquish an assumption that they've held to be true. Relinquishing an assumption invites discussion about how we categorize people knowingly and on an unconscious level. The instructor then reveals which statement is false and provides, if desired, the background of the two factual statements.

Possible Challenges

Under the instructor's direction, students must arrive at guidelines to facilitate the discussion. As they explain their rationale for the decisions within their groups, they will be expected to preface their remarks with "In my experience..." or "It has typically been the case for me that..." rather than "All ____ people always are/have ____" or "But you look/are ____." Students must understand that being transparent about one's assumptions and bravery requires courage to hear beliefs about oneself. Thus a climate of respect and trust is critical. It may be the case that this activity is best in a post-secondary setting where we can assume a required level of maturity.

GENERAL RESOURCES

- Navigating Difficult Conversations: A 4 module course intended to help educators navigate difficult conversations (about social justice) in their classrooms. It includes an introduction to EDI vocabulary, EDI pushback, civil discourse and actual examples of controversies and protests on Canadian post-secondary campuses.
- Living Room Conversations: A non-profit organization that strives to connect people across polarizing issues through guided conversations to build understanding and respect. Visitors to the site have access to over 100 conversation guides on various topics developed by dialogue experts who help people of different political positions, backgrounds, and ideologies find common ground and ultimately transform how we talk about complex issues.
- Open Mind Platform: An educational tool designed to engage in constructive, de-polarized conversations. It is an interactive, psychology-based platform for educational institutions and private and public sector organizations that develops intellectual humility, empathy, and mutual understanding. Its goal is to equip people with the skills, shared experiences and shared language to engage in productive conversations despite differences in beliefs, values and political persuasions.

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UDL in Online Learning - One Size Doesn't Fit All

TRICIA DWYER-KUNTZ

INTRODUCTION

Universal Design for Learning (UDL) “is an educational framework based on research in the learning sciences, including cognitive neuroscience, that guides the development of flexible learning environments that can accommodate individual learning differences” (Rose & Meyer, 2002). Recognizing that our classrooms include highly diverse learners – one in five post-secondary students have a disability (Rogers, 2018; Elfein, 2021) – lesson planning needs to be developed from the ground up in a way that minimizes barriers and maximizes learning for ALL students.

UDL is a set of principles developed by CAST that provides all individuals with an equal opportunity to learn and thrive by creating learning goals, teaching methods, materials, and assessments that work for all class members. One size does NOT fit all, and therefore, teaching needs to be flexible and customizable to adjust it to accommodate individual needs. The goal of UDL is to adjust the design of the environment, lesson plans, and teaching approach rather than change the learner. By proactively reducing barriers to learning, classroom spaces become fertile grounds empowering learners to grow and reach their maximum potential. Recent studies have shown that students without disabilities benefit from the same strategies that students with disabilities need. (Schreffler et al., 2019; Seok et al., 2018; Thompson & Copeland, 2020). Universal design for learning makes it apparent that what is necessary for a few is good for all. Constantly, we need to address UDL when designing online learning environments.

GENERAL GUIDELINES

DESIGN PRINCIPLES

UDL was inspired by the universal design (UD) movement in architecture in the 1990s. A group of architects, environmental design researchers, engineers and product designers collaborated to develop a fundamental set of universal design principles, which include (Council for Exceptional Children, 2005):

- **Principle 1 Equitable Use:** Equal access for all users.
- **Principle 2 Flexibility in Use:** Accommodates a wide range of individual abilities and preferences.
- **Principle 3 Simple and Intuitive:** Easy to understand.
- **Principle 4 Perceptible Information:** Necessary information is communicated through different

modes to reach all users (pictorial, verbal, tactile).

- **Principle 5 Tolerance for Error:** The design eliminates the possibility of interpretation errors.
- **Principle 6 Low Physical Effort:** Can be used comfortably and efficiently, reducing fatigue.

DIFFERENTIATED INSTRUCTION (DI)

Implementing UDL in the classroom space will help organize instruction and prepare for the teaching of diverse learners. Differentiated instruction (DI) is an instructional method that engages effective teaching practices to provide the flexible, student-centred principles of UDL. Where UDL is the framework, DI is the practice. In a differentiated classroom, “the teacher proactively plans and carries out varied approaches to content, process, and product in anticipation of and response to student differences in readiness, interest, and learning needs” (Tomlinson, 2001, p. 231).

What Can Educators Differentiate

Differentiation reflects a teacher’s ability to understand where students begin in the context of lesson or course success criteria (Hattie, 2012). Educators can differentiate in four essential areas:

- **Content** (The WHAT of learning)
 - Curriculum
 - What the student is expected to learn
 - Materials and/or mechanics through which learning is accomplished
 - Examples:
 - Different vocabulary lists based on student proficiency
 - Use of images/text or audio files to introduce a new concept
- **Process** (The HOW of Learning)
 - Design activities to ensure student learning
 - Supports students in making sense of essential ideas and critical information
 - Examples:
 - Provide students with assorted graphic organizers to guide them through the lesson.
 - Allow students to work alone or in groups.
- **Product** (How we ASSESS learning)
 - The vehicle by which students demonstrate their learning
 - Evidence of the level of mastery of the content
 - Students should be provided with a choice to support their needs and interests.
 - Examples:
 - Students have the choice of creating an infographic or writing a paragraph.
 - Students can select from teacher-proposed projects – all of which have the same learning goals and success criteria but offer different modes of creation (e.g., poem, rant, digital story, Google Slides presentation).

- **Environment** (SETTING – Where learning takes place)
 - The physical environment where a student learns
 - The social/emotional norms of the learning space
 - Examples:
 - Students are given a choice when they will have their cameras on or off.
 - Allow students to move to a break-out room to work independently or in a small group.
 - Create a Discord channel solely for social gatherings.

CRITICAL FEATURES OF DIFFERENTIATED INSTRUCTION

1. **Flexible Learning Groups.** Students are provided with opportunities to work in various groups that vary throughout the course.
 1. Groupings based on prior assessment.
 2. Takes into account student readiness, interests and learning preferences.
 3. Sometimes determined by the teacher; sometimes determined by the student; sometimes random – depending on the purpose of the activity.
 4. Follows a set of collaborative group norms.
2. **Choice.** Students are provided with personalized choices connected to their prior knowledge, interests and learning preferences.
 1. Fosters a sense of ownership and commitment to their learning.
 2. All choices should take the same amount of time to complete.
 3. All choices address the curriculum expectations and learning goals.
 4. The number of choices is reasonable and not overwhelming.
3. **Respectful Tasks.** All students are provided with tasks that have high expectations and promote optimal achievement.
 1. Encourages risk-taking.
 2. Develops a sense of security when students see their peers working on tasks equally as challenging as their own.
 3. Requires the students to work at the edge of their current readiness (Vygotsky, 1978).
 4. All tasks are engaging.
4. **Shared Responsibility for Learning.**
 1. Students can think and talk about the ways they learn best.
 2. Students can articulate their learning goals.
 3. Students are taught how to self-assess.
 4. Students seek feedback and respond to suggestions.

ACTIVITIES

ACTIVITY 1: CHOICE BOARDS

Overview

A *choice board*, sometimes referred to as a Tic-Tac-Toe assignment, is a common differentiated instruction structure created to provide students with choice. A choice board can be used as a way for students to choose how they learn or as a way to decide how they will demonstrate their learning. Choice boards address student readiness, interests, and learning preferences and are easily adapted to any level.

Description

- The teacher creates (or co-creates) nine different lessons or assessment tasks (Figure 1).
- All tasks have the same learning outcomes and assessment criteria.
- Tasks are placed on the choice board with a required task (WILD CARD) in the middle.
- Students choose three tasks, one of which must be the WILD CARD.
- The student chooses the three tasks.
- Choice boards can be done individually or in groups.

Figure 1.

Sample Choice Board

Choice 1	Choice 4	Choice 7
Choice 2	Wild card	Choice 8
Choice3	Choice 6	Choice 9

Possible Adaptations:

- Students are assigned tasks based on the roll of digital dice.
- Assign students to choice boards based on their readiness.
- Create choice boards based on learning preferences (e.g., one choice board could be all visual tasks).
- Allow students to complete any three tasks even if they do not complete the tic-tac-toe line.

Resources

- Interactive Tic-Tac-Toe Choice Board for Google Slides
- Choice Boards [PDF]
- 5 Reasons to Use Digital Choice Boards
- Digital Dice

ACTIVITY 2: CUBING

Overview

Cubing is a popular differentiated instruction structure that allows students to visualize a concept or idea from six perspectives. Each of the six faces of the cube or die represents a different perspective. Students roll the die or cube and complete the activity that is displayed. The tasks on a single cube can increase in difficulty, or there can be multiple cubes, each with its difficulty level. Cubing addresses student readiness, interests, and learning preferences. It can be easily adapted to any level.

Description

- The teacher creates (or co-creates) six different prompts per cube used.
- Each cube focuses on the same learning objectives.
- The prompts are put onto the face of a digital cube or a digital die, and numbered indexes with corresponding prompts can be used.
- Students roll the cube and complete the prompt that is displayed.
- Multiple cubes can be created – each varying in difficulty level or focus. Students can be directed to roll specific cubes based on their readiness, interests or learning preferences.
- Cubing activities can be done individually or in groups.
- *Example:*
 - Side one – Describe it
 - Side two – Compare it
 - Side three – Contrast it
 - Side four – Analyze it
 - Side five – Apply it
 - Side six – Argue for or against it

Possible Adaptations:

- Students can work with a partner or in a group.
- Cubes can be created with prompts of different readiness levels (e.g., The green cube could have all the *describe it* tasks; the red cube the *compare it* tasks etc.) and students directed to the appropriate cube for their learning needs.

Resources

- Dice Roller
- Digital Dice
- Five Ways to Use Cubing

ACTIVITY 3: LEARNING STATIONS

Overview

Learning stations provide different activities in different places (e.g., Break Out Rooms, Google Meets, Discord Channels). Students are not expected to go to each station, but instead, stations are attended only by students who need or are interested in the activities presented. Learning stations address student readiness, interests, and learning preferences. They can be easily adapted to any level.

Description

- The teacher creates (or co-creates) different instructional tasks for each Learning Station.
- Learning Stations are located in various locations, and the student must leave the main 'room' to work on the tasks (e.g., Break Out Rooms, Google Meets, Discord Channels).
- Tasks at each station are varied according to student readiness, interest or learning preference.
- Students are not expected to complete all stations. Instead, they travel to meet their needs. The decision of which stations to visit can be made by the student or in conjunction with the teacher.
- The Learning Stations have the same learning objectives for all students.

Example of Learning Stations with a growth mindset theme.

- **Station 1** – Students visit a digital library and find picture books with a growth mindset theme. Students share the title, author and brief synopsis on a designated Google Jamboard page.
- **Station 2** – Students listen to a podcast episode of "How I Built This." Each group is to write a Google Doc' review' of the podcast, reflecting on the perseverance of the podcast guest. This review is to be shared in a class Google Folder.
- **Station 3** – Students explore digital magazines to find an article featuring someone who shows a growth mindset. As a group, they create a guided sketchnote [37:00] of that person's journey. The sketchnote is then scanned or photographed and uploaded to a class Padlet.
- **Station 4** – Using Canva, students create posters of famous growth mindset sayings.

Possible Adaptations:

- Students can work individually, in pairs, or in small groups.
- Learning Centres can be created based on student readiness – students could choose between three or four stations geared to their needs.
- Students can choose to work on the stations in their own time or space.

Resources

- Differentiated Stations
- Four Strategies for Implementing Learning Stations
- Learning Stations in Higher Education

ACTIVITY 4: TIERING

Overview

Tiering creates more than one version of a task and allows teachers to fine-tune lessons/activities based on students' varying readiness levels. Student assessment and knowing each student's starting point are crucial to tiering. Tiering addresses student readiness, interests, and learning preferences. It can be easily adapted to any level.

Description

- The teacher chooses or creates a learning task based on the grade or course level.
- Designed to allow students to succeed at their difficulty level while focusing on the same essential learning goals.
- The teacher then creates different versions of the lesson to meet the readiness needs (based on pre-assessment) of the students.
- All tasks are meant to challenge the learners while remaining engaging and based on student interests.
- Develop enough versions of the original task to challenge the range of learners.

Tier 1

- Find a way to determine the number of students in the four closest schools.
- Be ready to demonstrate how you found the answers.

Tier 2 (based on grade level)

- Find a way to determine the number of students in the four closest schools.
- Find a way to determine the number of students in a local virtual school.
- Be ready to share how you found the answers.

Tier 3

- Find a way to determine the number of students in the four closest schools.
- Find a way to determine the number of students in a local virtual school.
- Find a way to determine the number of student absences for the past week.
- Compare and contrast the number of student absences in a brick and mortar school and a virtual school.

Possible Adaptations:

- Students can work individually or in groups to complete the tasks.
- Each task (from all Tiers) can be assigned several points. Students are to complete a specified number of points and choose from all three tiers.
 - Example: Tier 1 Tasks are worth 2, Tier 2 Tasks are worth 5, Tier 3 Tasks are worth 10.

- Based on readiness, students must complete tasks worth 20/30/50 points from any of the three tiers.

Resources

- Tiered Instruction
- Planning a Tiered Activity [PDF].
- Differentiated Instruction Strategies: Tiered Assignments

ACTIVITY 5: RAFT

Overview

RAFT is an acronym for Role, Audience, Format, and Topic. In a RAFT, students take on a particular role in developing a product for a specified audience in a specific format and on a topic that targets the learning outcomes for the lesson. RAFT addresses student readiness, interests, and learning preferences. It can be easily adapted to any level.

Description

- Create a grid with the headings Role, Audience, Format, and Topic across the top (see Figure 2).
- The teacher creates several different options for each heading based on the learning outcomes for the lesson or unit.
- Students choose from the options and create a product based on the headings/options.

Figure 2.

Raft Examples

ROLE	AUDIENCE	FORMAT	TOPIC
• Botanist	• Kindergarten students	• Oral presentation	• Global warming
• An endangered animal	• Humans	• A poster created in Canva	• How you can help
• Literary Critic	• Readers of a specific non-fiction book.	• Newspaper editorial	• Credibility

Possible Adaptations

- Can be done individually or in small groups.
- Can be incorporated into cubing.
- Students can roll dice for each heading.
- Teachers can create headings based on student readiness and interests (e.g., skateboarding or ballet).

Resources

- Using RAFT Writing Strategies with Artwork
- RAFT Strategy [PDF]
- Using RAFT as a Collaborative Teaching Technique [PDF]

ACTIVITY 6: VIRTUAL EXIT TICKET!

Overview

Virtual Exit Tickets are a structure that allows students to consolidate their learning and/or provides the teacher with summative feedback on how students are doing, and where the lesson should go next.

Description

- Using a feedback tool such as PollEverywhere or a Google Form, provide students with a range of possible responses to the virtual lesson or the end of an assignment. Students choose a response based on their understanding of how they are doing. Responses could include:
 - In progress (I need help)
 - Approaching the finish line (I need more time.)
 - Conquered! (I can do this on my own)
 - I'm the Boss! (I can help others)
- Knowing where the students think they are, helps the instructor plan for individualized support.
- By using student responses, the instructor can develop a class profile. This will assist the instructor in developing their starting point for the next lesson or assignment based on student strengths and needs.
- Student feedback on what level of support they need can aid in distributing students in Break Out rooms:
 - Homogeneous groups with the teacher providing support for struggling students.
 - Heterogeneous groups with stronger students support students who need more time or clarification.

Possible Adaptations

- Prompts can include possible next steps based on student interests. This can aid in the development of *Learning Stations* and *Tiered* activities.
- Prompts can be directly related to the cohesiveness of a group and act as a peer assessment.

Resources

- Poll Everywhere
- Survey Monkey

- Slido

GENERAL RESOURCES

- Fulfilling the Promise of the Differentiated Classroom: In this book, Tomlinson revisits her responsive teaching principles to examine how successful teachers handle the three interdependent elements of the differentiated classroom: student needs, teacher needs, and the role of curriculum and instruction to address learner needs.
- Not sure what Universal Design for Learning (UDL) is all about? [1:23]: Short video explaining UDL.
- Remote Learning Resources: Dedicated UDL resources for remote online learning.
- UDL on Campus: Resources for Universal Design for Learning in Higher Education.
- UDL Learning Resources: Vast collection of UDL resources including books, journal articles, policy statements, magazine and newsletter pieces, and are also contributors to radio programs, podcasts, blogs, and videos.

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Accessibility in Online Learning

ROB POWER

INTRODUCTION

I have been designing and building online courses and digital learning resources for many years, and I am still learning new ways to make my resources as engaging and effective as possible for all of my students. An important area that I have been concentrating on in recent years is Digital Accessibility. I have learned that it can be fairly easy to maximize the accessibility of our courses by following a few simple guidelines.

WHY ACCESSIBILITY MATTERS

For me, accessibility issues started as a professional interest. While working as an instructional developer at the College of the North Atlantic-Qatar, I had the opportunity to learn about creating accessible documents through a professional development opportunity hosted by the *Mada Assistive Technology Centre* (Mada, 2017). While working with the Online Learning team at the Fraser Health Authority, I had the opportunity to explore accessibility issues in education more deeply by participating in the University of Southampton's Digital Accessibility: Enabling Participation in the Information Society course (Wald et al., n.d.). But, in recent years, my interest has become more personal because I have two children with very different accessibility needs. I have also worked with students who have had documented accessibility needs, and I suspect that there have been many others who had needs that they either had not disclosed or were not even aware of.

You will likely be working with students who have either documented, undisclosed, or perhaps undiagnosed needs that will be impacted by how you prepare and present your digital learning resources. As Doyle (2021) points out, "22% of Canadians over the age of 15 live with at least one disability that limits their everyday activities" (para. 1). According to Dyslexia Canada (n.d.), 15-20% of the population has a language-based learning disability, meaning that nearly one in five of your students will likely be impacted by basic readability accessibility accommodations when creating your digital learning resources. Many Canadian jurisdictions have already enacted legislation dictating Digital Accessibility standards for instructional design of courses and digitally-mediated communications with our students, their parents, colleagues, and the general public. In Canada, Ontario was the first province to explicitly codify Digital Accessibility standards through the Accessibility for Ontarians with Disabilities Act (AODA, 2005). Provinces such as Manitoba, Nova Scotia, and Quebec have similar existing laws, while others, such as British Columbia, have legislation in the proposal stages (Doyle, 2021). Most of the standards these provinces have put forth are based on the World Wide Web Consortium's Web Content Accessibility Guidelines (W3C, 2022).

It is unreasonable to expect that all teachers will be well-versed in all of the web-content authoring guidelines or the range of digital tools available to support their students' variety of accessibility needs. However, everyone needs to be aware of basic accessibility standards. In some jurisdictions, you may be required to meet these basic standards whether or not you are aware of a particular student who needs accommodations (Ontario Human Rights Commission, 2016). These efforts represent small changes in practice that benefit all of our students, not just those with diagnosed needs.

GUIDELINES FOR CREATING ACCESSIBLE LEARNING RESOURCES

The following guidelines are based on the WCAG 2.1 standards (W3C, n.d.). Without investing in specialized software or learning additional web-coding skills, these are steps anyone can take.

- **Properly format and tag headings and text.** Whether you are creating a word processor document, a PDF, a PowerPoint presentation, or a web page (including a page in a learning management system), avoid manually formatting the font, size, or colour of your text to create document headings (Pennsylvania State University, 2021). Use the formatting toolbar in your word processor or web editor to tag your headings as *Heading 1*, *Heading 2*, *Heading 3*, etc., and your main text as *Paragraph*. These tags will allow digital screen reader applications to navigate your document or web content using a keyboard or digital switch. Sticking to the default paragraph and heading tags will also enable your students to use their device's accessibility settings or browser plugins. An example is the Open Dyslexic font (abbiecod.es, 2021; OpenDyslexic.org, n.d.), which adjusts your digital reading materials to meet individual needs.
- **Add ALT-text and avoid embedding a lot of text within images.** If you include an image in your document or web page, be sure to add alternate (ALT) text to the image (Harvard University, 2022). You can usually do this by selecting the appropriate option when inserting the image or by right-clicking on the image. Your ALT-text should be a short (1-2 sentences, at most) description of the image. This text will be read aloud to students using a screen reader application, which is beneficial to visually impaired students. If the image is purely decorative, and your document or web editor provides the option, check the box to tag the image as *decorative* so that a screen reader will ignore it. Keep in mind that any text in the image itself is not machine-readable – so it is not accessible. Thus, avoid embedding important text within an image.
- **Be careful when using colour.** Colours do not always display how we intend them to on everyone's screen. Some of our students may also have visual impairments that make it challenging to read coloured text (Morton, 2016). With this in mind, you should avoid using coloured text to create emphasis, as that emphasis will not be apparent to some students. You should also be careful to maximize the contrast ratio (called colour-contrast ratio) between your text and the background. Some colour combinations may make it difficult to read the text. When in doubt, stick to black text on a white background. Many learning management systems will point out colour-contrast issues when using the built-in accessibility checker. You can also use a free *Color Contrast Analyzer* like the one shared by the Paciello Group (n.d.) to check your documents and web pages.
- **Check your reading order.** When you create a document, PowerPoint presentation, or web page, the intended reading order for your content may be apparent to *visual* readers. However, this may not be the case for anyone using a screen reader application (Colorado State University, 2022). Reading order is often impacted by the order in which you placed the items on the page when creating the document (especially when creating slideshow presentations). One trick to ensure the correct reading order is to keep things linear on the page or screen, as screen readers will read the content from top to bottom by default. Another strategy is to avoid using tables to present content unless you

offer statistical data as tables need to be correctly formatted with tagged header rows or columns, or they become confusing to a screen reader. Built-in Accessibility Checkers in word processors, PowerPoint, PDF editors, and web editors often can identify potential issues with the reading order of content.

- **Make sure videos have Closed Captions.** Many users may not be able to hear the narration in videos you choose or create to add to your course or web-based content. Many other users frequently decide to watch videos with the sound turned off. Make sure you select videos that have Closed Captions available. Use your video editor or YouTube's closed captioning tools (Google, 2022) to add captions to your videos.
- **Use an Accessibility Checker.** Most word processing such as Microsoft Word (Microsoft, 2022a), web editing applications, and learning management systems such as Canvas (Instructure, 2022) now include an Accessibility Checker tool. It is often as easy to use as the spell checker. While an Accessibility Checker may not detect compatibility issues with some students' advanced accessibility tools, it will pick up many common issues. Some examples include colour-contrast ratios for text, missing table headers, and missing ALT-text for images. The Accessibility Checker will often provide suggestions or simple click-through options to help you resolve any issues detected.

These general guidelines are summarized in Power's (2020) downloadable Digital Accessibility Cheat Sheet [PDF].

ACTIVITIES

ACTIVITY 1: TESTING WITH A SCREEN READER

Overview

Let's look at how accessible the readability is for some of your digital learning resources. We will examine any material that you want to share with your students electronically for this activity. It can be a word-processed document, a PowerPoint slide deck, or web-based reading content. We want to determine if your materials are optimized for accessibility or if there are any potential barriers that you can easily remove.

Description

You can try this activity as often as you like, with various digital learning resource types. We want to determine if your students can easily access the materials using the most common accessibility tools, such as screen readers and browser extensions.

Try out a basic screen reader. Once you have one of your digital learning resources available, try using a screen reader application to read the text to you. Most applications are compatible with built-in text-to-speech tools or your device's accessibility features. Let's start with some of these basic tools.

For a Microsoft Word or PowerPoint document, go to the *Review* tab and click on the *Read Aloud* icon.

For web-based content, such as a document in Google Classroom or a page in a learning management system, try installing and using a screen reading browser extension such as Google's (2021) Screen Reader.

- Try using the *play*, *rewind*, and *forward* options to navigate through your materials.

- Does the application read all of the text?
- Are there any text or images that are not read aloud? How might this impact your students' understanding of the materials?

Try out a full-featured screen reader. Now, let's try an application with more accessibility features some of your students may want to use, including document navigation tools. NVDA (NV Access, 2021) is a free, fully-functional screen reader application. Try downloading and installing NVDA, using it to navigate your digital learning materials.

- Try using the navigation tools to navigate between sections of your document.
- Does the application read all of the text?
- Are there any text or images that are not read aloud? How might this impact your students' understanding of the materials?
- Are there any major headings or sections that you cannot navigate easily? How might this impact your students' ability to read the materials? Can you fix navigation issues by adding proper heading tags in your materials?

Possible Challenges

The activities described here assume that you are using either a recent version of the Microsoft Office suite or the Chrome browser on a Windows computer. Older versions of Word or PowerPoint may not have the built-in Read Aloud feature. But, you can still try these activities using an add-on tool such as NVDA. Likewise, you may need to look for a screen reader plugin or extension for your preferred web browser.

Resources

- Google Chrome Screen Reader Extension (Google, 2021)
- Listen to Your Word Documents (Microsoft, 2022)
- NVDA Free Screen Reader (NV Access, 2021)

ACTIVITY 2: TESTING FONTS AND COLORS

Overview

Some of your students may use their device's accessibility features or web browser extensions to make digital reading materials more easily accessible for visual reading. It is good to test your materials to determine if things like font or colour choice might create unintended barriers to learning.

Description

For this activity, let's look at some materials you have posted online (such as a web page or content page in a learning management system). We will examine whether your students can manipulate the fonts of your text or if the colours of your text might impact accessibility.

Try manipulating the text size. Some of your students may use accessibility tools to make the text easier to read. One of the most common ways is to enlarge the text. If you are viewing your materials in a desktop web browser, try using the built-in zoom feature to enlarge the content. If you are viewing your materials on a touch screen device (such as a phone or tablet), try *pinching and zooming* on the page.

- Does your text get bigger when you zoom in on the screen?
- Does your text extend off the side of the screen, forcing students to scroll left to right to read everything?

If you encounter these issues, you may need to reformat your text, determine if the text is in a text box with a *hardcoded* width, or determine if the content is inserted as text or contained within an image.

Try changing the display font. Another commonly used tool for students with language-based learning disabilities is a browser extension or plugin such as the OpenDyslexic font (abbiecod.es, 2021; OpenDyslexic.org, n.d.). This tool changes the default text font on a web page to a font that is easier for some students to read. Try installing the OpenDyslexic plugin for the Chrome browser, and use it to view your online content.

- Does your content display with the updated font when you use the extension?

If your text does not display with the updated font, you may need to reformat your text to revert to the default paragraph text formatting.

Try checking your colours. Colour contrast can impact the accessibility of your learning materials for some students who are colorblind or who have other visual acuity issues (Morton, 2016). For this exercise, you can use either web-based content or a word-processed document, PDF, or PowerPoint slide deck that you want to share with your students digitally. Download the Paciello Group's (n.d.) free Color Contrast Analyzer tool. Use the colour pick to check the contrast of your text or image (foreground) against the page's background colour.

- Does your colour-contrast ratio pass WCAG 2.1 standards for AA or AAA accessibility?

If your colour combination does not pass accessibility standards, you may need to change your text or background colours. Remember, when in doubt, stick to black text on a white background for the highest possible contrast ratio (and accessibility).

Possible Challenges

The text font plugin activity described above draws upon a browser plugin for the Chrome browser. You may need to search for the OpenDyslexic font for your preferred web browser. Suppose you are testing the colour contrast ratio for your online content in a learning management system. In that case, you may not be able to alter the default font colours set by your system administrator.

Resources

- OpenDyslexic for Chrome (abbiecod.es, 2021)
- OpenDyslexic Font Resources (OpenDyslexic.org, n.d.)
- Color Contrast Analyzer (CCA) (The Paciello Group, n.d.)

GENERAL RESOURCES

- Accessible Digital Documents and Websites and Accessibility in E-Learning: The Council of Ontario Universities (2017a, b) provides many excellent resources to help you make your online teaching, and learning resources are accessible to all learners and AODA compliant.
- BCampus Open Education Accessibility Toolkit: BCampus (Coolidge et al., 2018) recently published an Open Access eBook on making digital learning resources, such as eBooks, compliant with digital accessibility guidelines.
- Google for Education Accessibility Resources: Want to learn more about maximizing Digital Accessibility in your Google Classroom or using Google Apps for Education? Google for Education (n.d.) provides a two-page PDF with overviews and links to their accessibility resources for teachers and students.
- Power Learning Solutions Digital Accessibility Resources: Are you looking for more tips, tricks, and resources to help you improve the Digital Accessibility compliance of your digital learning resources? You can find an ever-growing list of resources on my website, including recorded webinar presentations, tutorial videos, and links to tools (Power, 2022).
- Understanding WCAG Compliance Checkers and Their Shortfalls: Want to evaluate the Digital Accessibility compliance of your web-based learning resources, but there is no Accessibility Checker built into your platform? Essential Accessibility (2018) provides a good overview of how online accessibility checkers work, along with links to some free online accessibility checking tools, and a good must-have WCAG compliance checklist.

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PART IV

LEARNING ACTIVITIES

Eleven chapters in our book focus on learning environments and activities that lead to successful teaching and learning online. The first three chapters illustrated how to develop and create effective learning communities and include:

- *Creating Dynamic Engaging Learning Environments*
- *Cultivating Community Building in Online Learning Environments*
- *Fostering Creativity and Critical Thinking Online*

The next seven chapters target specific teaching strategies that have been researched and used in online classrooms for over a decade. The chapters focus on:

- *Creating Engaging Online Synchronous Activities*
- *Fostering Productive Asynchronous Activities*
- *Creating Online Learning Modules*
- *Problem-Based Learning*
- *Flipping Virtual Classrooms*
- *Interactive Lectures and Digital Technology*
- *Critical Reflection as Online Educators*
- *Fun, Play, Playfulness and Positivity Online*

The final chapter in this section encourages a growth mindset and offers guidance to becoming critically reflective online educators – *Critical Reflection as Online Educators*.

Creating Dynamic Engaging Online Learning Environments

WENDY S. BARBER AND ALISON MANN

INTRODUCTION

OVERVIEW

Definitions of online learning vary from asynchronous, synchronous, hybrid, blended, distance, multimodal, remote and hyperflex. To further complicate this messy menagerie, recent rapid moves to online learning spaces due to the pandemic resulted in systemic challenges and, in some cases, pedagogical panic on the part of teachers. These terms describe fundamentally different pedagogical models in the vast sea of online learning options. Some of these approaches may not consider other critical factors in online learning success: student engagement, attrition, instructors' pedagogical practices, and a sense of community. The remote nature of online learning can result in isolation and discouragement and higher attrition levels (Dabbagh & Kitsantas, 2004; Kizilcec & Halawa, 2015; Lehman & Conceicao, 2014). Historically, there is evidence that students learning online often feel isolated, leading to attrition rates up to 20% higher than face-to-face learning (Angelino & Natvig, 2009).

As educators in arts and physical education, we wanted to address this issue. We came to online learning ready to challenge engaging students through creative, visual, musical, and physical means. We wanted to discover and share how human qualities such as affect, humour, empathy, compassion, grit, relationships, and the innately human creative process could translate to online learning spaces. Our goal was to develop online communities that empowered students to take risks, learn new technologies, and build a brave, safe space in which to learn. This chapter aims to share a few of the ideas and lessons we learned along the way.

Acknowledging that engagement and motivation are unique challenges in online environments is critical. In every online learning situation, instructors have competition from other devices. We identified some of the issues:

1. Who's hiding online?
2. How can we engage students to avoid external distractions?
3. What front-end investments of relationship-building can pay off big time in terms of quality of attention and quality of student work?
4. What elements of creativity and arts-based learning can support the development of online commu-

nities?

5. How can we get students physically moving to avoid endless hours of sitting in front of a screen?

Rooted in our experiences with physical wellness and culture, we innately focus on the human aspects of learning. We believe that education is more than content; it is a lived experience shaped by the past experiential contexts that students bring to the class. Kaufman (2013) reveals that “school is not simply about tests and *checking boxes* of topics and assignments. Rather, schools today should have a mission of developing students as individuals and igniting their creativity” (p. 79). Atkinson and Claxton (2000) discuss the cultural value judgements placed on cognition as a higher order of knowing than aesthetics and intuition, proposing that “the distrust of intuition and the inability to see how and even perhaps why it could be incorporated into education reflect three hundred years of European cultural history. The Enlightenment picked out just this single way of knowing and, in raising it to a high art, implicitly ignored or disabled others: those that were not so clinical and cognitive and were instead more bodily, sensory, affective, mythic or aesthetic, in a word, intuitive” (p. 32).

Creativity in learning can be challenging. It disrupts traditional notions of teacher-centred pedagogy and narrowly defined criteria for assignments and projects. However, McNeill et al. (2012) state, “universities increasingly acknowledge the value of skills such as problem-solving, critical thinking and creativity, yet the curriculum needs to be designed to support and scaffold the development of these skills” (p. 283). The authors add that “academics who were likely to introduce the development of student creativity in their curriculum found that confidence emerged as a key characteristic” (McNeill et al., 2012, p. 284).

WHAT DOES IT LOOK LIKE?

- Investment upfront in building relationships.
- Be authentic online. Make it personal, be real, invest upfront. Students often come in *tight* and want to know the expectations. At times, it is jarring for them to be asked their own opinions and take ownership of their learning since old learning paradigms put the teacher at the centre.
- Qualitative representations of knowledge such as Art, Music, Aesthetics, Physical Movement, Mindfulness. These can be invitations to the content of the course so that students can personalize and contextualize the learning space.
- Find multiple ways and means to invite engagement. These must access the human qualities that are sometimes scary or risky, and that means instructors take risks too!
- Celebrate and honour divergent thinking, multiple outcomes and representations of learning in assignments and products.
- With a little bit of thought, planning and a dash of creative risk-taking, you can design a dynamic and engaging online course that your students will find memorable.

WHAT DOES THE RESEARCH SAY ABOUT ONLINE COMMUNITIES?

The Fully Online Learning Community Model (FOLC) model is a community structure that focuses on a collaborative learning process. Roles in the community are shared amongst all members of the learning community. This means that the instructor acts as a facilitator, lurker, learner, organizer, and instructional partner. The leadership of class discussions, selection of problems, means of representation of data and visual presentations are negotiated. Other possible models include Garrison et al.’s (2010) Community of Inquiry (CoI), which emphasizes social, cognitive, and teaching presence as critical components for online learning commu-

nities. The main difference between these two models is that the FOLC model sees all community members as learners; as such, there is no direct teacher presence since learning is co-designed and collaboratively generated.

Figure 1.

Framework for community (FOLC) van Oostveen et al 2016



Fully Online Learning Community Model

DESIGNING THE LEARNING SPACE

Whether you use Canvas, Moodle, D2L, Blackboard, or any other learning management system, there are several strategies you can use to make your online environment more engaging and appealing. Students need to OWN the environment. Garrison and Cleveland-Innes (2005) concur that “design had a significant impact on the nature of the interaction and whether students approached learning in a deep and meaningful manner. Structure and leadership were found to be crucial for online learners to take a deep and meaningful approach to learning” (2005, p. 133).

WHAT IS THE PAYOFF?

In our experience, instructors who open these doors find students have increased attention and participation in class. They often go above and beyond, find original tangents and discover new ideas or technologies because they feel safe and encouraged. By acknowledging the humanity of our learners, we see more significant investment by learners in their assignments/representations of their learning and higher quality of products and submitted work. We find there is much greater peer interaction when you throw them into the deep end. They are all in it together. No one is put individually on the spot. They demonstrate greater accountability to and empathy for their peers.

GENERAL GUIDELINES

If you are feeling a bit lost in the forest at this point, don't despair! Here is a list of tips and tricks that can help you along the way. Pack your adventure bag, trust the evidence-based research on community building in online settings, and empower yourself and your students to take the reins of the digital learning space.

HELPFUL STRATEGIES

- **Pack your humanity tool kit:** Bring your style and creativity. It's something that you can't get wrong. The approach shows students that you are willing to go out on the edge of things and make the class unique, personal and engaging. Authenticity, humour, empathy, compassion, resilience and grittiness — you'll need them all!
- **Consider visual balance:** Avoid modules that are TOO WORDY. Make an engaging header, break up the text with the images, use colourful subheadings, point-form text, and visual icons to highlight and *signpost* important content.
- **Embed multimedia** such as video clips, interactive media, a podcast rather than relying only on text.
- **Talk space:** Encourage students to use the chat feature to stay in touch. Set up discussion boards for different purposes (e.g., social space, bulletin boards, etc.). If students have course-related questions, direct them to the chat space to ask others before emailing the instructor.
- **Changing Teacher Role:** Shift your mindset, give shared control of online space, and encourage shared ownership and accountability to each other. Shifting paradigms is imperative online, moving from teacher-centred to student-centred and learner-directed. Become a facilitator and share your own mistakes.
- **Breakout Rooms:** These can be effective ways to get smaller groups of students from larger classes to have greater accountability for discussion and participation. In groups of 4-6, provide them with a structured task or specific idea to investigate. You can also assign roles to each group member (e.g., recorder, reporter, observer, challenger) and rotate these roles each time you use breakout rooms.

ADVICE

- Don't be afraid to disrupt the status quo.
- Ask for help and *SAY* you don't know or reach out to help someone else.
- Have a process orientation, go with the flow.
- Co-design of learning space — Negotiation, flexibility, grab that trapeze and fly!
- Get over yourself. Challenge any fear of giving up control of the online space, grow as a facilitator, and let students come to the forefront.
- Setting class norms (e.g., social media, respectful interactions, trust and right to pass).
- Don't be a scaredy-cat: life begins at the edge of your comfort zone. Check out Yubing Zhang's video – Life Begins at the End of Your Comfort Zone (9:36).
- Take a few breaths, let your hair down: you have to take a few risks :).
- Celebrate mistakes, enjoy the left turns, find adventure on the tangents.
- Embrace initial resistance or discomfort – in yourself or your students!
- Encourage multiple formats for assignments and tasks.
- Hack the syllabus and make it *JUICY*.
- Keep a sense of humour.

ACTIVITIES & EXAMPLES

ACTIVITY 1: DIGITAL MOMENTS

Overview

Developing social presence and effective collaboration in an online environment can be a challenging endeavour. This activity describes the community-building impact of *Digital Moments* (DM), a strategy that enables students to develop educational alliances and build relationships that improve and sustain a collaborative learning environment. As teachers in art and physical education, we wondered how the qualitative arts-based Digital Moments could be used for students to visually describe their emotional state and readiness to learn that students and instructors bring to class. Using this strategy across age groups, we have found that this has a significant effect on developing caring relationships online, willingness to take risks, and working collaboratively in teams. Using story-telling and narratives of learning through arts can influence participants' willingness to take risks and learn new technological skills.

Description

Specifically, a Digital Moment is presented by each student on a shared screen at the beginning of an online synchronous class and consists of a creative, multimedia representation of how weekly readings and discussions connect to their personal lives. A digital moment could be a photo, quote, colour, artistic expression, poll, or anything qualitative representing their readiness for learning. No names appear, and students the artifacts they want to hear about.

Possible Challenges

In the beginning, some students readily embrace the strategy, others have a history of teacher-centred content-based learning, so it takes a week or two to get everyone comfortable. Still, you may find that students arrive early, think about their DM during the week, and look forward to seeing others' contributions. In addition, the right to pass each week is offered to protect privacy and encourage authenticity.

Resources

- Barber, W., Taylor, S. & Buchanan, S. (2014). Empowering knowledge-building pedagogy in online environments: Creating digital moments to transform practice. *Electronic Journal of e-Learning*, 12(2), 128-137. <https://academic-publishing.org/index.php/ejel/article/view/1685>

ACTIVITY 2: CREATIVE DESIGN CHALLENGE

Overview

Creative design challenges are a fast and effective opener at the start of class to loosen up and exercise the brain's creative side! Design challenges can get students out of their comfort zone and illicit divergent thinking. Activities like the following are beneficial for classes that engage in group work, problem-based learning, collaboration, feedback loops, critical thinking, problem-based learning, community-building, and so much more. Does this sound like your class? Read on.

When undertaking any creative design activity, it's helpful to remind adult learners that there is *no mistake, only make*. In the first few weeks we embarked on these design challenges, I noticed a few puzzled looks, some laughter, but most importantly, students who were willing and keen to take risks. And it was a risk for me, too! By the end of the course, students had drawn blind contour portraits of one another in breakout rooms, had an e-pumpkin carving contest on Halloween, visually communicated how to make toast without any words, and so much more. Below are two examples of opening activities that encourage the skills mentioned above.

Description

The following two activities take very little prep time and require about 10 minutes of class time. No artistic skill is ever needed, just an open mind and willingness to take a risk.

- **Squiggle Birds:** While this is typically a face-to-face activity, it was quickly adapted using Google Jamboard and Zoom. This is an excellent, low-stakes *ideation* activity. See the Interactive Design Foundation for more on ideation.
 - Before class, I filled a few pages with random squiggles and asked everyone to select one squiggle and turn it into a bird. They had 2-3 minutes to draw their bird, adding colour and detail. It helped talk students through the process and reminded them of basic features- the beak, a tail, feet, and wings. They soon catch on to how simple this is! It's a great activity to lift confidence and demonstrate how the brain connects seemingly abstract imagery. It also helps students loosen up and feel more confident to take risks, think creatively and not hold back. When the activity is over, it's fun to do a *gallery walk* through the Jamboard pages and discuss their drawings. It's a hoot!
 - **Draw Toast:** Draw Toast has become a classic systems thinking activity that can be done individually and in design teams. It can take anywhere from 10 to 30 minutes, depending on how deeply you'd like to go with the design process and post-activity discussion. This activity reveals how we generate ideas and solve problems in various ways. This is an excellent activity to build engagement and collaboration in your classroom.

Again, this is traditionally a face-to-face activity, but it was easily modified for Zoom online. Ask students to have a large piece of white paper and preferably a black marker ready. I don't suggest pencils as there is a tendency to erase, and pencil drawings can be challenging to see when shared on screen. The instructions are incredibly straightforward: ask students to draw a picture of making toast. No words are allowed. Once the time is up, have students hold up their work. You will be amazed at how differently everyone arrives at their solution (see illustration below).

When our students debriefed, they had an opportunity to share how they arrived at their design solution, and it was fascinating to see how differently an everyday task was communicated. I remarked to one student, "Wow, I am impressed with the amount of detail on your toaster. You even added the plugin to the outlet!" She responded that she spent five years working in a tech call centre and started most calls with the question, "Is your modem plugged in?" To her, the plug was everything.

The activity can be further extended in working groups in which teams can build from individual designs to come up with a final, collaborative plan. A timer and some fun accordion music can add flair and excitement.

Possible Challenges

- Early in the activity, students may operate from a false belief that *I can't draw, I'm not an artist*. We can effectively challenge this idea by ensuring that they cannot get it wrong, diverse results are always welcome, and, well, model this as a teacher by participating in the activity yourself.
- Students don't always feel safe, open, or welcome. Having the right to *pass* is an effective way to make students feel safe and welcomed. But this provides an excellent barometer for the teacher about student readiness to participate in other aspects of the class. It gives practical information about which students are ready for more challenges and need a softer hand on the reins.

Resources

- Squiggle Bird and many more creative warmups.
- A fully downloadable Draw Toast activity package and TED talk video.

ACTIVITY 3: PHYSICAL ACTIVITY AND MOVEMENT

Overview

While it may seem like a challenge to get students up and moving in online environments, there are lots of cool ideas out there to quickly and easily integrate lesson content into movement. Using open access games with little or no preparation time is a great way to engage students and can be used for topic review or just as an engaging hook.

Description

- **Baamboozle** is a free online resource with more than 750,000 interactive games and activities created by teachers across any subject area you can think of or imagine. Depending on the topic, you can also make your own game for free. Play from a single device on a projector, smartboard or in an online lesson. No student accounts are needed. It's simple to set up. Put the power back in your students' hands. Working in teams, they make discoveries together and judge if answers are up to scratch. Students have to reproduce the answers, not just recognize them. Learning is, in context, highly engaging in a competitive or cooperative environment.
- **Sworakit** is a great online resource full of pre-designed workouts and fitness ideas for all ages and activity levels. Sworakit makes it easy to integrate physical activity in online settings. If you sign up as an educator, it is free and gives you access to all the resources you need for kids, families and getting everyone's attention focused. With a short body break, your students can be invigorated and pay greater attention to their online learning tasks.

Possible Challenges

- Safety is always a consideration, especially with younger students. It is essential to ensure they have enough space to move freely — providing instruction about required personal movement space can help.
- Checking for other obstacles such as furniture, slippery floors is also important; however, once this is okay, students do not need more than their desk space to do most of the movements. In addition,

Bamboozled games can be done sitting down, allowing for the inclusion of individuals with movement challenges.

Resources

- Baamboozle
- Sworkit

ACTIVITY 4: CLASS PLAYLIST

Music is an excellent strategy to make your online room more welcoming and engaging. It can also be a way to give students ownership of the room by having them select the opening tunes to be played as they enter the online space. Take requests, sense the energy in the room, and create your playlist for class opening and closing. Using mindfulness meditation music or *pump you up* music can make your students feel your online space is creative, welcoming and fun. You can create your playlist or have the class create a playlist to share. Themed seasonal music can also work well, or classical-themed music.

- For a stressed-out class needing some mindful meditation, consider this piece “Ra Ma Da Sa” by Snatum Kaur (9:48).
- To energize learners, try anything by Jess Glynne, such as “Hold My Hand (4:02).”

General Resources

- Grice, S. & Hughes, J. (2009). Can Music and Animation improve the Flow and Attainment in Online Learning? *Journal of Educational Multimedia and Hypermedia*, 18(4), 385-403. Association for the Advancement of Computing in Education (AACE). <https://www.learntechlib.org/primary/p/30275/>
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Cultivating Community Building in Online Learning Environments

DIANA PETRARCA; TRICIA DWYER-KUNTZ; AND TERRI JACKSON

INTRODUCTION

Learning is an active, complex, and individual process shaped by cognitive, biological, social, emotional, cultural, and environmental influences (National Academies of Sciences, Engineering, and Medicine, 2018; National Research Council, 2000). There is no one-size-fits-all formula for educators to facilitate student learning. However, there are evidence-based findings regarding how people learn and how the design of learning environments might enhance student learning (National Research Council, 2000). For this chapter, we draw from the chapter on designing learning environments from the expanded edition of *How people learn: Brain, mind, experience, and school* (2000), which frames the optimal learning environment around Bransford et al.'s (1998) perspectives. Optimal learning environments recognize that a community is built through the interconnectedness of a knowledge-centred, learner-centred, and assessment-centred space. While all of these elements are interconnected and critical to enhancing the learning experience, this chapter focuses on the broader and all-encompassing backdrop of community.

This chapter first addresses why community matters so that instructors understand how creating a sense of community in the learning environment enhances the learning experience. Some students may also wonder why time is spent on community building, so feel free to share the rationale and help them understand that learning is complex and multifaceted. Next, we offer general guidelines for instructors to consider and specific examples of establishing community:

1. Before the course begins.
2. At the onset of the course.
3. As the course progresses.

Community building does not simply happen in one isolated event, but rather the process of establishing a learning community is ongoing. Building a classroom community in which students feel safe, included, and understood requires educators to create a deep knowledge of the students (Seravello, 2020). Particularly in a virtual space, it can be difficult for students to feel seen and known (Martin, 2019).

WHY DOES COMMUNITY MATTER?

By engaging in a learning environment in which shared norms and a sense of community that values learning is established, learners have increased opportunities to engage with others, take risks, obtain feedback, and ultimately learn (National Research Council, 2000). As noted in the Ready, Set, Go – Your First Week chapter, establishing a solid community plays a critical role in students' learning experiences by helping learners engage with one another (Conrad & Donaldson, 2004; Lehman & Conceicao, 2014), establishing a foundation for successful collaborative learning (Johnson & Johnson, 2009; Nilson & Goodson, 2018), and establishing an environment for deeper learning (Quinn et al., 2019; Savin-Baden, 2007).

In asynchronous learning environments, community-building is still possible using online discussion boards, social media networks, or collaborative annotation tools in shared documents and whiteboards. However, it is essential to note that students who typically engage in independent distance learning experiences appreciate the flexibility of completing coursework anytime and anyplace (Anderson, 2008). We do not want to create potential restrictions on the learner's independence. Anderson (2008) also reminds us that we must create learning environments that accommodate the wide range of learner-needs and that no single virtual learning environment that meets the needs of all learners exists.

GENERAL GUIDELINES

Based on numerous articles and books on pedagogy and online learning, as well as our collective experiences in teaching online virtual classes, we offer the following general guidelines or suggestions to foster a culture of community and connection in your virtual classroom:

1. **Recognize that community building is not an event.** Like all relationships, ongoing maintenance is required. Seek regular opportunities to connect and reflect, both individually and in groups. Do this as often as your schedule allows.
2. **Establish the context.** The nature of relationships varies depending on who you are teaching. For example, relationships will look different in a post-secondary setting than in a secondary school classroom.
3. **Consider who is in a relationship.** Within your community of learners, consider the relationships between instructors and students, students and students, and students and self (both in terms of their evolving self-perception as a consequence of learning and intrinsic factors, like motivation). Each of these will require different supports. Don't forget the importance of building relationships with caregivers within a high school setting.
4. **Establish norms.** Provide general guidelines regarding establishing classroom norms; begin with modelling. Ensure your expectations are clear yet concise. You may wish to review the chapter on fostering productive social interactions for further ideas.
5. **Be flexible.** Don't feel bound by your live sessions – feel free to extend your communication beyond your synchronous video meetings. A quick email or a well-timed announcement can reinforce a relationship. Consider a variety of platforms and avenues to build community. Twitter is a great way to connect outside the assigned learning space, expanding the learning beyond the lessons.
6. **Acknowledge your audience.** Knowing that freedom and independence are often major motivations for enrolment in virtual learning contexts, consider how your requirements for community building impact individual autonomy.
7. **Considerations for cameras.** Respect that learners may need the opportunity to choose whether

they appear camera on/off (i.e., home environments, bandwidth, learning preferences all impact an individual's decision to appear on or off-camera). Clearly indicate your preference but acknowledge that individual preferences and needs may vary. Let students know that you value the opportunity to see how they are reacting and consider encouraging them to have the camera on in breakouts even if they are not comfortable in the whole class setting. It might be worth suggesting the option of using a screen background since not everyone may be comfortable sharing the background in which they broadcast.

8. **Supporting diversity in learner profile.** Always enable closed captioning and offer an unobstructed view of the speaker's mouth. This practice helps individuals in need of auditory support, English Language Learners, and persons with attention and focus needs (and others!) Providing an opportunity for students to complete a short survey (e.g., Google form) gives individuals a chance to share vital information about their learner profile with the instructor at the start of the course.
9. **Use of pronouns.** Encourage pronoun use (some platforms, like Zoom, allow users to change their display name to include their pronouns). This practice will ensure that you refer to individuals appropriately.
10. **Consider your professionalism.** Both in terms of your surroundings (e.g., leverage filters if you teach in shared or cluttered space) and the comfort of your students (e.g., don't teach from bed... no matter how comfortable it is!).
11. **Be genuine.** If you *are* cheesy icebreakers, roll with it... but don't force it on yourself or your students if this doesn't fit your personality. Community is built in many ways. Plan it the way you plan lessons.

ACTIVITIES

ACTIVITY 1: INTRODUCTORY EMAIL

Overview

Before starting the course, the instructor can send students a brief message introducing themselves, welcoming students to the course, and sharing pertinent reminders connected to the beginning of the course. This message aims to share information and begin to build the bond between teacher/student. In addition, it ensures your emails are getting to the students. Leverage this message to present yourself as an instructor who is present, available, and committed to student success.

Description

As some students may feel nervous and anxious, the introductory email creates a culture of care and puts students at ease. The initial email serves as your first contact with your students – first impressions are critical. The tone you set in this message offers insight into the expectations students can have of you throughout the semester (Brown, 2019). Instructors may include a brief introduction of themselves, either in the body of the message or in an introduction video [0:49]. This introductory message must have pertinent information without overwhelming the students. Resist sharing all the things.

Instructors may wish to include information on class timing, LMS platform(s) and login instructions, contact information, and course expectations within the introductory email. The inclusion of support structures can ease tensions for many new to online learning (e.g., offer to log in thirty minutes before the first class to assist students with testing video and microphone capabilities in providing links to the institution's technology help desk, introduce unusual software so students can play with it in advance).

If your audience is students below the age of majority (e.g., early high school students), ensure you include parents/caregivers in the introductory email. They will want to know how to connect with you and how best to support their learner.

Possible Challenges

- **Access.** Some students (and/or parents) may be concerned about accessing the email or video promptly. In addition, share communication in a space where individuals are likely to access it (i.e., institutional email address, LMS messaging, course announcement page).
- **Clarity.** Some students may require an opportunity to ask additional questions. Consider creating a Padlet (or similar) as a parking lot of procedural questions. You may also wish to make a frequently asked questions forum.
- **TMI** (Too Much Information. Sometimes there is a lot of information to share. It is critical that you filter through this and only communicate the information necessary for the students to succeed. Other information can (and will) be shared as needed.

Resources

These resources offer further options to consider, as you add a personal flair to your introductory email:

- Sample Email [PDF].
- Name Tent

ACTIVITY 2: BUILDING COMMUNITY – RIGHT OUT OF THE GATES (MEETING ONE)

Overview

A significant component is student identity – the unique characteristics, talents, abilities, interests, customs, cultural practices, and norms that a student brings into the space (Howard, Milner-McCall, & Howard, 2020). Often, we respond to one another based on assumptions about another's identities (or perceived identities, e.g., Minor, 2019). As such, seeking opportunities to honour and welcome student identities begins the process of building an online environment anchored in relational trust (Seravello, 2020).

Description

An identity web is a personalized graphic tool that helps us consider the many factors shaping us (Ahmed, 2018). Identity webs can be used as introduction tools to facilitate interconnectedness – supporting us to notice, wonder, and see the humanity in one another (Searvello, 2020). From Sara Ahmed's (2018) book, *Being the Change*, this activity has been adapted to a virtual environment.

While not directly connected to community building, some classes benefit from an example/exemplar. For those groups, a read-aloud offers the perfect opportunity to model the creation of an identity web. Children's storybooks offer utility in both secondary and post-secondary classrooms. We have used *Rosie Revere, Engineer* [Book] and *The Girl Who Thought in Pictures* [Book] as the anchor text for our identity webs. Finding a rich storybook allows students to see themselves in the pages and offers opportunities to build vocabulary (particularly valuable spaces with multilingual learners). After reading, the class co-constructs an identity web for the main character in the picture book, outlining the key features and attributes. Consider drawing attention to pieces of your identity and positionality as you collectively work through this. Google JamBoard allows for multiple contributors simultaneously.

For homework, individuals now create their identity web, or alternatively, you could provide class time to do this. They may choose to do this electronically or on paper.

Individuals may choose to share identity webs asynchronously (e.g., on FlipGrid) or live in breakout rooms. Either option allows participants to determine their level of self-disclosure and begins the critical process of building relationships amongst peers.

Possible Challenges

- **Level of self-disclosure.** Some students will share a great deal about themselves, while others will share only superficial information. Recognizing and encouraging acceptance of the individual level of self-disclosure will vary considerably is critical.
- **Time.** Some students will choose to share for extended periods. If you decide to do this activity with live sharing, establish a timekeeper who will manage individual sharing time. In addition, discuss sharing guidelines in advance. Alternatively, you can schedule out-of-class time for this to be shared.
- **Lack of engagement.** Some students, particularly at the secondary level, may not wish to participate. Opportunities to share an asynchronous video may appeal to these individuals.

Resources

Creating opportunities to build relationships and comfort within the classroom will support your work throughout the semester/term. These resources offer further options to consider, should the identity web activity not quite fit your context:

- Me as a Tree – Alternative Identity Activity
- Identity Iceberg
- Discovering my Identity
- Social Identity Wheel [PDF].

ACTIVITY 3: BUILDING COMMUNITY AS WE GO!

Overview

Throughout the term, it is vital to continue offering opportunities for students to feel connected to their teacher, peers, and learning space (Seravello, 2020). This connection can be achieved by providing safe and low-risk activities either intermittently or in schedules (e.g., daily, weekly or bi-weekly).

Students of all ages look forward to starting their day/class with a game about themselves, and it allows teachers to get to know their students on a more personal level. Enhancing relationships between students and instructors increases the effectiveness of our teaching, as it enhances the communal, relatable, transferable nature of the knowledge (Howard, Milner-McCall, & Howard, 2020).

Description

Someone Among Us! is a daily or weekly activity that connects a popular game theme (Among Us! [0:40]) and to an equally popular presentation mode (Kahoot!).

Begin by having students complete a pre-class “All About Me” Google Form where students share standard information (i.e., a telephone number, an alternate email address, allergies, comfort with technology, required accommodations). As the last question on the form, ask participants to include two or three unique things about themselves that others might not know (and that they do not mind sharing with the class!).

Before each class, the instructor then creates a Kahoot game highlighting three individuals in the class. The instructor will turn each idea into a question such as, “Someone among us has travelled to 3 different continents.” Add the student’s name to the Kahoot! and include two distractor student names. The instructor should have all participants turn off their cameras except for the target plus the two distractors and have the class vote on who they think the statement is referring to. As per Kahoot!, students will choose a multiple choice answer. Once the solution is revealed, the target student can share more about their experience.

Possible Challenges

1. **Level of self-disclosure.** Some students will share a great deal about themselves, while others will share only superficial information. Recognizing the individual level of self-disclosure will vary considerably is critical.
2. **Varied life experiences.** Some students will come to class with a background of rich experiences. Others will not and may have difficulty sharing. Offer examples of things that are both intrinsic and extrinsic to the students. For example, a student who may not have had travel or sport/recreation opportunities can share a talent or interest. To support students, a list of sample ideas could be provided (e.g., chess player, wears mismatched socks, hates the colour red).
3. **Level of comfort with personal sharing.** Students should always have the *right to pass* regarding personal sharing. Playing the game in small groups may help hesitant students to share with a partner. This game is played over a period of time, so a genuinely reluctant student would not be noticed if they chose not to participate.

Resources

Creating opportunities to enhance relationships within the classroom will support your work throughout the semester/term. These resources offer further options to consider:

- Community from a Distance: Building a Sense of Belonging Online Classroom.
- How Can We Make the Most of Synchronous and Asynchronous Time in Distance Learning?
- A Place of (Remote) Belonging: How educators can create a welcoming classroom community during distance learning.

ACTIVITY 4: BEFORE YOU KNOW IT, YOU ARE A GRADUATE!

Overview

Making an effort to stay connected with students throughout the year can build a robust classroom community. Therefore it is essential to bring social/emotional closure and celebrate the end of a school year, semester or course with your students.

Description

Students will create an avatar and participate in a *virtual graduation picture through celebration*.

Using Pixton Class Photo, participants create an avatar that will be included in a Class Graduation Picture. This *grad photo* can be shared with students and families or compiled with photos from over the year to create a class yearbook.

Possible Challenges

1. **Body image:** Some students may have difficulty creating an avatar. To avoid having a student be excluded from the final Class Photo, the avatar creation could occur at the beginning of the course, allowing for discussion and support.
2. **Non-inclusive software.** The software must have fully inclusive choices for student avatars. Be sure to know your students and preview the software to ensure they feel included when creating their avatar.

Resources

- Pixton: Make a Class Photo
- Twelve Best Avatar Maker Apps of 2022
- Using avatars and virtual environments in learning: What do they have to offer? [PDF].

GENERAL RESOURCES

- Creating Online Learning Communities: THE Campus (part of Times Higher Education) has compiled various ideas to build online learning communities.
- Engaging Students Through Asynchronous Video-Based Discussions in Online Courses: This article provides a brief overview of several video-based tools that support asynchronous collaboration and engagement.
- Great Online Communities for Kids and Teens: This resource curated by Common Sense, a nonprofit organization that provides reviews and overviews of digital tools for students, lists a wide range of sites that support online collaboration.
- 5 Online Discussion Tools to Fuel Student Engagement: Another resource from Common Sense includes five online discussion tools that help students have meaningful conversations.

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Fostering Creativity and Critical Thinking Online

JANETTE HUGHES; LAURA MORRISON; AND DIANA PETRARCA

INTRODUCTION

This chapter provides an overview of fostering creativity and critical thinking in secondary school and higher education online teaching and learning. Our advice is grounded on a recent research partnership with the Organisation for Economic Co-operation and Development (OECD) that examines how educators might foster the development of critical thinking and creativity in their students. The overarching objective of this project is to make more visible and tangible what it means to teach, learn and make progress in these skills in education through digital literacies.

Using Design Thinking methodology (Gobble, 2014; Psenka et al., 2017; Doppelt, 2009) and a focus on innovation, educators use production pedagogies (maker approach) to promote inquiry, imagination, creativity, curiosity, and perseverance by learning through mistakes. Most notably, making fosters the development of critical global competencies and transferable skills, such as creative and critical thinking, problem-solving, collaboration, leadership, and innovation. Like the Anticipation-Action-Reflection cycle, design thinking is a fluid and non-linear methodology that tackles complex problems in our local and global communities. Using design thinking, learners exercise their agency to define real-world issues they are passionate about by empathizing and understanding the human needs involved. They brainstorm to generate multiple solutions and prototype and test their solutions. The teacher's role as a critical facilitator of student learning and nurturer of student metacognition is crucial in this process of constant reflection, collaboration, and sharing, which are built into this iterative cycle and encourage deeper engagement and better solutions to complex social issues.

CREATIVITY

Henriksen et al. (2018) explain that “the definitional challenge of creativity speaks to its ill-structured, multi-faceted nature, which is emergent, contextual, and complex in expression” (p. 2). While this is true, specific characteristics of creativity are shared across the varied definitions in the literature. For example, creativity includes novel or original ideas and effective or impactful products (Zhou & George, 2003; Kaufman & Sternberg, 2010; Sternberg, 2016). Sternberg (2018) explains that “creative work challenges existing ways of seeing and understanding the world” (p. 50). He also explains that creativity can vary between cultures and is “bounded by the constraints of time and place” (p. 50). Boden (2004) classifies creativity into three categories: combinational, exploratory or transformational. Combinational includes combining the familiar in new ways. Exploration includes developing or creating new ideas or products within an existing framework, and trans-

formation consists of generating completely innovative ideas and products outside any conventional framework. The previously impossible is made possible. There are challenges to teaching creativity online. There can be a tendency to prepare lectures because it is relatively easy to create a slide deck; however, providing students with the space and time to do hands-on creating is still possible, whether completed in a synchronous or asynchronous format.

CRITICAL THINKING

As with creativity, the term *critical thinking* can be challenging to define. Johnson and Hamby (2015) explain that “there is an overabundance of problematic definitions” and that “it is not at all clear that these definitions are equivalent or even compatible” (p. 417). Another reason for the difficulty in defining critical thinking is that critical thinking can look very different across different domains and subject areas (Hansson, 2019). However, Mulnix (2012) believes that while the skills associated with critical thinking may depend on domain knowledge, they are, in fact, not domain-specific. Willingham (2008) explains that “in layperson’s terms, critical thinking consists of seeing both sides of an issue, being open to new evidence that disconfirms your ideas, reasoning dispassionately, demanding that claims be backed by evidence, deducing and inferring conclusions from available facts, solving problems, and so forth” (p. 21). However, he also asserts that critical thinking “is very much dependent on domain knowledge and practice” (p. 21) and therefore, as a stand-alone skill, it can be challenging to teach. Teaching critical thinking online can be done in various ways, including discussion boards or activities requiring students to consider several perspectives on a problem based on different assumptions or explain a theory or concept through both strengths and limitations. The key to teaching critical thinking and creativity is to ensure that students can inquire, imagine, do (make), and reflect on their learning.

GENERAL GUIDELINES

Several rubrics were co-developed by OECD and other participating institutions. Below we share the class-friendly version of the rubric we used to revise our online courses and assignments to focus more explicitly on developing critical thinking and creativity. In developing the rubric, we considered eight design criteria for good lessons:

1. Create students’ need/interest to learn.
2. Be challenging.
3. Develop explicit technical knowledge in one domain or more.
4. Include the development of a product.
5. Have students co-design part of the product/solution or problem.
6. Deal with problems that can be looked at from different perspectives.
7. Leave room for the unexpected.
8. Include space and time for students to reflect and give/receive feedback.

See Figure 1 for a general class-friendly rubric to assess creativity and creative thinking.

Figure 1.

Class Friendly Rubric

	CREATIVITY (Coming up with new ideas and solutions)	CRITICAL THINKING (Questioning Ideas and solutions)
INQUIRING	<ul style="list-style-type: none"> • Make connections to other concepts and knowledge from the same or other disciplines 	<ul style="list-style-type: none"> • Identify and question ideas generally accepted ideas or practices
IMAGINING	<ul style="list-style-type: none"> • Generate and play with unusual and radical ideas 	<ul style="list-style-type: none"> • Consider several perspectives of a problem base on different assumptions
DOING	<ul style="list-style-type: none"> • Produce, perform or envision meaningful output that is personally novel 	<ul style="list-style-type: none"> • Explain both strengths and limitations of a product, a solution or a theory justified by logical, ethical or aesthetic criteria
REFLECTING	<ul style="list-style-type: none"> • Reflect on the novelty of solution and of its possible consequences 	<ul style="list-style-type: none"> • Reflect on the chosen solution/position relative to possible alternatives

ACTIVITIES

ACTIVITY 1: SCAFFOLDED ASSIGNMENTS TO FOSTER CRITICAL THINKING & CREATIVITY

Overview

Below is an example of integrating critical thinking and creativity in an online classroom using a scaffolded assignments approach. The practice of online teaching and learning relies heavily on skills related to critical thinking as individuals need to be able to critically navigate, consume and produce digital content, which often requires creativity.

Description

In their first major course assignment, students use the inquiring, imagining, doing, and reflecting model from the rubric above to critique an *Online Learning Environment* (OLE) of their choice. Examples of OLEs include Khan Academy, NearPod, Duolingo, Coursera c- and x-MOOCs. The purpose of this assignment is for students to understand the common nature of online learning environments in all areas of education – elementary to post-secondary, non-formal to formal – and also to understand what makes a good online learning environment. Students consider the affordances, considerations and promising pedagogical practices associated with their chosen OLEs. More specifically, students are required to use online learning theory to critique their OLE to develop a practical and nuanced understanding of how learning theory connects with good online teaching and learning practices. Students consider, for example, how and why embedding learner-facilitated breakout room discussions in an online course can facilitate engagement and learning (e.g., agency-building practices, socio-constructivist learning theory). Having the students apply learning theory in their OLE critique also prepares students for the next and final major course assignment — creating their own OLE.

The final course assignment (OLE creation) is a natural, scaffolded, progression from the first course assignment (OLE critique). Where the first assignment is based on observation, analysis, and evaluation, the final assignment focuses on understanding, application, and creation. Students apply their knowledge and understanding of general learning theories such as social constructivism for the final assignment (Vygotsky, 1978). They also apply their knowledge and understanding of online learning and content-design frameworks such as the principles of e-learning (Clark & Mayer, 2016) and the Community of Inquiry framework (Garrison et

al., 2000). Students are asked to move beyond critiquing other OLEs and create their own OLE – one they could use in their teaching division (i.e., a junior or intermediate classroom) or subject-specific domain (e.g., the English classroom). The purpose of this culminating assignment is for students to consolidate, synthesize, and apply their knowledge to create something new, personally relevant and helpful to their future careers in teaching. Much of the focus of this assignment includes inquiry-based, student-centred, and collaborative learning (otherwise referred to as maker learning or maker pedagogies), so one requirement of the assignment is that the OLEs integrate active (as opposed to passive) learning.

Possible Challenges

- As students are encouraged to select an online learning environment to critique in the first assignment, they may find sourcing difficult. Therefore, selecting potential subject-specific OLEs for the students to choose from is important (e.g., Khan Academy, Duolingo, Coursera). Also, if the students have previously taken any online courses, especially in the near past, these would be good options for their critique.
- Students may feel overwhelmed by the second assignment if they have previously used a website builder. Curating intro tutorials for students or running simple “getting started” workshops may help. In addition, encouraging students to work in pairs or groups to learn and create with the website building tools may be beneficial.

Resources

- Clark, R. C., & Mayer, R. E. (2016). *e-Learning and the science of instruction*. John Wiley & Sons, Inc.
- Five Educational Learning Theories – A place to start with learning theories
- Weebly (website builder)
- Wix (website builder)

ACTIVITY 2: DIGITAL LEARNING PORTFOLIOS

Overview

Reflection plays a critical role in the learning process. Creating a digital learning portfolio serves as a culminating task where learners analyze the contents of their digital learning portfolios, which include responses to weekly prompts and self-assessments based on readings and learning activities. The weekly prompts or guiding questions serve as tools to poke at learners’ prior assumptions about learning and teaching (or it could be adapted to any discipline to address previous assumptions), gently nudging them to frame and reframe puzzling situations. Towards the end of the semester, after engaging with critical thinking prompts to support their analyses, learners reflect on their DLP entries to summarize their key learnings. For example, in initial teacher education programs, students are asked to summarize and share their learning at the end of the semester via creating a personal vision of teaching and learning video (screen-capture). They take the viewer through the various elements of the DLP that shaped the learner’s current vision.

Description

The digital learning portfolio (DLP) is a web-based repository to document learning as students progress through a course. It is important to note that the DLP is a learning portfolio and not a showcase portfolio (Barrette, 2016) where learners document their learning during the course. The overarching purpose of the DLP is to help students:

- Critically reflect on a variety of topics, including their assumptions, learning, content, pedagogy, and cultural contexts.
- Self-assess their learning and development.
- Creatively document personal learning.
- Explore and integrate a variety of technologies in creative and meaningful ways.
- Share ideas and learning with peers and instructors (social and cognitive presence).
- Analyze growth.

DLP Structure

The actual shell of the DLP is created using any website creation platform of choice. We strongly encourage the use of platforms that allow for password protection, given the personal nature of the DLP. The DLP could include a variety of sections to document learning, such as 1) personal statements (in response to bigger-picture questions at various points in the course, 2) guiding questions (these are the weekly prompts to facilitate reflection); 3) self-assessments (conducted periodically throughout the semester), and 4) reflective analysis (opportunities to analyze weekly entries, personal statements, self-assessments within the e-portfolio to examine growth and learning explicitly). The following section describes examples of reflective analysis.

Reflective Analysis

A reflective analysis provides students with opportunities to take stock of their learning by analyzing the contents of their DLP at a particular point in time. For example, midway through a course, learners could reflect on their learning thus far and identify questions or areas that are still puzzling or fuzzy and wish to explore during the rest of the course. Students complete a final reflective analysis of their overall learning at the end of the course. It is crucial to provide a series of questions or prompts to guide the analysis of the DLP. The reflective analysis could be in essay form, whereby specific elements of the DLP are used as in-text citations to provide evidence of the learning, or the reflective analysis could take other multimedia formats. For example, one strategy is to have learners create a video using screen-capture software to explicitly demonstrate learning over the semester. For instance, in initial teacher education, learners are asked to create a final *vision of teaching-learning* that has emerged from a thorough analysis of the semester's work in the DLP. This *vision* approach can be adapted depending on the discipline and course. Learners are provided with a series of questions to help guide the analysis of their responses to weekly reflective prompts, self-assessments, and personal statements. Examples of the questions to help guide the analysis of the DLP include:

- What mental image of effectiveness [discipline-related concept such as leadership, researcher, communicator, child youth worker] will guide your practice or activities in this field?
- How and why has this vision shifted since beginning this course?
- Consider your current mental image of effective [discipline-related concept] within the context of your prior assumptions of [discipline-related concept].

- What might limit the enactment of your vision?
- What research and theories inform your vision? Why?
- What evidence in your DLP explicitly supports the development of your vision?
- How might you creatively approach this culminating task?
- How will you present your vision, and how will it emerge innovatively? Consider the design, techniques, and content.

The final product is a short (4 – 5 minute) video sharing the learner’s vision and how it emerged. Using screen-capture software, the learner guides the viewer through the relevant contents of the DLP to explicitly develop their current vision.

Possible Challenges

- Initially, students may need support and guidance to create a website to create the DLP and the final screen-capture video using the free resources. Some students may lack the confidence and experience to explore various platforms, and some may require directed tutorials.
- The weekly guiding prompts require scaffolding and explicit instruction to help foster reflection.

Resources

- Dr. Barrett’s work on e-portfolios
- Google Sites
- Screencastify – Google Chrome extension (screen-capture software)
- Weebly (website builder)
- Wix (website builder)

GENERAL RESOURCES

- On teaching critical thinking: This web page reflects Downes’ perspective of critical thinking and how the formal teaching of critical thinking might be approached.
- Our concept and definition of critical thinking. The Foundation for Critical Thinking: This webpage outlines one perspective on the definition of critical thinking and the dispositions/habits of mind of a critical thinker.
- Human Capability Standards: Reference Model: This document outlines the Human Capability Standards, which include four domains of workforce needs. It aims to bridge the knowledge, skills, dispositions and experiences from the world of education with the needs of the current employment landscape, so students are workforce ready.
- Robert J. Sternberg’s website provides an overview of such subjects as creativity, emotion, intelligence, and leadership. There are resources and references to his work for further reflection.

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Creating Engaging Online Synchronous Activities

ROBIN H. KAY

INTRODUCTION

I believe that the heart and soul of online teaching and learning rest in selecting high-quality, engaging synchronous activities. A poorly organized activity or the passive presentation of knowledge can quickly derail focus and success in a virtual classroom. On the other hand, a carefully crafted, collaborative, focused set of activities can transform the class.

An ideal activity needs to address social and cognitive presence (Garrison, 2001). The social construction of knowledge through meaningful collaboration typically leads to productive cognitive engagement. In addition, an instructor needs to select activities that align best with learning outcomes and the student's development level. Fullan's (2013) deep learning approach is also helpful in designing activities that promote character, communication, creativity and critical thinking.

Most online teachers, including me, have designed less than ideal activities that may have worked in a face-to-face class but somehow do not translate to an online environment. In this chapter, I will share guidelines for creating optimal synchronous learning activities based on over a decade of online teaching and, perhaps more importantly, evidence-based practice.

GENERAL GUIDELINES

This section offers ten guiding principles for designing effective online synchronous learning activities.

1. **Authentic.** Learning is more effective when connecting ideas/concepts/skills to authentic or real-world situations/problems (Herrington et al., 2003; Lombardi, 2007). Organizing students into breakout rooms to address a relevant, engaging, real-world problem can stimulate thought, focus and cognitive engagement. Examples might include a case study, designing a learning tool, evaluating a program, comparing two approaches or contrasting opinions, debating messy social issues, or creating a web page.
2. **Breakout Rooms.** Large groups do not work particularly well in online learning. Lecturing is often ineffective. Students turn off their cameras and are reluctant to participate in discussions more often than not. Breakout rooms, consisting of four students maximum, can change the online dynamic entirely, particularly if you create engaging, meaningful tasks. Ask students to turn on cameras in breakout rooms — suddenly, there is no place to hide, and social interaction improves.

3. **Collaboration.** Collaboration is a well-supported learning strategy (Johnson et al., 2007; Kyndt et al., 2013; Hattie, 2012) that works especially well in online synchronous environments.
4. **Productive.** To maximize the benefit of breakout room activities, ask groups to produce an artifact – fill in a Google Slide with ideas, create a mind map, brainstorm on a Jamboard, or write a collaborative solution on a Google Doc. If students do not have a clear, concrete end goal, the breakout room could be a waste of time. Having students simply discuss a problem often deteriorates to more social, off-topic conversation.
5. **Timing.** Timing is critical for a successful virtual class. If you choose to present or lecture, you need to chunk (Clark & Mayer, 2016; Van Merriënboer & Sweller, 2005), ideally in 5-10 minute segments. After 5-10 minutes, present information, shift student attention by asking them a chat question, presenting a poll, or testing their knowledge. If you do not follow this rule, students will likely shift their attention to an off-tasks activity – email, texting, surfing the web. Timing is also required for breakout room activities to increase focus. Tell students how much time they have to complete their tasks. Provide a reminder midway through the task and with one minute left. Finally, rotate among the breakout groups to provide advice, direct students and assess whether your initial time estimate is too short or long.
6. **Clarity.** You need to be extra clear when providing instructions for an online breakout activity because it is more challenging to repair confusion when students have shifted into groups. I advise having written instructions (e.g., in a Google Sheet) that students can refer to after moving to breakout rooms. Before shifting into groups, go over the activity instructions. Next, ask the whole class if there are any questions. You might even ask a student to repeat back the instructions to you. Finally, shift around to each breakout group quickly one minute after the start of the activity to address procedural questions.
7. **Choice.** As much as possible, I like to give students a choice about how they approach an activity, the format they wish to present group summaries and discussions, and the topic they want to discuss. This approach works best with open-ended, messy questions or tasks. Offering choice gives students control over their learning. This sense of control helps them build independence and problem-solving skills.
8. **Creativity.** I have observed that activities requiring exploration and creativity lead to the most impressive and engaging results. Challenge students to brainstorm, develop new ideas and think outside the box. Surprising and unexpected thoughts, products and plans often emerge, leading to exciting discussions.
9. **Interactive.** Passive presentation of information is not an effective strategy to promote learning. Students need to engage with concepts and procedures and construct meaning to truly understand and learn (Bruner, 2009; Donovan et al., 2000; Petty, 2009). Therefore, when creating synchronous activities, consider increasing interactivity and engagement with the learning content.
10. **Polling.** Offering a short survey of student opinion or understanding of concepts is a great way to break up a presentation or start a rich conversation. Two-step-polling (described in the activity section below) is a particularly effective activity.
11. **Variety.** I have found the most successful online classes use a variety of activities, including short presentations, polls, chat discussion, breakout discussions, and large group discussions. Of course, the most critical guideline is designing activities to achieve the intended learning goals.

ACTIVITIES

ACTIVITY 1: CLASS DISCUSSION

Overview & Description

Large class discussions can be quite challenging in an online environment. Many students keep their cameras off and are nervous about speaking, perhaps because they feel they might look foolish in front of their peers or the instructor. However, I have had some success with the strategies described below. Here are my suggestions for stimulating class participation:

1. **Getting Camera On.** It is very tough to get students to turn on their cameras. I explain to students that I understand their reluctance. I add that when they turn their cameras on, I can get feedback on how the class is going and whether it is boring or engaging. Finally, I note that when I see their faces, I get to know them better, which can be very important should they need an academic reference in the future.
2. **Warm-up your audience.** Start with a few fun questions in the chat like “What was the best part of your week?”, “Favourite song right now,” or “Best thing you ate last week?” Students readily participate in the chat and will not be intimidated by these questions. Use a delayed response in which all students press enter simultaneously to share their responses.
3. **Ask a meaningful question.** Make sure you ask questions worthy of discussion and debate. Then tell the students that they need to respond in the chat.
4. **Follow-Up on chat responses.** Most students feel comfortable using chat, so you should see reasonable participation. Find an interesting answer and follow up with the student with, “Robin, I noticed you said [], can you please explain that further? I’m not sure I quite understand” this gets the student to use their microphone to explain their answer.
5. **Be supportive and positive.** When a student responds, be positive and make them feel comfortable. That will encourage others to answer. Also, ask students to elaborate on their responses to promote a richer discussion.
6. **Continue follow-up questions.** After a student clarifies their response, you could ask the class, “Does anyone have something to add to what Robin is saying?” The idea is to build discussion off initial responses. You could pick another student who might have a different point of view and ask them to respond to Robin’s comments.
7. **Quick presentations.** A completely different approach is to break students into small groups to produce something, then bring them back for one-minute summaries and discussion. That gets the class talking and often leads to more involved dialogue.
8. **Talk Show Format.** Another option is to set up a talk show or CNN-type format where at least two people debate a topic and use the chat as a call-in feature, where the other students can queue up to ask questions during the debate.
9. **Show and Tell Feature.** To get a large class engaged, first stimulate their interest with a short video, podcast, case study, or short article – preferably something that is controversial and would naturally elicit multiple perspectives.
10. **Do not use grades.** Using grades to force students to participate is not a good idea because it devalues the intrinsic value of a good discussion. The discussion will likely have little teaching or learning

value because students will simply say something to ensure they get a checkmark for participation.

Possible Challenges

Efforts to create engaging, meaningful large group discussions will take time – be patient. I have been teaching online for over a decade, and I still struggle. Sometimes the discussion just does not happen. Move on quickly and use smaller breakout groups to reduce the number of students and intimidation factor.

Resources

- Effective Online Discussions (a very detailed and helpful chapter)
- How to Make Your Virtual Discussions Engaging, Effective, and Equitable in Eight Steps
- Managing Discussion in Large Classes
- What is the Ideal Size for Online Discussion Groups?

ACTIVITY 2: CREATE AND PRESENT

Overview

This idea is relatively simple. Ask students to create, design or summarize an artifact that will support the intended learning outcomes of the class. If they do not produce something in a breakout room, they will likely waste time on non-learning activities because there is no accountability. For example, ask the breakout groups to:

- Present a summary of ideas (in Google Doc or Slide)
- Brainstorm ideas (in a Google Jamboard)
- Create a mind map (in Google Jamboard or any other shareable Mind Mapping Tool)
- Post annotated resources (in Padlet or Google Jamboard)
- List characteristics or features related to a concept (Google Doc)
- Create a case study (in Google Doc or Slide)
- Solve a problem (in Google Jamboard)

Description

Here is a list of general guidelines for the *Create and Present* strategy

1. **Set up groups of 2-4 students.** The ideal group size will be two to four students depending on the task. If the group size is larger, students can hide from the group and not participate.
2. **Provide written and verbal instructions.** Provide clear written instructions in a Google Doc that students can refer to once they are in the breakout room. Go over the instructions verbally and ask the class for clarification questions before breaking out into small groups.
3. **Quickly rotate among breakout groups after two minutes.** Give students time to settle into their breakout groups and get started. Rotate quickly among all groups to ensure students understand what they should do.

4. **Use Google Apps.** Ask groups to produce work in a shared space so that you can monitor their progress and students can see what their peers have created. For example, you could build a large Google Slide deck and have each breakout group create a slide on a different topic. You can easily see how they are progressing on their slide and when the activity is complete, students can benefit from seeing and using the contributions of their peers who produced other slides.
5. **Give time reminders.** Send out time reminders letting students know how much time they have left to complete their work. These reminders keep groups on task.
6. **One-Minute Presentations.** Ask each group to select one student to present the group's final work. Keep presentations short and sweet, or you will quickly lose your class.
7. **Invite discussion after each presentation.** Invite discussion, questions or char response after each presentation.

ACTIVITY 3: CLASS DEBATE

Overview & Description

Depending on the content of your online course, debate can be an effective way to engage students and stimulate critical thinking. Debate can also help address the large class discussion problem. Here is one approach to setting up a class debate activity.

1. **Set the stage.** Develop rich debate topics ahead of time, ideally as a class. If your students develop the debate questions, they are more likely to be engaged.
2. **Outside debate preparation.** Give students the debate topic before the class, so they have time to do research and prepare. Have students select a position on the debate and assign groups accordingly. I like to encourage students to choose a side they usually would not choose. For example, if they are against standardized testing, I challenge them to debate for standardized testing to push their thinking and attempt to understand another perspective.
3. **Establish debate rules and structure.** Develop debate rules and guidelines so that students focus on well-reasoned, evidence-based arguments. Above all, promote respectful conversation. In addition, identify how much time groups will have to present their ideas and the structure of the debate (e.g., 3 minutes for, 3 minutes against, 3-min rebuttals, 3 minutes audience questions for each side, 1-minute summaries).
4. **Pre-Debate Vote.** Before the debate begins, ask the class to vote on whether they are for or against the proposed resolution. Keep track of the results.
5. **In-Class debate preparation.** Divide the class into breakout groups with specific roles. I have used six to eight distinct groups: For-Initial Argument, Against-Initial Argument, For-Rebuttal, Against-Rebuttal, For-Summary, Against-Summary, For-Audience Questions, Against Audience Question. You can have multiple debate topics if you have a larger class so everyone can participate.
6. **Keep debate on time.** Use a timer to keep to your agreed-upon debate structure.
7. **Post-Debate Vote.** After the debate, ask the class to vote on whether they are for or against the proposed resolution.
8. **Post new learning.** Have students post new insights and/or perspectives on a Padlet or Google Jamboard.
9. **Debate summary.** Ask students to produce a summary of the debate for a home activity.

Possible Challenges

This activity requires considerable planning, so make sure the debate topics are worthwhile, engaging and above all, promote deeper learning. Create a Google Doc with all the instructions and guidelines so that students have a clear reference to expectations.

ACTIVITY 4: CASE STUDY

Overview & Description

Good case studies can bring learning to life and help students understand, synthesize and apply their knowledge to authentic, relevant situations. Having students create case studies encourages them to consider various factors influencing a particular situation. Furthermore, building case studies helps them become aware of the complexities of real-life decision-making. Working as a team to solve a case study promotes collaboration, articulating multiple perspectives, synthesizing arguments, and bringing otherwise inert concepts and procedures to life. Here are a few guidelines to set up a good online case study activity.

1. **Develop foundational knowledge (in or outside class).** Give students time to research and learn basic conceptual and foundational knowledge. Otherwise, case study solutions could lead to uninformed, narrow opinions.
2. **Student-created case studies (in or outside class).** After students have a reasonably solid understanding of the relevant concepts and knowledge, divide them into small breakout groups to create individual case studies. Provide clear guidelines about a good case study (e.g., Good Case Study Guide) and the critical subject area focus. You may ask each group to address a different situation. Each of these case studies should be presented on a single Google slide so that students have access to all case studies.
3. **Review student-created case studies (in or outside class).** Pair up breakout groups to review each other's case studies to increase clarity and improve quality. Groups can add comments to their partner group's case study and meet with them after to discuss.
4. **Bonus – Video Case Studies (outside class).** Have groups create videos of their case studies outside class to maximize engagement.
5. **Pre-Made Case Studies (outside class).** Alternatively, you could use pre-made case studies from other sources (e.g., books, websites) or previous case studies created and evaluated by students.
6. **Read Case Studies (in class).** Divide students into breakout rooms to ensure they understand the case study. Each group could work on a different case study, at least two groups are assigned to the same case study, or all groups could work on the same case study. Give groups 5-10 minutes to digest the content of the case study.
7. **Large Group (in-class).** Ask the class if there are any questions about the case studies and their learning task.
8. **Case-study solution (in-class).** Return students to breakout rooms to develop solutions to their assigned case study. Give groups adequate time to discuss, generate and summarize their response on a pre-assigned Google Slide.
9. **Present-Solution.** Return to the class to present solutions (2-3 minutes per group) and discuss.
10. **Pressbooks.** As a class, create online books that include your case studies. Pressbooks are a good tool to create an OER that future classes could use and augment.

Resources

- Making Learning Relevant with Case Studies
- The Ultimate Guide to Creating a Good Case Study
- Using Case Studies to Teach

ACTIVITY 5: TWO-VOTE POLLING

Overview & Description

Polling can effectively break a long lecture into chunks, soliciting opinions and attitudes, and determining whether students understand concepts/procedures. Two-step polling occurs when

1. **Polling Step 1.** A multiple-choice question is asked, and responses are gathered and displayed to all students.
2. **Different responses.** Ideally, the spread of answers indicates some level of confusion or debate.
3. **Discuss and debate.** Students meet in small breakout rooms and debate about the correct response.
4. **Polling Step 2.** The same multiple-choice question is asked, and students vote a second time.
5. **Large class discussion.** Finally, the class and the instructor discuss the response.

With this approach, students are more invested in understanding the solution and uncovering misconceptions. This approach works particularly well in subject areas with numerous misconceptions. For example, the two-step polling also encourages students to debate topics not generally discussed in mathematics or science.

ACTIVITY 6: INDIVIDUAL LEARN AND SHARE

Overview & Description

Having students work individually on a question or task (e.g., solving a question, researching a topic, evaluating an artifact) during a synchronous class can improve engagement, increase discussion, encourage different solutions, and lead to richer solutions. Sample activities might be to:

- Play with an interactive tool to learn a concept (e.g., PhET Science & Math Simulations).
- Create short video commentary and post of Flipgrid.
- Generate a summary of the concept or topic.
- Finding resources for a topic.
- Identifying key issues or problems.
- Analyzing a video, article or social media post.
- Solving mathematics or science problems.
- Creating a mind-map.

Of course, students can do this type of activity at home, asynchronously but working on individual tasks and sharing solutions adds to an otherwise isolated and potentially monotonous task. Giving students time to work independently allows them to think about and address a problem before collaborating. Once they have a solution they are comfortable with or perhaps a list of challenges, they can more actively share those ideas within a small group. The basic procedure is as follows:

1. **Sharing of ideas.** Create a commonly shared document (e.g., Google Slide, Dox, Sheet, Jamboard) where each student has a place to share their ideas/solutions. In some cases, students might use their phones to take a picture of a solution.
2. **Assign tasks and form breakout groups.** Write down the assigned tasks in a Google Doc, communicate the task verbally to the class, then form breakout groups of 3-4 students.
3. **Quick meet and solve.** Students meet in the breakout group to have a brief discussion to understand the tasks.
4. **Check for understanding.** After 2-3 minutes, rotate quickly around all groups to ensure students understand the assigned.
5. **Small-group discussion.** After an agreed time, students return to the group to share and discuss their responses.

ACTIVITY 7: GROUP PROBLEM SETS AND DISCUSS

Overview & Description

Solving problem sets in subject areas such as mathematics and science is traditionally an independent activity. However, the exact opposite is true for real-world problems. Group problem solving is the norm. This strategy encourages students to prepare for and work on problem sets as a team. The process is as follows:

1. **Pre-class preparation.** Students are assigned readings and/or videos to develop an understanding for solving the given problem sets in class.
2. **Breakout groups.** Assign students to breakout groups to develop solutions for the assigned problem-set. Give groups ample time to discuss and develop solutions.
3. **Everyone understands.** A primary goal of the groupies to ensure that everyone understands the solutions submitted
4. **Google Form.** Each group must submit their answers using an online form to ensure accountability. Google forms work well because you can submit pictures, which may be required for handwritten solutions.
5. **Contribution and understanding form.** Students fill in a separate form articulating how they contributed to the final solutions, how much they understood the submitted answers and assessing how well the group worked together.

GENERAL RESOURCES

- 5 Activities for More Engaging Synchronous Online Language Classes: Some new ideas here – worth a look.
- 8 Strategies to Improve Participation in Your Virtual Classroom: Quick, easy-to-understand strategies

for spacing up synchronous learning.

- Engaging Online Activities: Variety of activities for engaging students online.
- Online Synchronous Strategies: Several helpful synchronous strategies.
- Organize Content by Chunking: A concise summary of how to chunk content online.

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Dr. Kay is currently the Dean of and a Full Professor in the Faculty of Education at Ontario Tech University in Oshawa, Canada. He has published over 160 articles, chapters, and conference papers in pedagogy, technology in education. He taught computer science, mathematics, learning and development, and educational technology for over 25 years at the high school, college, undergraduate, and graduate levels. Current projects include research on laptop use in higher education, BYOD in K-12 education, web-based learning tools, e-learning and blended learning in secondary and higher education, video podcasts, scale development, emotions and the use of computers, the impact of social media tools in education, and factors that influence how students learn with technology. Dr. Kay received his M.A. in Computer Applications in Education at the University of Toronto and his Ph.D. in Cognitive Science (Educational Psychology) at the University of Toronto.

Fostering Productive Social Interactions Using Asynchronous Activities

JOSHUA DIPASQUALE AND WILLIAM J. HUNTER

OVERVIEW

Fostering productive social interactions is essential to creating meaningful learning experiences, including online learning (e.g., Hurst et al., 2013). In this chapter, we explore the ways asynchronous learning activities can engage students in online discussions and wikis. We will rely on Hurst et al. (2013), who see social interactions as vital “meaningful dialogue among learners” (p. 376). In this view, learning takes place “largely through interactions among students” and “students learn by expressing their questions, pursuing lines of inquiry together, teaching each other, and seeing how others are learning” (Stahl et al., 2014, p. 480). Following Atwood et al. (2010), however, we see “productive social interactions as occurring when it is possible that some interactions “are more beneficial for knowledge development than are others” (p. 359). Atwood sees such interactions as grounded in the work of Jean Piaget in that they are “ideally suited for achieving mutual understanding and knowledge development” (p. 360).

However, online learning has a doggedly persistent reputation for lacking productive social interactions. It is often associated with isolating experiences that may impact attendance, motivation, and participation in learning activities. In the rapid shift to online learning during the COVID-19 pandemic, some research has reported a lack of social interaction or socialization in virtual learning settings (e.g., Al-Mawee et al., 2021; Bestiantono et al., 2020; Bdair, 2021; Ewing & Cooper, 2021; Famularsih, 2020). We recognize that many of these concerns are well-founded. Still, our own experiences (and the academic literature) suggest that the problems and challenges encountered in online learning environments are often attributable to poorly designed learning environments. Professors and teachers have had millennia to hone the skills involved in onsite learning but online environments are novel for most instructors forced to adopt online methods recently. They require skills which are not part of their current *bag of tricks*, including identifying and using new technologies to enrich synchronous and asynchronous online learning.

In this chapter, we will show how well-designed asynchronous activities can promote productive social interactions that may lead to deep learning (Fullan et al., 2013). We will provide practical guidelines for designing, implementing, and facilitating well-researched asynchronous learning tools in collaborative wiki projects and online text-based discussions. We will indicate possible challenges that might arise during the design and implementation of these activities and steps that may be taken to overcome them. We conclude each section with a list of valuable resources that should support readers who want more information.

GENERAL GUIDELINES

One general guideline that we think needs to be stated regarding productive social interactions is that they are unlikely to spontaneously manifest independently. For example, although wikis have “properties that are particularly amenable” to constructing collaborative learning experiences, it does not follow that any and all wiki work will necessarily result in productive social interactions (Larsson & Alternamn, 2009, p. 373). That is, telling students to construct a wiki collaboratively will not automatically lead to productive collaborative discourse though it could happen on rare occasions (cf. Oeberst et al., 2014)—more on this below. We consider the role of the educator, as a designer and curator of learning experiences, to be fundamental in the planning, development, implementation, and facilitation of such activities to ensure that they can engender productive social interactions that may consequently mediate meaningful learning outcomes.

The demand for careful planning for productive engagement may be especially applicable to fully online learning settings, in which “stimulating and sustaining productive student interaction is difficult to achieve; it requires skillful planning, coordination, and implementation of curriculum, pedagogy, and technology” (Stahl et al., 2014, p. 480-481). Many established and well-researched online learning frameworks highlight the teacher’s fundamental role in orchestrating meaningful learning experiences for students in online learning settings. As a generally well-received and researched example, the Col framework illustrates that the teacher’s role, or what they refer to as teaching presence, “is essential in balancing cognitive and social issues consistent with intended educational outcomes” (p. 101). In this way, the teacher “models effective problem solving, provides constructive feedback, offers probing questions and otherwise actively facilitates tasks so that students can witness scholarly and ethical thinking in action” (Anderson, 2017, p. 7). The salience of teaching presence is evident in Zhang et al. (2016), who found that even students’ perceptions that the teacher is engaged in an online learning environment can positively “impact on their constructive and interactive engagement behaviours” (p. 887).

While teaching presence may not be limited to the activities of the teacher (cf. van Oostveen et al., 2016), we want to emphasize that it should not refer to simply providing direct instruction. Teaching presence also involves designing, organizing and facilitating educational activities (Anderson et al., 2001). Our objective is to demonstrate that deep and meaningful education doesn’t rely on broadcasting information. Indeed, “appropriate forms of interjections through direct instruction” (Anderson, 2017, p. 7) may sometimes be effective. However, the careful design, organization, and facilitation of asynchronous activities are integral for realizing students’ potential while fostering productive social interactions and meaningful learning experiences. The asynchronous activities described below depend on careful curation and reflection to work well.

ACTIVITIES

OVERVIEW

Our focus is on two kinds of asynchronous activities: wikis and text-based discussions. Productive social interactions occur in both environments. Both are Web 2.0 technologies that arguably have a positive impact on education. Glassman and Kang (2011) refer to such tools as harbingers “of innovations a long time coming” (p. 94) in education. We believe that the activities we describe can lead to productive student social interactions and may democratize classrooms by empowering students to direct and co-construct their own learning experiences (van Oostveen et al., 2016).

Our guidelines for designing, implementing, and facilitating asynchronous activities will be concrete strategies that you may adapt to your contexts and purposes. The reference list and *general resources* are available for those interested in further reading.

ACTIVITY 1: COLLABORATIVE WIKIPROJECTS

Many think of collaboration as a synchronous face-to-face activity (e.g., Dillenbourg, 1999). We will show that collaboration can also happen asynchronously. Wikis, for example, are tools for engaging students in collaborative learning across time and distance (e.g., Larusson & Alternamn, 2009). Think of wikis as websites that learners use to connect with, restructure, expand, and link to numerous web pages (Karasavvidis, 2010). They can foster collaborative activity through their “intuitive basic functions...and their underlying structure and mechanisms (that) can support learning processes and social interaction” (Heimbuch et al., 2018, p. 333, parentheses added). Those essential functions enable learners to edit content, review prior versions of pages, and communicate with one another (Lin & Reigeluth, 2016). Nonetheless, “it does not necessarily follow that they will ensure or even encourage collaborative learning behaviour” (Judd et al., 2010, p. 341). As Zheng et al. (2015) noted, productive wiki usage to support collaborative learning depends on “well-designed instruction” that is “vitaly important in wiki-based learning activities” (p. 372).

Preliminary Guidelines

Before discussing the strategies that you might use to specifically foster collaboration in class wiki projects, we have some preliminary guidelines on selecting an appropriate wiki platform and properly orienting your students to the unique demands of working in a collaborative wiki environment.

Choose a Wiki Platform

Choosing an appropriate wiki platform may be challenging since some require a server or high levels of technical skills. On the other hand, some learning management systems (LMS), such as BlackBoard, offer built-in wikis that may have limited features but offer the virtue of being private and not publicly accessible. Some publicly available wikis will allow learners to search the wiki but not edit it—thus limiting the possibilities for collaborative learning.

While it is possible to get educational value from browsing a wiki (e.g., KidzSearch—see Table 1), we use wikis as places for knowledge production. Engaging learners in writing their wiki entries and editing others involves collaborative learning that can stretch across space and time (if multiple schools are engaged in projects over several years). We believe learning to accept the edits of others and to improve pages involves the kind of critical reflection that we have described as productive social interaction. Figure 1 provides two examples of Wiki creation tools with specific pros and cons.

Figure 1

Wiki creation tools pros and cons

MediaWiki

Pros	Cons
<ul style="list-style-type: none"> • Authoring environment for Wikipedia (transferable skills) • Rich set of features • Lots of wikis based on it (see note below) • Familiar interface for many • Plentiful HELP docs and FAQs 	<ul style="list-style-type: none"> • Hosting requires downloading to a server • Creating and editing pages proves challenging for some users

Vikidia

Pros	Cons
<ul style="list-style-type: none"> • MediaWiki base • Easy access • Focus on 8-13-year-olds • No server needed • Clear, simple rules • Visual editor available • Multiple languages • Best to start with kids portal or education portal 	<ul style="list-style-type: none"> • Not intuitive re: posting • Content not readily visible • (search “portal” to find topics) • School projects welcome

Plan a Wiki-Orientation Session

Planning a wiki orientation session can help overcome barriers such as learners’ technical abilities and learning mindsets. For example, your students may lack knowledge of basic wiki functions (e.g., logging in, navigating, creating/editing pages). Many are uncomfortable with the idea of editing or removing others’ existing work in the wiki or working collaboratively with peers. We have found it useful to overcome such barriers by having a wiki-edit-a-thon at the beginning of each semester to allow students to get accustomed to the nature of collaborative wiki projects. During such orientations, you may find it beneficial to:

- Have small groups rather than whole group sessions since collaboration happens better with small groups. We do this in a synchronous meeting and provide each group with a topic and some starter links—the attached overview [Doc.] is an example from the Principles of Learning course (names other than the authors’ have been removed).
- Give each group a guide—an experienced wiki user (volunteers from previous classes or knowledgeable, enthusiastic class members)— if possible.
- Have the guides help with wiki skills like finding pages, adding pages, using special pages, encouraging and supporting collaborative writing, planning, and editing/deleting other people’s work. Guides should encourage group members to identify needed content and plan for future contributions.
- Debrief with your students so that students may ask questions, and you can get feedback for further development of the wiki and the course.

Interested readers may access the Teaching and Learning Wiki to see some of the results from this edit-a-thon or explore the wiki more generally. Any professionals interested in contributing to the wiki may request an account (see top right of the main page).

Guidelines for Designing and Implementing Your WikiProject (Before the Activity)

Having chosen a wiki platform and considered planning an orientation session for your students, you may consider the design and implementation strategies that can foster collaborative activity among your students. You will want to avoid situations where the wiki contributions are simply collections of individual work rather than joint products (Stahl et al., 2014). The following strategies should help you encourage your students to collaborate in the co-construction of a class wiki.

Form Small Groups and Assign Roles

Collaborative learning theory suggests that students collaborate more effectively in small groups where individual group members are assigned roles (Zheng et al., 2015). We encourage you to consider at least three roles:

- A starter initiates discussions and ideas for possible wiki edits (e.g., explores possible themes and topics that the group can work on together).
- A moderator facilitates discussions (e.g., posing questions and soliciting opinions).
- A source searcher retrieves valuable resources to inform the group about their chosen topic (e.g., exploring sources beyond the course material).

Other possible roles include analyst, recorder, timekeeper, synthesizer, skeptic, ombudsperson, and peacemaker. The exact set of roles is less critical than giving each participant a legitimate reason for speaking up. For a single event, it usually works well to let students choose the role they want to play. In a class where group activities are frequent, assigning roles may help students apply different skill sets.

Use a Collaboration Script

A collaboration script is a set of explicit instructions for learners that should “focus on the discussion aspect of wiki-based knowledge construction” (Heimbuch et al., 2018, p. 334). Collaboration scripts can encourage your students to engage in collaborative activity, not independent collections. They believe collaboration scripts should encompass a DDR approach (discuss, deliberate, revise). Participants are encouraged to discuss and collectively contemplate any planned edits and revisions before making changes to the document. Heimbuch et al. (2018) suggest a three-step process:

1. Students to propose article edits in a designated and corresponding discussion area (see below).
2. Students to reach a consensus about what changes before editing.
3. Coupons reaching consensus, students plan and make changes to the wiki.

We would add that it is important to frequently remind students that future students may edit their contributions and that this is a form of collaboration.

Set-up a Designated Discussion Space

Many wikis have a built-in communication tool (e.g., a discussion page); however, students will need other tools to keep up with current events (Larsson & Alternamn, 2009). An LMS, for example, can help structure and organize support group interaction and foster dialogue about issues within the wiki environment. A des-

ignated discussion space supports group interaction, fosters dialogue and enables instructors to provide guiding questions and help set and manage goals. Other collaborative writing tools, like Google Docs, support collaboration and communication.

Having a discussion space available should do more than help coordinate activities – it should encourage students to get maximum *credit* for their learning by cross-posting information from the wiki to the discussion platform and vice-versa. Cross-posting enriches the discussions and helps the students to focus on writing for an audience—the discussion is for us, but the wiki is for anybody. Equally important, writing about their learning on multiple platforms should strengthen understanding.

Guidelines for Facilitating your WikiProject (During the Activity)

Facilitating collaborative learning during wiki projects should maintain productive collaborative discourse and attend to group dissolution. Both direct and indirect strategies may facilitate collaborative learning during the wiki activity.

Provide Guiding Questions

Encourage collaboration throughout your class wiki project by providing guiding questions for teams to plan and design wiki-page outlines. The edit-a-thon is one approach, but open-ended questions also work. Algasahb et al. (2019) recommend a dialogic approach including questions, suggestions, and resources. More directive approaches may hinder the collaborative writing process and breed dependency on the instructor.

Help Set and Manage Goals

Breaking a project into smaller pieces helps students from becoming overwhelmed. For instance, Zheng et al. (2015) note that helping set and manage goals during the wiki project can be as easy as providing a timeline “to finish an outline, when to complete the first draft and when to have a final draft” (p. 370). Importantly, helping to set and manage goals for your students will be crucial for ensuring that they can co-construct the wiki collaboratively in their groups. Judd et al. (2010) explain that if students’ contributions are made individually and behind schedule, it may preclude the possibility of them engaging in *extensive collaborations* with their peers.

Influence Learning Mindsets

Influencing your learners’ mindsets about collaborative writing and knowledge construction may be necessary for success. Some research has shown that students may engage more in collaborative knowledge building if they adopt a positive mindset about co-constructed learning (Lin & Regeluth, 2015; 2021). You can help by actively facilitating this shift in perspective by providing ongoing feedback and encouraging a culture of sharing (Lin & Reigeluth, 2019). This process may include discussing student concerns and establishing the importance of community building (Reigeluth, 2021).

Possible Challenges Using Collaborative Wiki Activities

Your efforts to promote collaboration in a wiki project may not be successful at first. Therefore we recommend that you monitor student contributions and make suggestions for collaboration where you see opportunities. There is also potential for unequal participation among students. For instance, you may notice that one or two students are doing most or all of the work in their group. Strauß & Rummel (2021) argue that

unequal participation may prevent productive collaboration among students and negatively affect their satisfaction with the activity. They suggest explicitly creating group awareness to assist students in socially regulating their collaborative activity. We recommend making students aware of practical collaboration guidelines and monitoring their interactions. While it is beyond the scope of this piece, there is much to be gained from Johnson and Johnson's (2008) notion of positive interdependence.

Other Helpful Resources

The following resources are links to other guides that we believe can help you successfully design, implement, and facilitate collaborative wiki projects with your students:

1. Wikis – Vanderbilt University
2. Wikis For Teaching – The University of British Columbia

ACTIVITY 2: CRITICAL INQUIRY IN ONLINE DISCUSSIONS

Overview

Asynchronous online discussions (AODs) are text-based forums for students' discussion and development of critical thinking (e.g., DiPasquale & Hunter, 2018). AODs have the potential to engage students in interactions that promote critical thinking due to "increased opportunities for all students...to contribute to the discussion and more time for information processing, reflective thinking, and the construction of high-quality responses to peers" (Schindler & Burkholder, 2014, p. 12).

Critical thinking and discussion in AODs are often associated with the Community of Inquiry (CoI) framework's Practical Inquiry Model (PIM). Very briefly, the CoI model conceptualizes critical thinking as cognitive presence, "the extent to which the participants in any particular configuration of a community of inquiry can construct meaning through sustained communication" (Garrison et al., 2000, p. 90). The PIM provides a logical rationale for such sustained communication. In this way, AODs may lead to transformative and deep learning experiences. We believe the following strategies can encourage productive online social interaction among your students in AODs.

Preliminary Guidelines

Get Familiar with the Practical Inquiry Model

The critical elements of the PIM are

- a triggering event recognizing a dilemma or problem;
- exploration—seeking relevant information to understand the problem better;
- integration of divergent ideas and construction of meaning; and
- resolution of problem that demonstrates "opportunities to apply newly created knowledge" (Garrison et al., 2000, p. 11).

Systematically designing activities that include these elements should ensure that your AODs foster productive social interactions.

Choose an Online Discussion Medium

The discussion board in your school's LMS has significant advantages in accessibility and familiarity. Still, social media platforms like Facebook or WeChat (e.g., Xu et al., 2020) may also serve your needs. A key element in choosing a platform is the capability of *threading* posts so that comments related to a common topic follow one another.

Guidelines for Designing and Implementing AODs (Before the Activity)

In planning for and designing activities for your AOD, we encourage you to explicitly use the processes of the PIM (listed above) to guide your thinking so that we will use those processes in the following discussion.

Use Pre-work Activities

Plan to implement your AODs after your students have become familiar with the course themes and topics to allow deeper, meaningful conversations. They will be ready to encounter a PIM triggering event with this background. A case study, for example, could incorporate information sources that may shape opinions. We have used a case study involving public education for dealing with the hypothetical H2N5 virus. If we were re-writing that case now, news articles about COVID measures could inform students before engaging in problem-solving for the case. In a history education setting, you might introduce students to conflicting accounts of historical events to create a solid foundation to engage them in an asynchronous discussion about how historians assess the validity of data and arguments. They will then be prepared for the PIM processes of exploring new information and integrating diverse perspectives as they work toward a resolution that addresses the problem in the case.

Design Argumentative and Open-ended Questions

Case studies present learners with a problem, but you may prefer to pose open-ended questions as a triggering device. Oh, and Kim (2016) claim that conventional open-ended questioning methods may result in only "surface-level thinking, such as simple information sharing and exploration" (p. 40) and also call for using the PIM to guide your questioning. They also stress encouraging them to share their thoughts and constructively comment on peer contributions.

For instance, in a social studies context, instead of asking "what biases do you perceive in the ways different media outlets reported on the January 2022 truckers' convoy to Ottawa?", it may be more productive to ask "which media outlets influenced your thinking about the January 2022 truckers' convoy to Ottawa? How did their portrayal of events shape your thinking about the issues involved?" Such Socratic questioning in your AODs can move the critical inquiry process beyond exploration and encourage your students to begin to integrate different perspectives and information and move to the resolution phase.

Create and Assign Scripted Roles

Creating and assigning scripted roles during AODs can promote critical thinking and discussion (e.g., Olesova & Lim, 2017; Gašević, 2015; Kanuka et al., 2007; Darabi et al., 2013). Our literature review (DiPasquale & Hunter, 2018) noted the general potential of role assignment, but Schindler and Burkholder (2014) illustrate several specific roles that may promote critical discussion and thinking in AODs:

- Devil's advocate—take an opposing position of a classmate and justify it.

- Elaborator— expand or provide support for an idea someone else has already made.
- Importer—bring outside ideas, from other classes or the news, into the discussion.
- Inventor—generate new ideas and perspectives that have yet to be brought up.
- Mini-me—represent the author’s position (from an assigned reading) on the discussion topic.
- Synthesizer—make connections between posts and push the conversation forward.
- Theoretician— introduce theoretical information to the discussion.
- Traffic director—keep the discussion moving and intervene when the discussion gets off track. (p.20)

Provide Step-by-Step Discussion Protocols

It may be helpful to share step-by-step discussion protocols with your students explicitly. Zydney et al. (2012) explicit discussion protocols that “provide a very structured discussion prompt, which lets students know their role, giving built-in supports leading to a progression in thought” (p. 80), were effective at supporting productive social interaction in asynchronous activities. Improving self-regulation also reduces the need for the instructor to post or intervene in discussion excessively, which allows students to “feel more comfortable expressing themselves” (An et al., 2009, p. 81).

We have found value in giving students a list of specific tips [Doc.] for posting in the AODs before the activities begin. These tips inform students that they should prepare their posts adequately and that they have done the required readings and reviewed the previous posts of their peers before making their contributions. However, since AODs can quickly become overwhelming, remind students not to respond to all of their peers’ posts.

Use Critical Thinking Constructs

As we noted above, familiarizing yourself with critical discussion and inquiry frameworks will be beneficial when you are designing AODs. In our review of the literature (DiPasquale & Hunter, 2018), we found support for developing and implementing AODs using specific constructs of critical thinking (Morueta et al., 2016; Sadaf & Olesova, 2017). Others used a construct as a procedural facilitation instrument (De Leng et al., 2009). For example, Sadaf and Olesova (2017) demonstrate how designing discussion questions based on the PIM can correlate with higher levels of cognitive presence during AODs. Specifically, the researchers designed a case-based discussion guided by a sequence of four questions that reflected the triggering, exploration, integration, and resolution. The authors provide the following examples to illustrate the kinds of PIM questions that they developed for their study:

What do you think are the problems with the way Mr. Evans has designed his instruction [Triggering question]? How can your (use the one you have been assigned) theoretical perspective help to understand the problems presented in this case [Exploration question]?... Briefly identify a fundamental principle (or principles) taken from the theoretical perspective and explain how it would be applied to solve the learning problem presented in the case [Integration question]. Justify your response by providing applications of your solutions in real-world situations [Resolution question]. (Sadaf & Olesova, 2017, p. 61).

Using Bloom's taxonomy, Morueta et al. (2016) created analytical, evaluative, and creative web tasks that required self-regulation. These tasks encouraged students to make "judgements based on criteria and standards through checking and critiquing" and put "elements together to form a coherent and functional whole" (p. 124). For instance, in a creation discussion task, the goal might be to have students ultimately design an artifact (e.g., blog post, essay, wiki page, etc.) that may also correspond to the resolution phase of the PIM.

The studies mentioned here are only examples of using critical thinking constructs like Bloom's Taxonomy or the PIM to develop different AOD strategies. We encourage you to be creative and explore the different ways that frameworks like these can become embedded in AODs.

Integrate with WikiProjects

Combining your AODs with collaborative wiki projects can simultaneously facilitate two kinds of productive social interactions: critical discussion/inquiry and collaborative learning. For example, when one of the author's experiences in a collaborative wiki project lacked communication with his peers, it left him feeling the activity was anything but collaborative (DiPasquale, 2017). Based on his critique, he began to explore ways the wiki project might be coordinated with the class AODs to foster student interaction and collaboration.

Guidelines for Facilitating AODs (During the Activity)

Teaching presence is essential in OADs; however, it may be better to moderate your intervention during discussions when implementing the following strategies. Too much instructor intervention during AODs can paradoxically lower student-student interactions (e.g., An et al., 2009). The goal is to facilitate a mostly self-directed process of critical inquiry. Finding a healthy balance between proper facilitation techniques and fostering students' autonomy will likely require some experience and practice. Each group of students will be different and require either more or less direct intervention during AODs.

Use and Model Socratic Questioning

One potentially effective way to facilitate the critical inquiry process among your students during their participation in AODs is to use and model Socratic questioning (Schindler & Burkholder, 2014; Yang et al., 2005). According to Hew et al. (2010), Socratic questioning involves posing questions to clarify assertions, prove assumptions, and elicit reasoning and evidence. Socratic questioning may consist of questions that elicit clarification, challenge assumptions, evidence and reasoning, alternative viewpoints, implications and consequences, and challenges to the question itself (Sutton, 2021). As an example, when eliciting clarification and evidence/reasoning, you may ask, *can you explain what you mean by this and provide examples that support your position?* To avoid excessive instructor intervention, use Socratic questioning moderately and focus on modelling the behaviour so that students may adopt the strategy themselves.

Invite Expert Virtual Guests

Some research has suggested that, when possible, inviting expert guests to post in AODs and respond to students can help facilitate processes of critical discussion and inquiry (Kanuka et al., 2007). Hemphill and Hemphill (2007) demonstrated that the presence of a virtual guest speaker can encourage "a wide range of critical thinking responses from the students, as well as extensive communication among the students" (p. 2929). You may want to recruit local colleagues or previous students to be virtual guests by posting recorded presentations, initiating discussions, and responding to students' discussion posts.

Possible Challenges

The most likely challenge you will face in supporting critical discussion and inquiry among your students in AODs is getting your students to participate. Some literature has noted that lack of participation and engagement can plague even well-designed and well-intentioned AOD activities as students become 'lurkers' who may just skim discussions without actively participating in them (Amichai-Hamburger et al., 2016). Rather than dwell on instructor-led interventions to address this, try increasing student responsibility as part of assigning roles to your students (as discussed above). Hew and Cheung (2008) demonstrated that randomly choosing students to act as facilitators of weekly AODs can help attract other students to participate in the discussions. They offer the following techniques to student facilitators to attract their peers' participation effectively:

1. Sharing their own opinions and/or experiences about the theme or topic.
2. Questioning the perspectives of others and asking for clarifications.
3. Establishing expectations and rules for participation in the AODs.
4. Demonstrating appreciation to those who make posts and contributions to the discussions.
5. Offering new directions by suggesting potentially new areas for discussion.
6. Personally inviting their peers to contribute to specific posts.
7. Occasionally summarizing the progress of discussions. (p. 1118)

GENERAL RESOURCES

These links to other guides may help you successfully design, implement, and facilitate critical asynchronous discussions with your students:

1. [Best 11 Open-source Free Wiki Tools](#)
2. [3 Design Tips To Improve An Online Discussion Forum](#)
3. [Effective Asynchronous Discussions](#)

CONCLUDING THOUGHTS

We have focused on just two kinds of online interaction for brevity: wikis and AODs. However, we think you can also apply the principles and practices discussed above to blogs, tweets, and other social media. We'd like to point in that direction with just a few guiding questions:

- What are the assets of blogs as instructional tools, and how might we promote productive social interactions there?
- What Twitter features (e.g., likes, re-tweets, attachments, hashtags and direct messaging) create a different set of challenges and opportunities than other social media, and how can they promote productive social interactions?
- How would the image dominance of Instagram or the video dominance of TicToc shape different kinds of interactions, and how might they be educationally productive?

Lastly, we hope the advice here will help some readers move beyond the perception of online learning as an added chore and begin seeing it as an opportunity to revitalize thinking, teaching, and students' learning experiences.

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Creating Online Learning Modules

ROB POWER

INTRODUCTION

When asked to write this chapter on creating learning modules, I admit that the idea seemed a bit overwhelming. After all, I teach graduate-level courses where we spend an entire term exploring the principles of the instructional design process, design, build, and test prototype online modules. We spend a great deal of time not just on the theoretical aspects of good instructional design but also on helping each other select appropriate learning activities and digital tools and mastering how to use those tools to construct a solid product. How do I encapsulate those elements into a concise chapter with practical tips for busy teachers? With the great variety of learning management systems such as Blackboard, Brightspace (D2L), Canvas (Instructure), Moodle, or Google Classroom: How do I keep things relevant when many of you use a range of different platforms to create and host your modules?

Then I realized many of the theoretical and technical issues we explore in my instructional design courses are already covered elsewhere in this eBook. There are chapters on everything from designing learning activities and assessments to using technology to provide meaningful feedback and selecting useful digital tools to meet all of your teaching and learning needs throughout an online module. So, I will focus this chapter on the process of designing, creating, and launching your learning module.

THE MODULE DEVELOPMENT PROCESS

The processes that I follow with my instructional design students are those that I use when developing learning modules for clients or my courses. Creating modules is independent of the platform used. It does not matter if you build a module inside a learning management system, create a module for your Google Classroom, or use an advanced eLearning content authoring system like Adobe Captivate or Articulate Storyline. There are two sets of guidelines to follow. The first will guide the module development “project” itself. The second will show what your learning module looks like and how your students interact with it.

GUIDELINES FOR THE MODULE DEVELOPMENT PROJECT

Most instructional designers follow a standardized sequence to design, develop, and launch a learning module. I like to follow the ADDIE model (Branson, 1978; Culatta, 2022; Kurt, 2018). ADDIE stands for:

- **Analyze** (determining what you need in your module),

- **Design** (creating a map of what the module will look like),
- **Develop** (building the module in whatever platform you choose),
- **Implement** (launching your module for your students), and
- **Evaluate** (looking at what works, what does not work, and how to make things better).

The traditional descriptions of the ADDIE model depict it as a linear or waterfall process, yet dynamic interplay between each aspect can be very effective and potentially more timely (Tripp & Bichelmeyer, 1990). Figure 1 outlines a modified interrelated interpretation of the linear model.

Figure 1. *ADDIE as a Cyclical Process*



The guidelines below outline some practical ways to use the ADDIE model to guide you towards creating your learning module.

- **Analyze your needs.** Determine what you need from your learning module before deciding what activities to include and what resources and tools to create it. You want to make sure that you cover the desired learning outcomes and target the right student audience. Create a list of these things to make sure you meet all your needs and do not try to do too much in one learning module. Think of this as doing a bit of pre-planning before starting a home repair or home renovation project. If you do not know what you need to tackle, you cannot determine what supplies you will need and what steps to follow.
- **Design your module before you start building it.** Plan your module in detail before you start building it. I cannot emphasize this step enough! Instructional designers create a blueprint, map, or storyboard before developing anything (Aura Interactive, 2022). This plan can be as simple as pen-and-paper sketches of what should be on each page or slide. Some designers use PowerPoint slides to create a non-functioning mock-up of what things will look like in the learning management system or on a web page. I prefer to use a table in a Word document or a spreadsheet, where each row represents one page of content and activities. Similarly, Google Docs and Sheets afford increased collaborative opportunities with active linking, which can save time as well. I also strongly recommend including as much detail as possible at this stage, including scripts of the text you will put on each page, the media you will embed, and links to any digital resources you will need. If you do not have these links or need a new media resource, list it here to keep track of these requirements. As you list your media and resource requirements, it is good to keep track of any copyright issues, subscriptions or accounts needed, and any potential student privacy considerations. This stage is often the

most time-consuming part of the process, but it is worth it. Mapping everything out before you start building will accomplish three things:

- It will make sure that you cover all your learning objectives and needs.
 - It will prevent you from suffering from “scope creep,” a phenomenon of constant growth occurring as you find new things you think would be nice to include (Adeboye, 2014). Often, it gets to the point where it becomes difficult for you to finish the project, and the module will likely have too much for your students to handle.
 - It will make it much easier for you to build the learning module in whatever platform you choose because you can focus on how to build it in that platform rather than on what to include.
- **Develop your learning module.** With a plan in place, you can focus on the process of building your learning module in whatever platform you choose. At this stage, do not build anything that you have not included in your plan. Focus on putting everything together and on learning how to use the specific digital tools you have chosen (if needed). I find it helpful to do this methodically, focusing on one technical aspect at a time.
 - Create your skeleton structure, adding blank pages as placeholders for everything in your storyboard or blueprint.
 - Add the text to each page, focusing on getting the text on the page and formatting it consistently throughout the module.
 - Insert any images needed on the content pages or slides, focusing on adequately embedding, sizing, and adding ALT-text to each image. This is also a good stage to model curriculum standards and standardized referencing processes (e.g., APA citation, hyperlinking).
 - Insert any embedded media such as audio or video links to external resources.
 - Check each content page or slide for Digital Accessibility compliance and potential barriers for your students (refer to the chapter Accessibility in Online Learning in this eBook).

I also find it helpful to stop after I have built a small chunk of my learning module to evaluate what works, what does not work, and what needs to be redesigned or improved by rapid self-testing the content. Suppose you create a short learning module (something that students could complete in a few minutes or even an hour or so). In that case, it is okay to build everything before moving on to the Implementation and Evaluation stages. But, if you are working on something larger (like an entire unit or even a whole course), it is far better to stop and evaluate what needs tweaking before going too far. There will be far less for you to fix if you make changes to your general design now, rather than waiting until you build everything.

If you are developing your learning module before teaching a course, you may have the luxury of pre-testing the module before your actual students interact with it. If not, that is okay. You can always view your first run with a learning module as a pilot test for future terms. If you can, ask a colleague or a group of “pilot” students to try out the module to give you some feedback.

- The **implementation** phase is the action phase of the learning process, where we share the content with the students. For our situation, this phase includes:
 - **Preparing the learning environment ensures** that what we have planned works as anticipated and changes as required. Examples include reflecting on content adaptiveness (e.g., does screen size impact the content), potential privacy issues (e.g., will students be required to set up an account), and low-fi backups if there are connectivity issues (e.g., having a PDF

of your video lectures).

- **Preparing the student** includes providing insights into what is anticipated and required. During this time, you will want to ensure that you have provided time to know how to use the tools, understand processes or workflows, or acquire other assets (such as headphones) that lead to their success.
- **Evaluate how things went.** Use your observations of how your students (or colleagues) interacted with your learning module. This evaluation can be done informally (chatting with users) or through a short feedback survey. I find it helpful to revisit my storyboard or blueprint and add these notes to have an updated map of the changes I need to make before using the learning module. I also find it helpful to categorize my potential changes as either “must do now,” “nice to do now,” “nice to do for next time,” and “not possible to do.” You can use a separate column for each category at the end of each row (content page) in your blueprint, or you can colour-code the notes for quick reference. Whatever your process is, make sure that you budget time for this stage as it is essential for future success.

GUIDELINES FOR THE STRUCTURE OF YOUR LEARNING MODULE

The previous guidelines help manage the learning module design and building phase. But, how should the module look? Regardless of the learning content, I find it helpful to follow some guidelines for the general structure of my learning modules, similar to the general design of a good lesson plan. I like to follow the BOPPPS model developed by the Instructional Skills Workshop program (Pattison & Day, 2006).

GENERAL GUIDELINES

- **Bridge into the learning.** Before you ask your students to engage with any learning resources or activities, you must capture their attention. Your learning module should begin with introducing the topic and piquing their interest. This introduction can be as simple as a brief overview, focusing on why the topic is relevant to them. Or it could be a video overview that you find online or record yourself. Potentially, you can engage students with provocative questions as well.
- **State the outcomes clearly.** Once you have your students' attention, you should list the outcomes for the module. What will students learn? What should they be able to do by the end of the learning module? Or, if you follow a constructivist approach, you can recruit student insights to support self-concepts and motivation to learn.
- **Pre-test your students' knowledge.** What do your students already know about the topic? What misconceptions do they have? By integrating an activity that checks students' knowledge, you can better determine if you need to provide additional resources or spend more time with them (perhaps in a live instructional session). In some cases, you may find that your students can already demonstrate mastery of the learning outcomes. When creating an online learning module, you can use this feedback to allow some students to skip ahead to another topic or provide them with advanced activities and resources to keep them engaged while other students focus on the primary activities. It is up to you to determine the best way to integrate a knowledge pre-test. I frequently use discussion forum postings to self-scoring and self-paced quizzes.
- **Participatory learning activities** are the primary learning resources and activities your students will engage with throughout the module. These activities can include background readings, multimedia resources, and individual or group tasks (e.g., discussions, peer-assessment, or group projects).

- **Post-test students' knowledge.** It is essential to determine if students have achieved the learning outcomes before moving on to another topic (or completing a course). You can draw upon many technology-mediated assessment activities, including some explored elsewhere in this eBook.
- **Summarize the learning.** Don't just leave things hanging. It is essential to provide students with a summary of what they have ideally learned at the end of your module. It is also helpful to provide your students with a quick overview of what is coming next with a simple email overview or a multi-media presentation such as a video.

ACTIVITIES

This book has many resources to help you choose digital tools for your module to share content, facilitate learning activities or learner interaction, or assess student learning. The emphasis of this chapter is on the planning or designing aspects of creating your learning module, as there are many tools available to help you translate your plans into a live module. The planning stage takes the most time, which is crucial in creating a meaningful and effective learning experience. Similarly, the evaluation stage is often overlooked when creating learning modules. But we should avoid skipping this stage as it provides valuable insight into whether the module we have designed is accomplishing what we had intended. The following activities focus on the Design and Evaluate stages in the ADDIE cycle.

ACTIVITY 1: PLANNING YOUR LEARNING MODULE

Overview

So, you are going to build an online learning module. Like an architect or a construction contractor, you will need a plan. Without a good plan, you will likely miss something important or exhaust your time building far more than you need to. Let's create a storyboard for your learning module.

Description

For this activity, choose a lesson or a unit for which you would like to create an online learning module for your students. The following steps will help you create a storyboard that can detail the page (or slide) details and resources required to bring it to life.

- **Choose a template.** Storyboarding or blueprinting can seem overwhelming, especially if you have not done it before. How do you decide what goes on each page or slide when you don't even know what pages or slides you need yet? It is helpful to use a ready-made template that will help you keep track of these things, make sure that you don't miss anything, and help you to avoid scope creep. I have provided links to a couple of templates below that I have created for designing modules (or even whole courses) using the Canvas and Moodle learning management systems.
- **Modify the template as needed.** The templates that I am providing here are optimized for Canvas and Moodle. But they follow the same general structure and can be quickly modified to meet the specific requirements of whatever platform you will be using. It is good to make a few customizations to the template before populating it. For instance, you may want to do something as simple as adding a "notes" column on each page, or you may need to add a column to list settings requirements for each page in your chosen platform.
- **Populate the template in stages.** I find it helpful to start with the basics, such as listing the module

(or chapter) titles, the page titles, and the types of content pages that I need to add to my learning module. Then, I go back and add the text script for each of these pages, including placeholders in the script where I think that I will need to embed links or media. Then, go back and list all the resources and media you will need for each page.

- **Align your template to your outcomes.** Review your completed storyboard. Ensure that every content page, learning activity, and assessment is connected to at least one of your learning outcomes. If it is not, reconsider whether you need content or activity. Ensure that all your required outcomes are covered at least once somewhere in your storyboard. If outcomes are not covered, you may need to add some content or activity before building your design. The process of creating a Table of Specifications [PDF] may also be beneficial, which helps us reflect on the validity of our efforts (Fives & DiDonato-Barnes, 2013).
- **Keep track of student time requirements.** You may have covered all of your learning outcomes and created a plan to keep you on track when the time comes to build your module. But have you designed too little or too much for your students to handle? Review your storyboard to estimate how much time it might take the average student to engage with the planned content and activities. I find it helpful to add at least 10 to 20 percent extra time to my estimate and use that to help me determine if I need to add more to my module or start paring things down.
- **Keep track of resource requirements.** The templates I have provided include a column listing your resource needs throughout your module. But listing these resources is not enough. Using these resources may present challenges, which you should keep track of to avoid running into problems when it comes time to build what you have planned. I find it helpful to keep a master list of all of my resource requirements, including the (I have included a link below to a template that I developed to help keep track of these requirements):
 - costs;
 - copyright requirements;
 - permissions that I may need from either my IT team or the school district; and
 - potential privacy issues that might impact my students.

Possible Challenges

One challenge you may face is that your chosen storyboard or blueprint template may not reflect all the requirements to consider for the platform in which you will end up creating your learning module. It can be difficult to determine such shortcomings at the planning stage, especially if you do not have extensive experience using your authoring platform. You should understand that weaknesses are perfectly okay. Complete all of the sections of your storyboarding template. You can always revisit the template to add a new column as you discover platform-specific considerations. The benefit is that you will not be overwhelmed with figuring out what your module should look like and what it should include as you are learning the technical nuances of the platform that will host your module.

Resources

- Education – Microsoft Templates
- Google Slides: Online Slideshow Maker
- Storyboarding Template for Canvas [Spreadsheet]

- Storyboarding Template for Moodle [Spreadsheet]
- ETICPC – The Educational Technology Integration Copyright and Privacy Considerations Template (MS Word) (MS Word) (PDF)

ACTIVITY 2: EVALUATING YOUR LEARNING MODULE

Overview

Depending on your context, you may or may not have the luxury of being able to pilot test your learning module before using it in one of your courses. Students and colleagues can provide insights that can be critical assets in the development process. Colleagues can provide insight into how well your module meets course requirements. Those with instructional design or technology experience can also provide insight into the technical aspects of implementing your module design. Your students can give critical insights into what works for them and what you can add, modify, or remove to make your learning module as effective as possible.

DESCRIPTION

We will assume that you have created an online learning module based on a storyboard that you have already developed for this activity. Once you have built at least part of your module, we will get some “expert” feedback before using the module with your students. By “expert,” we mean input from the perspective of a colleague who is either a fellow subject-matter expert or one who has experience designing and building learning modules. You can use this feedback to help tweak your module before launching it. Once you have a polished version of your module ready for your students, we will ask them for feedback. You can use this feedback to help tweak things before using the module with different students.

- **Get some expert feedback.** Ask one or more colleagues to review your learning module. Ask them to provide feedback on the content, the learning activities, and the overall functionality of the module. It is helpful to use a targeted feedback form or rubric. Suppose your school or organization is a member of the Quality Matters (2021a) consortium. In that case, you may be able to avail of the QM Rubric (Quality Matters, 2021b) or submit your learning module for review by a QM-trained peer review expert. For our purposes, I have included a link below to a targeted feedback form based on Northcote and Seddon’s (2011) MOOBRIC self-evaluation tool. I frequently use this form with participants in my instructional design courses to provide peer feedback to develop their own prototype modules.
 - Provide your colleague with access to your learning module.
 - Provide them with a copy of a rubric or feedback form to record their observations.
 - Add notes from the feedback you receive to your storyboard or blueprint document. These notes will make finding where you need to make the necessary changes easier.
 - Implement any of the changes that may be needed.
- **Get student feedback.** If your context permits, ask some students to pilot test your learning module before using it in your actual course. Consider your first run with your learning module like a pilot test for future terms or school years if this is not possible. Once your students have completed the module, get their feedback. You can do this through informal observations. However, it is valuable to collect formal feedback at this stage using a targeted student feedback form. I have provided a link below to a student feedback form based on Northcote and Seddon’s (2011) MOOBRIC self-evalua-

tion tool and a standardized student feedback form based on the Community of Inquiry framework (Athabasca University, 2014). I frequently use this form with participants in my instructional design courses to facilitate structured feedback for prototype modules.

- Provide your students with access to your learning module.
- Provide them with a copy of a rubric or feedback form to record their observations.
- Add notes from the feedback you receive to your storyboard or blueprint document. These notes will make finding where you need to make changes easier.
- Implement any of the changes that may be needed.

Possible Challenges

The biggest challenge that you are likely to encounter is the time to conduct evaluations of your learning module. You may be pressed for time to complete your module and implement it in your course. Your colleagues and students may not have adequate time to provide structured feedback. However, the return on time investment on your part to collect this feedback is worth it. This feedback is critical to knowing whether your module has succeeded in meeting your needs and determining what, if any, improvements may be needed.

Resources

- Online Teaching Course Setup Peer Review Form (MS Word)
- Online Teaching Course Setup Peer Review Form (PDF Version)
- Online Teaching Module Delivery Peer Review Form (MS Word)
- Online Teaching Module Delivery Peer Review Form (PDF Version)

ADDITIONAL RESOURCES

- Are you looking to build your online learning modules of courses using either your organization's Canvas learning management system or the Canvas Free for Teachers [Login page] (Instructure, n.d.) platform? Creating Your Courses in Canvas includes insights such as:
 - basic Canvas configuration settings to manage users creating content pages;
 - organizing your activities;
 - embedding interactive content; and
 - creating branching or differentiated learning pathways.
- Do you want to use Google Classroom to turn your storyboard into an interactive learning module? This Google Classroom User Guide [PDF] contains everything you need to learn how to set up your own Google Classroom space (if your organization does not provide one) and create your content and learning activities.
- Do you want to learn more about organizing your digital learning resources in your modules, including tracking potential copyright and privacy issues? Check out The free ETICPC template from Power Learning Solutions to learn more about the open-access Educational Technology Integration Copyright and Privacy Considerations Template (ETICPC) template.

- The Power Learning Solutions ID Resources site is a curated collection of instructional design templates I have used when developing online learning modules and as resources for my instructional design students.
- eLearning course developers need to plan in detail before creating any media or building a course inside an LMS. In the Using Storyboards to Develop eLearning Courses [10:30] video, I demonstrate a storyboarding process to:
 - Create a blueprint
 - Complete with a page-level script (before even logging into the LMS to build a course)
 - How the map translates into reality
- In A Simple Guide to Creating an eLearning Storyboard, Aura Interactive (2021) summarizes a storyboard and how to get started creating one for your learning module or course.
- Learn more about the Quality Matters (2021a) consortium, including how you or your organization can become a member. This organization has provided training and resources related to quality assurance in instructional design for online learning modules since 2002.

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Problem-Based Learning: Developing 21st Century Skills in Online Environments

CHRIS D CRAIG

INTRODUCTION

Thriving in the modern world requires more than literacy and numeracy skills (Bourn, 2018; Care et al., 2016; Lai & Viering, 2012). Indeed, Care et al. (2016) found that critical twenty-first-century-skills include:

- Creativity
- Communication
- Critical-thinking, and
- Problem-solving

Initially developed for medical education (Servant-Miklos, 2019), *Problem-Based Learning* (PBL) provides an opportunity to develop the essential skills mentioned above. This chapter offers foundational insight for using PBL in online learning environments. I offer insights rooted in the original McMaster Philosophy and from its use in Ontario Tech University's fully online education studies programs.

PROBLEM-BASED LEARNING (PBL)

PBL acts as a landmark in the transformation of modern education in which educators recognize that formal learning could be more than the rehearsal of facts (Servant-Miklos, 2019). Using an opportunity to revise the medical program at McMaster University, a group of innovators developed a unique program that is now a foundational process in learning across the globe. Building on ideas such as system-based courses, the McMaster Philosophy evolved through dynamic frameworks into what is commonly known as PBL (Servant-Miklos, 2019).

PBL focuses on learning and not the problem itself (Walsh, 2005). Instead, problems stimulate students' creative and critical thinking abilities while communicating with their peers. In turn, students are encouraged to be self-aware and develop capabilities and characteristics that extend knowledge into practical and flexible applications (Neufeld & Barrows, 1974). According to Barrows and Tamblyn (1980), PBL is "the learning that results from the process of working toward the understanding or resolution of a problem" (p. 1).

PBL requires scaffolding and parallels learning how to ride a bicycle. Typically someone trying to ride on two wheels starts with some extra supports, which, over time, are removed so that the rider requires a greater sense and application of balance. In PBL, an educator first guides the process with support but increasingly provides the student with more responsibility to achieve learning outcomes, requiring more self-efficacy.

COLLABORATIVE LEARNING

While PBL can support individual learning situations (Pease & Kuhn, 2011), it is traditionally a collaborative experience. Working in a team or group is valuable beyond academic study, and further benefits of using collaborative learning include (Burke, 2011). Here are the four primary skills associated with PBL:

- **Creativity.** Reflecting on independent insights from each group member can stimulate creative thinking, while the process of problem-solving is creative in and of itself. Also, exploring the problem may require applying knowledge in ways that differ from how it was initially learned.
- **Communication.** Developing a cohesive response requires communication. In PBL, communication is multi-faceted and different strategies will be apparent in different groups.
- **Critical-thinking.** Collaborative learning helps students apply insights, requiring critical reflection (e.g., what is known and what isn't, who will perform specific tasks, why an answer is relevant).
- **Problem-solving.** Students must reflect on the problem and navigate diverse opinions towards an answer or solution.

GENERAL GUIDELINES

Implementing PBL into practice may involve an entire course or a single project or assignment. In both scenarios, the process supports a broad spectrum of skills ranging from technical to interpersonal. Student workflow is flexible and independent, requiring adaptability from students and educators (Hillman, 2003).

FOCUS

Educators may create a single problem or case study at the onset of a course or a series of issues throughout the course. When presenting a single problem, it should be focused enough to make sense in the context of the course but broad enough to afford diverse responses, requiring extensive reflection. Multiple problems throughout a course might be independent of each other, emphasizing different skill sets (e.g., developing learning outcomes, activities, and assessment). If a series of problems is scaffolded, you can include multiple interrelated questions at the onset, or students can develop "what's next?" questions. For example, a team of students might find that a problem is too broad to learn in a set time, so they might choose to refine their initial question.

CONCEPTUAL OVERVIEW

The following guidelines act as a fluid framework for applying PBL in online learning environments.

- **What is the problem?** There are many ways to present a problem, such as statements providing diverse insights into a situation or a case study that helps skill development through subject-related contexts (Belt, 2018).
- **Creating a group.** Self-selected groups may be preferential for students, but it can reflect increased

socialization versus focusing on the task at hand. Try randomizing the groups or personally assigning them for a fully-immersive PBL experience with increased learning potential (Burke, 2011). A benefit of many online conference tools is that you can randomize breakout sessions, which can help facilitate the process.

- **Limit the number of students.** Larger groups can reduce learner opportunities to participate, while pairs may not support diverse ideation, so keeping groups between three and five is recommended (Burke, 2011).
- **Good Problems.** The problem presented should be relevant to the field of study and adequately represent potential scenarios (Hillman, 2003).
 - *Authentic.* Reflecting on how a situation may have real-life implications can enhance student intrigue and perceptions of relevance (Fogarty, 1997). Similarly, it can help learners understand real-world scenarios for their field of study (Gibbs et al., 1994).
 - *Ill-structured and ambiguous.* Real-life problems don't follow a particular set of rules, extending to your proposed issues (Fogarty, 1997).
 - *Learning outcomes* should be clearly defined. Students need to know/determine the end goal before they begin.
- **Distribute power.** Distribute power equally among the educators and learners (Childs & van Oostveen, 2016). The process affords critical reflection, an integral part of teaching and that instructors and students need to learn and grow.
- **Establish ground rules** (e.g., a learning contract) for the PBL, or follow ones outlined at the beginning of the course. Developing ground rules can even be created through a mini-PBL (see Activity 1 of this chapter).
- **Think long-term.** PBL is a particularly effective form of education for long-term knowledge retention (Yew & Goh, 2016).
 - *It could be painful.* Building on our bicycle reference earlier: Taking away traditional learning supports (e.g., explicit guidelines) may lead to some road-rash. Students are used to performance measures and quantitative guidance (Stommel, 2018), so changing a traditional paradigm may not be a smooth process for everyone.
- **Learning is socially constructed.** Lave and Wenger (1991) propose that learning occurs through social processes where knowledge builds on insights developed through a social and physical environment. Working in small groups can offer a similar experience.
- **Formative Process.** PBL-based work is intended to support the formative development of students (Neufeld & Barrows, 1974) and may not easily lend itself to summative or final assessment rubrics or guidelines.

KEY ROLES

- **Educator** refers to anyone responsible for guiding content to achieve learning outcomes. In this context, examples of educators include a clinician, professor, teacher, or teaching assistant. This role is commonly referred to as a *tutor* and requires adaptability and support for learner cohesion and task orientation. As such, an educator does not dominate discussions, give away answers, or ignore conflict.
- **Student or learner.** In this chapter, I use the terms students and learners interchangeably. If I were to differentiate, a student might be considered an individual enrolled in formal education while

learners include life-long, informal, and nonformal learning.

- **Group.** A small collection of students or learners connected with the intent of collaboratively exploring a shared problem.

PBL PROCESS

The following seven dynamic steps outline the PBL process (Neufeld & Barrows, 1974; Walsh, 2005):

1. **Identify a problem.** The learning goal is problem exploration, not a diagnosis. Learners should be encouraged to start with the Five Ws of problem-solving.
2. **Explore pre-existing insights.** Identifying a spectrum of information can support problem identification and critical thinking processes. In this step, clarifying information and determining meaning through personal and group reflection is crucial for deeper understanding.
3. **Generate a hypothesis.** Building on previous insights, learners conceive of characteristics and mechanisms regarding the nature of the problem.
4. **Identify issues.** Now that there are some knowns, learners should identify unknowns, such as gaps in personal knowledge or skills related to addressing the problem. Also, learners may note missing insights into the problem itself in this step.
5. **Self-study.** Often, learners will retract to areas of existing comfort rather than exploring novel insights of the previously unknown. This step can include using personal time to reflect on emotional, physical, and social gaps that might inhibit awareness.
6. **Reflect & re-evaluate.** Groups reconvene and consider insights about the problems and their abilities to seek a solution. In this step, the tutor may work as a mediator to help learners consolidate and develop potential actions.
7. **Culmination.** In this step, the groups present a consolidation of their solution or responses. Educators will likely find self and peer feedback or assessment beneficial in summarizing the learning experience.

PBL AND DIGITAL TECHNOLOGY

Digital technology provides unique opportunities for students to build on the effectiveness of pen and paper PBL. Traditionally, a lecture hall would be loud and visibly busy, whereas breakout sessions provide students with personalized learning spaces to support individual learning and communication strategies. And, recognizing that synchronous activities such as breakouts aren't always feasible for diverse student groups, cloud-based documents such as Google Docs provide excellent opportunities for asynchronous communication. The shareable documents also mean that there is no longer a need for designated *note-takers*, with each group member can explore the problem and reflect on the same page at the same time as their peers. Similarly, students may elect to use digital messaging platforms (e.g., text messages, Facebook, or TikTok) to communicate ideas or debate. Also, digital library hubs, Google Scholar, and web search engines increase student access to high-quality information that may otherwise be unavailable in traditional libraries or lecture halls.

The integration of digital tools also supports diverse delivery methods. One example is using video or multimedia-based case studies to represent problems, reflecting real-life or simulated events (van Oostveen et al., 2019). Educators can share video case studies that reflect problem scenarios. You can also have students develop a video-based case study to present to their peers, which I build on in the activities section. The process of video creation has become much more accessible and timely, with cameras being a standard

accessory in cell phones. Also, recent advances can take video-based case studies to the next level, providing diverse fields such as physics and EFL opportunities to engage in immersive experiences through augmented and virtual reality (Chen et al., 2021; Fidan & Tuncel, 2019; Jivram et al., 2021).

Using Online Breakout Sessions

Breakout sessions are a crucial aspect of the collaborative PBL process. Online learning environments such as Google Meet, Microsoft Teams, or Zoom allow students to engage in small, face-to-face, peer learning groups. Below are three evidence-based guidelines for effective group sessions (Burgess et al., 2020; Thrall et al., 2016; Ulfa et al., 2021):

1. **Manage but don't direct.** Maintain your teaching presence by circulating breakout rooms, responding to direct questions, clarifying and stimulating discussion. Let your learners control and lead the discussion.
2. **Timely feedback.** Your ability to respond and provide timely feedback can increase engagement and reduce the chance of students diverging off task.
3. **Self and peer-assessment** support student self-efficacy (Liu et al., 2018; Mao & Peck, 2013) while also providing insights into while also providing insight into learning. Consider collecting and reflecting on student insights regularly so that they understand expectations and stay informed.

Potential Challenges

Four basic challenges that you might experience when implementing PBL in online environments include:

1. **Technical requirements.** Whether fully online or hybrid, students engaged in online learning may have differing access (e.g., shared technology with family, time zones, or funds for additional resources).
2. **The educator (tutor) overreaches.** Students need to take the lead in PBL scenarios, meaning that educators will need to be active participants rather than being the leader (Walsh, 2005).
3. **Less effective for short-term learning.** While there are many advantages of PBL, short-term learning is not likely one. PBL develops creativity, communication, critical thinking, and problem-solving over an entire course.
4. **Differences in implementation.** Reflecting on previous research, Yew and Goh (2016) found a variety of PBL strategies across different fields of study. I recommend considering the guidelines here and adapting them in a way that works best for your situation.

TOOLS TO GET STARTED

- **Canva** is a drag-and-drop style multimedia editing platform for making visually appealing presentations, videos, infographics and more with limited technology skills. There are restrictions with the free version and various plans to fit your needs.
- **LabXChange** is a free platform that provides collaborative STEM labs for low-stakes (as in, things don't go *boom* in real life) experimentation and problem-solving.
- **Social media** platforms offer diverse content types (e.g., text-only or multimedia) and opportunities to reflect on current problems or share them.

- **Synchronous document platforms** such as Google Workspace and Microsoft 365—which are often offered through the school board or institution—provide opportunities for real-time collaboration and feedback.
- **TedTalks** and **TedEd** provide opportunities to recruit unique situations or case studies on diverse subject matter.
- **The Knowledge Compass** is your one-stop-shop for developing questions.
- **Thinkrolls** is a paid app for youth aged three to eight that supports the development of critical thinking skills.

ACTIVITIES

ACTIVITY 1: ESTABLISHING A RUBRIC, AN INTRODUCTION TO PBL

Overview

As educators, we can immerse students into a PBL experience through a small-scale activity in the first and second classes by co-creating *ground rules* for the term. The ground rules act as a learning contract or rubric that will guide self and peer assessment for a fully online PBL curriculum. Students engage with a shared goal as an icebreaker at the onset of a course as an added benefit.

Description

In the spirit of PBL, this activity will require you to fill in the details, guided by the question, *What factors will you need to consider to make this work?* (e.g., time, subject, or technology platform). The following steps act as a general guide:

Step 1

1. **Present the learning outcomes** and outline how they relate to the field of study.
2. **Gather group insights** about the learning outcomes.
3. **Outline a class schedule** (Note: I like this idea because it involves modelling the expected attention to details) but expect to adapt it over the remainder of the class.
4. **Present the problem.** In this case, you may use a series of questions such as: “Concerning the learning outcomes, what do you expect from yourselves? What do we expect from your peers? And, what do we expect from our teacher/educator/tutor/TA/EA?”
5. **Build self-efficacy early.** Advise students that they will need to find the course outline in the course shell (learning management system) and record (e.g., write on paper or type) the questions for reflection in the next step.
6. **Provide technical details** such as how to connect with you in the breakout sessions. The details should support student success but aren’t a part of the exercise.
7. **Divide the class into groups.** Put students into groups of three to five by randomizing breakout rooms.
8. **Visit each room** and ask questions.

9. **End the breakout session.**
10. **Anticipate confusion** as there is a strong chance students won't know how to build a rubric.
11. **Generate a discussion** about what information students think they need to answer the questions better. Alternatively, reflect on what they think they know. Using something like a Jamboard may be beneficial here.
12. **Start breakout rooms again** with new randomized groups, so students work with new individuals.
13. **Regroup** and collect each group's ideas on the Jamboard.
14. **Provide sample rubrics** and insights for developing them as homework.

Step 2

1. **Discuss** students' new insights about rubrics.
2. **Example.** Provide the previous Jamboard.
3. **Start breakout sessions** with randomized students.
4. **Revise previous insights.** Students develop a rubric based on the last session and their new insights in this step.
5. **End breakouts.**
6. **Pitch.** Each group shares their rubric and outlines why they think it's a good idea.
7. **Vote.** Students vote on what they believe is a challenging but reasonable set of expectations for the term.
8. **Collect the responses** and add them to the course outline or learning shell.

Next Steps

- Have students use the rubric to guide their self-assessment of activity contributions.
- Use the rubric at least once before the end of the course for self and peer assessment (e.g. mid-term assessment).

Possible Challenges

- Some students may miss the first class and feel left out.
- The aspects of the co-created rubric might not lead to challenging expectations.
- This activity might go longer than anticipated if students do not engage.

Resources

- Rubrics: Useful Assessment Tools | Centre for Teaching Excellence | University of Waterloo
- Rubrics: Tools for Making Learning Goals and Evaluation Criteria Explicit for Both Teachers and Learners | CBE—Life Sciences Education
- Using rubrics | Center for Teaching Innovation
- 23. Use a Rubric to Evaluate Your Work

- How to use breakout rooms through Google Meet, Microsoft Teams, and Zoom.

ACTIVITY 2: PROBLEM-BASED LEARNING OBJECTS (PBLOS)

Overview

Problem-Based Learning Objects (PBLOs) are shareable digital multimedia modules communicated through various platforms such as presentation software, websites, or spreadsheets (van Oostveen et al., 2018). Essentially, PBLOs consist of video case studies and supporting materials that present an ill-defined situation to stimulate thinking and discussion. Building on a proposed problem, learners gather, develop, and share information towards context-appropriate solutions. Educators may use the objects to present problem-based case studies in asynchronous or synchronous learning environments. For over a decade, the latter has been a foundational experience for BA students in Ontario Tech's education program.

PBLOs build on the Fully Online Learning Communities (FOLC) framework, providing an opportunity for collaborative online learning. The framework fosters social and cognitive presence, collaboration, and co-creating a digital space (Blayone et al., 2017). Please note that while we share a streamlined process here, the development and implementation of PBLOs will benefit from a dynamic reflection between the phases and steps.

Description

In this two-stage activity, groups of learners will learn to orient themselves towards independent study that focuses on authentic, cooperative, and multi-disciplinary work. The first stage of a PBLOs involves three development phases.

Stage 1: Research and Development

1.1 Investigation. Developing a topic and scenario is rooted in an authentic learning experience. The case should be relevant to the learners and challenge their existing assumptions, stimulating them to learn more independently.

1.2 Discourse. For educator-based PBLOs, the intent is to stimulate learner discourse. The resulting conversation can support critical reflection to guide potential changes. For learner-based PBLOs, the objects are developed through multiple group meetings (e.g., weekly if PBLOs are a full term in duration) to ensure inclusivity, challenge personal perceptions, and explore creative ideas on the subject.

1.3 Creation. Before Stage 2, reflect on the goal of the scenario and how to convey a situation that stimulates curiosity. The challenge in the creation phase is to remain open, sharing a problem that does not express personal bias.

Stage 2: Implementation

The second stage focuses on developing the four-part object. The scope of this process lends itself to development over a longer time, such as a semester, but it may be adapted for shorter periods as well.

2.1 Video case study. Here, the aim is to stimulate thought processes and encourage the viewers to imagine themselves in the situation depicted. Embed the video using closed captioning. The content includes

- A title/topic;
- 4-5 analysis questions to prompt and provide context for inquiry;
- A video-based case study (1-2 minutes) with an authentic problem with room for viewer interpretation;
- A transcript; and
- A brief description of the video clip setting.

2.2 Contextual information. Our goal is to provide further insight and background information for the video case study on page 1. The content includes supporting documents and resources for the video and video references.

2.3 Theoretical lens. This page or section intends to provide information that promotes critical inquiry through alternative perspectives, essentially viewing the initial problem from a different lens. Content includes

- ill-structured information promoting creative reflection about the problem (no more than 400 words); and
- new references and resources to develop personalized insights.

2.4 Synthesis is the final page or section, providing an opportunity to share, discuss, and debate solutions and reflections. Here, learners will need to engage in the act and expression of creative and critical thinking. Content includes:

- Repeat 2.1, but replace analysis questions with synthesis questions.
- Learners are encouraged to use the questions to discuss insights and perspectives in group discussions.

Possible Challenges

- **Creating problems.** Traditional learning outcomes consist of concise and structured information leading to defined answers. Initially, students may find it challenging to develop ill-structured situations to create more questions than answers.
- **Video creation.** Students might not have created a video of this nature before, requiring skill-development time they may not have anticipated when planning the assignment. I recommended that you offer subtle hints about the challenge long before the deadline.

Resources

- Towards a reconceptualization of online teacher professional learning: Problem-based learning objects (PBLOs).
- Problem-Based Learning Objects, PBLOs slideshow
- AEDT1110 PBLO PBL Scenario A

GENERAL RESOURCES

- Roland van Oostveen: Teaching online with a Problem-Based Learning Approach, the FOLC Model, & more [74 min.].
- U of Delaware PBL Resources offers several sample syllabi, evaluation forms, and sample problems.
- Problem-Based Learning – Digital Pedagogy – A Guide for Librarians, Faculty, and Students – Research guides at the University of Toronto offers a brief overview.
- The Wiley Handbook of Problem-Based Learning

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Flipping Your Virtual Classrooms

JANETTE HUGHES AND LAURA MORRISON

INTRODUCTION

In a flipped classroom model, students use the time before class to prepare to participate in class discussions and hands-on, interactive activities. This learning model maximizes in-class, face-to-face instructional time and is based on the socio-constructivist approach to learning which holds that knowledge is both socially negotiated and constructed (Vygotsky, 1978). Students are first provided with information on a given topic, including facts, processes, concepts and ideas (Bergman & Sams, 2012). We can provide the students with this information in the form of recordings (e.g., videos, audio, podcasts), text (e.g., readings, slides) and images (e.g., infographics, pictures; Morrison, 2021). Most often, we can present the information using a combination of all three (recordings, text, and images). Students have anywhere from a day to multiple days to go through the content provided at their own pace and begin to understand the topic and the accompanying materials. After developing this foundation, students come to class prepared to unpack and extend their knowledge and understanding through discussion and activities with their peers and instructor.

A flipped classroom prioritizes student autonomy and agency as students have more freedom and flexibility. Notably regarding when, where, and how to go through the content and build their understanding of a topic (Morrison, 2021). For example, if a class happens once per week, students have that length of time to go through the curated content at their own pace — they may go through some or all of the content multiple times, they may divide it up over several days for better absorption (Morrison, 2021).

GENERAL GUIDELINES

We have found eight essential guidelines for using a flipped-classroom approach for online learning.

1. Reserve adequate time for setting up the flipped classroom environment, materials, learning goals and expectations.
2. Community-building should be explicitly integrated into the classroom design.
3. All students have consistent access to a device connected to the Internet at home.
4. Ensure students have access to working tech equipment such as headphones and microphones for privacy/noise reduction during classroom discussions and activities.
5. Diverse Content. Ensure all content is accessible to diverse students (e.g., closed-captioned videos or podcast transcriptions).

6. Ensure all learning goals, expectations and assessment criteria are explicitly communicated to students in advance as students may move ahead or revisit material throughout the course.
7. Provide a variety of learning materials in the preparation packages to reach diverse learners. Choosing which materials to go through and activities to complete before class are also important to foster student autonomy and agency.
8. Embed accountability into the learning activities. A flipped classroom model makes it easy for students to rely on their peers to fill them in, so individual responsibility is essential.

ACTIVITIES

ACTIVITY 1: ACCOUNTABILITY THROUGH REFLECTION TEMPLATES & DISCUSSION QUESTIONS

Overview

This activity provides an overview of building accountability into the flipped classroom model at secondary or higher education. The technique includes using a reflection template and student-generated discussion questions that synthesize the resources curated by the teacher.

Description

We prepare an interactive slide deck for the students as a minds-on activity. The deck includes various reflection questions and curated student resources related to the weekly thematic topic (e.g., TedTalks, websites). It also consists of a reflection template the students must complete before their weekly synchronous class or video-recorded student meeting.

Within the slides and the reflection template, the students always choose what content they want to go in-depth with and which questions they want to answer. The students' weekly reflection templates are always required to generate three discussion prompts that synthesize the weekly readings and the content from the slide decks. In discussion groups, students use the questions, and each week a new facilitator reads through everyone's discussion prompts and chooses the three to guide the conversation.

Teachers can ask for the student-facilitated sessions to be recorded, affording educators to gain a more in-depth understanding of what the students know. The recording also provides further insight into what clarifications or prompting questions might be required to advance student thinking and understanding. You can then share your feedback with each student group via email or the direct messaging feature embedded in the course's LMS platform.

Possible Challenges

- Students might not find the content engaging, resulting in limited or surface responses.
- Students might not be prepared before the session. The process can limit their engagement or result in fragmented attention as they attempt to catch up, which can be disruptive for the other students.
- While a recording can be advantageous for reflection, students might not want their answers recorded. Establishing comfort for these types of sessions is critical for student success (Van Wart et al., 2020).

ACTIVITY 2: ONLINE DISCUSSION CIRCLES TO PROMOTE DEEPER ENGAGEMENT

Overview

This activity promotes deeper engagement with curated content and builds on Activity 1 by facilitating student interaction with peers in preparation for in-class activities. This model encourages students to discuss the content ahead of class time in a social way that moves them beyond the traditional expectation that they post a written response to an article or video on an LMS, resulting in little discussion among students in the class.

Description

Rather than using the in-class time to have students discuss the articles, videos or other curated content, students can engage in online discussion circles that can be recorded or summarized for the instructor. Discussion circles are small groups of 4-6 students who meet outside of class time, using Zoom, Google Meet, Discord or another platform of their choice. Before the meeting, each group member takes on an assigned role for the discussion. These roles can vary depending on the content they are reading/viewing. Some examples of roles include, but are not limited to, discussion facilitator, connector/reflector, summarizer, vocabulary enricher, synthesizer, illustrator (see Figure 1).

Figure 1.

Role Chart for Online Discussions

Role	Responsibility	Tips
Discussion Facilitator	<ul style="list-style-type: none"> • Develop a list of questions to discuss • Keep discussion on point • Ensure everyone has an opportunity to participate 	<ul style="list-style-type: none"> • Focus on big ideas • Isolate confusing parts of the article/video • Begin with your thoughts, concerns, responses to the content
Connector	<ul style="list-style-type: none"> • Find connections between the reading/video and other course concepts and to the broader world. 	<ul style="list-style-type: none"> • Consider stories in the news, similar events or ideas, other issues/situations you are reminded of, your own experiences.
Summarizer	<ul style="list-style-type: none"> • Prepare a summary of the curated content. 	<ul style="list-style-type: none"> • Cover the key points, main idea, highlights, and general idea of the content
Vocabulary Enricher	<ul style="list-style-type: none"> • Record words and phrases that have significant meaning in the content • Record words that you had to look up to enhance your meaning-making 	<ul style="list-style-type: none"> • Jot down puzzling or unfamiliar words or phrases while reading/viewing • Look up definitions and share them with your group • Highlight words that are crucial to the meaning of the text
Illustrator	<ul style="list-style-type: none"> • Creation of images (e.g., diagrams, a mindmap, flowcharts, or doodles) related to the content. 	<ul style="list-style-type: none"> • Don't explain your drawing/graphic right away — let your group members speculate about what it means. • Convey what it represents to you afterwards

Student roles should rotate from week to week to encourage reading/viewing the material from different perspectives. They come to the scheduled meeting prepared to share with their group.

Not only does this approach build in accountability, but it also promotes purposeful talk and helps students to engage with the ideas, concepts and information, clarify and deepen their understanding, extend their learning, and interact with their peers. It promotes social presence (Garrison, 2011) and a better sense of community in the classroom and helps students who might be struggling with the content gain a better understanding before class. This approach is also beneficial for English language learners as it allows them to speak about the content and listen to peers do the same in a smaller group setting. This activity can also raise students' interest in the course content and motivate them to engage more deeply during class, as it provides them with better confidence in their understanding.

In addition to encouraging cognitive engagement with the course material, this approach can promote a variety of social and emotional learning, including self-awareness, self-management, social awareness, relationship and communication skills and responsible decision-making (Venegas, 2019).

Possible Challenges

While the flipped classroom model can make the online learning experience much more student-centred, inquiry-based, interactive, and engaging, some challenges are associated with its implementation. Below, we outline some of the potential challenges we have encountered in using the flipped classroom model in the online learning context.

- **Increased workload.** One challenge in using the flipped classroom model can be the increased educator workload at the beginning of a course. Where more traditional courses can accommodate course development on a week-by-week basis, the flipped classroom model requires teachers to spend more time before a course begins developing the course's asynchronous resources (slides, activities, videos). As one of the goals of the flipped classroom model is the development of student autonomy and self-paced learning, students need to be able to access most, if not all, of a course's resources and to move forward and backward with these resources as needed, throughout a course.
- **Communication of expectations.** Another challenge connected to the initial increase in workload is the need for the teacher to clearly communicate the expectations of the new model — what is considered “prep” work and what is considered “homework.” If other classes do not follow a similar model, it can become difficult for students to track the weekly preparation and follow-up work. Also, if students tend to want or need to work ahead with content, they need to trust that the content will not suddenly change and that the instructions and expectations are clear enough to complete the activities at their own pace.
- **Reviewing progress.** Given the frequency, it can also be difficult for teachers to monitor students' weekly progress. On the one hand, the frequent submissions keep students accountable, and the regular teacher feedback helps students learn and develop. On the other hand, providing weekly feedback can be overwhelming for one teacher to complete independently. Finding a dynamic balance that works for you is critical and may shift depending on each group of students.
- **Digital divide.** Finally, consider the digital divide when deciding whether or not to adopt this model into one's pedagogy. Suppose students in one's classroom do not have regular access to an appropriate device (desktop, laptop, iPad) or the Internet. In that case, these students could be disadvantaged in the learning process. It is essential to know one's students and whether this model might be possible for them and beneficial.

GENERAL RESOURCES

- Explain Everything is a one-stop whiteboard for remote teaching.
- Google Slides provides easily accessible resources for creating shareable content.
- Khan Academy is a mainstream example of flipped learning.
- Find a balanced overview of The Flipped Classroom, Pros and Cons.
- TedEd is a vast resource for creating video-based molecules for students.
- Weebly provides the opportunity to develop a website for creating and storing resources.

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Interactive Online Lectures

SHARON LAURICELLA; LAURA BANKS; AND CHRIS D CRAIG

INTRODUCTION

OVERVIEW

The typical image of an undergraduate learning environment invokes a large, theatre-style room with (usually uncomfortable) seats arranged so that everyone can watch and hear the instructor at a lectern or podium. The longstanding practice of lecturing speaks to its efficacy; lectures can emphasize and add context to the information in a time-efficient manner (White, 2011). However, online environments provide opportunities for creative and interactive lecturing that are difficult or even impossible to do in face-to-face lecture-style settings. This chapter describes the benefits of interactive lecturing and presents four activities to contribute to an engaging online lecture.

Proponents of online lecturing describe the many benefits of communicating to and with students in a lecture-type format. For example:

- **Online lectures** can be delivered and recorded in real-time (synchronously) or pre-recorded for enhanced flexibility and accessibility (asynchronously).
- **Digitally-mediated lectures** extend benefits that live, face-to-face lectures cannot, including accessibility (ex. captions, playback speed), device flexibility, convenience, and built-in formative assessment (quizzes or pauses to reinforce learning).
- **Recorded lectures** permit instructors to edit and revise a lecture to chunk information into smaller lecture episodes, address speaking errors, add visuals, or adjust sound quality.
- **Synchronous lecture-style delivery** invites student participation via polls, breakout activities, or surveys related to the lecture topic.

An engaging lecture does not simply mean that the instructor is energetic, uses examples, or incorporates humour into an otherwise dull monologue. Instead, interactive lecturing actively involves students throughout a digital lecture. Online interactive lectures engage students in critical thinking about learning materials to enhance the group's collective energy or engagement (Moellenberg & Aldridge, 2010).

BENEFITS

Attention. An online lecture can be constructed to increase student attention. Although instructors have lamented a lack of student focus for generations (Wilson & Korn, 2007), studies show that students are often not actively involved with a lecture and thus are not able or willing to focus on it (Steinert & Snell, 1999). In the online environment, actively involving students in a lecture rather than passively transmitting information improves student engagement and learning outcomes (Prince, 2004).

Equity, diversity, and inclusion. Underrepresented and minoritized students, undergraduates who lack academic preparation, and women benefit disproportionately from active learning (Eddy & Hogan, 2014; Lorenzo, Crouch & Mazur, 2006; Haak et al., 2011; Preszler, 2009; Bullard, Felder & Raubenheimer, 2008).

Investment. Interactive teaching and learning strategies can encourage students to engage with one another and course content, fostering investment in course study (Braxton et al., 2000).

Participation: Elements of interactive learning, such as engagement, rapport, and collaboration, improve student motivation and a more inclusive learning environment (Ambrose et al., 2010; Tanner, 2013; McGuire, 2015).

Rapport. Interactive lectures can provide space to develop rapport between and amongst students and instructors. Studies show that interactive lectures increase the potential to build such prosocial bonds and connections (Sharma et al., 2010). The online environment is a particularly welcome venue for building such relationships; digital opportunities such as backchannel discussion or crowdsourced responses throughout a digitally-mediated lecture can help establish familiarity and recognition amongst students. The formation of prosocial bonds is critical in improving student retention, particularly in first-year courses (Madgett & Belanger, 2008).

Small-group learning. The interactive lecture can incorporate opportunities for small-group learning. Educators can use case-based learning (CBL) and problem-based learning (PBL), typically in small groups, to engage and motivate students in applying their knowledge (Thistlethwaite et al., 2012). Students report high satisfaction with these approaches given the real-world application and social rapport that can be established (Curran et al., 2008). Such strategies, which can be implemented successfully in a remote online environment or a traditional classroom, have also positively affected learning (Davidson et al., 2014). However, it is unclear whether the learning occurs through curriculum delivery or the beneficial effect of small-group education (Thistlethwaite et al., 2012).

Student success. The active process of interactive lecturing requires that students critically think about course materials (Prince, 2004). In a meta-analysis of 225 studies, Freeman et al. (2014) found that “failure rates under traditional lecturing increase by 55% over the rates observed under active learning” (p. 23), while active learning enhanced examination performance and raised grades by a half a letter. Interactive lectures have also been shown to increase understanding of course content (Chimmalgi, 2019; Sharma et al., 2010).

Understanding. Active learning can improve comprehension and retention compared to passive learning strategies (Delauriers et al., 2011).

GENERAL GUIDELINES

An interactive online lecture is broadly a semi-structured discussion where instructors aim to ensure that students are comfortable answering questions or sharing thoughts rather than being lectured at (Moellenberg & Aldridge, 2010; Steinert & Snell, 1999). Consider the following practices to ensure the best possible digital lecture experience for both you and your students:

PLAN

- **Variable student group size.** While it is essential to consider overall class size, attendance at synchronous lectures may vary. You may consider activities that offer flexibility, such as the use of breakout rooms along with interactive quizzes (Mentimeter), such that you can amend interactivity on short notice.
- **Type and level of course.** The types of interactive activities that you choose to implement may be discipline-specific (e.g., humanities vs. science) and vary according to the specifics of the student group (e.g., fourth-year vs. first-year students). For example, a fourth-year humanities course may lend itself to a rich discussion of a controversial topic. In contrast, a first-year anatomy and physiology course may establish objective content knowledge.
- **Time and resource needs.** Interactive lectures can be time and resource-intensive. Consider factors such as how long it will take to set up and what resources (e.g., technology, learning materials, space) are required. Engage in contingency planning if the interactive lecture does not go as planned (e.g., technical difficulties can happen when you least expect it!).
- **Inclusive Environment.** Interactive lectures should include the development of an environment in which students feel comfortable participating and sharing experiences, knowledge, and perspectives. An authentic interactive lecture will consist of participation by most students, not just a select few.
- **Student Participation and Accessibility Needs.** It can take time for students to process and develop meaningful responses without the potential influence of the larger student group, so plan to give time to respond. Even 10 seconds can help foster independent thinking, especially during reflective exercises, discussions or content review.

LECTURES = DISCUSSIONS.

- **The presentation is a guide.** PowerPoint Presentations or slides are guides, not teleprompters. Lectures shouldn't be the sole means of information dissemination.
- **Ensure learning materials are accessible.** Let students know the focus and intent of the lecture ahead of time. Sharing materials well in advance will afford students to prepare (hopefully) and a chance to reflect.
- **Don't repeat** information that is overtly present in books.

ENGAGE

- Learn students' names and use them.
- Begin with low cognitive load activities and build based on response and engage volunteers and non-volunteers.

- Implement a pre-class exercise (e.g., informal quiz, reading, reflection) to encourage advanced preparation and comprehension
- Conduct an experiment or view a multimedia presentation in an online classroom, then prompt discussion.
- Connect students' experience/background with the topic (ex. Q & A, educator ties it back to the topic).
- Use visual organizers such as slide colour or progress bars/images to chunk information into smaller conceptual components.
- Using multimedia content such as video lectures can help reduce cognitive load (Clark et al., 2011).
- Be aware of facial expressions. Lecturers' facial expressiveness in online learning may enhance student learning experiences (Wang et al., 2019). Video lectures with heightened levels of expressiveness were more effective for increasing student arousal and learning satisfaction than conventional levels or audio-only (Wang et al., 2019).

POTENTIAL LIMITATIONS OR ISSUES

- Using personal technology such as social media and texting may present challenges in maintaining focus on learning tasks (Morrell & Joyce, 2019).
- Efforts to impress (e.g., theatrics, audio, visuals) should add to, not take away from the content.
- A lack of student preparedness for an interactive class may limit their participation.

ACTIVITIES

ACTIVITY 1: INTERACTIVE LECTURING WITH MENTIMETER

Overview

Mentimeter is an interactive, web-based presentation tool that replaces traditional slides to facilitate engagement between and amongst students and instructors. The value-add is an ability for audiences to interact anonymously with each slide through various response options. The use of EdTech, such as Mentimeter, is in direct contrast to passive methods of teaching that resemble the factory (Leather et al., 2020) or banking (Freire & Ramos, 1970) knowledge transmission models. Using Mentimeter can help to improve interactivity and engagement in lecture formats.

Description

1. **Sign up.** Visit [mentimeter.com](https://www.mentimeter.com) and create a free account if your institution has a paid membership, all the better, though the free version is sufficient for most online lectures.
2. **Get a presentation code.** Mentimeter generates a unique numerical code for each presentation, which will appear on each slide. As students join the lecture or presentation, direct them to the Menti site to enter the code and join the group online. All participation and results in Mentimeter are anonymous.
3. **Introduction.** When beginning a lecture, it is helpful to find out what students know or don't know

already. Invite students to respond to pre-instruction questions in various ways, as below.

4. **Polls/Votes.** Mentimeter allows polling results in various formats, including multiple-choice, ranking, or scales. You could ask students to rank their knowledge of a particular topic or concept that you'll cover in the online lecture and then repeat this exercise at the end of class to assess the efficacy of the lecture.
5. **Word clouds.** This interaction format invites responses to open-ended questions answered in one word or a brief phrase. Responses automatically appear on screen in real-time. Words or phrases with more than one response appear larger than those with fewer responses.
6. **Short answers.** Invite students to ask questions throughout the presentation. Questions appear in small text blocks live on screen.
7. **Content.** For slides in which you seek to deliver information, Mentimeter offers content slides with bullet points, headings, images, or video functions.
8. **Check-in.** Students can still respond to slides that contain primary content. Each Mentimeter slide has the option to present a series of check-in responses: the heart, question mark, thumbs up, thumbs down, and cat silhouette buttons. Students can click one of these options to indicate the presence, confusion, something they like/dislike, or the cat (which is somewhat random but cute nonetheless).
9. **Quiz.** Mentimeter has a quiz function whereby students can respond to questions, and results are displayed (anonymously) on screen. This function can help both instructors and students gauge comprehension and is particularly useful at the lecture's conclusion to informally assess retention.
10. **Debrief.** Mentimeter saves all student responses anonymously, so instructors can revisit each slide to see where there were questions, increased or decreased participation, and quiz results.

Possible Challenges

- **Format.** Mentimeter can be used in either asynchronous or synchronous environments. However, many of its functions (such as polling and Q & A) are best suited to lectures/presentations in synchronous online environments. It may take some experimentation to determine how to best use Mentimeter in recorded lectures in your specific discipline.
- **Anonymity.** As Mentimeter affords anonymity, it is unlikely that you can identify students presenting issues best served through a private response. Also, inappropriate dialogue might occur even with filtering settings engaged.

Resources

- Mentimeter
- OTU Teaching with Mentimeter

ACTIVITY 2: IMPLEMENTATION OF CASE STUDIES

Overview

Case studies offer a unique opportunity to engage and motivate students to apply their basic theoretical knowledge to real-world scenarios. They enable scientific inquiry, integrate knowledge and practice, promote critical reflection and clinical reasoning (Thistlethwaite et al., 2012). Through personal experience, undergraduate students enjoy discussing authentic clinical cases, particularly in small group settings.

Description

1. **Case Study Content Development.** Case studies should provide an in-depth, multidisciplinary perspective of the issue. There are plenty of case studies already published for use that you may consider, including traditional textbooks, subscription-based repositories and OER publications (see Resources). In the case study development phase, educators can evaluate the level of the student group. For example, first-year students may be content with more structured activities. In contrast, fourth-year students should be able to integrate and apply knowledge from current and past courses in forming shareable answers), relevant course content (e.g., to ensure overlap with theoretical concepts presented in the course), and intended timing and format of the case study presentation.
2. **Timing and Format of Case Study Presentation.** The introduction of case studies in the undergraduate health sciences curriculum typically follows an interactive lecture on the related theoretical content. Notably, a detailed case study can be time-consuming, so it's essential to provide sufficient time to share relevant information and discussion. Therefore, case studies will likely extend beyond the time spent in a lecture.
3. **Case Study Release.** Release the details well before the lecture, ensuring that theoretical concepts and relevant information are concise and easily accessible.

Possible Challenges

Here are some of the challenges that you may experience with implementing case studies:

- **Student preparedness.** Students need to acquire basic knowledge before they can apply it. Consider including a pre-class quiz or assignment as a knowledge check, affording time for reflection and correction.
- **Student participation.** Students have considerable experience remembering and understanding course materials but might be apprehensive about applying their knowledge in front of peers (Krathwohl, 2002). Small groups such as breakouts or tutorial groups can be helpful, particularly with guided discussion.

Resources

1. National Center for Case Study Teaching in the Sciences
2. Multi-Course Case Studies in Health Sciences [Open textbook]

ACTIVITY 3: BREAKOUT ROOMS IN SYNCHRONOUS LECTURES

Overview

Breakout rooms are particularly suitable for online synchronous lectures. These smaller group sessions are separate from the main online meeting room. Managing breakout rooms can be challenging, especially in larger classes with novice student groups, but they are adaptable.

Description

The primary objective of a breakout room is to permit small group interactions and collaborative learning. How can this be accomplished in an online learning environment?

1. **Group Assignment.** Educators may choose between random or pre-defined group allocation. A random distribution of students may permit them to gain a diverse perspective with interactivity, whereas students may feel more comfortable establishing a rapport with pre-defined, consistent groups. Consider the scope of the activity or objective and populate the room accordingly.
2. **Tasks and Assignments.** Educators should provide structured activities to keep students on task and stimulate meaningful discussion. For example, educators may utilize a collaborative workspace (e.g., Google Docs, Jamboard) to support student interaction.
3. **Use of Web Cameras (Webcam).** Educators and students should be encouraged to keep a webcam active during small-group conversations to enable rapport-building.
4. **Educator Interactions in Breakout Rooms.** Educators should consider circulating between breakout rooms when they are not called upon directly to respond to student questions. For example, some online platforms will enable participants to raise a (virtual) hand to prompt the educator host.

Possible Challenges

Here are some of the challenges that you may experience with implementing case studies:

- **Student preparedness.** While students can tutor each other or catch up on material at the start of a breakout session, prior knowledge is often a key for effectiveness.
- **Student participation.** Students may be reluctant to participate in small groups with unfamiliar individuals. The inclusion of ice breaker activities and consistency in student groupings (vs. random group allocation) may build familiarity.
- **Educator-student interaction.** Class and breakout sizes can affect connectivity and can still be challenging even with small groups if there are many. Ensure that you construct structured outcomes to guide focus and then circulate and monitor student prompts.

Resources

- Successful breakout rooms in Zoom | Teaching Commons
- Managing Breakout Rooms – Zoom Support

ACTIVITY 4: DIGITAL MEDIA IN SYNCHRONOUS LECTURES

Overview

Digital media is an extensive term including social media, popular media websites, and podcasts. And, often, students tend to enjoy integrating digital media into a largely theoretical lecture.

Description

1. **Preparation.** Finding, integrating, and developing relevant, thought-provoking lecture content takes time. Educators should focus on high-quality digital media content rather than quantity.
2. **Student group.** Our students tend to thrive with digital media content. However, the first-year student may be more concerned about remembering and understanding the content, whereas the fourth-year student may interact and apply the knowledge. The course content may also matter. For example, I teach anatomy and physiology, which may not lend itself to interpretation and discussion to the same extent as a course in the humanities.
3. **Implementation.** Provide sufficient time for the integration of digital media content and discussion afterward. Consider implementing a small number of digital media segments into your larger lecture. For example, you may choose to start a synchronous lecture review session with a 5–7-minute YouTube video (e.g., TedEd talk) to frame the lecture content. Overall, the intent is to provide a new and communal stimulus (e.g., not your voice or theirs).

Possible Challenges

Here are some of the challenges that you may experience with implementing digital media:

- **Cognitive overload.** The introduction of content from multiple sources should proceed with caution. To overcome this challenge, consider integrating digital media content into lecture slides, providing relevant hyperlinks in advance. Moreover, you may choose to select and emphasize a focused number of platforms to reduce unnecessary issues as the term progresses.
- **Student engagement.** While students may enjoy digital media content, additional strategies are required to encourage participation. A structured activity that includes reviewing the digital media content alongside a question set may be more engaging and prevent students from tuning out.

GENERAL RESOURCES

- **Polls**
 - Poll Everywhere Audience Response System (ARS) or Nearpod: Live online polling.
 - Google Meet Polls: Conduct polls in Google Meet, Polls in Google Meet [3:41].
 - Microsoft Teams Polls: Poll attendees during a Teams meeting, How to create a Poll in Microsoft Teams
 - Zoom: Polling for meetings – Zoom Support, Polling for Zoom Meetings and Webinars [4:08].
- **Presentations.** Create engaging presentations with platforms like Canva and Adobe Spark.
- **Google Meet Q & A.** Engage students or encourage backchannel discussion as you progress through

your content. Ask participants questions in Google Meet, How to use Q&A in Google Meet [4:08]

- **Google Arts & Culture.** A resource that offers high-quality visuals to explore architecture, art, and history to engage students' creative thinking processes. Consider virtual tours or road trips, your collection based on a theme (ex. colour, subject), or VR. Learn With Google Arts & Culture, Google Arts & Culture [Video playlist]

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Ludic Pedagogy Online: Fun, Play, Playfulness, and Positivity

SHARON LAURICELLA AND T. KEITH EDMUNDS

INTRODUCTION

Students report that positive experiences help them succeed academically and socially (Madgett & Belanger, 2008). As online and blended course offerings increase at postsecondary institutions and students are less frequently present on campus, providing opportunities for fun, social interaction. Positive experiences have become increasingly crucial in attracting and retaining students.

We suggest that the image of online learning can shift from drudgery in which students feel isolated with the weight of the world on their shoulders to one that invokes laughter, play, and playful experiments. The online learning environment provides a unique space for inviting play and fun. Enjoyable, tech-enhanced experiences for students are possible even as they simultaneously engage or even struggle with academic concepts.

Some educators believe that education should focus solely on academic rigour (Cohan, 2021) rather than the enjoyment of learning. In other words, learning is complex, students must struggle with concepts, and this (usually unpleasant) struggle is a rite of passage. Yet Fisher et al. (2011) explicitly argue that “play and learning are not incompatible; it is not *play versus* learning but rather *play via* learning for which we must strive” (p. 353). Similarly, hooks (1994) argues that fun and excitement are fundamental to the learning experience. We suggest that well-honed scholarly skills and the enjoyment of learning can coexist. The growing influence of the online educational environment provides an opportunity to experiment, explore, and enjoy new educational technologies.

The philosophy and practice of inviting fun into the learning process are based upon the Ludic Pedagogy model. From *ludere*, Latin for to play or to play games, this pedagogical model builds upon four elements: fun, play, playfulness, and positivity (Lauricella & Edmunds, 2021; Edmunds & Lauricella, 2021). Recognizing the fundamental roles of fun and play early on in students’ educational and intellectual development, Ludic Pedagogy acknowledges that the amount of fun and play associated with learning is often slowly reduced, if not removed, as students progress through their formal education.

GENERAL GUIDELINES

The online environment provides a unique space to implement the Ludic Pedagogy model. All four elements need not be incorporated into each activity and class. A focus on one aspect of the model can guide meaningful online experiences.

FUN

- **Engage in fun activities with students.** In other words, don't be a bystander or passive supervisor. Students are far more likely to engage in a move that the instructor themselves participates in without reservation. In other words, you need to be willing to jump in and have fun (or, in some cases, actually start the fun) if you are going to expect it from your students.
- **Carefully consider equity, diversity, and inclusion in online environments.** Ensure that any fun activity doesn't require additional bandwidth-consuming time, expensive software, or costly updates. Address and mitigate potential sociocultural barriers: will all students, regardless of ability, sex/gender, age, or ethnicity, understand and be able to participate?

PLAY

- **Games are a great way to introduce play in online classes.** Games can increase motivation to learn (Iten & Petko, 2016) and actual learning because they typically require fewer cognitive resources than more serious learning contexts (Robson et al., 2015).
- **Make the objective of play clear.** Students in higher education are unaccustomed to the combination of play and learning and need to know that a game or experiment has a clear purpose. Describe how the activity connects to learning objectives or goals, and students may be more likely to buy in.

PLAYFULNESS

- **Embrace a playful attitude.** Many students perceive postsecondary education as a stressful experience as they learn to process vast amounts of new material in the context of tight time- and deadlines. In such situations, a playful attitude, and in particular the use of humour, can reduce stress (Martin, 2002).

POSITIVITY

- According to King et al. (2015), positivity closely relates to higher student engagement: a positive environment helps keep students involved in the class, the learning environment, and their learning. Further, when experiencing positive affect, individuals' thinking becomes "more creative, integrative, flexible and open to information" (Fredrickson, 2003, p. 333).
- An instructor can be enthusiastic, welcoming, and engaging in online environments. The manifestation that this positive affect takes on will vary from person to person, but modelling a positive outlook toward both learning and the class will go a long way in helping students to embody a positive attitude.

ACTIVITIES

ACTIVITY 1: MUSIC FOR A POSITIVE AND PLAYFUL INTRO

Overview

In a synchronous video-based learning environment such as a Zoom classroom, we can set up a more inviting and familiar atmosphere by broadcasting student-chosen music at the start of class. The music can help establish a relatable tone, signalling to students that they are in the right place and the instructor is present (even if all cameras are off).

Description

The presence of music when students log in to the virtual classroom can replace the informal chatter that usually exists in face-to-face environments. Music can regulate emotion beyond simply providing a positive atmosphere before class (Thayer et al., 1994). That is, happy music can create happy listeners. Additionally, music can be relaxing (Van Goethem & Sloboda, 2011). The resulting well-curated, student-created playlist can assist in developing a comfortable, positive group of students and all of the benefits that accompany such a group.

Creating a playlist can act as a community-building exercise, thus building rapport and climate in a venue that can otherwise feel lonely or isolating (Kaufmamnn & Vallade, 2020).

- Invite students to fill out a Google Form or similar submission tool to submit which tracks they'd like to see in the pre-class playlist.
- Set up and invite students to use polling software to rate, vote, or remove songs from the pre-class playlist.

This playful, positive crowd-sourcing exercise can help curate positive emotions toward the course and its environment. Additional beneficial outcomes include the development of prosocial bonds (Armenta et al., 2016) and the reduction of potential interactional stresses (Dingle et al., 2021; Fredrickson, 2001). Because this activity is outside the bounds of class time, it:

- Does not negatively impact the time required for classroom activities.
- Can create a context for learning in which students start the class with a mindset more conducive to learning.
- May result in an increased likelihood of student engagement in positive behaviours, such as studying, attending class, participating in classroom activities, among others (Williams et al., 2013).
- It will likely result in pre-class conversation via the chat (Sharon has found this true, without exception!). While not a guarantee, students are likely to make comments in the chat, including "Who chose this?", "What artist is this?" "I forget which album this is from!" "Omg, I remember this from middle school!" and "This was my prom song!"

Possible Challenges

- Music preferences are highly subjective. Not all track selections or genres will be appealing to all stu-

dents. Mitigate this challenge by reminding students that you will feature their chosen tracks eventually. Even if someone likes country music, that doesn't mean that they are a terrible person (the authors have an ongoing debate about such matters).

- Much contemporary music is potentially objectionable or even offensive. Establish ground rules with students and encourage them to choose generally appreciable tracks. We suggest using *clean*, *over explicit* edits of songs when possible to limit potential awkwardness and discomfort.
- Most music apps require a paid subscription, but at the same time, more people than ever subscribed to music streaming apps in 2020 (Millman, 2021), and younger consumers report using more than one streaming platform (Perez, 2017). If instructors don't have a paid subscription to music, Spotify and YouTube offer free versions (but beware of advertisements).

Resources

Popular streaming apps for curated playlists include:

- Spotify (Premium subscription is free for one month, \$9.99/month, and there are student rates)
- Apple Music (3 months free, \$9.99/month or \$99.99/year)
- YouTube (1 month free, \$9.99/month)
- Note: Pandora is not available in Canada

ACTIVITY 2: ONLINE JEOPARDY! AS REVIEW

Overview

Formative assessment and gamifying a pre-exam or unit review is an active learning strategy that keeps students engaged (Baszuk & Heath, 2020) and increases content retention (Putz et al., 2020). Games such as Jeopardy! can be used to review course concepts in advance of exams, tests, or simply as a fun way of reinforcing course materials. Games in learning have multiple benefits, such as increased knowledge, enhanced problem-solving skills, and improved learning motivation (Backlund & Hendrix, 2013).

Games used in formal education are often called *serious games*, an unfortunate moniker that sounds contrary to fun (Michael & Chen, 2005). Naming conventions aside, games such as Jeopardy! allow students to:

- Receive immediate feedback on their responses to content- or skill-based questions.
- Receive ongoing feedback, affording students opportunities to assess their understanding of information.
- Retain a focus on the fun elements of the activity while not denying the underlying learning goal of the activity.
- Play with being wrong without high-stakes consequences.

This activity can be conducted in any subject area. While word answers are often common in games like Jeopardy!, educators can easily include equations, problems, or more involved solutions. We offer a template for personalized use in the resources below.

Description

There are a variety of templates for Jeopardy!-style activities, but we like this one [Doc.] (also listed in the Resources section).

1. Populate the template with answers and questions relative to course material as appropriate.
2. Decide on the format of play:
 - The number of students enrolled or present in class will dictate whether the game is played individually or in teams. If you use a team approach, consider whether they will be randomized or chosen.
 - Ensure that you have a way for students to *ring in* to answer questions. Students can use the *raise hand* function if the review is via Zoom.
3. Do your best Alex Trebek or Mayim Bialik imitation to host the game.
 - Share the prepared template via the *share screen* function in whichever hosting platform is employed in the online class.
 - While the Jeopardy! template totals the points, the group can address incorrect answers once the question is answered correctly: why are certain answers plausible, and what contributes to the correct answer? Discussion is encouraged!
 - Celebrate correct answers! Encourage backchannel conversation in the online chat.

Possible Challenges

Some students may not view the activity as a learning event and may choose not to participate. In such cases, educators should emphasize the game's content rather than the method of presentation.

Resources

- Google Slides Jeopardy game template [Doc.], developed under a Creative Commons license, can be adapted or otherwise changed to meet the requirements of one's course. This template contains complete editing directions.
- 9 Best Free Jeopardy Templates for the Classroom.

ACTIVITY 3: ROLEPLAY

Overview

Course-related roleplay can help students implement knowledge, practice skills, or rehearse a performance; roleplay allows students to engage in interactions as if they were real (DeNeve & Heppner, 1997). It is particularly effective to employ roleplays as an in-class activity with no consequences for *failure*. Scenarios in which students can pretend to take on roles and responsibilities of specific actors allow for the opportunity to take risks and have fun while internalizing learning.

Description

The key to successful roleplay is the student's immersion into the activity. Heinrich (2018) states that as the activities "become more dynamic, the interactions become more authentic, the discussion becomes more focused, and people grow and take risks" (p. xiii). Roleplay and *acting out* a situation can function as a bridge between theory and practice where students practice skills and knowledge applicable in the real-world context.

In a virtual setting, roleplays can occur through synchronous face-to-face technologies, voice-only media, or asynchronous text-only methods. According to Russell & Shepherd (2010), critical factors for a successful roleplay activity include the application of learning and authenticity. Applied and authentic learning situations help build skill and confidence (Russell & Shepherd, 2010).

In keeping with the Ludic Pedagogy model (Lauricella & Edmunds, 2021; Edmunds & Lauricella, 2021), we add a third but overarching element in roleplay – fun. Recognizing that fun is not a pre-requisite for roleplay, we propose that as students make themselves vulnerable in the potentially embarrassing or even silly context of roleplay, the internal motivation of fun must exist. When students engage in activities without a sense of fun, it may be better referred to as *simulation* rather than roleplay.

To effectively implement a successful and fun role play in the higher education setting, we provide the following guidelines (Rao & Stupans, 2012):

- Consider the purpose of roleplaying. What should students practice or experience in this activity? Make the learning objectives clear at the start of the activity.
- To minimize students' concerns about participation and encourage students to have fun in their roles, teachers must reassure students that they can express themselves "without fear of the negative consequences or feedback that their speech, comment, or action might generate" (Lateef, 2020, p 5). Even with these reassurances, give students the option to opt-out of activities that cause them discomfort.
- Consider the requirements of the roleplay activity:
 - How many practice scenarios will maximize the experience for students? How many students will be involved in each scenario?
 - Carefully consider each actor in the activity and connect to a learning objective.
 - Prepare background information for each scenario. Communicate to students the scenario, each actor, and how they would respond.
 - Definition of roles can be sent directly to individual students via the direct message in the online chat or a more extensive document.
- Consider timing. Ensure that students possess the requisite content, skills, or knowledge before engaging in the activity. For example, roleplays are not often effective at starting a new unit or subject. Instead, they should occur once students have enough information to take on a specific role or purpose.
- Provide guidelines for students regarding respectful behaviour. Students should understand that taking opposing views in the activity is simply an exercise.
- Prepare several questions for debriefing. Ask each actor what they found easy, helpful, or challenging about their role. Students may have after-the-fact revelations such as "I should have said..." which are beneficial to consider after the exercise.

Possible Challenges

Some students may be hesitant to make themselves vulnerable in a roleplay. An environment of psychological safety must be developed and reinforced. Every student should feel comfortable knowing that any laughter is not directed at them personally. To minimize student concerns, model a positive attitude and a playful approach to any roleplay activity. Humour, in particular, can assist in dealing with anxiety and stress reduction (Rao & Stupans, 2012). The instructor can even take on a small or minor role in the scenario to demonstrate willingness.

Resources

- [Creating Effective Scenarios, Case Studies, and Role Plays \[PDF\]](#) by University of New Brunswick

ACTIVITY 4: ICEBREAKERS

Overview

Fun icebreakers can help students get to know one another and feel more comfortable in an online learning environment which is paramount given the perceived distance in learner-learner relationships (Moore, 1993). Using icebreaker questions and discussion can help students connect, enjoy a sense of community, and feel comfortable with collaborative work (Dixon et al., 2006).

Description

Prepare

- Consider the objective of the icebreaker. Do you want to introduce students to the course material, would you like to set the tone for the course, unit, or class period, or do you seek to provide time and space for students to get to know one another?
- Consider logistics, including the time you're able to devote to the activity and the number of students participating in the icebreaker. This consideration will help to determine the specific activity that you employ.
- Ideas for icebreakers suitable for online higher education are listed below.

Play

- Introduce the activity to students and explain the objective of the icebreaker. Describe whether the purpose is to introduce course information or provide students with the opportunity to meet and learn about their peers, for example.
- Explain logistics, such as duration and how many students will be in each small group.
- Breakout rooms can help to distribute students into groups or partners. Be sure to describe to students how they will return to the large group. For example, make it clear that you'll close breakout rooms after 5 minutes.
- Mid-point check-ins can help ensure that everyone has a chance to contribute.
- Giving a 2-minute or 1-minute timekeeping cue is an example of a broadcast message that can help

keep students on time.

- Debrief after the activity. When students return to the large group, invite individuals or groups to share what they learned or something funny/surprising/unusual that happened in their small group or pair.

Possible Challenges

- Icebreakers, like all activities, may not go as expected; your flexibility and adaptability will be critical factors in the activity's success.
- Students may need encouragement to begin a small group or paired discussion. Suggest to students that the first person to speak should be the person with the first birthday of the calendar year or the shortest person in the group or pair.

Resources

- Icebreakers for online students
- Online icebreakers
- Fun icebreaker ideas

ACTIVITY 5: POLLING

Overview

We can use polling tools to keep students on-task (Price, 2021) and engaged (Khan et al., 2021) in online class periods. Interactive polling can also be a fun way to develop mutual insights between peers and the educator alike. Polling is adaptable, and we often use it as an introduction to a class, attention-grabber, or as a formative assessment at the end of a class.

Description

- Polling is a common feature in most hosting platforms (e.g., Zoom, Google Meet), or often we can recruit add-ons or other platforms for enhanced responsiveness. An example is Mentimeter, where polls can be embedded directly into a slide presentation.
- Decide what kind of poll you'd like to run: Do you want students to vote on something (e.g., their favourite type of fries or vacation spot), provide one-word answers, or submit phrases or short answers? Polls with votes can result in bar or pie graphs to communicate results. One-word or short phrases can result in word clouds and be displayed in text blocks on the screen.
- Incorporate a poll at the start of class to gauge student mood. A fun option is the *how are you feeling today scale*. A Google Images search will reveal many humorous possibilities, including dog expressions, cat photos, or famous art, to name just a few. Responses can help everyone understand the class's general vibe on any particular day.
- Throughout an online lecture, invite students to respond to a poll relative to course concepts. The question could include a simple quiz question to gauge student comprehension or a fun question about how the topic relates to popular culture.

- At the end of a class period, ask students to respond to a poll question about the course or the day's topic. Or, have students respond to a poll about their weekend plans, goals for the semester, or winter/summer break.
- Debrief each poll. Invite students to explain their response, ask a related question, or ask a question of a colleague or the larger group.

Possible Challenges

- If students do not have another device other than that with which they are consulting the course stream, it may be awkward for students to switch applications. For this reason, it is helpful to either use Mentimeter, which streamlines the presentation and polling process, or use polls only in every few slides so that students do not have to switch windows or devices too often.
- Students may not be willing to explain why they chose a particular answer to the polling question. In this case, it may be helpful to select a more debatable topic in future (such as, "is cereal soup?" or "is a hot dog a sandwich?").

Resources

- Mentimeter
- Zoom
- PollEverywhere

GENERAL RESOURCES

- #creativeHE supports pedagogical rebels and free-thinking innovators through the design and development of novel education tools.
- 101 Creative Ideas is an OER project that shares ideas fostering and promoting creativity in higher education.
- The power of play in higher education: Creativity in tertiary learning is a book that collects a wide range of insights into integrating play into the higher education experience.
- The book When roleplay comes alive: A theory and practice covers the theory and practice of roleplay in the context of active learning, providing instructors implement insights for effective implementation.
- Using Play to Rewire & Improve Your Brain | Huberman Lab Podcast #58 [1:46:35].

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Critical Reflection as Online Educators

JOSEPH M. STOKES AND CHRIS D CRAIG

INTRODUCTION

An over-reliance on surface information and the inherent belief that education, in and of itself, results in a deeper understanding can limit our awareness of reality and our students' relative success (Hattie, 2008). While memorizing and simplistic insights, or surface learning, are common in society, deep learning requires critical insights to extract meaning from experience (Warburton, 2003). Critical reflection is a cognitive and emotional activity or process associated with improved thinking and learning, but it requires active, careful, and persistent consideration (Rogers, 2001; Smith, 2011). Consider Brookfield's (1987) four components of critical thinking as you reflect on your practice:

- identify and challenge your assumptions;
- recognize how situational context influences our thoughts and actions;
- consider alternative ways of thinking and teaching; and
- be aware of, but challenge, what experts consider the status quo.

As educators work to build and interpret meaningful curricula for their students, we must consider both the learning within the instructional setting and appropriate ways to reinforce core concepts. If teachers can't critically challenge what they are doing in the classroom, it ultimately makes it hard to get better. Moreover, a focused evaluation of individual teaching practice can enhance content delivery methods, help us take responsibility for instructional design, and develop purposeful learning experiences (Brookfield, 2017).

This chapter will discuss the concept of critical reflection in education and how educators can use reflective practice to strengthen the consolidation of core learning outcomes within the instructional setting and long-range curriculum.

AN EVOLVING PROCESS

The early work of John Dewey and Donald Schön set the foundation for our current understanding of critical reflection, and engaging with their earlier work can help us contextualize our reflective practice (Farrell, 2012). Reflective practice can ensure that we have an increased awareness of our environment and that we as educators don't stay on cruise control for too long, stuck in a repetitive cycle (Dewey, 1933).

Dewey (1933) connected reflective thinking to teaching by challenging educators to review what was happening in their learning environments and make adjustments based on the assessment of their observations. The idea may seem simple, and perhaps it's a prominent part of modern teaching practice to some. But, Dewey's ideas were unique for their time and started the discussions of how educators can move from routine teaching practices to a more intelligent and informed teaching practice. To help with our ability to be innovative and learn from challenging situations, getting comfortable with disruption is a good first step; we can then mentally restructure challenges as opportunities for growth. Breaking the routine is essential for ensuring good critical reflection, and it can augment teaching and learning in the classroom.

The later work of Donald Schön (1983, 1987) extended Dewey's thinking, developing the concepts of reflection-on-action and reflection-in-action: the ability of an individual to be reflective in the moment and be actionable on that reflection. Schön (1987) connected the concepts to the idea of knowing-in-action, or the process of an individual's awareness of their implicit knowledge. In the context of teaching, an educator can rely on their knowing-in-action, or their tacit knowledge, to help guide when reflection-in-action becomes necessary. When a teacher experiences situations outside the norm, Schön (1987) proposes that we move to reflection-in-action, which involves a critical evaluation and actionable outcomes.

Building on Schön's work in the context of teachers, Farrell (2017) suggests many implications for real-time reflection in the teaching profession. Think about how many times we as educators have been in a situation in which our approach did not work. It is easy to bypass these situations, but they offer opportunities to engage in reflection that can enhance our teaching practice. If we as educators recognize these moments of reflection in action and act on them accordingly, we can refocus our attention and modify our teaching. And, at the very least, we might adjust our teaching to better respond to the circumstances and our learners.

PERSONAL PRACTICE

Some teachers today may be familiar with knowledge consolidation in the classroom. Consolidation exercises help reinforce key concepts in a summative fashion for teachers, reinforcing important information and allowing for clarification and exploration on the part of a student. One of the problems with knowledge consolidation exercises is that teachers may fall into the trap of assuming students' understanding or perceiving one concept is more important to the class than another concept. In other words, teachers don't know what they don't know, and this is especially true of how educators can perceive the classroom environment. For example, it's easy for an educator to believe that they are providing effective course materials, especially if they haven't reflected on what they are providing. Critical reflection and good course consolidation meet when we gauge student understanding by asking them and assessing the responses. By building critically reflective consolidation exercises, teachers can create deep learning that is developed thoughtfully in the context of student needs.

Critical reflection in course consolidation can be a powerful tool for teachers who want to build solid lessons and a longer-range curriculum tailored to their students' needs (Brookfield, 2017). The following general guidelines and activities illustrate how reflective practice can enhance knowledge consolidation activities in the physical or digital classroom.

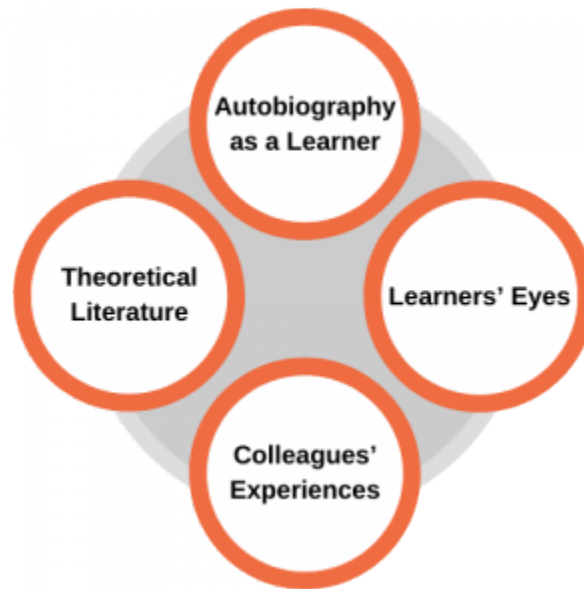
GENERAL GUIDELINES

More recent work on critical reflection has built on earlier ideas and concepts. Brookfield (2017) recognized that critical reflection in the classroom needs to be an intentional process in which teachers continually evaluate and reevaluate the validity of their assumptions. The process can apply to various situations such as classroom dynamic and composition, content delivery tactics, and in-course activities.

We, as educators, need to take the time to work the reflective process into our professional practice as the intentionality of the reflective process is critical for success. While it may be easy to recommend that teachers become reflective practitioners (Schön, 1987), we concur that the tactical approach of incorporating critical reflection is challenging. Most teachers would likely feel that they reflect on their teaching at some point in their day, but there are some interesting and practical ways to be truly intentional about the process. We suggest Brookfield's (1998) Lenses (Figure 1) as a concise framework and offer further opportunities in the activities section following.

Figure 1.

Brookfield's (1998) Lenses



LENS 1: OUR AUTOBIOGRAPHY AS A LEARNER OF PRACTICE

Reflecting on our learning history can add context to what we feel strongly about and why we gravitate towards it, casting light onto something we consider instinctual. The process can help us understand personal biases along with strengths.

LENS 2: OUR LEARNERS' EYES

Understanding how our students perceive us and our teaching practices can be surprising. Interpretations can be diverse and guide insight into how personal backgrounds shape individual learning. While live student conversations can offer some insight, blinded feedback is critical for enhanced honesty.

LENS 3: OUR COLLEAGUES' EXPERIENCES

Conversations with our colleagues can help us reflect on and broaden our perspectives on experiences and practice. Further, diverse perspectives (ex. talk with a physical sciences and arts educator about the same topic) can also help build awareness, and a feeling of connection, recognizing our experience might not be unique.

LENS 4: THEORETICAL LITERATURE

Considering and reflecting on the theory and psychology underpinning our learning approach helps us understand strengths and gaps in our practices. The resulting understanding can help us recognize weaknesses and stimulate a process to help address such a gap.

POTENTIAL LIMITATIONS OR ISSUES

- Reflection can recall profound experiences that might not always be comfortable (Brookfield, 1998).
- Students may find blatant honesty challenging, even in anonymous situations, and might fear reprisal if the educators' feedback might not be considered desirable (Brookfield, 1998).
- Critical reflection might not be immediately rewarding (Watson & Kenny, 2014).
- Vague or limited reflection may relate to superficial learning (Ash, 2004).
- We might not always like what we hear or receive.
- Seeking peer insights from like-minded individuals may enhance bias and inhibit personal growth.

ACTIVITIES

ACTIVITY 1: REFLECTIVE JOURNALING

Overview

Reflection journaling can be helpful as teachers become more actively reflective of their practice in the classroom. A recent study by Zulfiker and Mujiburrahman (2018) found that teachers perceived an increase in their overall performance when engaging in reflective journal writing. Journaling can be easily facilitated in our digital world through blogs, websites, or other digital tools that allow for reflective process (Cheng et al., 2015). Also, the process can be private or shared with peers and students, depending on intent.

Description

- **Limit friction** by considering a platform you are motivated to learn about or find easy to use. Ensuring ease can help build the habit of reflecting (Fogg, 2019).
- **Schedule** a time or trigger activity to enhance active engagement following existing life patterns (Fogg, 2019). An example for scheduling a time could be inputting journaling into your digital calendar as an event, while a trigger could be journaling while you drink your morning [insert beverage of your choice here].
- **Manage expectations.** Clearly outline manageable expectations for what you need to achieve each

time you create a reflection, so there is no reason that you can't engage in the reflection process (Fogg, 2019). Examples include one paragraph, five bullet points, or five minutes.

Possible Challenges

- **It's easy to forget** a commitment to ourselves when concerned about others and their learning outcomes.
- **Consistency.** Some form of consistency is paramount for developing insights over time.
- **Tech changes.** Digital technology and our access to it can change over time.

Resources

- 14 Reasons Teachers Should Keep a Reflective Journal
- Use of Reflective Journals in Development of Teachers' Leadership and Teaching Skills*[PDF]

ACTIVITY 2: LEARNER CRITICAL REFLECTION QUESTIONNAIRE

Overview

By using a Forms platform that easily integrates with the learning environment, an educator can develop a class reflection log that affords for blinded and meaningful reflection on class activities. The resulting record can guide an understanding of student challenges, experiences, and perceptions for immediate and future reflection.

Description

Consider what information you would like to reflect on, and develop consistent questions throughout the course. Inspired by Brookfield's (1989) Classroom Critical Incident Questionnaire, we offer the following sample questions:

- At what moment in our session today did you feel **most engaged**?
- At what moment in our session today did you feel **least engaged**?
- What event did you find the most affirming or **helpful**?
- What event or insight **surprised you the most** during the session?

Guidelines

- **Be concise**, making the intent clear but open for interpretation.
- **Anonymize** or blind the feedback process to enhance honesty and avoid embarrassment.
- **Repeat the questions** throughout the term to provide consistent landmarks for student reflection. The repetition reduces your time requirements and may increase students' comfort as they know what is coming.
- **Limit questions.** Use a limited number of questions, three to five, to reduce perceived overload.
- **Give time in the class.** The built-in time is already in student schedules, requiring little extra effort

on their part (= greater chance of participation).

- **Review insights** by linking a linked spreadsheet to collect responses for personal reflection. The spreadsheet also affords chunking by date, formatting, and filtering particular insights.

Possible Challenges

- **Honest feedback.** Students might be nervous about providing honest feedback for fear of reprisal, even in an anonymized process.
- **Blinding** presents challenges related to consistency as we cannot narrow evolving individual student perceptions or even determine if the same students are responding.
- **Students** might have limited motivation to engage and respond.

Resources

- Critical Incident Questionnaire — Stephen D. Brookfield
- Full article: Using student feedback to improve teaching
- Improving practice through student feedback

ACTIVITY 3: CONNECT ON SOCIAL MEDIA

Overview

Using social media can help educators with the reflective process (Brookfield, 2017), as we can use online platforms to connect with their peers and students to achieve desired outcomes. We can communicate on specific topics and connect with people outside our traditional circle of influence by connecting with online peers. With students, we can communicate in an environment that they are often used to, offering unique opportunities to understand student comprehension and attitudes toward course material. Also, we can engage in or foster collaborative experiences that standard education technologies might not afford.

Description

- Consider the primary intent and purpose of using social media. We can consider demographics (e.g., students or peers), desired outcomes, and time-related actions or activities.
- Pick a platform that aligns with your intent (e.g., Twitter is often associated with textual content, Instagram is primarily image-based, and Facebook skews to an older demographic).
- Review institutional or departmental guidelines regarding branding, sharing, and privacy.
- Develop a personal plan for the critical reflection of the experiences and how they impact your practice.

Possible Challenges

- International peers or students may have limitations related to specific platforms.
- We extend our presence beyond the traditional confines of the institution.

- Digital technologies can be fashionable, and their reach may change with time (consider the story of MySpace as a case study).
- We may require time to learn about platform function, reach, and privacy.

Resources

- Social Media for Teachers: Guides, Resources, and Ideas | Edutopia
- Educator's Guide to Social Media – ConnectSafely
- Social Media for Educators: Strategies and Best Practices [Book]
- Social Media in Education: Resource Toolkit | Edutopia

ACTIVITY 4: CONSOLIDATION THROUGH DESIGN THINKING

Overview

While the process of critical reflection is informative, it requires implementation. Building on the concept of design thinking, we offer a framework to implement the insight(s) gained from critical reflection. Design thinking can guide the development and implementation of new ideas through a context-dependent framework (Black et al., 2019; Leifer & Meinel, 2016). Building on the Stanford model (Plattner et al., 2011), we offer a framework for consolidating insights.

DESCRIPTION

- **Critically reflect** on your practice from insights you've gained through activities one-three (or from your personal process).
- **Define** what you plan to implement. In this stage, create a concise and communicable issue that you plan to address.
- **Ideate** (idea generation) different strategies that you could implement to address the issue. Examples include mind maps, collaborative discussion, and the 5 W's (who, what, where, why, when, how). Try not to limit yourself in this stage; create as many ideas as possible.
- **Prototype** your solution(s). You start to expand on a particular idea and create a skeleton of your solution in this stage. Consider your students at this stage, building on your reflection to see if the concept can enhance your desired outcome.
- **Test** your prototype to gain insights into its effectiveness. You may elect to let it sit for a time to approach it with a fresh focus, ask your colleagues for feedback, do a trial with a small group, or even implement it live in a course.
- **Critically reflect** on how your idea was received, start the process again if required, or move on to the next task.

Possible Challenges

- The timing might be challenging. Depending on your approach and experience, the design thinking process can take time.
- Students change, and what might work for one group may not work for another.

- If our new idea isn't successful, we might experience disruptive emotions that challenge our desire to adapt.

Resources

- Design Thinking in Education | HGSE Teaching and Learning Lab
- An Introduction to Design Thinking PROCESS GUIDE [PDF]
- The world is poorly designed. But copying nature helps [6:49].
- Abstract: The Art of Design | Tinker Hatfield: Footwear Design | FULL EPISODE | Netflix [41:46]
- Tools for taking action. — Stanford d.school

GENERAL RESOURCES

- Keynote: Assessing Our Impact on Students' Learning: Becoming a Critically Reflective Teacher
- Becoming a Critically Reflective Teacher, 2nd Edition | Wiley
- Reflecting on Reflection: A Habit of Mind | Edutopia

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PART V

FEEDBACK AND ASSESSMENT

Meaningful feedback and assessment are essential for effective learning. We devoted four chapters to help you navigate the twists and turns that are unique to online learning environments. Key areas included

- *Fair and Formative Feedback*
- *Video Feedback*
- *Equitable Assessment*
- *Alternative Grading*

Video Feedback in Online Learning

TIMOTHY BAHULA AND ROBIN H. KAY

INTRODUCTION

Feedback is essential for learning and maximizing student achievement (Hattie & Timperley, 2007). Ideally, it is a dialogic process that reduces the gap between a student's actual performance and the desired learning outcomes (Carless, 2006; Hattie & Timperley, 2007). However, the quality of feedback provided, how it is received, and its use can vary considerably. In the worst case, feedback can lead to adverse learning outcomes (Kluger & DeNisi, 1996). Therefore educators need to consider the quality and format of feedback (Boud & Malloy, 2013) and become feedback literate (Boud & Dawson, 2021).

Before widespread computer use, instructors offered handwritten comments on students' assignments and tests (Sommers, 1989). Many students found this feedback unhelpful because comments were illegible, vague, limited in providing guidance, excessively focussed on errors and omissions, or inconsistent with the assignment learning goals (Glover & Brown, 2006; Weaver, 2006). Many educators shifted to text-based feedback with the advent of computers (Parkin et al., 2019). This shift in format helped overcome the challenge of deciphering illegible scratches (Glover et al., 2015; Hepplestone et al., 2011). However, other problems remained, including lack of detail (Pitt & Norton, 2017), the absence of pedagogical training for instructors (Richards et al., 2017), student difficulty in making connections between grades, feedback, and assessment criteria (Glover et al., 2015), and negative emotional responses elicited from feedback (Shields, 2015).

Video is a rich, expressive media that transmit much more information than text, images, or audio alone (Bahula & Kay, 2021). It captures movement and change. Subtle nuances are communicated by the tone of voice, facial expressions, and hand gestures. Much information is left to the reader's imagination in many forms of written communication, while video makes many aspects of communication more explicit.

The use of video has significant potential to reshape assessment feedback (Bahula & Kay, 2021), particularly in online learning environments. Benefits cited in an extensive literature review for using video-based feedback included a more detailed, clearer, richer quality of feedback, increased understanding and higher-order thinking skills, more personal, authentic and supportive communication, and making the feedback process more interactive (Bahula & Kay, 2021). Using video feedback can help create a meaningful connection between you and your students (teaching presence in Garrison, 2011), develop a culture of collaborative assessment (Quinn et al., 2019) and stimulate a growth mindset (Dweck, 2007) and cognitive presence (Garrison, 2011). This chapter focuses on helping educators maximize the benefits of providing video feedback.

GENERAL GUIDELINES

We have been providing video feedback for over a decade and would like to share some of the valuable lessons learned based on practice and a review of the research on teacher perspectives of using video feedback (Borup et al., 2015; Harper et al., 2015; Jones et al., 2012; Lamey, 2015; Mahoney et al., 2018).

1. **Make sure you purchase a good microphone.** Do not use your laptop microphone to provide video feedback. Your voice needs to be clear and easy to hear. Distorted audio is not particularly helpful. Please consult the technology chapter for suggestions. We use Plantronics Headsets (about CAD\$90), but Logitech Headsets are fine too (about CAD\$30-40).
2. **Pick a good video recording tool.** There are numerous options here, and they often depend on your preferences and pocketbook. Snagit for Education (about CAD\$50) and Screencast-O-Matic (free) are easy-to-use screen recording tools. Screencast-O-Matic is particularly effective because you do not have to upload to YouTube to share – it is relatively automatic, which is essential for busy educators.
3. **Pace yourself.** Pacing is essential when giving video feedback. Complete feedback for 8-10 assignments, then take a break. Otherwise, you may start to get tired, stressed, or frustrated, which may lead to a change in the tone of your voice. Video feedback is very personal (Henderson & Phillips, 2015), so you need to be aware of your tone.
4. **Choose a quiet place to record.** The last thing you want to happen is extraneous noises interrupting your thoughtful, meaningful feedback by outside noises. Choosing a quiet place to record could save you a fair bit of time.
5. **Avoid perfection.** If you are a perfectionist, you could become quite frustrated with video feedback because you will make slips and mistakes while creating feedback. Keep your first recording unless there are serious errors or you start rambling. Remember, your feedback is a friendly, open, helpful guide for students, not a formalized presentation.
6. **Take a few notes to guide your conversation.** Taking a few point-form notes before recording is quite helpful to focus your feedback and avoid rambling. You can even add these notes to the student's work. These notes will help reduce the number of retakes you will need to do.
7. **Do not record when you are stressed.** Aside from pacing yourself to reduce stress, try not to provide video feedback when frustrated or stressed. Your tone may not be friendly or helpful. Students have noted that they hear the negative tone in feedback, so try hard to be aware of how you feel when you record.
8. **Use a conversational, supportive tone.** Students respond well to a relaxed, conversational tone. When recording, imagine that you are tutoring a student in person and sitting across the table from them. You want to be careful to guide but not judge. Students will find it hard to receive feedback if there is a judgemental tone.
9. **Balance and growth mindset.** In the general chapter of providing feedback, you will note that you should try to provide balanced feedback, noting positive efforts and opportunities for growth. Regardless of whether you provide positive or negative feedback, always try to focus on helping your students learn and grow. A statement like, "one opportunity for growth here is ..." is much better than "what you did wrong was...". Bottom line—focus on what students can do to improve.
10. **Short and sweet hits the spot.** Long, rambling feedback videos that do not work well for four reasons. First, students lose focus and stop listening to them. Second, the student can be overwhelmed with information and too many suggestions. Third, students cannot locate the points you make in

your video when they want to review again—they have to listen to the entire video. Finally, long videos tend to include rambling and a lack of focus – at least mine do. Keep your video feedback videos short—1 to 3 minutes. Focus on one area of feedback per video and make multiple videos.

11. **Screen share student work.** Technically, you could use a tool like Mote to provide audio feedback on essays or written assignments. However, recording the actual assignment (screencast) can provide greater clarity, particularly when referring to multiple sections in an assignment. Recording the screen is essential when an assignment is more visually oriented (e.g., a website, learning tool, coding, mindmap).
12. **Use highlighting.** When recording written work, make sure to record the cursor (easy to forget) and use some form of highlighting, so the students know exactly what you are referring to.
13. **Talking heads need not apply.** Some instructors like to add a talking head while providing feedback because it is more personal. Your talking head could be distracting. And quite frankly, when creating video feedback in the wee hours of the night, you may not want students to see your face. Dressing up to give feedback seems like a lot of work.

ACTIVITIES

ACTIVITY 1: INDIVIDUALIZED SCREENCAST FEEDBACK

Overview & Description

Individualized screencast feedback is the activity most often used by educators (Bahula & Kay, 2021). This type of feedback can help establish teaching presence (Garrison, 2011) by building a strong connection between you and your students, particularly in blended and online learning environments. One of the key benefits is offering a more detailed, clearer, richer quality of feedback and increased understanding and higher-order thinking skills, leading to a greater cognitive presence in your class (Bahula & Kay, 2021). Finally, video feedback can lead to a more interactive, collaborative assessment (Bahula & Kay, 2021; Quinn et al., 2019).

Description

Using a good headset and screen recording software, the instructor opens up a student assignment and records short videos focussing on key areas of strength or opportunities for growth. We provide General Guidelines for creating these videos above. The bottom line, though, is to imagine yourself tutoring your student while you create the video as if you were having a personal conference about their work.

You also need to develop a system for creating, storing and sharing videos. My system is as follows:

1. Open the student's digital assignment and review, adding short comments on the work to guide my video.
2. Open video recording set-up and test the recording first to ensure it is working.
3. Plan to create a 1-3 minute video on one point you would like to make.
4. Get the link from the video you created and add it as a comment on the assignment.
5. Repeat until finished.

6. Take at least 5 minutes before you start reviewing the next student's assignment.

Possible Challenges

1. **Set-up time.** We cover many of the challenges instructors experience in the general guidelines section above. Perhaps the biggest challenge is the time it will take to set up and learn your video feedback system. Once you have that in place, though, you should find that video feedback is quicker than written feedback, especially when communicating in-depth suggestions that are nuanced.
2. **Do we need to use video feedback?** One other challenge is to determine whether you need to use video feedback. Sometimes, written feedback or rubrics might be a better, more efficient choice, especially with assignments focussed on skills and procedures rather than higher-level thinking. We have found that video feedback is quite effective when guiding writing skills. It can also be quite effective with static multimedia presentations or websites but not videos.

Resources

- Screencast-O-Matic: Free (although it does have a paid version), easy to use, and perhaps most importantly, easy to store and share videos.
- Snagit for Education: About \$50, but offers some editing options and provides a quick upload to YouTube.

ACTIVITY 2: GROUP VIDEO FEEDBACK

Overview & Description

Group video feedback offers many of the advantages of individualized feedback listed above. It is not as personalized as individual videos for each student, but providing video feedback on an assignment for an entire class might be more time-efficient, especially when there are common patterns of mistakes made. For example, reviewing common errors in a test, formatting, essay structure, or design issues might be more efficient to guide future learning. Providing group or class feedback might soften the blow of errors or mistakes made—students would feel that their peers have similar problems.

The general procedure that we use to provide group feedback is as follows:

1. Review all students' assignments and take notes on key problem areas.
2. When reviewing an individual student's assignment, label the problem areas but do not provide extensive detail, which will be covered in the video.
3. Once you have compiled your list of problem areas, use your typed list to create your video. You might use slides or a word document so the students can see examples of what you mean.
4. This type of video is typically 10-15 minutes long depending on how many issues there are—try to keep it concise, though, as students lose interest past about 5-6 minutes.
5. Ideally, allow students to revise their work and offer the option to re-submit changes made. At first, this might seem very time-consuming, but if you tell students to mark where they made changes clearly, it will be far easier to review. It has been my experience that most students do not re-submit, but the offer of improvement and growth is essential to good feedback practice.

Possible Challenges

1. **Increased error analysis time.** Offering group feedback reduces video creation time but increases assignment analysis time. In other words, you spend time identifying patterns of strengths and common areas where students are having trouble. This process may be quite beneficial for improving your teaching and noting where more instruction or scaffolding is required.
2. **Not watching the video.** Some students may not watch your group video because it is too long, they did exceptionally well on the assignment, or a number of the common areas do not apply to their submission. You may want to add the *talking* head to engage students a little more or opportunities to improve their original assignment to increase motivation.
3. **Need for individual feedback.** Students who are struggling may need more personal guidance—a group video may not provide enough specific help.

ACTIVITY 3: PEER VIDEO FEEDBACK

Overview & Description

Peer-video feedback provides similar benefits to those listed for individualized feedback. It also offers the added benefits of increased social presence (Garrison, 2011) and engagement among students within the class. This type of feedback also helps create a collaborative class atmosphere where students can develop a sense of community (Quinn et al., 2019). Finally, peer feedback heightens student awareness of learning outcomes and the criteria required to succeed with their assignments. We have found that asking students to provide video peer feedback before submitting their final version of an assignment to the instructor improves the quality of work vastly. Fundamental guidelines that we have used to set up video-based peer feedback include:

1. Provide students with a clear list of assessment criteria.
2. Provide a few software suggestions for recording feedback and ask students to use proper headsets to record.
3. Tell students to review their peer's assignment using the written checklist, noting problem areas.
4. Ask students to create a video clearly explaining their assessment decisions—primarily focussing on the growth opportunities.
5. Assign a grade to the peer video assessment so that students take it seriously.
6. Give students at least a week to make revisions and submit their final assignments.

Possible Challenges

1. **Feedback training.** One key challenge for providing peer video reviews is training students to provide good quality feedback. This task is challenging for experienced educators, so do not underestimate the challenge for your students. Provide solid guidelines, detailed checklists, examples and remind students to offer a balanced perspective, focussing on opportunities for growth and improvement.
2. **Feedback quality.** Another challenge of peer video feedback is the time and quality of feedback provided. Students need to take this process seriously. That is why we attach a grade to the actual peer review video. Another challenge is that if a student does not provide a review to their peer (e.g., for-

gets or chooses not to), the absence of good feedback could influence the quality of the final product.

3. **Older vs. younger students.** Older students in higher education may take the peer review video process more seriously than younger students in secondary school. However, if you truly take time to establish a community of learners, the likelihood of delinquent reviewers is reduced.
4. **Anonymity of feedback.** When feedback is not anonymous, peers can be squeamish about giving more constructive or negative feedback. Consequently, feedback can be excessively positive and general. You can address this by (a) labelling this type of feedback as *opportunities for growth*, (b) training students to give effective feedback, (c) establishing a class culture of learning and reminding students that they are helping their peers improve and/or (d) making feedback anonymous.

General Resources

- Back to Feedback Basics Using Video Recordings provides a comprehensive summary of types of video feedback and tips for improving quality.
- The Importance of Constructive Video Feedback in Education is an excellent summary of the various ways in which video feedback can be used in a variety of subject areas.
- Three Ways to Use Video Feedback to Enhance Student Engagement is a solid article walking you through the process of creating video feedback, the benefits and a few examples.
- Why use video feedback in education? (2020): A short article outlining the benefits of video feedback for educators and students.

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Fair and Formative Feedback in Online Learning

SHARON LAURICELLA AND ROBIN H. KAY

INTRODUCTION

Effective feedback provides more than information on whether a student is right or wrong; it gives them clear directions about how their performance or knowledge aligns with assignment expectations (Feldman, 2019). Good feedback will also provide students with information on adjusting or changing their work to achieve success (Talbert, 2015). For large projects that have many phases, it is helpful if students can receive feedback throughout the process of an assignment, project, or performance. Online feedback works best when students have the opportunity to incorporate that feedback into further practice (Ambrose et al., 2010).

Feedback consists of two primary categories. Formative feedback provides students with guidance and supports them while learning, leading to modifications and improvements (Ambrose et al., 2010). This kind of feedback is non-judgemental and supportive. On the other hand, summative feedback or evaluation explains how and why students achieved a final grade (Ambrose et al., 2010; Formative vs. Summative Feedback). This chapter is primarily concerned with formative feedback or helping students learn and grow.

DIGITAL FEEDBACK

Digital feedback can potentially reshape assessment feedback (Bahula, 2021), particularly in online learning environments. In addition to detailed written information typed directly into a student's digital document, instructors can record audio or video clips with transcription so that students can hear the instructor's tone and read the transcribed comments. Benefits of media-delivered feedback include a clearer, richer quality of personalized feedback, increased understanding and higher-order thinking skills, more personal, authentic, and supportive communication, and a more interactive feedback process (Bahula, 2021). Using video feedback can help create a meaningful connection between you and your students (teaching presence in Garrison, 2011), develop a culture of collaborative assessment (Fullan, 2013) and stimulate a growth mindset (Dweck, 2007) and cognitive presence (Garrison, 2011).

Peer Feedback

Feedback amongst peers provides timely comments on student work and improves self-reflection (Meeks, McLeod, Grabill & Hart-Davidson, 2021). When students review one another's work, feedback can often be completed more quickly than if the instructor reviewed each student's work individually. Further, when students consult one another's work, they have the opportunity to consider their work, how it may be improved,

and how it meets assignment criteria. Peer feedback can be challenging because it may be affected by friendships or race (Dancer & Dancer, 1992; Pond et al., 1995), but when instructors provide clear direction and questions with which students can engage, peer feedback can be constructive and helpful (Nilson, 2003).

Feedback for the Instructor

Soliciting feedback from students about the impact and quality of your course is critical for successful teaching, particularly in online learning environments where the terrain is relatively new to many educators (Hattie & Timperley, 2007). When we first taught online, we were anxious – both of us had taught for over 20 years but felt like first-year teachers. Robin solicited anonymous feedback from students weekly, and it was one of the best instructional decisions that he made. Responding to student feedback is essential and helps increase teacher presence (Garrison, 2011) and develop a true community of learners who have an active role in their learning (Fullan, 2013). After a decade of teaching online, we would argue that gathering feedback from students about the course is one of the easiest and most effective strategies to improve teaching and learning.

Learning is the Focus

Regardless of how and when feedback is delivered, the purpose is to communicate where students are with respect to their learning. Some educators prefer to recast feedback to the term *feedforward* (Goldsmith, 2012). This revised moniker is more readily understood as formative and assists and guides students as they move along in a course or assignment. Waiting to give feedback until an assignment is completed points out all the ways a student could have improved or what they did wrong – at that point, students can't do anything about it. Hirsch (2017) suggests that feedforward is helpful because Instructors can find ways to give students specific direction while working, and consequently, students can make immediate changes or adjustments.

GENERAL GUIDELINES

Guiding students means careful consideration of how we provide feedback to students and how students receive feedback (Hattie, 2008).

1. **One suggestion/idea at a time.** In general, it is best practice not to bombard students with too many suggestions at one time (Ambrose et al., 2010). Organize and focus on one suggestion or idea at a time
2. **Timely feedback – don't delay.** Timely feedback is essential for student learning (Hattie & Timperley, 2007). If you wait to provide feedback, the connection between learning and this feedback is significantly reduced.
3. **Balance and Growth Mindset.** You should try to provide balanced feedback, noting positive efforts and opportunities for growth. Many instructors struggle with this balance because we want to get right to the point. Regardless of whether you provide positive or negative feedback, always focus on helping your students learn and grow. A statement like, "one opportunity for growth here is ..." is much better than "what you did wrong was...". Bottom line: focus on what students can do to improve.
4. **Watch the tone.** Tone and meaning, especially in text format, can easily be misinterpreted and may unintentionally alienate students. They may not digest the feedback if the tone is too strong. Be conscious of tone and, if need be, use video feedback for the more challenging issues.
5. **Opportunities for revision.** Ideally, students should use feedback to learn, grow and improve. If

there are no practical follow-up opportunities, suggestions for growth may be lost. Best practice includes offering all students the opportunity for re-submission of specific assignments. At first glance, that seems like an unreasonable offer given the potential assessment workload, but we have found that only a few students take us up on the offer, even in large classes. At the very least, assignments should be designed so that the feedback from one assignment can also be used in subsequent assignments.

6. **Scaffolding Peer Feedback.** When using peer feedback, offer guidance and training on how to give meaningful and effective feedback. Please see the resource list below on Teaching Students to Give Peer Feedback.
7. **Receiving feedback.** Students need to be taught how to receive feedback, and it is not as easy as you might think (Malecka et al., 2020). Emotions can get in the way of assimilating the suggestions and ideas that you offer. Please see the article in the resource list below on Receiving and Giving Effective Feedback.
8. **Consider audio or video feedback.** Consider adding audio or video feedback for more complex assignments involving higher-level thinking or integrated tasks that cannot be easily assessed using a rubric. Refer to the activities below on how to do this effectively and the Chapter on Video Feedback.
9. **Use Google Docs.** If your institution's technology parameters permit, encourage students to submit their assignments in Google Docs so that you can easily provide feedback and suggestions within the document. Students can also add their responses to your feedback, thus making the process interactive.

ACTIVITIES

ACTIVITY 1: SCAFFOLDED FEEDBACK

Overview

Consider how you plan a road trip. You probably will organize snacks, podcasts, and an ample supply of coffee. Key to your trip is a navigation system – a GPS that tells you how to get where you are going and how long it will take to get there. This experience is similar to completing an online assignment: students are often equipped with a rubric, an overview of each assignment, and/or video recordings outlining expectations. But beyond the basics of an assignment, students require guidance as they take on this work. Feedback and check-ins help guide students along, improve their work, and help them reach their goals.

Description

Scaffolded assignments are long-term projects composed of several steps or phases. In each step of the project, students complete a component which is a part or section of the larger project or assignment. For example, for a lab report, students do background research for a lab project, create an experiment, conduct an experiment, and then write up the report. For a term paper, students could create a research question, gather sources, submit an annotated bibliography, write a literature review, draw their own conclusions, and then submit a full paper.

1. **Use backward design** (Wiggins & McTighe, 2005). What do you want your students to submit at

the end of the term? Once you know what you would like students to do, write, submit, or perform, consider the components of this larger project carefully. Does the project include data gathering? Research? Synthesis? Sketch out each of the components of the larger project.

2. **Organization.** Create clear assignments for each component of the summative project. Consider each of these *chunks* or elements of the final assignment. Each component assignment should include instructions, a rubric, and feedback opportunities. Explain to students that each smaller assignment contributes to constructing a larger summative project.
3. **Medium.** Decide how feedback will be provided for each component of the assignment and in which mediated format (see below). Some components will be best suited to peer feedback, others feedback from the instructor (via video, audio, or written comments), and others will be best suited to video conferencing.
4. **Revision.** Offer students the opportunity to revise their work, and resubmit if necessary.
5. **Rubrics and feedback.** The rubric is not feedback. Rubrics tell students what score they got on an assignment. The rubric can communicate what elements of an assignment are done well or are missing. However, the rubric itself does not serve as feedback. Students require the *why* or *how* to improve.

Possible Challenges

- **Grades vs. feedback.** Studies show that when receiving both a grade and feedback, students focus more on the grade and less (if at all) on the feedback (Butler & Nisan, 1986; Butler 1987, 1988). Ensure that students understand that feedback is intended to help them improve and that the scaffolded nature of the feedback is in their long-term interest. Revision based on feedback early on will enhance the quality of their final, summative assignment.
- **Resubmission.** Offering students the opportunity to resubmit an assignment after feedback is essential but can be time-consuming. Communicate with students whether you will re-grade the assignment, use the higher mark, or average marks.

Resources

- Vanderbilt University guide on Backward design
- Backward design: The Basics

ACTIVITY 2: PEER FEEDBACK

Overview

As authors of this chapter, we work together frequently and share our work regularly. We work together well because we share idea generation, drafting, and revising. Much professional work is collaborative, and sharing ideas, drafts, and revisions is fundamental in the working world. In our objective to prepare students for post-academic life, peer review helps share work and provide feedback and critique.

The benefits of peer review in secondary and postsecondary education include:

- **Time-efficiency.** Peers can often provide more timely feedback than an instructor, thus enabling quick and sometimes even immediate direction or assistance (Meeks et al., 2021).

- **A level playing field.** Rather than receiving feedback with a top-down approach, students have the opportunity to engage with others in a non-hierarchical model (Hirsch, 2017).
- **Reflection and revision.** Hart-Davidson (2018) describes *giver's gain*. Being a helpful peer reviewer comes with significant gains: What you read, you too can imitate. What you detect, you too can correct. What you explain, you too can retain. What you suggest, you too can try.

Description

Good peer feedback is constructive, helpful, and kind. Establish clear parameters and objectives for students:

1. **Aim for improvement.** Explain to students that constructive feedback respects their peer's work and can help to highlight what they did well and what they can do to build a better draft. Peer feedback aims to collectively improve a submission by rethinking the purpose, goals, audiences, message/thesis, or problems addressed by the assignment (Meeks et al., 2021).
2. **Feedback should not be judgmental.** Yes/no questions such as "did the assignment meet the requirements" are problematic, and students are unlikely to be equipped to answer such questions (Nilson, 2003).
3. **Structure the feedback exercises.** It is not enough to ask students to consult their classmate's work and offer comments. There should be clear instructions for giving feedback on online submissions. Depending upon the discipline, instructions could include:
 1. Format with a yellow highlighter the strongest sentence/solution.
 2. Underline something that needs further clarification or that you found confusing.
 3. Outline your peer's paper/speech/project/process at the bottom of the submission (Nilson, 2003). Is there anything missing that needs to be added?
 4. Format in red font anything that needs a citation that does not yet have one.
4. **Product vs. person.** Remind students to direct feedback toward the submission/product, not the person.
5. **Play nice.** Making feedback personal means being kind (Meeks et al., 2021). The online disinhibition effect sometimes permits people to say things in digitally mediated spaces that they would not say to someone in a face-to-face conversation (Suler, 2004). Remind students that everyone is human, has feelings, and that peer feedback aims to improve their work and the work of their colleagues.
6. **Wrap-up.** Allow students to have sufficient time to receive their feedback, ask questions, and integrate suggestions.

Possible Challenges

- **Bias.** It is possible that students might feel concerned about providing feedback to someone they don't know well or could be too generous when paired with a friend. Dancer & Dancer (1992) and Pond, Ulhaq & Wade (1995) have shown that peer assessments are biased by friendship and race. One way to avoid this challenge is to make the feedback blind/anonymous. Another is to encourage students to be honest and kind. Structured questions, as described above, help to remove subjectivity or judgement, which should result in a more thorough and honest review.
- **Trust.** One of the biggest challenges with peer feedback is anxiety (Meeks et al., 2021).
 - Explain to students that they should have confidence in their peers' feedback, especially if it

is structured in response to a guide described above.

- Encourage students to recognize that they are qualified to give meaningful and constructive feedback, and the feedback is a dialogue. After all, they are in the course, have completed their drafts, understand the challenges of the assignment, and are following a structured guide.

ACTIVITY 3: MOTE FOR AUDIO AND TRANSCRIBED FEEDBACK

Overview

Students report that they like receiving audio feedback from instructors because it is clear, engaging, and helpful (Brearley & Cullen, 2015). Further, research suggests that giving students the option to receive audio feedback can help motivated, engaged students connect more fully with their instructors (Bilbro, Iluzada & Clark, 2013). While audio feedback can be helpful to students, it is also beneficial for instructors because minute-for-minute speaking can provide more detail than a written script (Ekinsmyth, 2015). Further, audio notes help to convey tone; one student in our research told us that “when I read comments, it’s in a teacher’s mean voice. When I heard the Mote, I could tell that [the instructor] was being helpful and nice.”

Mote is a free add-on available for Chrome users. Paid upgrades are available, but the free version works fine for most instructors. This tool allows users to capture audio in the form of a voice note (it’s almost like the digital form of voicemail) and insert it digitally onto online documents, sheets, slides, forms, or email.

Description

Using Mote is fun and easy.

1. Go to mote.com and install the add-on.
2. Open the student’s submission – this could be anywhere in the Google suite, so long as the Chrome browser is in use.
3. Review the student’s work and consider where feedback is best suited.
4. Highlight an area, click on the purple Mote button, record your audio, and click again to stop.
5. Press *Comment*, and the comment immediately embeds into the document with a message guiding the student to “click here to listen to your Mote.”
6. Add as many Motes as you like; some instructors prefer to add several short ones, but it is also helpful to provide a summative comment after the submission that offers direction and encouragement.
7. The paid version of Mote permits transcription; this is helpful for accessibility. After Mote automatically transcribes the voice note, the instructor can edit it for accuracy of spelling and punctuation.
8. The Mote voice notes do not expire; students can listen to them as many times as they like.

Possible Challenges

- **Hearing-impaired students.** Audio feedback can be challenging for hearing-impaired students; the transcription option is helpful in this instance.
- **Short videos.** You only get 30 seconds of recording time with the free version, 180 seconds with a paid version. More detailed nuanced feedback might be challenging to provide

Resources

- Mote (Chrome add-on)
- Mote Tutorial for Teachers [9:43]

ACTIVITY 4: VIDEO FEEDBACK

Overview

Providing video feedback can help build teacher presence by building a strong connection between you and your students, particularly in blended and online learning environments. One of the key benefits is offering a more detailed, clearer, and a richer quality of feedback and increased understanding and higher-order thinking skills, which leads to greater cognitive presence in your class (Bahula, 2021). Furthermore, video feedback can lead to interactive, collaborative assessments (Bahula, 2021; Fullan, 2013). This type of video is generally reserved for more detailed, higher-level assignments that require extensive feedback. We have found it is much easier to articulate complex, nuanced and detailed feedback using video or audio compared to text. Please refer to the Video Feedback chapter for a more detailed discussion and guidance on creating video feedback.

Description

First, get yourself both a good headset (e.g., Logitech or Plantronics) or stand-alone microphone (e.g., Yeti or Blue Snowball) and screen recording software (e.g. Screencast-O-Matic) to create video feedback. Next, open the student assignment and review it carefully, and take brief notes on what you would like to include in your video conversation. When you are satisfied with your brief guiding notes, create videos to fully explain the feedback you wish to give. Once you have completed the video, share the link in the assignment at the point where the feedback makes the most sense. You may wish to record after each set of notes to ensure that you do not forget key points that you want to communicate.

Here is our recommended six-step approach:

1. Open the student's digital assignment and review, adding short comments on the work to guide the video.
2. Open video recording software and test the recording first to ensure it is working.
3. Create a 1-3 minute video on one point or issue you would like to make.
4. Get the link to the video and insert it into the document using the comment function.
5. Repeat until finished.
6. Take at least a 5-minute break before you start reviewing the next student's assignment.

Refer to the General Guidelines for creating video feedback in the Video Feedback Chapter – they will be helpful.

Possible Challenges

1. **Setup time.** It will take time to learn and set up a video feedback approach. Once you have that in place, though, video feedback is often quicker than written feedback, especially when communicat-

ing in-depth suggestions.

2. **Do I need to use video feedback?** Sometimes, written feedback or rubrics might be a better, more efficient choice, especially with assignments focussed on skills and procedures as opposed to higher-level thinking. Video feedback is quite effective when providing feedback on writing skills.

Resources

- Screencast-O-Matic: Free (although it does have a paid version), easy to use, and perhaps most importantly, easy to store and share videos
- Screencastify: This tool is simple and easy to use – it also works well with Google Chrome as an add-on. Many teachers swear by it.
- Snagit for Education: About \$50, but offers some editing options and provides a quick upload to YouTube.

ACTIVITY 5: VIDEO CONFERENCES

Overview

Engaging in individual or group video conferences helps strengthen teacher presence (Garrison, 2013), stimulates greater cognitive presence (Garrison, 2011), and improves critical thinking (Fullan, 2013). This approach is a good option when providing feedback for smaller classes (15 – 60 students). Many instructors might consider video conferences a potentially time-consuming process, but these meetings can clarify expectations, focus students, and reduce the number of emails that require clarification. Sometimes, it is easier to explain critical issues and concerns in real-time than in a recorded format.

Description

Setting up a series of video conferences is relatively straightforward:

1. **Length.** Determine how long the video conference should take. For example, 10-15 minutes for individual meetings and 15-30 minutes for groups is about right.
2. **Sign up sheet.** Create a table in Google Docs or Sheets with at least two columns: student name and time slot for an appointment.
3. **Share the link.** Share the Google Doc or Sheet with students – make sure they can edit and add their names. It is helpful to use the first-come, first-served approach to entice students to sign up quickly.
4. **Student preparation.** Provide explicit instructions on how students need to prepare for the video conference. For example, ask students to come to the conference with two questions, one idea for their next project, etc.
5. **Prepare notes.** Create a series of points for each meeting to share with students – this is an agenda for the video conference. What would you like to cover?
6. **Questions.** Allow time for questions and discussion.
7. **Record.** Encourages students to take notes during the conference or record the session to review it afterwards.

Possible Challenges

1. **Time.** Discussions can be fun, and it is easy to run out of time. Ensure that everyone focuses, has good guiding notes, and uses a timer.
2. **Students are not prepared.** Some students or groups may not have prepared for the meeting. It is best to ask students to go back, prepare, and schedule another session when this happens.
3. **Key issues not recorded.** Individual or group meetings can be productive but are less helpful if students do not take notes or record the session. Set up a system of recording before you start the discussion.
4. **Students/Groups do not sign up.** Sometimes students or groups do not sign up. When feedback sessions are optional, this allows students to control the flow of their learning and make choices accordingly.

Resources

- 3 Ways to Use Video Conferencing with Students Learning Remotely
- One-on-One Conferences as a Tool for Building a Rapport With Students
- 12 Ideas for Using Video Conferences With Students

ACTIVITY 6: FEEDBACK FROM STUDENTS

Overview

Hyperbole aside, obtaining regular feedback from your students during your course is essential (Hattie & Timperley, 2007). Generally speaking, secondary school instructors rarely collect feedback from students on teaching and learning. Higher education instructors gather this feedback at the end of their course when it is too late to make adjustments. Both of us began gathering student feedback in face-to-face courses 20 years ago. Extending this practice to online learning environments has been – again, forgive the hyperbole – absolutely key to our work in teaching and learning. Put simply, gathering feedback from students is one of the easiest and most effective ways to improve the quality of your instruction.

Description

Soliciting student feedback is a relatively simple process.

1. **Feedback on what?** Do you want feedback from students on a specific activity or practice, or do you want general comments on the course?
2. **Open-ended comments.** Free-response questions that focus on learning (e.g., how ‘fill-in strategy’ impacted your learning) tend to be most helpful.
3. **General feedback questions.** For general feedback, three questions are usually sufficient:
 1. What do you LIKE about the course?
 2. What do you DISLIKE about the course?
 3. What suggestions do you have for making the course better?
4. **Format.** Anonymous feedback is essential because there is a power differential between the instruc-

tor and students. We use Google Forms to collect feedback, but any anonymous survey tool would work.

5. **Respectful feedback.** Tell students not to vent, rant or make feedback personal. It is human nature to have a tough time interpreting forceful or highly negative feedback. Invite students to provide detailed feedback with thoughtful reasoning that can result in meaningful changes if necessary.
6. **Timing.** Start early – within the first 2-3 weeks of a new course. Then ask for feedback at least two more times before the final course evaluation.
7. **Class discussion.** After students give feedback, summarize it in a list and respond at the start of the next class. Students want to know that instructors listen to and act on feedback.

Possible Challenges

There are several challenges with soliciting feedback from students.

1. **Getting enough responses.** Sometimes there are not enough student responses to get an accurate perspective, especially if you ask students to provide feedback via email, which they would complete on their own time. Set aside 5 minutes at the beginning of a class to ensure feedback from most students.
2. **Identifying clear patterns.** Look closely at the feedback and its patterns. It is crucial not to react to a single strong comment because it may not represent the entire class. Try to establish a consistent theme before you make significant changes.
3. **Rants and raves.** Some students want to vent, and the comments are not particularly helpful, and sometimes they are hurtful. Before asking for feedback, remind students that you have feelings and that it is tough to listen and respond to extreme, negative comments. If they want changes, note that it is best to offer reasoned suggestions.
4. **Consistency of gathering feedback.** Try to establish a routine of student feedback that works for you and stick to it. After gathering feedback on the first four to five online courses, feedback is solicited less often. That was a mistake – A growth mindset is critical here.
5. **Reacting to feedback.** We design our courses to be successful, and it takes a long time to create the best learning experience possible. So it can be hard to receive and process negative feedback from students. After all, you have created this amazing course! Read student comments and take a few days to respond – this waiting period is essential to let your emotions settle. Then you can focus on the message. Then be curious and open to change.
6. **Long class discussions.** Responding to class feedback can take time, especially if you are not organized. The discussions can quickly go off on a tangent and take too much time from an instruction period. When discussing feedback, have a clear plan for responding to the patterns you have observed. Tell students what adjustments you can and cannot make and why. Thank them, have a brief discussion, and then begin class.

RESOURCES

- 5 Tips for Gathering Useful Feedback from Your Students
- Four ways to Gather Student Feedback
- Getting Feedback on Teaching (Higher Education)

- How to Ask Students for Meaningful Feedback

GENERAL RESOURCES

- 20 Ways to Provide Effective Feedback for Learning: Excellent graphic and concise summary of 20 strategies for maximizing the effectiveness of feedback.
- Receiving and Giving Effective Feedback: A concise article on giving and receiving feedback – It helps to teach your students how to receive feedback – a skill we often overlook.
- Teaching Students to Give Peer Feedback: A friendly guide on how to teach students to provide practical, meaningful feedback.
- Top 16 Student Survey Questions to Enhance Your Student Feedback: A great set of questions to build a productive student survey.

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Equitable Assessment in Online Environments

SHARON LAURICELLA

INTRODUCTION

Most of us remember a school project that was an epic fail. One that snuck up on us, we didn't understand, or simply didn't have the interest to complete. As a humble example, in grade 6, I was supposed to make a 3D map of South America. I completely forgot about it until the night before it was due and thus brought a very wet model made from homemade play-dough on a plank of plywood to school on the fateful due date. It looked terrible, got squished, the wet paint bled everywhere, and my grade was most undesirable. While I learned not to leave assignments to the last minute, I could have learned a whole lot more about geography.

Mercifully, the online environment does not accept submissions still wet with paint. However, as more courses, programs, or lessons are delivered online, educators and students have had to rethink how online, synchronous, and asynchronous learning occurs and how it can be demonstrated. The most effective online and blended teaching and learning environments employ meaningful technology tools that help students understand what they know so far and what they still need to understand or practice (Gikandi et al., 2011). Educators can also use web-based assessment tools to gauge and maximize their teaching efficacy through unique affordances from different platforms.

Traditional assessment ideas include bleary-eyed students woefully answering exam questions after staying up all night cramming for a test. But when assessments are most meaningful, they are not a series of hoops through which students need to jump. While diverse in delivery, type, and implementation, assessments generally refer to a process of fostering and monitoring topical awareness over a defined time (Andrade & Brookhart, 2020; Walvoord, 2010). When we assess student learning using technology, we gather information on what students know or understand based on their online learning experiences. The results can indicate where students need additional direction and whether the content delivered by the educator meets learning objectives (Gikandi et al., 2011). Thus, the goals of assessment are to both evaluate and improve student learning (Dixson & Worrell, 2016).

When constructing online assessments, the best place to begin is not with *how do I assess students using online tools?* or *how do I make my online assessments equitable and accessible?* Instead, Morris (2021) suggests that we ask ourselves, what am I teaching? Only then can we consider the people in our classes, how they learn, and how they can best express what they have learned. In most cases, educators outline learning objectives and outcomes at the start of any course or semester, and this is a sound place to begin when constructing online assessments.

Learning objectives and outcomes are otherwise known as learning goals. Research on student assessment suggests that articulating clear and explicit goals for student learning in any assignment, unit, topic, or course is essential before constructing any assessment or giving feedback to students (Ambrose et al., 2010). A stated goal may relate to a specific task or performance, be relative to a standard expected of students, or be comparable to prior performance (Gikandi et al., 2011). For example, a goal may be to understand and solve specific mathematics problems, it could be to build a free-standing structure, or it might be to write a persuasive essay. The online or blended environment, like all learning environments, demands clarity so that students understand what they will learn and will be able to know when they have met learning objectives (Hattie & Temperley, 2007). In other words, at the outset of each new course, module or activity, students must know where they are going (Hattie & Temperley, 2007).

GENERAL GUIDELINES

Rubrics

Many educators suggest constructing and using rubrics to articulate and measure progress toward learning goals. Ambrose et al. (2010) recommend using a rubric to specify and communicate students' performance criteria into unique components. The rubric can describe precise characteristics of *high*, *medium*, and *low quality* work in each component, guiding a student's understanding of the expectations and relative outcomes (Andrade, 2000). To that end, educators must carefully consider what they want students to know and how students can express this knowledge. In online environments, educators must also design an assessment that can be constructed and submitted digitally.

One potential caveat regarding the use of rubrics in any learning environment is the potential risk of assessing only one-dimensional tasks such as spelling or organization rather than subjective processes such as critical thinking (Kohn, 2006). Rubrics should guide the student, articulate goals, facilitate communication between and amongst faculty and students, and not be a defensible position that reflects only a grade or standard (Andrade, 2005). Many free online rubric makers (see resources below) can help create and communicate learning goals and criteria to students.

However, sound online assessments do not begin and end with a rubric or checklist — rubrics are simply tools to guide the assessment process (Andrade, 2005). Further, not all activities require a rubric. Participation in online games, puzzles, or collaborative activities can be straightforward enough that simply completing or participating in them demonstrates success or indicates where a student may have gaps in learning. Further, some online tools have built-in algorithms that provide students and educators with results, helping to remove subjectivity or bias from an assessment based solely on our input.

Purpose of Assessments

A benefit of assessment in online environments is that technology can often provide instant results to both students and educators. Online quizzes, tests, or even synchronous peer review can be quick and, in many cases, immediate. Communicating real-time results to individual students helps guide their relative understanding of learning goals in a timely manner (Gikandi et al., 2011). At the group level, immediate tech-enabled assessment results offer educators the opportunity to observe general trends in the course and where they may need to provide additional guidance or support. Instant tech-enabled results give an advantage over traditional teaching venues in which students complete a written test or quiz and then wait days (or even weeks) for the results. Immediate indications of students' goals or learning objectives significantly benefit from online, tech-hosted assessment (Gikandi et al., 2011).

The objective of an assessment will differ based upon its purpose. There are two general types of assessment:

- Formative assessments are delivered in any online course, unit, or lesson when the objective is to determine how well a student is learning smaller or incremental sections of course material. For example, a formative assessment may indicate how thoroughly a student understands content from an online video they watch outside of class time, information covered in synchronous online classes, or readings covered in online sources that they consult asynchronously. Formative assessments are often incremental and ongoing, providing feedback to students to support tangible improvement (Bennett, 2011). These developmental assessments can give us a sense of where students are in their learning and where we need to focus on subsequent or additional learning. Formative assessments are often low-stakes or no-stakes in the context of grades, which means they contribute minimally to a student's final mark in a course or program.
- Typical forms of summative assessment include a final exam, unit test, or cumulative project. Often, these types of assessments quantitatively measure student learning over a full term, entire course, or more extended program (Gikandi et al., 2011). Summative assessments are usually high-stakes and significantly contribute to a student's final mark in a course or program. From an educator's perspective, this kind of assessment can provide insights for developing subsequent iterations of a course, unit, program, or significant assignment.

Challenges

Rubrics and coordinating assessments are important for articulating performance criteria. However, when considering and constructing both rubrics and a variety of assessments, online educators should be mindful of potential variables that impact equitable inclusion practices. Consider the clarity of expectations, access to technology, communal support, and each student's individual growth and development (Ambrose et al., 2010; Bond, 2020; Fornauf & Erickson, 2020).

- Avoid academic or educational terms that do not relate to or enhance understanding of the assessment focus (Gikandi et al., 2011).
- Be consistent with expectations and your feedback. Diverging from the norm without cause or suitable warning can distract from the learning at hand and clutter student understanding (Tierney & Simon, 2004).
- While we may believe that we have clearly outlined expectations and learning outcomes, mistakes can occur. If we thought that we described expectations clearly, but multiple students expressed confusion or interpreted our directions differently, we need to think further about the clarity of our guidelines (Andrade, 2005).
- Although students might have access to video streaming services, there may still be complications related to various uses. The abilities of different technologies are not the same for all students (Wattal et al., 2011).
- Instructors should be mindful that cultural and individual differences regarding the role of family and community can impact students' learning communities and the role of formal education in life (Eliason & Turalba, 2019). Notably, family and community responsibilities may impact how and when students engage online.
- Not all students begin and end their learning in the same intellectual space; some students start with a more advanced understanding of course concepts, while others require support to move beyond their previous knowledge.

- It can be challenging for instructors to ensure that all students are challenged and encouraged, given the various preparation when entering the course.
- When considering the affordances of cohorts and individual students, instructors do not need to limit student performance and progress indicators to one specific type of assessment. We can combine results from both formative and summative assessments to gauge how well students are learning, where gaps in learning exist, and to calculate students' grades (Dixson & Worrell, 2016).
- Contemporary research on grading suggests that formative and summative assessment should not be static and that arriving at a final grade requires coherent and equitable grading practices, including a teachers' professional judgment (Feldman, 2019).

EXAMPLES

EXAMPLE 1: THE SUMMATIVE UN-ESSAY

Overview

An UnEssay invites students to submit a summative assignment in their chosen format. This practice is inspired by the literature on authentic assessment (Svinicki, 2004), which emphasizes creating assessments relevant to student goals, intended professional environment, and students' unique strengths and talents. The UnEssay is particularly welcome in digital environments because it mirrors concurrent revisions in pedagogy to suit the digital environment.

Rather than completing a traditional essay or lab report, the UnEssay invites students to plan and create a summative project that addresses course concepts in their interpretive way. This creative opportunity requires a clear explanation to students and a sincere invitation to challenge themselves, play to their strengths, or try something new while embracing the freedom to do so. Students can take on their learning objectives, express them in any way they like, and present their work digitally.

Description

The Un-Essay significantly departs from the traditional end-of-term research paper or final exam. It requires concise communication to support students' understanding of the parameters and possibilities of this creative assignment.

- I introduce the UnEssay in the first week of class so that students can begin to generate ideas and, quite frankly, get accustomed to the idea that they have freedom of expression in their final assessment.
- Provide examples of previous projects that students have completed. If this is the first time you've incorporated an UnEssay into the course, it may be helpful to see examples from students in courses taught by Cate Denial and Christopher Jones [Twitter post]. Students submit a series of paintings/drawings, documentary-style videos, websites, blogs, podcasts, and social media accounts.
- Scaffold the assignment.
 - Within the first few weeks of the course, my students discuss potential ideas in small online breakout groups. I have found that discussions amongst peers help refine ideas, provide direction, and help students make their project plan.

- Within the first month of the course, ask students to submit a proposal for their UnEssay project. Provide feedback on potential directions, revisions, challenges, or guidance.
- At mid-semester, students complete a check-in (either personally or via a Google Form). Formative discussions help students stay on track and be aware of problems that could negatively impact completion.
- Discuss with students how their projects will be assessed/graded. Unconventional assignments often demand unconventional assessment methods. What *counts* in this assignment? What if a student attempts a project that involves a steep learning curve in using technology, for example? How will you and the student account for *failures or experiments*? Create a rubric or guideline with students that clearly outlines the project's requirements but still permits freedom of expression and calculated risk-taking. These clear expectations are essential in recognizing Feldman's (2019) requirement that fair assessments be structured accurately.
- If students prefer to write a traditional essay, this is entirely acceptable! Some students find the security in this helpful, or they genuinely enjoy academic writing.
- Artist Statements are what I ask students to submit with their creative artwork. I ask them to indicate the project's connection to course content and how it meets the assignment's requirements. Requirements for the artist's statement can be outlined in the rubric as collectively established above.
- Build-in time at the end of the term for students to share their projects, a process that I find invites increased connection and rapport in class (which is especially welcome in online environments). Potential *presentation* opportunities include small group discussions, an online recording of digital projects, or large group presentations, depending upon the size of the course.

Possible Challenges

- Be prepared for discussion as students lack experience with such a creative assignment. I find that asking them about their learning goals, professional goals, or personal interests helps shape a meaningful project.
- In a semester-long project, it is crucial to ensure incremental progress. Scaffold the assignment such that students brainstorm ideas independently and with one another, submit a proposal to the instructor, check on progress at mid-semester, and make a final submission.
- Creating a grading scheme for a variety of creative projects is sometimes challenging. Each project will be different, so creating a rubric that is both fair and flexible can take some time and some iterations. Be prepared to revise or reconstruct the rubric as the variety of UnEssay projects becomes more apparent.

Resources

- Cara Ockobock's Fundamentals of Biological Anthropology UnEssay Instructions [PDF]
- Mark Kissel's UnEssay Guidelines
- Examples of UnEssay projects in Christopher Jones's US History course [Twitter post]
- Cate Denial's guidelines for grading UnEssays

EXAMPLE 2: ASSESSMENT WITH BLOOKET, A NOT-SO-SERIOUS GAME

Overview

Blooket is a digital quiz game platform that can be used by individual students in their own time or amongst groups of students as they play the game simultaneously. Games are helpful because they can raise motivation during learning processes (Iten & Petko, 2016) and increase learning. After all, games generally require fewer cognitive resources (Robson et al., 2015) than other static learning contexts.

Online games are suitable for reviewing academic concepts before a large-stakes assessment, determining student knowledge before a lesson, or measuring student recall at the end of a class period. Blooket is helpful because, unlike other tools, it does not require that the game award points for how quickly students respond to questions. The lack of scoring can reduce non-helpful pressures for students who need additional time. The platform offers a variety of visual and play themes, including car races, a cafe, gold mining, and even holiday themes (such as *Candy Quest* at Halloween). The thematic presentation helps transform quizzes into competitive games similar to those students might play on their phones.

Description

- Instructors can sign up for a free account on Blooket.com
- The game can be played using pre-established *sets* of questions, or instructors can create sets relevant to their specific needs or topics.
- To assess student knowledge before a lesson or unit, an instructor can create a game to see how many questions a student can already answer. This information can be helpful for the instructor in creating subsequent lessons and can outline to students what they may or may not already know. Students can repeat the game at the end of the class to guide personal insights into what they learned through the session.
- You can use Blooket as a review tool: course terms, definitions, and concepts can be expressed in multiple-choice questions so that students can practice in advance of a test or other high-stakes assessment.
- Many of the game themes on Blooket offer the opportunity for students to *steal* points or assets from other students, which can help limit how many times a single student wins.
- Most Blooket games can end after all students answer all questions or expire after a set time. The time mode allows for repeatable questions so students can revisit questions that they did not answer the first time correctly.
- The instructor can see how many questions each student answered correctly, providing insights into which students may be struggling with course concepts or retention.

Possible Challenges

- Online game platforms require that students access the requisite technology to participate. Not all students will have a mobile phone, laptop, or tablet, but teams can use Blooket if one student has technology that the group can use.
- Games can help students identify which questions or concepts they are less familiar with, but there is no way to record answers they may wish to revisit. Instructors should remind students to take

note of words, concepts, or information that they need to review.

Resources

- EdTech Classroom Blooket Tutorial for Teachers [12:21]
- Getting Started with Blooket[2:41]

GENERAL RESOURCES

- Rubric-Maker.com is a rubric authoring tool.
- Quick Rubric is an easy-to-use tool for creating rubrics.
- 14 Ways to Turn Your Classroom into a Game Show includes good ideas for creating interaction in your online class.

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Alternative Grading in Online Learning

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INTRODUCTION

After the first pivot to online learning due to the COVID-19 pandemic in 2020, many universities invited students the option of receiving their semester grades on a pass-fail scale. The shift accommodated students who experienced challenges related to illness, technology, and newly-online educators (Zimmerman, 2020). Some students chose to take a pass instead of a B because an 80% grade might, conceptually, destroy an otherwise pristine GPA. Others decided to take the pass instead of a C because it was easier. However, while the scale of implementation was indeed new, fundamental grading structure changes are not. The movement to challenge traditional grading builds on emerging issues with education with an awareness of modern education's scale and scope (Kohn, 2020).

Fundamentally, report cards, grades, marks, standardized tests, and grade point average calculations are part of most students' academic experiences. Indeed, university enrollment, scholarships, and formal recognition are associated with the measurements. However, if our goal as educators is to enhance learning, we also need to be aware of the implications of grade distribution.

CHALLENGES WITH TRADITIONAL GRADING

Despite the tradition of grading, there are significant problems with the practice of ranking students and assigning a numerical value to their work (Durm, 1993; Morris, 2021). Kohn (2013) suggests that aligning a grade to learning outcomes is akin to bombing for peace. Consider the following issues associated with grading:

- Grades do not equal feedback. When students receive a grade for their work – even with a rubric – instructors often expect them to see where they missed the mark or did something well. Unfortunately, a student's focus on the grade will usually disregard educator feedback (Butler & Nisan, 1986; Butler, 1987, 1988). The focus on a grade limits the effectiveness of the activity as often the student won't understand the *why* associated with the learning activity (Weaver, 2006).
- Although grades may be considered incentives to pay attention to requirements, guidelines, or rubrics, students may understand that grades prioritize conformity. If students think they could complete, perform, or present something different from what a rubric or instructions dictate, they are often penalized (Schinske & Tanner, 2014).
- Grading can foster deconstructive competition between students, which can inhibit the effectiveness and engagement of collaboration (Feldman, 2020; Stommel, 2020). Similarly, traditional grading can

reinforce socioeconomic status through practices such as the 'Gentleman's C' or the 'gift' of a grade to a student of status (Merelman, 1973).

WHAT IS ALT-GRADING?

The movement toward alternative grading, revised grading schemes, or ungrading generates increased attention. Kohn (2020) suggests that going gradeless is part of a systemic overhaul that demands instructors reconsider curriculum, pedagogy, assessment, and control (Kohn, 2020). As an increasing number of courses are adopted in online environments and are revised to suit the digital domain, instructors can simultaneously reconsider grading strategies.

The alternative grading movement rejects the notion that grades should be a 'gotcha' strategy in which educators use grades as a punitive measure. Instead, this framework suggests that instructors consider how students can best demonstrate their understanding of course concepts and have a fair and equitable space. It also promotes an instructor's more fulsome understanding of how students have learned and grown in their academic experiences.

MOTIVATION

For many students, grades are a form of extrinsic motivation as getting a good grade on a test, exam, or course can encourage them to study and perform well to have better chances at a prize, recognition, or honour (Covington & Müeller, 2001). The ungrading framework may provide freedom for the learning environment to facilitate intrinsic motivation or a student's personal desire to learn (Covington & Müeller, 2001), no matter the outcome in terms of a grade or measurement.

Removing, revising, and reconstructing the meaning of grades affords students to focus more on learning and less on how someone else will judge their work (Covington & Müeller, 2001). Even ungraded assignments offer students freedom from the ambiguity associated with the precision of grades, including the + and - scale (Elbow, 1997). Ungrading in whatever degree or format it takes can open the time and space for students to learn for their own personal and professional benefit rather than the external praise, marks, or satisfaction of being ranked at the top of the class.

GENERAL GUIDELINES

- **Start by trusting students** (HASTAC, 2014; Stommel, 2018, 2020).
 - You're not alone if you get cold sweats thinking about trusting students. It's challenging to concede our perceived power and control, especially in the transition from in-person to online (Hasinoff, 2018).
 - By trusting students to explore their motivations and goals, instructors can redefine roles and partner with students rather than play the exhausting part of enforcer.
- **Communicate.**
 - Students have likely been immersed in the boundaries associated with grades since kindergarten and may believe that they are inherent to education and learning. The parameters provide a sense of security, limitation, and expectation. As a result, students may face unique challenges in the context of personal goals, creative output, peer-review, and self-assessment. So, communicating the new normal can help to enhance their experience.

- Decide which assignments in your course will receive grading and which ones won't. For graded work, explain grade determination in self-assessment, peer assessment, and contracts.
- **Progress gradually.**
 - In your first iterations of teaching with ungrading in the online environment, begin by incorporating a few low-stakes or no-stakes assignments (see example below). Then, once you and your students become more comfortable with the spirit of ungrading, introduce a few more strategies that buck the traditional grading trend, such as self- or peer-assessment. See the chapter on Fair and Formative Assessments in this book.
- **Be flexible.**
 - Learning goals and objectives are essential in framing activities and learning experiences. Yet when students can present their work in alternative formats or more creative ways in the online environment, their work may not fit into a concise rubric. Be prepared to realign rubric lines or redefine a course deliverable based on a student's stated goal, format, or idea.
 - Learning goals can be dynamic and unique, so try to be open to what students deem personally relevant about the subject. Consider examples of a content-related epiphany, creation, or a need for increased awareness (Stommel, 2017).
- **Create authentic assignments.**
 - Authentic assignments are "student activities that replicate real-world performances as closely as possible" (Svinicki, 2004, p. 23). In other words, an authentic assessment or assignment asks students to apply disciplinary or course concepts to a situation as they would if they were professionals in the field. As much of the professional world has shifted to online and remote work, these assignments are particularly relevant to online teaching and learning.
 - Authentic assignments are meaningful to students beyond a grade after completing a course or assignment (Frey, Schmitt & Allen, 2012). Identifying the value of learning beyond the grade on their transcripts is inherent in authentic education.

EXAMPLES

EXAMPLE 1: NO STAKES OR LOW STAKES ASSIGNMENTS

Overview

Moving from a full-on graded course to an entirely ungraded semester is likely to be overwhelming or confusing for both faculty and students, whether one does it online or in f2f format. Start to play with ungrading by offering some assignments and activities that either count very little or not at all to a student's final mark in a course.

Description

- **Low- or no-stakes assignments tend to be informal.** This informal work can include freewriting, practicing a math problem, or brainstorming hypotheses for a lab experiment. Students can keep an

online journal or contribute to a digital, classwide document annotated asynchronously by all students in online environments. Another no-stakes activity could be a 5-minute problem or case that students discuss in small groups, attempt to convince one another of a particular outcome, or one student who knows the answer can help others.

- **Informal assignments are suited to informal grading schema.** Elbow (1997) suggests that we inform students that most professional work will not be assessed in detail, so it is best to get on with it.
- **All disciplines and learning environments can incorporate reflection** on the process. Elbow (1997) suggests a low-stakes assignment that asks students to write out the steps they went through when solving a problem. This reflective process can help students identify helpful strategies and become increasingly self-aware.
- **Online games** are an informal no-stakes activity. Games can raise motivation during learning processes and increase learning because they generally require fewer cognitive resources (Iten & Petko, 2016; Robson et al., 2015) than other static learning contexts. Although some online games such as Kahoot or Blooket can tally scores, there's no reason to record them or account for them in calculating a final course mark. In this case, games can be considered activities or 'teaching' rather than assessment.
- **Model ungraded assignments.** Provide an example of a reflection, annotation, or process reflection so that students can see how it may be helpful. Another – and perhaps more effective – strategy is to participate in the ungraded exercise yourself. As students engage in an ungraded online activity, write your reflection, journal entry, process note, or annotation on a problem simultaneously.

Possible Challenges

It is plausible that if work is not graded, students will perceive that it doesn't count. However, as soon as they realize that ungraded assignments can help them prepare for larger stakes or graded submissions, they're likely to realize the benefit of assignments that enable them to learn without explicitly connecting to a grade.

Resources

- [Low-Stakes Assignments | Feedback & Grading | Teaching Guides | Teaching Commons | DePaul University, Chicago](#)
- [Low-Stakes Formative Assessments | Academic Outreach and Innovation](#)

EXAMPLE 2: CONTRACT GRADING

Overview

Rather than focusing on a final product or exam in a course or unit, contract grading considers effort and labour (Jordan, 2020). This grading method is a different way of calculating points and can also lower stress, helping students focus on the learning process rather than a summative outcome (Melzer et al., n.d.). Contract grading is particularly suitable to arts, humanities, and social science online courses in which grades can be more subjective or interpretive.

Description

Instructors who use contract grading emphasize process over product, and some base an entire course grade on steps in the learning process and the work that students put into the course (Melzer et al., n.d.).

- Most grades are based on final revisions to a summative assignment in traditional classes such as an essay, lab report, or project. A contract-graded course can include pre-writing activities, following steps in solving an equation or problem, participating in digitally-mediated peer review exercises, or revising previous errors. This grading schema places less weight on details such as grammar or mistakes during formative assignments but still encourages attention to detail in final submissions.
- Do not penalize students for taking risks in digital presentations. The grades should not suffer if the learning outcomes are recognized, but technology errors can be unpredictable. However, I recommend encouraging students to have a technologically-basic backup if such events occur.
- A contract might outline that students must outline definitive parameters around certain variables such as timelines to receive the defined grade (Melzer et al., n.d.).
- The advantage of contract grading is that students decide how much work they wish to do for a particular assignment or in a specific semester. If they complete the work and follow clear standards using a rubric, they secure the grade outlined in the contract (Davidson, 2015).
- Contract grading can be done in a variety of ways. One can stipulate that there are only two possible grades for an assignment: satisfactory (full credit) or unsatisfactory (poor quality, late, or not submitted). If a student fails to complete a contracted assignment or the assignment is deemed unsatisfactory by educators or peers, they will receive a contract-defined penalty. Another approach is to invite students to develop a contract for a specific mark. This process is either negotiated individually or constructed from a set of requirements prepared by the instructor. For example, to earn an A, a student must complete ten or more satisfactory assignments in a specific category. To achieve an A- they must complete 8-9 satisfactory assignments, and so on. See the section on Specifications Grading below.
- At the start of the term, learning contract details should be outlined and constructed either by the instructor or collaboratively with students. It guides students' understanding of expectations associated with a specific grade.

Possible Challenges

- Contract grading requires significant front-end work as the instructor must outline particular requirements for each assignment and the minimum standards for each final grade. However, educators can work with students at the start of the term to construct the outlines. Even in an online format, the criteria for contract grading are arguably no more than in a traditional course in which quizzes, tests, and assignments carry specific weights as outlined at the start of the semester. Communication must be clear; a video posted in the course LMS is helpful in that students can revisit it to clarify questions about the grading scheme.
- Students may develop contracts for a particular grade but face personal challenges that change their desired grade. Perhaps circumstances prevent students from completing coursework, or, conversely, students are more enthusiastic about the course than they initially thought and therefore seek to contract a higher mark. Or maybe – imagine – that there's a global pandemic and students or their families become ill. Be prepared to address changes with students that consider specific personal needs or challenges.

- Potential criticisms of contract grading argue that because effort and labour are considered (instead of a final exam or assessment), students who try hard can be rewarded even if they do not produce something polished or perfect. However, building in satisfactory/unsatisfactory criteria helps ensure the grade's integrity. If a student receives an unsatisfactory mark, they can either accept it and the associated penalty or resubmit until their work meets the satisfactory elements of the assignment.

Resources

- Ryan Cordell, How I Contract Grade
- Grading Contracts 101 [PDF]

EXAMPLE 3: SPECIFICATIONS GRADING

Overview

Specifications, or specs, grading is an assessment strategy based on mastery, clear learning objectives, and frequent evaluations and feedback (Tsoi et al., 2019). Instead of using points to assess student work, the specifications grading scheme considers work on a two-level rubric: Pass/Fail or Satisfactory/Unsatisfactory. Instructors establish a set of specifications, colloquially called 'specs,' for assignments so that all students have an example of a satisfactory submission. When assignments are complete, the instructor simply categorizes them as Satisfactory or Unsatisfactory depending upon whether it meets the specs or does not. In this grading system, there are no points, so there is no partial credit. Specs grading is particularly suitable to STEM fields, where learning is less subjective, and a student can either demonstrate understanding or mastery or cannot. Proponents of specs grading argue that it saves time and helps to eliminate ambiguity (Talbert, 2015).

DESCRIPTION

- Students earn letter grades in the specs system by completing "bundles" of work like traditional grading. The higher the grade, the larger and broader the collection of work becomes. For example, students who aim for a C in the course will complete some work that meets the specs. Those seeking a B have to do everything the C people do, but more work at a higher quality or difficulty level. Similarly, students working toward an A do everything for a B level, plus even greater quantity and quality.
- Consider Talbert's (2015) specs graded mathematics course. He created a list of 20 basic skills that he deemed essential building-block skills. These became students' Learning Targets and were connected to the four major topics in the course (proof, graphs, relations, trees). For example, specifications included:
 - The ability to identify the used predicate in a proof by mathematical induction and use it to set up a framework of assumptions and conclusions for an induction proof; and
 - Describe a valid vertex colouring for a graph and determine a graph's chromatic number.
- Specs grading should not be a one-shot deal for students. Tsoi et al. (2019) suggest that courses graded by specs should offer students multiple opportunities to demonstrate their understanding and abilities.

POSSIBLE CHALLENGES

- Specs grading can demand additional time from instructors when students resubmit assignments multiple times. Mitigate these demands by offering peer review opportunities or providing video instruction for common errors so that students can revise their work accordingly.
- Specs grading requires organization and planning. Although the specs grading system is not more complex than traditional grading systems, it is different. Therefore, it requires that students buy into the system. They need to read the syllabus carefully, organize their work promptly, mark due dates, and resubmit dates well in advance. While time management is often not amongst students' most significant assets, the organization and planning demanded in specs grading offers the opportunity to practice this vital skill.

Resources

- Matt Salamone's example of specs grading in mathematics
- Eric Reyes's example of specs grading in mathematics

General Resources

- 5 Lessons for Teachers from the Ungrading Movement: A comprehensive discussion on upgrading addressing many questions for educators considering this approach.
- Clarissa Sorensen-Unruh on Ungrading : A series of blogs on key areas of upgrading (self-assessment).
- Starr Sackstein on Ungrading in Higher Education: A short article on how upgrading can be achieved in college.
- John Warner on Choice: Addresses issues of grading, why students believe it is important and how to deal with resistance to ungrading.
- Schinske & Tanner on Teaching More and Grading Less [PDF]: Academic article on shifting the focus from grading to teaching (and learning).
- Teach Anywhere: Guidelines, research, blog posts and helpful resources on upgrading.
- Ungrading: A Bibliography: A great set of starting resources on upgrading (e.g., foundations, discussions, research) from Jesse Stommel.

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PART VI

USEFUL TOOLS

In our penultimate section, we start with two chapters offering multiple suggestions for resources and useful tools for the online educator:

- *Digital Tool Box for Online Learning*
- *Open Educational Resources: Supporting Diverse Learners*

We then shift the focus on how to create effective videos and how to meaningfully integrate them into an online learning environment. The two chapters target:

- *Video Production for Online Learning*
- *Effective Video Use in Online Learning*

Digital ToolBox for Online Learning

STEPHANIE THOMPSON

INTRODUCTION

Although educators in Ontario schools, colleges, and universities have been embracing technology at the point of instruction and learning in varying degrees for quite some time, the pandemic has significantly impacted the uptake of these technologies over the past two years. As a result, teachers have faced the additional responsibility of selecting, learning, and implementing several digital tools to keep their students engaged and learning in virtual and face-to-face learning environments. However, without adequate training or targeted professional development, how are teachers to know which tools to use and how? How will they ensure that deep learning (Fullan, 2013) occurs? Moreover, how can they harness the power of these tools to enhance their assessment practices?

TEACHING AND LEARNING

An abundance of research has shown that learner engagement is paramount to their success in learning (Herrington et al., 2003). Today's learners are no exception; however, students of today demand access to an increased quantity of information and the availability of emerging technologies in the classroom to optimize their learning (Yang & Wu, 2012). Robin (2008) believed that through these multimodal technologies, teachers could motivate students to learn and that significant gains could be made in the areas of higher-order thinking and problem-solving abilities such as analysis, synthesis, and evaluation (Forehand, 2010). Furthermore, teachers can make their students' thinking and learning visible by implementing accessible, user-friendly, collaborative software tools such as the five examples shown in this chapter (Hattie, 2012). Also, students can develop essential transferable skills or global competencies such as collaboration, communication, creativity and critical thinking (Fullan, 2013; Tiven et al., 2018).

The key to engaging students in the learning process is to integrate technology into meaningful activities that enable them to construct their knowledge in ways that did not exist before the advent of new technologies (Dexter et al., 1999; Sadik, 2008; Trilling & Hood, 2009). Additionally, students are more engaged in learning when interacting with their peers in a socially constructivist learning setting (Vygotsky, 1978) that is both low-risk and highly participatory. Social constructivism theory suggests that successful teaching and learning rely on interpersonal interaction and discussion, focusing on the students' understanding of the discussion (Prawat, 1992). With minimal setup, the tools in this chapter can provide these opportunities for stu-

dent collaboration, interaction, and fruitful discussion. These low-floor, high-ceiling web-based resources are described in detail in terms of the features they provide, how they can be used to enhance teaching and learning, and how they can be employed as effective assessment tools in online classrooms.

ASSESSMENT

Most teachers will agree that providing ongoing assessment for learning with effective descriptive feedback can be challenging (Black & Wiliam, 1998; Ambrose, 2010) in both face-to-face and virtual learning environments. However, the benefits of formative assessment in improving learning outcomes and bolstering student achievement are well documented (Hattie, 2007). In a review of the literature on assessment and classroom learning, Black and Wiliam (1998) found firm evidence that “innovations designed to strengthen the frequent feedback that students receive about their learning yield substantial learning gains” (p.7). The tools described in this chapter can all be used to make student learning visible (Hattie, 2012), provide teachers and students with opportunities for formative assessment, and facilitate ongoing descriptive feedback. Using the many features available in these platforms, teachers can decide when and how to give timely and specific feedback to individual students or the class as a whole. For example, suppose teachers notice significant gaps in understanding a concept based on student responses as a whole. In that case, they may wish to provide further explanations or additional examples for clarification to the whole class. Alternatively, teachers may provide targeted additional instruction to individual students whose responses indicate that they require support.

However, not all feedback must come from teachers to be valuable; students may use the tools to engage in peer and self-assessment practices. As Ambrose (2010) wrote, “with explicit guidelines, criteria, or a rubric, students can provide constructive feedback on each other’s work. This approach can also help students become better at identifying the qualities of good work and diagnosing their own problems” (p. 151). Additionally, according to *Growing Success* (2010), Ontario’s policy document on assessment and evaluation, “group work provides students with opportunities to develop and practise skills in peer and self-assessment and gives teachers opportunities to model and provide instruction related to applying success criteria, providing descriptive feedback, and developing collaborative learning skills” (p. 35). The tools described in this chapter can help students develop their peer- and self-assessment skills and the metacognitive skills that can help them improve as learners (Stanton et al., 2021).

GENERAL GUIDELINES

The five tools described in this chapter have been selected based on their ease of use and embedded features that, when utilized to their full potential, can help students develop their skills in Fullan’s (2013) 6 C’s of deeper learning:

- **Critical Thinking & Problem Solving,**
- **Creativity,**
- **Communication,**
- **Collaboration,**
- **Character Education,** and
- **Citizenship**

These digital tools can challenge students to think critically, problem-solve, work collaboratively, communicate with their peers and instructor, and help them develop as global citizens. Additionally, as assessment is an integral component of lesson planning and design, the tools provide educators with valuable assessment data on student achievement and well-being, informing teaching and guiding the next steps.

Each section below contains a description of the tool, its use in teaching and learning, how it can be used as an effective assessment tool, examples to illustrate its use in the classroom and possible challenges with using the tool.

TOOLS

TOOL #1: PEAR DECK

Overview

Pear Deck is a free, Google-based, interactive presentation tool that can be used in a variety of ways to engage students in individual and collaborative learning actively. When used as an extension of Google Slides, Pear Deck elevates the learning experience from a static presentation to an interactive and participatory lesson. For example, teachers can create diagnostic or formative assessments from existing templates that can be implemented at the beginning, middle or end of a lesson. In addition, students can work collaboratively or independently, in the classroom or remotely. Teachers can select several types of question/response activities. For example, students can drag their responses to a prompt in an agree/disagree or thumbs up/thumbs down screen, respond to multiple-choice questions or draw or type their answers to open-ended questions.

Teachers can display individual student responses or make responses anonymous, enabling them to make their students' learning visible without singling out individuals. Teachers can also pause, slow down or back up the lesson based on student needs.

Description

Teaching and Learning

- Pear Deck provides several pre-made and customizable prompts and interactive activities that enable teachers to actively engage students with the lesson content and the learning process. For example, students may respond to questions, complete concept maps, answer polls, share their ideas through drawings, text or images, post their observations, questions, wonderings or solutions and provide supporting evidence to support their ideas, either individually or as a class. Teachers may also publish student takeaways, which give students a record of the lesson and their responses which they can later use to review concepts or for test preparation.
- Active learning strategies such as discussion and participatory activities can significantly reduce achievement gaps and improve student achievement outcomes (Theobald et al., 2020). Students may also share their ideas anonymously through the Pear Deck teacher dashboard, which encourages participation from quieter students, ensures that all student voices are represented, and provides opportunities for students to learn from one another.
- Pear Deck promotes the development of Fullan's 6C's of deep learning (2013) by reminding teachers to incorporate critical thinking and complex problem solving daily in their teaching and by providing

templates that focus on critical thinking and collaboration in various ways of communicating.

Assessment

- According to *Growing Success* (2010), “assessment plays a critical role in teaching and learning and should have as its goal the development of students as independent and autonomous learners” (p. 29). Using a backwards design model (Wiggins & McTighe, 2005), assessment should be planned simultaneously with instruction and integrated seamlessly to guide instruction, inform next steps, and help teachers and students monitor students’ progress towards achieving learning objectives.
- Pear Deck’s embedded tools allow teachers to easily integrate diagnostic and formative assessments into each lesson, providing students with opportunities to make their learning visible and demonstrate areas of strength or need. This approach allows teachers to use the data to adapt their lessons to meet all student needs. Teachers can quickly gauge the class’s overall understanding, address any knowledge gaps that may exist, and adjust their lessons accordingly. Teachers can use the feedback tools to provide timely, targeted, and individualized feedback for students who require additional support.
- Pear Deck’s design promotes the development of metacognitive skills. It assists students in learning how to learn by providing formative assessments and feedback in real-time and opportunities for students to reflect on their learning, close gaps, correct misconceptions, and develop a growth mindset (Rathakrishnan et al., 2018).

Possible Challenges

- Pear Deck’s platform and the collection of pre-made templates are quite extensive and can be overwhelming for teachers who are new to the tool. However, many tutorials, webinars, and videos are available to walk teachers through the various components.

Resources

- Pear Deck Templates
 - Remote Learning using Pear Deck
 - Teaching with Peardeck
 - How to Engage Students using Pear Deck
 - Templates for Formative Assessment

TOOL #2: NEARPOD

Overview

Like Pear Deck, the Nearpod platform is a web-based application that enables teachers to take static lessons and transform them into interactive activities in the classroom and through a virtual platform. Some of the features [16:02] that can be embedded include quizzes, polls, audio files, videos, open-ended questions, matching activities, and collaborative whiteboards.

Description

Teaching and Learning

- Students can be invited to share their ideas and knowledge by drawing, posting a note or image, or typing their responses. Also, educators can create lessons from scratch. Hundreds of pre-made lessons for K-12 and higher education can be used or customized in any classroom, including topics that promote social and emotional learning (SEL), character development, and digital citizenship.
- Nearpod presentations can be controlled by the teacher or student-paced, which is useful when assigned tasks for homework, breakout groups, or asynchronous learning. Nearpod can also be used by teachers in its presentation format to enhance direct teaching as it makes a static slideshow more engaging by increasing its interactivity. In addition, educators can set up presentations to include accessibility features such as closed captioning and the immersive reader function, which may be necessary for students with exceptionalities but are beneficial for all students (Ontario Ministry of Education, 2013).
- To challenge students to think critically, Nearpod has a facility to create open-ended, rich discussion questions. To encourage students to develop their collaborative skills, they have introduced Collaborate!, a forum where students can share their ideas through written responses, images, links, or photos. Creativity is encouraged by the Draw It! feature, which can demonstrate the solving of equations or as a mind-mapping activity.

Assessment

- Nearpod contains several formative assessment activities that can make student learning visible and gather data on student learning. For example, teachers can create customized quizzes, polls, and open-ended questions to check for student understanding and inform future teaching practice. Nearpod then collects this data and creates reports to assist teachers in documenting student progress. Students can also self-assess their learning through a polling option in which they share their understanding of the lesson, which helps to build and develop their metacognitive skills.

Possible Challenges

- There is a bit of a learning curve with Nearpod compared to some other platforms, and it can take some time for users to become comfortable with the features. Nearpod offers a great deal of content, but the filtering system is not ideal, and teachers may need to have some patience as they search for the lesson content.
- As an American-based product, Nearpod may not correspond directly with Ontario curriculum expectations.

Resources

- Video Tutorial: Teaching with Nearpod [16:02]
- Making Virtual Learning Interactive and Accessible
- Using Nearpod as Formative Assessment

TOOL #3: JAMBOARD

Overview

Google Jamboard is an interactive digital whiteboard platform that teachers can use effectively in a virtual learning environment. Multiple users can contribute to a Jamboard synchronously or asynchronously from any location. The only requirement to access this free and user-friendly tool is a Google account. Work can be saved to Google Drive or as a PDF file.

Jamboard offers several features to annotate text, such as pens, markers, and highlighters in various colours. There is also a laser feature to briefly highlight areas on the boards. Participants can also add sticky notes to insert text into a Jamboard and upload images. Several customizable backgrounds are available, including graphing, dots, lines for writing, and scenes. Because there are 20 frames available on each Jamboard, teachers can have up to 20 groups working simultaneously. Frames can be easily moved around, duplicated, added, or deleted as needed.

Description

Teaching and Learning

- There is an almost endless list of ways that Jamboard can be used in the classroom to build the global competencies (Fullan, 2013) or transferable skills such as communication, collaboration, critical thinking, and creativity that students will need in their academic and professional lives. For example, students can collaborate in real-time to brainstorm, share ideas, curate images, resources, or research tools, draw collaboratively or independently, or create presentations. Students can be presented with a problem and work as a team, building on one another's ideas as they post on the Jamboard. For example, students can be given an equation to solve and graph in a math classroom. As students post their solutions, teachers can see how their knowledge evolves and how consensus builds on the correct response. Teachers can then debrief the exercise to address any misconceptions students might have had.
- Jamboards can also be used to determine prior knowledge and as a review at the end of a unit for test preparation. For example, an effective small group task could be to annotate an image, map, painting, historical photo, diagram, or short article and then share results with other groups. Students can do the annotation activity in a classroom setting or breakout rooms in a virtual platform such as Zoom or Google Meet. Teachers can also use Jamboard to do a four corners activity or create a concept map.

Assessment

- Due to its ease of use, accessibility, and range of features, Jamboard allows students at all proficiency levels to demonstrate their learning by sharing and defending their answers and reflecting on their next steps in the learning process (Epstein, 2021).

Possible Challenges

- Although students can upload images, there is no facility to add other media forms such as audio or music files or videos.

- Multiples of students editing at once will slow down the process.

Resources

- 10 Jamboard Templates for Virtual Learning
- Lesson Ideas
- Collaborating with Jamboard
- Making Student Learning Visible with Jamboard

TOOL #4: FLIPGRID

Overview

Flipgrid is a free, interactive platform where teachers and students can engage in video-based discussions. Teachers can set up forums and assign topics or provide prompts to which students respond in video format. Videos can be between 15 seconds and 10 minutes in length, with teachers setting the parameters. Teachers can provide feedback to individual students by written response or video. Student videos can be made private so that they are only visible to the teacher. They can also be used more as a discussion forum [PDF], whereby students view one another's videos and contribute their comments via text or recorded responses. There are several filters and tools available to students to customize their videos; students who are uncomfortable with being on video can use emojis in place of their images or submit an audio version instead. Students can also type out key points before recording their responses on the screen, and they can edit their responses using the pause, trim and re-record buttons.

Description

Teaching and Learning

- One of the benefits of Flipgrid is that it can help build communication and critical thinking skills by offering students an opportunity to articulate their ideas and responses to rich questions. After, they can plan, formulate, revise, and share their thoughts in their own time and experience the alternative viewpoints of their peers.
- The platform can be used for asynchronous learning and a flipped-classroom approach. Students are assigned a topic to research or a prompt to consider and invited to create a Flipgrid video response. The conversation can then continue in class the next day. For example, Flipgrid can be used in the mathematics classroom to describe how an equation was solved or in a science classroom to solve a complex problem or demonstrate design thinking or procedural knowledge. In addition, students can share their reflections on an assigned topic in other subject areas or reflect on their thinking processes to develop their metacognitive skills.
- As a teaching tool, Flipgrid encourages deep thinking, sparks discussion and encourages ongoing dialogue on relevant topics in the classroom. By providing prompts or questions that encourage students to think critically, question why or how, make comparisons or provide examples or evidence, teachers can inspire students to think deeply on topics. In addition, by having students respond to the videos of their peers, teachers are encouraging the development of communication skills and the ability to respect diverse opinions and perspectives (Davis, 1993). There are thousands of pre-

made topics that educators can explore to facilitate this. Teachers can also use the Shorts tool to create videos to share with students or parents via a link or a QR code.

Assessment

- Using video can be an effective way to make student learning visible (Morgan, 2013). Flipgrid offers built-in rubrics that are customizable and provide students with formative feedback.
- Students can also provide peer feedback either by written comment or video response.

Possible Challenges

- The many features of Flipgrid that make the tool fun and engaging to students can also distract students from the purpose of the assignment.

Resources

- Teaching with Flipgrid
- Building Community with Flipgrid [PDF]
- Digital Tools for Formative Assessment
- 9 Ways to Use Flipgrid in the Classroom

TOOL #5: PADLET

Overview

Padlet is a versatile and easy-to-use digital notice board that allows teachers and students to display images, links, audio clips, videos, and documents on a digital wall. As moderators, teachers can make the walls private, public or password-protected, allowing students and parents to join in the discussion.

Padlet can be used as a collaborative whiteboard or a way to curate information, resources, or research. Students can be required to display their names, or teachers can adjust the settings to post anonymously. Posting responses anonymously helps with sensitive topics or providing authentic feedback to peers. Teachers can also add moderators to discussions and enable the comment function to engage in richer discussions. Students can share work they have created, such as notes or assignments.

Description

Teaching and Learning

- Padlet's ease of use and variety of features provide many options for creative collaboration (Bond, 1983) and social constructivist learning (Prawat, 1992) in the classroom. For example, students may work in groups to explore a topic and curate research articles or other resources to share with the rest of the group. These resources could include text, videos, audio clips, or photos.
- Students could also use the draw feature to solve equations and problems in the mathematics classroom. Then other students could add comments about the different ways they may have

approached the problem. In the science classroom, it can be used as a way for students to collaborate on a lab report or to solve a complex issue. Padlet is also an excellent tool for brainstorming, ice-breaking activities, building community, reflecting, and responding to open-ended questions.

- Additionally, Padlet can be used for note-taking, to review a topic as quiz or test preparation, as a classroom message board, or even as a portfolio to showcase student work.

Assessment

- Padlet offers teachers the facility to view student work and make their learning visible at a glance at all stages of a lesson or unit. For example, Padlet can be used as a diagnostic assessment via a minds-on activity to determine prior knowledge. It can then facilitate peer assessment by allowing students to review and comment on one another's work. At the end of a lesson, teachers can use the tool to consolidate knowledge and/or as an exit ticket. The tool's versatility allows teachers to provide ongoing diagnostic and formative assessment and tailor lessons to individual and group needs based on student responses.

Possible Challenges

- Although there are several free features in Padlet, the more advanced features require an account upgrade.
- There is also a risk of students posting inappropriate content before the teacher can remove it.

Resources

- How to use Padlet
- Padlet for Teaching and Learning
- Examples of Formative Assessment Padlets
- Creative ways to Use Padlet in the Classroom

GENERAL RESOURCES

- Cult of Pedagogy offers articles, videos, podcasts, access to teaching resources, and courses run by teachers for teachers on a wide range of educational topics.
- Edutopia is a research-based blogging site that provides articles on a wide range of topics for educators. The link above includes information on various tools that can be used to enhance teaching and learning in virtual and face-to-face classrooms.
- Teachers Guide to Tech is a digital resource that contains descriptions of over 450 educational technology tools and how to use the tools in the classroom. The resources are grouped into assessment tools, interactive lessons, video creation tools. It is available for download at the cost of US\$25.
- Teachthought is a professional development site for teachers and administrators that provides workshops, articles, podcasts, etc., on various relevant topics. The link above provides recommendations for tech tools that facilitate collaboration amongst teachers and students.

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Open Educational Resources: Supporting Diverse Learners

SARAH ANN STOKES

INTRODUCTION

Open educational resources (OER) are resources for teaching and learning in the public domain or are openly licensed, permitting free and perpetual access and permission to use, edit, and share them (Creative Commons, n.d.). OER are generally digital but can also include non-digital resources. Proposed initially to provide learners in developing countries with free and accessible educational resources, the OER movement has grown in popularity in many countries worldwide. It affords benefits to support underrepresented learners in the post-secondary system. OER and their integration into curriculum, participatory technology, reflective practice, and collaborative learning form the basis of open educational practices (Hegarty, 2015). Open education and OER can support learners in a variety of contexts, supporting social presence (engaging with participants), cognitive presence (engaging with content) and discourse, as outlined in the Community of Inquiry model (Garrison, 2011).

ACCESSING LEARNING RESOURCES

Visiting the university bookstore is a common outing for post-secondary students when classes begin. And while the prospect of buying a stack of glossy books new in their wrappings is exciting, students may not be prepared for the financial costs associated with purchasing these resources, which, on average, can amount to between USD\$450 and \$635 per semester (Hanson, 2021). The costs of university and college textbooks increased by over 1000% between 1977 and 2015. Each new textbook edition rises an average of 12% over the previous edition (DiGangi, 2015). Even in the age where many resources can be found online, students still shoulder much of the cost for textbooks, online homework systems, and other digital resources they need to support their studies.

While the professor often determines what learning resources are necessary for a course, it is almost always the student who pays for them (Allen & Seaman, 2014). As many as 57% of surveyed students at the University of Guelph declined to purchase textbooks because of their cost (University of Guelph, 2016), while at the University of Florida, 45% reported avoiding registering for a course, and 27% reported dropping a course because of high textbook fees (Donaldson et al., 2012). Students used to turn to the library to find textbooks to borrow. The digital model has disrupted this practice, making digital copies of books available online for a subscription fee. Digital copies of textbooks can cost libraries up to seven times the cost of a

single print resource and come with user access limits and annual renewal fees (McColgan, 2020), putting pressure on continually underfunded library systems. Textbooks are increasingly available in a digital format, with no print copy available. The University of Guelph indicated that up to 85% of required course textbooks are available only in a limited-access digital-only version (University of Guelph, 2020). This access-controlled digital model prevents students and institutions from sharing resources, selling used copies, or even allowing them to maintain perpetual access to resources for future use.

The rising costs of teaching and learning resources do not only affect post-secondary institutions – K-12 markets are also experiencing a substantial increase in resource costs. There is a seemingly limited marketplace, with a somewhat limited group of K-12 publishers delivering content to a small number of customers (provincial ministries of education or local school boards). Taxpayer dollars are used to purchase textbooks, typically aligned with provincial curricula (Blomgren, 2018). However, the high initial costs, combined with the pilot and revision cycle of publishing, means schools would typically use textbooks past the time when the content becomes dated (Blomgren, 2018).

OPEN EDUCATIONAL RESOURCES

Open educational resources (OER) were initially created to provide high-quality, low-or-no-cost learning resources for developing nations. Since their inception, OER are also used in K-12 and post-secondary education in developed countries, finding a niche in education by providing intentional and relevant textbooks and other media, collaborative content creation, and additional opportunities for contribution to the elevation of the teaching profession (Blomgren, 2018).

OER Licensing

Unlike traditional copyright practices, open licensing permits far greater flexibility in how students view, save, edit, and share resources. The common phrase, all rights reserved, on a piece of copyrighted material means that the usage rights for the material are reserved for the author or the rights holder, often the publisher. These rights include the ability to share, copy, or use portions of the work for other purposes. Instructors might wish to post a particular diagram from a textbook to share in a set of slides or include a digital copy of a textbook for download on a website; open licenses afford these uses, but not by copyright restrictions. Open licenses include open-source licenses for software (Mozilla Public License, Apache License 2.0, etc.), GNU General Public License, and more. Often, organizations may have their own version of an open license (e.g., IBM Public License or Microsoft Public License). Creative Commons licenses (CC licenses) are some of the most commonly used open licenses and feature a standardized series of license codes combined to customize permissions to use the work.

CC licenses include:

- **CC**: Creative Commons license applies to the work
- **BY** (Attribution): attribution must be given to the original author of the work
- **SA** (Share-alike): users must apply the same type of license to any versions of the work they create based on the original work
- **ND** (No derivatives): users may not modify the work
- **NC** (Non-commercial): the work may not be sold or used for commercial gain.

The licenses give authors the freedom to release the work while indicating what users may do with the particular material (Creative Commons, n.d.).

OER Rights of Use

When a resource is labelled with a CC or other open license, there are various ways educators may use the resource in the classroom. Any material with a license other than ND (no derivative works) may be used in some or all of the following ways (Wiley, n.d.):

- **Retain**, keep and maintain copies for own use;
- **Reuse**, reuse multiple times, for any purpose, in perpetuity;
- **Revise**, adapt, change, or add to the work;
- **Remix**, combine multiple OER to create custom works; and
- **Redistribute**, share works with others.

OER Usage

Current OER resources and use patterns typically lean toward the professional and post-secondary level because the K-12 sector typically purchases textbooks directly from the publisher (often with oversight from the board on the students' behalf). However, there is a place for open education within the K-12 sector. Indeed, OER can be used in a supplemental fashion and for inquiry-based pedagogy. An OER can be used to supplement an existing textbook that examines a topic or discipline from a particular perspective, such as a Canadian Edition OER supplementing a U.S.-based textbook. They can also be used as primary resources, whether for traditional studying or to support student engagement and the collaborative creation of resources (see Activities in this chapter). OER provides instructors and students ways to engage with learning resources in a much more flexible and free (minus the cost of personal computers) manner than traditionally experienced, for a significantly reduced cost. Recognizing this need and further research could perpetuate open education in a cross-sector fashion, allowing for a more inclusive use of open pedagogy.

Supporting Diverse Students

The population of learners in Canadian higher education has changed significantly over several decades (Michalski et al., 2017). In the past, students were more homogenous and came from predominantly White, affluent backgrounds (Kirby, 2008; Michalski, 2017). Post-secondary institutions welcome students from diverse backgrounds, identities, socioeconomic statuses, abilities, and orientations. While student demographics have changed, post-secondary institutions have struggled to keep students long enough to award them a degree or diploma, as diverse student populations can experience additional barriers to equitable access to higher education compared with their peers (Michalski, 2017). Some of these student groups in Canada include Indigenous, those with disabilities, first-generation, and international. These barriers include access to education, participation in educational activities and class learning outcomes.

Openly licensed materials are still becoming established in the K-12 sector. However, the continual rising costs associated with education and the emphasis on digital materials make OER an increasingly attractive choice for educators and K-12 administration (Blomgren, 2018). Using OER in the K-12 classroom provides a cost-free way for teachers to address students of different backgrounds without waiting for the typical publishing cycle to offer updated editions of textbooks. In addition to cost savings, OER can allow local and community engagement and context to be added to typically unavailable resources, particularly for small or remote communities.

Access to Education

One of the most oft-cited reasons for using OER is to alleviate financial barriers to higher education. Students have reported avoiding buying textbooks or even registering for specific courses due to the additional costs of textbooks or other resources, such as online homework or quizzing subscriptions (University of Guelph, 2016). Students from diverse backgrounds can be disproportionately affected by the high price of resources. Because OER are accessible free of cost, they hold the potential to provide some level of financial relief for students who may come from disadvantaged socioeconomic backgrounds.

OER can achieve equitable access to education by reducing access restrictions, specifically time and location. OER can bring global educational contexts to diverse groups of students while at the same time affording a localization of content to link students' experiences to learning (Willems & Bossu, 2012). Students can access material written by global subject matter experts, but at a level and a language with which they are familiar. This accessibility is accomplished, in part, through the primarily digital nature of OER.

Participation in Educational Activities

Depending on the licensing of OER, resources may permit sharing/saving, editing, translation, and more (Creative Commons, n.d.). This unique feature can allow faculty members to customize resources to suit their courses and student populations, considering their individual needs, backgrounds, and desired outcomes. OER enable faculty members to align their resources with current global, social and political trends (Ossianilsson, 2019). Current events, which impact the lives of students and their families, can be included for discussion and analysis, giving validation to their lived experience. Culturally responsive materials can be created and inserted into the freely available OER to improve participatory access to learning (Kalir, 2018).

Achievement of Learning Outcomes

Instructors have been skeptical about whether OER can make a noticeable difference in educational achievement. They often cite concerns over the quality and accuracy of OER compared to traditional resources. A notable review study by Hilton (2016) examined nine studies analyzing student learning outcomes in courses that use OER versus conventional textbooks in a post-secondary setting. While results could not be generalized to conclude that OER improved student learning outcomes, students who used OER fared no worse than those who used traditional textbooks. Providing the information that OER does not reduce the quality of learning compared to conventional textbooks (Colvard et al., 2018) is essential for giving instructors more choice in selecting appropriate and impactful resources for their courses.

Potential Challenges

Often, many of the challenges related to the adoption of OER surround educator perceptions, including:

- **Funding & sustainability.** OER requires educators and support staff to play a more active role in sustaining the tools (Carson, 2020; Delgado et al., 2019). However, the process can afford increased content adaptability to support the desired learning outcomes.
- **Quality.** Educators adopting OER independently have an increased onus to vet materials and contributor qualifications before implementation. Yet, resources found through consortiums or hubs listed in this chapter's *General Resources* section will likely have undergone review before release. Further, often the hubs have areas for peer-review from other adopters.
- **Time-restriction.** Educators may believe that integrating OER into pre-existing courses will be too

time-intensive. Indeed, there might be time demands associated with learning a new process or technology, but the process is often equal to or less than that of traditional materials (Tipton, 2020).

GENERAL GUIDELINES

Usage of OER in courses can be as varied as the courses themselves. Implementing OER as a supplemental or primary resource for your course can be as simple as finding a resource online that you like or as complex as building a resource from scratch with your students.

IDENTIFY YOUR RESOURCE NEEDS

Consider what kind of resources you require. Think about:

- Availability of print or digital access.
- A primary resource or one to supplement other resources you already use.

Consider the content of the resource:

- Should the text be a general overview or highly specific to a particular topic or discipline?
- What level should the resource be? Is it intended for new, intermediate, or experienced learners?

Consider your students. It is essential to think about:

- Your students have specific accessibility needs (for instance, closed captioning support).
- Students' reading levels, including if English is an additional language for all or some.
- Their technological abilities. Do students know how to access online resources? Do they have devices and stable Internet or data connections?
- Any other barriers to educational access or participation.

Perform a curriculum analysis. To do so:

- Analyze your course for learning outcomes and topics covered in the course.
- Compare your learning outcomes to the existing resources you use. Are there any gaps between the two? How are these gaps addressed?
- Recruit peer or institutional support (e.g., an experienced co-worker, IT, or a Teaching & Learning Centre) to help address gaps beyond your scope.

FIND OER THAT CAN ADDRESS YOUR NEEDS

Once you have a firm understanding of the resources your students require and the content they must cover, you can use this information to select the appropriate OER.

Use one of the many OER repositories to search for suitable resources.

- Some online resources include the Ontario Open Library Portal, BC Open Textbook Collection, MERLOT, and MIT OpenCourseWare, to name a few.
- You may wish to enlist a teaching partner, educational developer, or librarian to assist you.

- Examine the ability of the OER to address your identified needs. Are there areas of weakness that need to be adjusted or replaced? Can you fill those areas yourself, or is there another OER that can be used in those areas?

REMIX OER COVER CURRICULUM OR MATERIAL GAPS

Use OER to fill in gaps, either as supplementary or primary resources.

- You may choose one or more OER to use, depending on your students' needs and those of your course.
- OER can fill in gaps not filled by traditional resources. Some OER can also fill in gaps not filled by other OER. You can remix OER in one document or flip between them throughout the course, as needed.

BUILD OER FOR GREATER FLEXIBILITY

If your discipline is highly specialized or you can't find a resource you like, consider building an OER from scratch.

- Use existing OER or your material as sources.
- Work collaboratively with other instructors or graduate students to lighten the workload.
- Consider asking for student input, such as reviews or focus groups, or have students create material, like study questions or chapter summaries.

ACTIVITIES

ACTIVITY 1: ADAPT THE CULTURAL CONTENT OF A RESOURCE

Overview

Invite students to lend their own cultural or experiential content to a resource to increase its meaning and value while asking students to create their connections with the material.

Description

It can be challenging to find textbooks that address students' points of view from varied cultural backgrounds. Often when cultural perspectives are addressed, they are done only from a superficial perspective. Inviting students to add their own cultural and experiential perspectives to existing OER drives student engagement with the content (cognitive presence) and encourages learning about others in the class (social presence).

Ask students to identify examples in an existing work that highlight a particular culture, or need an additional cultural perspective. These examples can be highly personal, so approach the selections from a guidance-oriented point of view. Then, have students rework the examples, bringing in their own cultural or experiential background. For instance, in a mathematics example requiring calculating the ratio for milk to flour to eggs

for a pancake recipe, students may change it to calculating the ratio of water to rice to tomatoes for a traditional rice dish. Ensure students also include the answer or solution to any questions or problems they create. Students may wish to have a cultural summary or a personal biography to increase personalization.

Possible Challenges

Students may find it challenging to determine areas that require additional changes from a cultural perspective. It may be worthwhile to compile a list of suggested areas to support students through personal or even class reflection activities.

If attempting this type of change is too lengthy or too large in scale for your context, a smaller scale project can be attempted by focussing on a single online module, chapter, or learning object.

Resources

- OER Fund(ed): Bringing culture and community to online language learning
- Using Open Educational Resources to Create a Culturally Relevant Classroom | Achieving the Dream

ACTIVITY 2: REMIX OER WITH STUDENT INPUTS

Overview

Encourage students to delve deeper into a topic by incorporating OER authoring into a course assignment.

DESCRIPTION

Incorporating peer review and community openness is a way to engage students in higher-order thinking. Studies have shown that students put more effort into their work and look beyond a superficial understanding of a topic when their peers view their work (Liu et al., 2001). As a course assignment, ask students to create, revise, or edit introductions, summaries, or other features of an existing OER. Build time into the assignment deadlines to facilitate a structured peer review session and allow time for revision. Then, incorporate student work into the OER, and use it for the next iteration of the course. This process encourages students to engage cognitively with the material and promotes social presence in a way that consumption of material alone cannot provide.

Possible Challenges

Students may require scaffolded support in the peer-review process to achieve beyond-superficial comments. This support might come from prompts provided or specific training in giving feedback. Students should be permitted to withdraw their work from the OER at any time. A consent form can be delivered to students, outlining the use of their work, the type of license applied and allowing them to withdraw their material at any time.

Resources

- Students' Vital Role in OER

- What Are OER, Why Are They Important, and What are the Barriers to Adoption?

GENERAL RESOURCES

- Open Library – eCampus Ontario. The eCampusOntario Open Library provides educators and learners access to more than 600 free and openly-licensed educational resources.
- OER Commons provides an extensive library of resources for all grade levels.
- Open Education Group offers resources to support OER adoption, including an impact calculator, toolkit, and a textbook cost-savings calculator.
- TEDxNYED – David Wiley: Open Education & the Future (2010) [14:55]: Insights from an early innovator in developing openness in education.
- United Nations Open Educational Resources (OER) Hub provides insights regarding OER and their global benefits, diffusion, and resources.
- COLcommons.org provides open courses from the *Commonwealth of Learning* to support educators with open education and digitally-assisted learning.

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Video Production for Online Learning

ALISON MANN AND ROBIN H. KAY

INTRODUCTION

Research identifies the importance of engaging students early in online and blended courses to increase motivation and improve retention. Instructor videos have become one of the many ways to effectively interact and communicate with our students in online learning environments. Instructor videos can improve overall course quality, increase student engagement (McAlister, 2014), significantly reduce course dropout rates (Brecht, 2012) and provide students with increased control over their learning (Zhang & Zhou, 2006). Teacher videos enable students to control their learning pace and regulate their information intake by reviewing, pausing and replaying at will. Moreover, both teacher and student videos can increase social presence and humanize online learning environments.

For instructors, creating course videos helps build up a set of resources over time for future cohorts. Using video, instructors can take learning beyond the four walls and capture their lessons in situ. The benefits of using instructor-created videos are numerous and comprehensively outlined in the Video Use chapter. Some practical examples of videos include:

- course/unit/lesson introductions and announcements (to increase social presence);
- procedural learning (e.g., a math tutorial or a sports demonstration);
- student feedback videos (offers another mode of feedback beyond text);
- micro-lecture (chunking lessons); and
- conceptual learning (e.g., introducing complex or abstract topics).

This chapter aims to guide the production of high-quality and effective videos for instruction and connects with the Video Use chapter, which focuses on integrating videos into online secondary school and higher education settings.

GENERAL GUIDELINES

TAKING A RESEARCH-INFORMED APPROACH

A growing body of research backs the use of instructor videos to support student learning. Two key areas of research we will look at in this chapter include the Community of Inquiry (CoI) framework (Garrison, 2012, 2020) and Brame's (2015) effective educational video elements.

The Community of Inquiry (CoI) framework is a valuable model for facilitating and guiding meaningful learning experiences in online and blended learning environments comprising three intersecting dimensions. These are social, cognitive and teaching *presences*. Below, we briefly expand on Garrison's (2016) presences and align them with potential video uses:

Social presence reflects the process of engagement and interaction, which supports the progressive development of relationships between learners.

- *Suggestions:*
 - Intro video: Model a video introduction and invite your students to do the same.
 - Walkthrough video: Use audio and video to offer directions for an activity or assessment (Lowenthal & Dunlap, 2018).
- *Benefits:* We can appear as real humans right in front of our students' eyes, supporting community and cohesion.

Cognitive presence refers to the process of developing personal meaning through sustained reflection. Or simply reflective thinking.

- *Suggestions:*
 - Use videos in discussion forums.
 - Stimulating situations in video form can be used to explore insights into unique situations (Banejee, 2020).
 - Embed questions in video lectures.
- *Benefits:* Provides meaningful direction, aligning insights with reality.

Teacher presence anchors and focuses on social and cognitive processes, providing directionality through the facilitation of learning outcomes.

- *Suggestions:*
 - Use a conversational tone and look at the camera as much as possible so your students feel you are speaking to them directly.
 - Assessment feedback can occur through video.
- *Benefits:* Provides meaningful direction, aligning insights with reality.

Elements of an Effective Instructor Video

Cynthia Brame (2015), a scientist and science lecturer, offers insightful, research-based suggestions to apply when creating and implementing instructor videos. The recommendations include segmenting, signalling, weeding and matching modalities (Brame, 2015), aiming to minimize information overload. We outline Brame's (2015) four practices below, along with some examples aimed to reduce students' cognitive load:

Segmenting, or chunking is the practice of packaging small bits of new information. Students should be afforded some control to support self-directed learning.

- *Suggestions:*
 - Chunk video lessons into smaller segments by topic or theme.
 - Videos are concise, no longer than 5-6 minutes each.

Signalling, also known as cueing, positions on-screen symbols to guide information flow.

- *Suggestions:*
 - Highlight important information using colour, symbols, arrows, etc.
 - Assessment feedback can occur through video.

Weeding eliminates information that does not contribute to the learning goal.

- *Suggestions:*
 - Pay attention to extraneous information in the video, such as distracting music or objects.

Matching Modalities filters information across multiple senses to provide complimentary streams of insights on a given subject.

- *Suggestions:*
 - Use auditory and visual information at the same time. A typical example is a video showing key points bulleted on short segmented slides with an expansive audio overlay.

PRACTICAL SUGGESTIONS FOR CREATING VIDEOS

SUGGESTION 1: RECORDING YOUR VIDEO

Whether or not to be in your instructional videos is a well-debated topic. While some research points to the fact that instructor presence on screen can compete for attention with other content and detract from learning (Stull et al., 2018), other studies note that instructor presence positively influences students' perceived learning and overall satisfaction (Wang, & Antonenko, 2017). For this reason, I am purposeful and deliberate about my on-screen time. For example, I choose to be on screen to discuss and acknowledge, provide whole-class feedback and encouragement, or wrap up a video lecture. Doing so builds connections with students and increases my visibility in the online classroom. If I walk students through a procedure using on-screen visuals, I prefer to use a voiceover to focus on the visual information. Scroll through this video lecture [24:49] to see how I balance my on-screen time vs. visual information with a voiceover.

Recording yourself on video can feel awkward and unnatural at first, but stay with it! With time and many takes, you will get the hang of it, becoming more confident and comfortable with your video work. You can use a camera phone, a video camera, an iPad or even your computer to record yourself. If you use your phone to record, remember to shoot horizontally, as this will maintain the correct aspect ratio for editing later. I like to press record and keep the video rolling, even if I say/ do something I want to change. I will often pause and repeat something I've said and simply replace the new take in the editing stage later. However, in the beginning, you might choose to record *takes of your video* and decide on the best one to use. Remember that it's okay to fumble or correct yourself when needed. Doing so and keeping it in your final cut maintains flow and keeps your lecture or lesson feeling natural and authentic. The following are some simple set-up suggestions if you plan to record yourself.

Audio: Do not underestimate good quality audio. Try to record in a quiet space free from distractions. Simple background sounds like an air conditioner are often augmented in video recordings and can be pretty distracting. It is best to record a *take* and replay it for an audio and visual check. If you plan to edit your video, another tip is to hold a pause before you begin speaking. This *air* time allows for editing transitions.

Background: Be mindful of what is in the background as it can detract from your lesson. You may choose to pick a space representing you, blur the background, or add a filter. For blurring or filters, a green screen or area with little interference can help reduce undesirable visual experiences.

Lighting: Make sure your lighting is even and consistent (avoid windows behind you, as that creates a silhouette) and position yourself comfortably at eye level to your camera. Either natural or artificial lighting can have a pleasing effect. If I am shooting during the day, I like to position myself in front of a window.

The following is a list of components to consider when recording your video:

1. Creating a script outline.
2. Length of your video (4-6 minutes for most videos).
3. Camera framing and angle (consider a medium shot at eye-level, as seen above).
4. Lighting – try to make it even by using multiple light sources.
5. Your background.
6. Ambient sound (try to record in a quiet space).
7. Be yourself (humour, small talk, make a connection).

SUGGESTION 2: EDITING YOUR VIDEO

Tools

The video editing process is part of the *post-production* phase, where all of the video, images and sounds are assembled for meaning and prepared for upload and distribution. Editing can be a straightforward process but can get quite complicated and detailed when more media is incorporated. Fortunately, many software options suit novice users and experts alike. We suggest taking some time to decide which of the applications are best suited for your needs and skill level. You can find many excellent, basic tutorials on Youtube for all applications below. Here are some of the editing applications we recommend:

- iMovie (comes with Mac iPads and computers)
- DaVinci (the free version is outstanding, available for all platforms, steep learning curve)

- Moviemaker (for Windows only)
- Openshot (free, opensource, available for all platforms)
- Videopad (for Windows only)
- Lightworks (paid, all platforms)
- WeVideo (limited free version, works on all platforms, users can collaborate)
- You can do basic editing on Youtube and with Quicktime (Mac only)

Editing Your Video – General Steps

1. **Gathering your media.** As a first step in the editing process, open a folder on your computer that contains all media and materials for your video project. Moving your files into one place is done so that your editing software can follow one straight path to your media (do not delete or remove media from this folder during your editing phase). Be sure to follow the suggested elements from Brame (2015) above (weeding, signalling, segmenting and highlighting) as you edit. Moving your files into one place is done so that your editing software can follow one straight path to your media (do not delete or remove media from this folder during your editing phase). Be sure to follow the suggested elements from Brame (2015) above (weeding, signalling, segmenting and highlighting) as you edit. This folder will include:
 - video files (from your phone, camera or other devices),
 - still images,
 - music, and
 - any other forms of media you will require.
2. **Preparing the source folder.** With your media folder and video outline ready, you can now begin uploading all of your media to the *source folder* on your editing software. You can add new items to the folder at any time throughout the editing process.
3. **Preparing the rough cut.** Now the fun experimentation begins! A rough cut entails sequencing your recorded video segments and other items you've gathered (e.g., an image of a framework you'd like to discuss) linearly on the timeline. Once you bring your media into the timeline from the source folder, it is part of your video. I like to begin with my recordings as a basis for the rough cut. You can trim or cut your clips to include what you want. Then, you can start to add other media you wish to have, such as a visual framework, a photograph, or even a screencast. While this step sounds straightforward, it does take a lot of time. Be patient!
4. **Adding text.** Once you have arranged your sequence, you can then take some time to add text. Consider your intro title and course information. Consider Brame's recommendations for reducing the cognitive load (from above), especially *signalling* and *matching modalities*. Consider where you can add text to emphasize what you say in your video.
5. **Adding transitions.** Once you are happy with your rough cut, you can now refine with editing extras such as transitions (fade-in or fade-out). This step is the creative part, so have fun and experiment. I tend to keep transitions minimal and use them to signal the end of a learning segment.
6. **Preparing the final cut.** Once you have finished your rough cut, you can pass through the video several times and finesse your edits. Consider Brame's (2015) *weeding* step. Is there anything in the video you'd like to edit out? Did you miss anything on your outline?

7. **Export your video.** Once you are satisfied with your work, it is time to begin the exporting process. Again, this is different for all editing software, but there are many tutorials to help you along the way. Once you have your finished video file, you can upload it to your learning management system, Google Drive or Youtube.

SUGGESTION 3: SCREEN-RECORDING (GENERAL TOOLS)

For some instructor-created videos, you might focus on sharing a brief tutorial or demonstration from your computer. One of the best options for this scenario is screen recording software. A screen capture video is a recording of your computer screen for a set period. Depending on your objectives, it can: record everything that takes place on your browser, record your desktop actions, or record the entire screen. This approach works best for video tutorials, step-by-step instructions, explainer videos, presentations and more. Keep in mind that you can create a screen recording and add it to another video. For example, if you make a longer lecture video, you might have some on-screen talk, followed by a screencast of something you are explaining. Some of the applications we recommend include:

- Screencastify
- Snagit
- Quicktime (Mac only)

SUGGESTION 4: SCREEN-RECORDING WITH SCREENCASTIFY

Overview

For this suggestion, we will take you through some of the steps for creating a screencast using Screencastify. However, when deciding on which screen recording application to use, it's worthwhile to research and consider your objectives and requirements. You might also wish to test-drive a few applications before deciding which works best for you. In Figure 1, we break down some of the highlights and pros and cons of Screencastify:

Figure 1

Pros and cons of Screencastify

Pros:	Cons
<ul style="list-style-type: none"> • A simple Chrome browser extension • The option of a browser tab, desktop, or webcam only • Record your screen, face, voice, audio and more. The 'picture in picture mode allows you to record both yourself and the screen simultaneously • Records up to 5 minutes • "Trim" video editing option • Autosaves to Google drive • Use the tools to write, draw, erase, keep time, restart, or spotlight a section on the screen while recording 	<ul style="list-style-type: none"> • It only works with the Chrome browser • Cost: unlimited version (\$49/year) allows for unlimited recording with access to more editing features

Before starting your screencast, it's a good idea to have an outline prepared for what you'd like to communicate using Brame's (2015) suggestion to segment content to avoid cognitive overload. For example, if you have two concepts to teach, you might decide to make this into two videos rather than one long video. As you work through your screencast, remember to speak clearly and stay on point. Many screencast applications

offer a *highlighted cursor* option so viewers can follow what your cursor is doing on the screen. If you are new to screencasting, be aware that it often requires several takes until you are pleased with your video. Finally, your screencasts can be shared with students as stand-alone videos or embedded in longer lecture videos.

- Here is a brief tutorial [2:54] demonstrating how to install Screencastify.
- Here is a brief tutorial [1:07] on using picture-in-picture mode on Screencastify.

GENERAL RESOURCES

- How to make a lecture video.
- The lowdown on basic editing software options.
- An excellent five-step guide to making your instructional video.
- More on educational videos.
- Read about how to create compelling educational videos.
- ZOOM Tutorial- How to use a Green Screen [11:22] offers some general insights for blurred and filtered backgrounds.

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Effective Video Use in Online Learning

ROBIN H. KAY AND ALISON MANN

INTRODUCTION

In today's online and blended classrooms, video use is essential for student and teacher success (Heilesen, 2010; Kay, 2012, 2014a). Using video has been proven to increase student engagement (Lowenthal et al., 2020), enhance instructor visibility (Martin & Bollinger, 2018), and improve student learning in online contexts (Hsin & Cigas, 2013). Using video can shift control over students, determining the pace (rewind, pause, forward) and regulating their information intake. Videos are typically used to present information to students about concepts, applications and procedures (Kay, 2012, 2014b). Students watch these videos to help them prepare for class (e.g., a flipped classroom) or review for assignments or tests. Sometimes videos inspire and motivate students (e.g., TED Talks). In addition to instruction-based videos, Kay (2012) identified four other areas where videos can support teaching and learning, including administration, student assignments, feedback, and building community.

ADMINISTRATIVE VIDEOS

Administrative video podcasts provide course information on learning goals, lesson plan instructions, course policies, and homework or assignment expectations. Yes, this information could be offered in a written format, but students often ignore or miss course outlines, assignment descriptions, and homework activities (Berdahl, 2021). Videos can help provide clarity, creativity and focus (Cocciolo, 2015). This type of video helps build teacher presence by providing a more engaging format to present the structural organization of a course (Garrison, 2016). More elements are needed to support teacher presence, but without a coherent and articulated foundation, an online course can rapidly deteriorate into confusion and chaos (Waterloo Centre for Teaching and Excellence, n.d.)

STUDENTS VIDEOS FOR ASSESSMENT

Student assignment video podcasts offer a creative way for students to demonstrate various skills in a wide range of subject areas. For example, students can create video podcasts to show understanding of mathematics and science concepts, provide interpretations of art, written passages, or historical decisions, express fluency when learning a foreign language, or create a wide range of presentations (Kay, 2014a). Offering alternative ways to communicate knowledge and understanding can promote social presence by acknowledging differences and diversity among students (Garrison, 2016). Creating videos can also enhance deeper learning by stimulating creativity, communication and collaboration (Fullan & Langworthy, 2013).

FEEDBACK VIDEOS

Feedback-based video podcasts provide formative guidance to students about their progress or summative evaluation for assignments they complete. This type of feedback is more personal, authentic, supportive and interactive (Bahula & Kay, 2021), supporting teacher and social presence (Garrison, 2016). Video feedback can increase understanding and higher-order thinking (Bahula & Kay, 2021), leading to better communication and critical thinking (Garrison, 2016). See the chapter on Video Feedback for more details on this highly successful use of videos.

COMMUNITY-BASED VIDEOS

Finally, community-based video podcasts help build instructor-to-peer (teacher presence) and peer-to-peer connections (social presence) within an online learning course (Bahula & Kay, 2021). Instructor-to-student relationships can be improved with personalized answers to student questions using video podcasts. Student-to-student connections improve when they provide feedback to each other using video podcasts. New life can be brought to online discussions using video podcasts instead of written messages. The use of community-based videos can improve overall communication, stimulate critical thinking, and promote citizenship, all qualities of deeper learning (Fullan & Langworthy, 2013). Lastly, community-based videos can be a refreshing break from Zoom and offer more flexibility and equitable opportunities for all students to have their voices heard.

GENERAL GUIDELINES

Effective videos, regardless of purpose, need planning. Based on numerous articles about video use in education (Kay 2012, 2014), as well as over a decade conducting research on and using videos for teaching and learning, we offer the following general guidelines or suggestions:

1. **Meaningful Title and Context.** Select a meaningful title to situate your video in a clear knowledge structure or framework, particularly an instructional video. Bransford et al. (2000) noted that well-structured, organized knowledge leads to better learning and retention.
2. **Pre-Planning with a Coherent Structure.** After establishing a clear title, create a rough plan for organizing your video. For example, you could write down the critical points in the order you wish to make them. You could create or work off a visual map. Or you might work off a course outline or existing document. The more focussed and organized you are, the faster you will create the video.
3. **Avoid Perfection.** You want to create a good video, and it may take three or four takes, but most educators do not have the time to create a professional video. You could quickly and automatically edit out the filler words (e.g., uhms, ahs, like, you know) with a tool like Descript, but I would recommend that you live with the small mistakes. The other tip is to use "Pause Record" often while you create your video to give you time to collect your thoughts.
4. **Conversational Tone.** Students respond well to a relaxed, conversational tone. When recording, imagine that you are tutoring a student in person and sitting across the table from them. You want to be careful to guide but not judge. In video feedback situations, most students will be less receptive if there is a judgemental tone.
5. **Video Length (2-6 minutes).** If you consider creating one long lecture for your students, lie down and wait for the feeling to go away. Long, rambling feedback videos do not work well for four reasons. First, students lose focus and stop listening to them. Second, the student can be overwhelmed

with information and too many suggestions. Third, students cannot locate the points you make in your video when they want to review again—they have to listen to the entire video. Finally, long videos tend to include rambling and a lack of focus – at least mine do. Keep most of your videos relatively short—no longer than 5-6 minutes (see optimal video length). Note that if you add interactive questions in your video (e.g., EdPuzzle or Menti), they can be longer.

6. **Instructional Pace.** The explanation pace can significantly impact learning, particularly concerning cognition (Kester et al., 2006). Determining the ideal pace of a video can be challenging. Students who are struggling may need a slower pace. Stronger students might get bored quickly. I recommend using a moderately slow pace and assuming your audience does not understand your video content. Otherwise, why would they be viewing it? Note that the impact of pace can be partially moderated by the pause, rewind features and modify speed features of any video.
7. **Clear Layout.** Keeping the layout well organized, clear, and uncluttered is essential. Crowded, dense text over numerous screens can overwhelm a novice student (Clark & Mayer, 2016).
8. **Use Visuals – Limit Text.** There are few online lessons that I can think of where reading text off the screen would be effective (examples involve dramatic readings or language learning). In general, you could simply give students a written handout without the onscreen reading. Reading text from a screen impedes your message, forcing the audience to focus on the written words and your voice simultaneously (Clark & Mayer, 2016). Creating simple, easy-to-follow onscreen visuals will be more effective (Cocciolo, 2015). See the Video Production chapter for further information about using visual signals and signposts in your video content.
9. **Add Closed-Captioning.** What is essential for some students is often suitable for most students. Closed-captioning helps students understand your message, particularly if they have hearing challenges. It also allows students to watch your videos in public spaces when it is inappropriate to play audio. And it is not that hard to do. Youtube does it automatically when uploading a video and is about 80 to 90% accurate. Descript is even more precise and creates captions quite quickly. Zoom has automatic captioning if you want to record a video.
10. **Limit Distractions.** Clark & Mayer (2016) provide considerable evidence to suggest that distractions in dramatic stories, pictures and background music have a detrimental impact on understanding videos. If you were teaching in a face-to-face environment, it is unlikely that you would turn music on while you were teaching because it would be distracting. The same is true for background music in a video.

ACTIVITIES

ACTIVITY 1: INSTRUCTIONAL VIDEO – PRESENTING A CONCEPT OR PROCEDURE

Overview

Instructional videos are essential for any online or blended learning course. However, according to Kay (2014), creating an effective video is challenging and involves at least 15 components (see guidelines here[PDF]). However, if you follow the general guidelines above, you should create a helpful series of short, well-organized videos. These videos can be used in a flipped classroom, supplemental material, or exam review. Note that you do not have to create your videos – many already exist on the web. You do need to review them before you share them with your students.

Description

Instructional videos can help build teacher presence (Garrison, 2016) because the students hear your voice and feel that you are working with them directly and individually.

Offer an overview of the activity, including the learning purpose/educational outcome. This type of video can also build cognitive presence (Garrison, 2016) by stimulating thought, especially if follow-up activities build on the video content. If you ask students to create instructional videos, deeper learning can be enhanced through collaboration, communication, creativity and critical thinking (Fullan & Langworthy, 2013). Some examples of instructional videos might include:

- A worked example of a mathematics or science problem (e.g., Quadratic Function example [4:27]).
- An analysis of a multimedia item (e.g., website, piece of art, movie, framework) (e.g., Comparing 3 Online Meeting Tools [6:06] example).
- Hands-on demonstrations of anything you could present in a face-to-face class (e.g., Science Demonstrations).
- How to use a specific software tool (e.g., Perusall Intro [5:01]).
- Guidelines for writing (e.g., Writing an Academic Paragraph [2:26] example).
- Reading instruction (e.g., How to Read a Research Article [2:26] quickly).
- Instruction on physical tasks (e.g., How to Dribble [2:08] example).

Possible Challenges

A number of the challenges for creating good instructional videos are covered in the general guidelines sections. The biggest challenge, not included, is students not watching videos or watching only the first 1-2 minutes, which is a significant issue in a Flipped Classroom. To address this challenge, you need to attach an activity to each video. Students will not learn by watching a video once – the knowledge will not stick. To increase interactivity with video content, students could:

- After the video, complete a quiz in Google Forms or Quizlet to assess understanding.
- Submit practice problems based on a video.
- Create a mind map based on the key ideas covered in the video.
- Answering questions while the video is playing (e.g., with EDPuzzle or Menti).
- Work with a video in a TED-ED Module with multiple activities – time-consuming but worth it.
- Comment on the video and ask questions using Perusall [5:01].
- Respond to post-video reflection prompts.

Resources

- Screencast-O-Matic: Free (although it does have a paid version), easy to use, and perhaps most importantly, easy to store in the cloud and share videos.
- Snagit for Education: About \$50, but offers some editing options and provides a quick upload to YouTube.
- Quicktime for Mac users is free and offers both screen and video recording options. Basic editing is

also possible, but it is limited.

ACTIVITY 2: ADMINISTRATIVE VIDEO – COURSE INFORMATION

Overview

At the beginning of a course, a teacher has to address several administrative issues, including introducing themselves, providing a *big picture* overview, and reviewing the key course topics. Typically, this occurs during the first class and is a relatively dull way to begin learning. In an online course, creating a short video to introduce yourself, a big picture overview of the course, and a walkthrough of key areas of the course outline is an alternative way to address these administrative issues. Students can review these videos and ask questions before the course or a home activity after the first class. This approach allows the first class to be more exciting and include more engaging learning activities.

Description

I have mentioned three key activities that most instructors address before a course starts: an introduction video, a big picture video and a walkthrough of the course outline. Instead of describing the videos, I will offer links to a few examples:

- Professor Introduction [2:34]
- Big Picture Video 1 [3:21] and Big Picture Video 2 [0:50]
- Course Outline Video 1 [2:45] and Course Outline Video 1 [3:25]
- Instructor's Model of Teaching [2:53]

Possible Challenges

The main challenge I found is that students might not watch the videos. That is their choice, and of course, they can watch the videos later. Ultimately each student has the right to view and review course materials.

ACTIVITY 3: ADMINISTRATIVE VIDEO – LESSON PLANS

Overview

Lesson plan videos offer a brief overview of what will happen during a class, specific instructions for learning tasks, and guidance for home activities. While a bit time-consuming to create, I find these videos helpful in running an asynchronous class or guiding students who missed a class. I have also found them useful when teaching a course multiple times because the videos remind me of what I was planning and the intended learning goals.

Description

Video explanations can improve teacher presence (Garrison, 2016) by having the instructor's supportive voice guides activities during asynchronous classes. Adding a bit of humour helps to enhance the teacher-student connection further. Written instructions can be tricky to follow, especially for multi-step learning activities. Videos can augment the quality of communication and possibly motivate students to think more critically (Fullan & Langworthy, 2013). Here are a few examples of videos used in lesson plans

- Explanation of Home Activity [6:28]
- Video to Support a Learning Task [2:51]
- How to Get Formative Feedback [2:43]
- How to Create a Good Blog Post [7:22]

ACTIVITY 4: ADMINISTRATIVE VIDEO – DESCRIBING ASSESSMENTS

Overview

One of the biggest time savers is creating video walkthroughs for all your assignments. That way, students can review the assignment expectations at any time, just in time. This type of video is a time saver for an online course because you do not get a flood of emails just before an assignment is due. Having a written explanation with a supporting video reduced the number of emails by at least 90%. Video descriptions allow you to provide crystal clear instructions and improve the quality of work submitted. More importantly, providing multi modes of communicating that valuable information is grasped by all students.

Description

Like other administrative videos, assignment videos help you communicate instruction and learning goals clearly, thereby improving critical thinking (Fullan & Langworthy, 2013) and cognitive presence (Fullan & Langworthy, 2013). When students understand expectations, they can shift their cognitive load to the learning task at hand. Here are a few examples of videos I created that walk students through an assignment step by step.

- Description of Community Contributions [2:27]
- Designing a Tool Review [4:20]
- Learning Theories Assignment [3:53]
- Teaching and Learning Assignment [1:30]

Possible Challenges

The main challenge in creating an assignment video is clarity. To increase clarity, create a clear written description of the assignment. You need to be crystal clear; otherwise, your inbox will fill up with emails. Then make your video going over each step in detail. Sometimes these videos are longer, but students appreciate the extra detail when they are up late completing an assignment due the next day.

ACTIVITY 5: ASSESSMENT – STUDENTS CREATING VIDEOS

Overview

Student-created videos can be used to explain a concept or how to solve a problem, provide an analysis of a multimedia artifact, articulate a specific approach or perspective, or review a book or software tool. The learning goals of your course only limit the possibilities. This type of video allows students to move beyond the standard writing assignment and move to a more creative, engaging and flexible format. Obviously, students need to learn how to write well, but they also need to learn how to communicate their ideas within a video format. A video is a critical communication medium with over 730,000 hours of content uploaded daily on YouTube alone (Oberlo, 2021).

Description

Student video creation can increase social presence (Garrison, 2016) and collaboration for team-developed videos (Fullan & Langworthy, 2013). The video creation process can also improve cognitive presence (Garrison, 2016), creativity, communication skills and critical thinking leading to deeper learning (Fullan & Langworthy, 2013). Some examples of the type of videos students can create might include:

- Presentation of the ARCS Model of Motivation Design [5:09]
- Teaching How to Use Padlet [5:16]
- Offering a Teaching Strategy with EDPuzzle [2:15]
- Articulating the Multimedia Instructional Design Principle [3:58]
- Describing Learning Module on the First Peoples Principles of Learning [1:57]

Possible Challenges

The main challenge for students is learning how to create an effective educational video. The most straightforward way to address this issue is to refer students to the general guidelines listed above. The same rules apply to teacher-created videos as they do to student-created videos.

ACTIVITY 6: VIDEO FEEDBACK

Overview

Individualized screencast feedback is the activity most often used by educators (Bahula, 2021). This type of feedback can help establish teaching presence (Garrison, 2016) by building a solid connection between you and your students, particularly in blended and online learning environments. One of the key benefits is offering a more detailed, clearer, richer quality of feedback and increased understanding and higher-order thinking skills, leading to a greater cognitive presence in your class (Bahula & Kay, 2021). Finally, video feedback can lead to a more interactive, collaborative assessment (Bahula & Kay, 2021; Quinn et al., 2019).

Description

Using a good headset and screen recording software, the instructor opens up a student assignment and records short videos focussing on key areas of strength or opportunities for growth. We provide General Guidelines for creating these videos above. The bottom line, though, is to imagine yourself tutoring your student as if you were having a personal conference about their work. If available to you, a helpful method for video feedback is the use of picture-in-picture (PiP) mode, where student work fills the screen and video of you speaking is in a smaller floating window. Students can benefit greatly from your gestural and social communication, and it helps increase your visibility in the course. You also need to develop a system for creating, storing and sharing videos. My system is as follows:

1. Open the student's digital assignment and review, adding short comments on the work to guide my video.
2. Open video recording set-up and test the recording first to ensure it is working.
3. Plan to create a 1-3 minute video on one point you would like to make.
4. Feedback videos can be stored on Google Drive, and a view-only link can be generated and shared with each student. Add the link as a comment on the assignment.
5. Repeat until finished.
6. Take at least 5 minutes before you start reviewing the next student's assignment.

Possible Challenges

1. **Set-up time.** We cover many of the challenges instructors experience in the general guidelines section above. Perhaps the biggest challenge is the time it will take to set up and learn your video feedback system. Once you have that in place, though, you should find that video feedback is quicker than written feedback, especially when communicating in-depth suggestions that are nuanced.
2. **Do we need to use video feedback?** One other challenge is to determine whether you need to use video feedback. Sometimes, written feedback or rubrics might be a better, more efficient choice, especially with assignments focussed on skills and procedures rather than higher-level thinking. We found that video feedback is quite effective when providing insights on writing skills. It can also be quite effective with static multimedia presentations or websites but not videos.

ACTIVITY 6: CREATING COMMUNITY-BASED VIDEOS

Overview

This type of video can help improve communication and connection with an online community. For example, students can receive instructor video responses on more complex issues, making it feel like the instructor is addressing them personally. Students can give feedback to each other using videos, particularly in peer-assessment scenarios. Short student-introduction videos can also be used in FlipGrid to build community. Marco Polo is a mobile app wherein users can record video or audio posts that can be viewed live or later (video posts are stored sequentially). Similar to the chat feature, users can communicate with their peers. Marco Polo is an excellent tool for informal course discussions, question and answer sessions, and student introductions.

Description

Community-based video podcasts help build instructor-to-peer (teacher presence) and peer-to-peer connections (social presence) within an online learning course (Bahula & Kay, 2021). Specific examples of these videos might include:

- personalized video answers to student questions;
- student video explanations of a problem they might be having that is difficult to explain in words;
- teacher video announcement about an event;
- quick video response to the entire class about an issue or concern;
- video peer-feedback or assessment;
- student introduction video; and
- video response to a discussion topic.

Possible Challenges

The main challenge is that students and teachers need to watch their tone when creating these relatively quick and informal videos. It is tempting to *wing it* when making this type of video, so I would advise outlining a brief plan before beginning the video creation process. Instructors are strongly encouraged to ensure that tools and apps accommodate all learners (e.g., closed-captioning).

GENERAL RESOURCES

- 10 Beginner Video Tips for Making Professional Videos is a good guide for students.
- A 5-Step Guide to Making Your Own Instructional Videos is a nice quick guide to improving the quality of your educational videos.
- How to Make an Instructional Video: 25 Essential Tips is a comprehensive list of easy-to-follow tips – worth reviewing when you have time.
- How to Make Great Training Videos is a comprehensive guide to creating high-quality training videos.
- Top 7 Free Online Video Tools For Teachers To Create Videos In Minutes offers more options for you and your students.

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CONCLUSION

The final chapter looks at what might be next for teaching and learning online. We are convinced that online and blended learning will become more prolific in the near future – it already has because of the COVID-19 pandemic. However, we have looked at six more predictions related to

1. A Technological Paradigm Shift
2. Decreasing the Digital Divide
3. Increasing Awareness of Students with Special Needs
4. Increased Qualities of Assessment
5. Connectivism and Messy Problems
6. Virtual Reality

Whether or not these predictions come to fruition, we believe that future online instructors will need to be open to change and evidence and willing to acquire new knowledge and adopt new practices to see significant improvements in teaching and learning quality in years to come.

What's Next?

WILLIAM J. HUNTER AND ROBIN H. KAY

INTRODUCTION

This book has sought to provide concise, evidence-based chapters that address a wide range of online teaching and learning topics. Our focus has been not on the minimal skills needed to survive online activities but on developing and promoting the knowledge and skills that will make thriving online a real option for many teachers. The chapter authors are leading thinkers and practitioners whose teaching practices have been enriched through selectively and skillfully taking advantage of the affordances of the technologies they have written about.

In assembling this work, we have relied on the academic expertise and the real-world experiences of 27 highly experienced contributing professionals to create what we hope will become a source of information and a welcome challenge for readers.

Each chapter has provided some academic background and general guidelines related to the chapter topic. We have also tried to emphasize ways to teach effectively online and encourage student engagement while ensuring that our teaching is responsive to the needs of the diverse student populations in our schools, colleges, and universities. In the process, we have been guided by three major bodies of educational research: the Community of Inquiry (CoI) model developed by Randy Garrison and his colleagues (Garrison, 2011), Michael Fullan's Deep Learning (DL) approach to more engaged learning (Fullan, 2013), and Collaborative Learning (CL). We hope that this book will help instructors engage in a self-designed and self-regulated program of professional development that will re-invigorate their professional work and improve their teaching effectiveness in-classroom and online.

We are talking about a vision in which deep learning, based on collaborative work in communities of inquiry, becomes the norm. Teachers at all levels need to accept the challenges involved in developing and redeveloping teaching strategies and practices that are informed by:

- a growing understanding of human learning (including new insights from educational neuroscience); and
- an ever-evolving body of educational technologies designed to improve professional practice in the context of our emerging knowledge.

In this chapter, we would like to focus briefly on where that vision comes from and what we think the future of education might be.

LESSONS FROM MEDICINE

It is practically a requirement for those who want to look forward to begin by looking back. *The Carnegie Foundation for the Advancement of Teaching* (CFAT) was founded in 1905 to improve college and university education. It has produced research reports that have shaped and guided North American education for over a century. The first was the *Flexner Report* (Flexner, 1910), possibly the most influential report in the history of medical education. Flexner's research involved site visits to 150 medical schools in the United States, Canada, and Newfoundland and comparisons of the data obtained from documents and interviews with the information held by the American Medical Association. In the absence of both the internet and air travel, this was a massive undertaking.

That research revealed that there was an oversupply of medical doctors, a host of low-quality commercial medical schools and a serious lack of standards in medical education at a time when the medical practice was changing: "Progress in chemical, biologic, and physical sciences was increasing the physician's resources, both diagnostic and remedial" (Flexner, 1910, p. 8). His recommendations included housing medical education in universities with hospital affiliations and significantly increasing admission standards. He also wanted North American medical education to emulate what happened in Edinburgh and Paris, where students encountered the "statistical and analytical study of disease, which is the discriminating mark of modern scientific medicine" (Flexner, 1910, p. 9), to dramatic changes in medical education (Cooke et al., 2006). Physicians took up the challenge, and by the end of the 20th century, surgeons were transplanting organs, smallpox and polio had been essentially eradicated, and biologists had mapped the entire human genome.

TODAY'S EDUCATION

In 1996, Lee Shulman became the head of the CFAT, bringing a background that included both teacher education and medical education. In a 1998 paper on the education of professionals, Shulman pointed to Flexner's long-term impact on medical education but noted changes taking place at that time, specifically, the use of case-based teaching and problem-based learning. In an earlier paper, Shulman (1986) took on the G. B. Shaw aphorism "He who can, does. He who cannot, teaches" when he asserted that "those who understand, teach" (p. 4) and developed the concept of *pedagogical content knowledge*. His idea was that teachers must not only understand the content matter, they must also understand how to convey that content to others.

Today, the body of information guiding teaching is growing rapidly through advances in cognitive psychology, neuropsychology and discipline-specific areas like language learning, STEAM, and kinesiology. At the same time, new technologies like social media, shared drives, internet search engines, and video conferencing are creating new opportunities for both pedagogy and andragogy.

While many of our chapters have provided sound advice and examples regarding the development of 21st-century teaching skills, we also share Shulman's view that skills alone are not enough:

I am not offering herein an argument against the conception of teaching as a skill. I am instead arguing for its insufficiency ... (we also need) a conception of teaching in which the principled skills and the well-studied cases are brought together in the development and formation of strategic pedagogical knowledge. (p. 12, parentheses added)

We like that phrase strategic pedagogic knowledge. It implies practical knowledge and suggests looking forward. The knowledge that might impact future teaching—that is precisely what we have been talking about in the chapters of this book.

A VISION

So, given that the future does not lend itself to a clear description (who would have foreseen the world turning to online teaching and learning to cope with a pandemic virus?), what sort of vision can portray busy educators thriving online? Who, in 1910, could envision the mapping of the human genome less than a century later—especially since the double helix at the genome’s base was not discovered until 1953 (Watson & Crick, 1953)? Envisioning is hazardous territory. Nonetheless, it seems clear that Flexner had a vision for medical education. His vision helped shape changes that radically altered both medical education and the practice of medicine.

Our goal is not that ambitious. Instead, we simply want to comment briefly on some areas of inquiry and practice that may begin to reshape teaching and teacher education in the decades ahead. The six predictions we want to focus on are

1. Technological Paradigm Shift.
2. Decreasing the Digital Divide.
3. Increasing Awareness of Students with Special Needs.
4. Increased Qualities of Assessment.
5. Connectivism and Messy Problems.
6. Virtual Reality.

TECHNOLOGICAL PARADIGM SHIFT

In *The Structure of Scientific Revolutions*, one of the most cited academic books of all time, Thomas Kuhn (1962) noted that a paradigm shift occurs when a new and significantly different approach replaces the typical way of doing something. In the early part of 2020, one could argue that a paradigm shift was forced on the education world by the COVID-19 pandemic. Educators across the globe were required to teach online, to use a wide range of new technology tools to reach and connect with their students. If this shift had lasted only a few months, instructors might have slipped back into familiar in-person teaching patterns without technology. However, the pandemic lasted over two years, establishing technology as a mainstay for all educators. Luddites and resisters had to adapt.

Some researchers, especially engineering educators, have called this changing dynamic a new paradigm, *Education 4.0*. Miranda et al. (2021) have defined Education 4.0 as

the current period in which Higher Education institutions apply new learning methods, innovative didactic and management tools, and smart and sustainable infrastructure mainly complemented by new and emerging ICTs to improve knowledge generation and information transfer processes. (p.4)

Further, Miranda et al. (2021) have elaborated its four core components:

1. Competencies (training and development of desirable critical competencies in today’s students).
2. Learning Methods (incorporation of new learning methods).
3. Information and Communication Technologies (ICTs) (implementation of current and emerging ICTs).
4. Infrastructure (use of innovative facilities, services, and systems to improve learning processes). (p. 4)

While Miranda et al. focused on higher education, we see the emergence of Education 4.0 as a consequence of the kinds of planning, programming, and delivery at all levels of education that we have described as *thriving online*.

It is reasonable to conclude that a significant paradigm shift is occurring with respect to the use of technology in education. Now and in the future, technology will likely be a mainstay in day-to-day education for students. In higher education, it is conceivable that 50% or more of all classes will be delivered online (Li & Lalani, 2020; McKenzie, 2021). K-12 public education may shift more slowly because parents need to work, and younger learners need opportunities for social interaction. Regardless of age, technology will play a more meaningful role in education.

Our first prediction is that online technologies will increasingly be a significant part of education at all levels and will be integrated into all aspects of education, whether delivered online or in classrooms.

DECREASING THE DIGITAL DIVIDE

COVID-19 and our dependence on the internet brought significant awareness of the marked digital divide worldwide (Broom, 2020). Almost half the world's population has no internet access, which means that half the world's population could not learn effectively during the pandemic. When internet access is down for an hour, we begin to feel panicked. Imagine having no access at all. While it may be optimistic to believe that governments will take action to ensure internet access for all, significant efforts are being made to make universal access a reality (Innovation, 2019; Ontario Government, 2022; UNICEF, 2020).

For example, although the *One Laptop Per Child* initiative started by Nicholas Negroponte fell far short of early expectations, it created new understandings of the kinds of adaptations and adjustments necessary for computer technologies to have widespread acceptance in developing countries nations (Shah, 2010). For example, United Nations Under-Secretary-General' Utoikamanu (2019) has indicated that while lack of access to high-speed networks is one limitation, building an economic infrastructure and a highly science-literate society are also significant hurdles to be overcome. While such cautions might seem to suggest that global equity is still quite distant, they also serve to shape a more straightforward pathway toward that destination.

Our second prediction is that internet connection will increasingly be considered a necessity, and access will grow globally. We hope that with a better understanding of the barriers and the international community's support, developing countries will not be left behind.

INCREASING AWARENESS OF STUDENTS WITH SPECIAL NEEDS

According to Whitley et al. (2020), students with special needs are more likely to be impacted negatively by Covid19 and the switch to online learning because of reduced community-based services and weakening of support systems necessary for these children to learn and develop. Educators have become acutely aware of how difficult it is to support children with special needs online (Maurer et al., 2021). While many online technology tools exist to help students with special needs, teachers need time to adjust and learn how to use them effectively and adapt them for online teaching and learning.

Although research on issues related specifically to online learning for diverse learners is limited, systematic reviews of the research literature on assistive technologies in various areas and levels of education (e.g., McNichol et al., 2021) are increasingly available. There is a growing understanding of the value and impor-

tance of Universal Design for Learning and of the importance of accessibility standards like Ontario's AODA. This increased awareness comes with greater support for and rapport with vulnerable populations whose voices can further shape the use of online technologies in teaching and learning.

Our third prediction is that increased awareness of vulnerable populations will lead to more research directly focused on the educational affordances of online technologies and improved availability and use of online resources for students with unique or individual needs.

INCREASE QUALITY OF ASSESSMENT

Many secondary schools and higher education institutions heavily rely on exams to assess student learning. Unfortunately, the shift to online learning revealed several obstacles to delivering online exams, including exam design and format, suitable software to provide the exam, power outages, unreliable internet, disparities in the quality of technology available to students, cheating, and privacy (Bashitialshaaer et al., 2021; Elsalem et al., 2021). Given this range of challenges, some teachers are looking for alternative forms of assessment to measure learning (Pokhrel & Chhetri, 2021). Possibilities include greater use of authentic assessment that involves the production of meaningful products (e.g., articles, chapters, podcasts, videos, mind maps, websites, blog posts), systematic peer-assessment, video or audio representations of knowledge, and collaborative projects.

In short, the shift to online teaching during Covid has stimulated conversations and thought about alternative approaches to evaluating students because e-exams do not work particularly well.

Our fourth prediction is that with the growth of online education, we will continue to see growth in research on and the practice of alternative forms of assessment better suited to online environments.

CONNECTIVISM AND MESSY PROBLEMS

George Siemens formally introduced the idea of connectivism in 2005, a broad theoretical framework to understand learning in the digital age. The main idea is that knowledge is developed and learned collaboratively through many shared resources, including web browsers, search engines, wikis, online discussion forums, social networks, and virtual classrooms. The predictable and rapid expansion in the range of resources and information available to teachers was sometimes overwhelming, particularly to those not accustomed to using technology. The growth in knowledge is a plus for humanity, but it creates demands on the education system that pose significant challenges. This growth may also involve reorganizing bodies of knowledge, revising theories, adapting curricula, and changing instructional methods. Educators are now more connected with information sources, with one another and with learners. Still, the range and rapidity of change have made the processes of teaching and learning substantially messier.

One of the consequences of this messiness has been for researchers to call for dramatic changes in approaches to education (e.g., Malik, 2018). Some observers might regard such challenges as problematic, but in assembling the work in this book, we chose a more proactive and positive interpretation.

Our fifth prediction is that educators will feel energized by new and engaging approaches to teaching and learning. They will also feel challenged by the volume of information, differing opinions, the validity of claims made, and consolidating multiple ideas into a well-reasoned teaching approach that will undoubtedly change over time. That is to say, we believe that educators will rise to the occasion and take productive steps to ensure a better educational future.

VIRTUAL REALITY

Initially, online learning was asynchronous—communication and collaboration occurred through email and discussion that did not require learners and teachers to be in the same place at the same time. With the advent of the 21st century, synchronous online learning emerged and students were connected through audio and video. A newer and potentially more promising possibility in online learning is immersive virtual reality. Dr. Jeremy Bailenson, a pioneer in virtual reality education, delivered one of the first online virtual reality courses at Stanford University in 2021 (Metz, 2022). In 2022, Western University started a three-year project on immersive learning in higher education (Banks, 2022). So what are the possibilities of immersive education?

In a systematic review of literature on VR in K-12 education, Tilhou et al. (2020) pointed to the current popularity of games like *World of Warcraft* as generating interest in the educational potential of VR. They observed that in the period 2010-2019, there were seven studies in peer-reviewed journals and that “the grade levels and disciplines where 3D VR is most often applied are middle and high school classrooms narrowed to branches of science” (Tilhou et al., 2020, p. 181). Other reviews with slightly different time periods and topical foci have also demonstrated that research on VR in K-12 education is already taking place (Maas & Hughes, 2020; Pellas et al., 20-21). Indeed, both the Tilhou et al. (2020) and the Maas & Hughes (2020) review included discussions of multiple previous (and non-overlapping) systematic reviews, suggesting that continued research and development can reasonably be expected.

Virtual Reality (VR) offers a learning experience in which learners are immersed in an alternative, digitally-generated environment. In a 10-year systematic review of the literature, Di Natele et al. (2020) concluded that immersive virtual reality systems provide a significant opportunity to support effective learning experiences in K-12 and higher education. The main advantages of VR are motivation, engagement, experiential learning and a chance to participate in first-hand experiences that would not be possible in the real world (Di Natele et al., 2020). Donally (2021) provides some examples of a VR experience such as:

- collecting artifacts from a (digitally created) archaeological dig;
- holding a 3D simulation of a beating heart in your hand;
- collaborating with students around the world in a virtual environment;
- participating in a fitness class in simulations of natural habitats;
- practicing a new language with a virtual avatar;
- visiting and exploring geographical sites around the world; and
- participating in virtual labs and conducting virtual chemistry experiments.

Perhaps the true potential of VR, though, is supporting students in creating their own personalized VR environments and programs, providing similar benefits to those gained by learning to code.

Our sixth and final prediction is that VR will be used increasingly in online higher education and that as the cost of virtual reality headsets (currently CAD\$400 in 2022) declines and VR software becomes ubiquitous, VR will emerge as an important element in K-12 environments.

ULTIMATE MORAL OF WHAT'S NEXT

The lesson of the Flexner Report and its impact on medical education and medical practice in the 20th century is clear and straightforward. In the presence of new technologies and a rapidly growing research base, if professionals commit to evidence-based practice, stunning improvements in professional practice can follow. Suppose postsecondary instructors and K-12 teachers over the coming decades build on the kinds of practices described in the chapters of this book. In that case, they will be creating a future in which they and their students will have unprecedented opportunities to thrive.

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