CHAPTER 1.

USING PUSH NOTIFICATIONS TO ESTABLISH TEACHER PRESENCE IN HYBRID/ONLINE COURSES

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*In this chapter, the authors describe **push notifications** used in online, real-time learning; online, any time learning; and hybrid learning. Specifically, the authors offer guidance for using announcements in the LMS as push notifications, which are messages forwarded to mobile devices that encourage users to tap into the course app, as a practice to promote social, cognitive, and teacher presence in online learning. In describing their "better practice," this chapter addresses the themes of Accessibility and Inclusivity and Professional Learning for Online Teachers.*

FRAMEWORKS AND PRINCIPLES IN THIS CHAPTER

- **Global Society of Online Literacy Educators (GSOLE) Principle 1.2:** Use of technology should support stated course objectives, thereby not presenting an undue burden for instructors and students.
- **Jessie Borgman and Casey McArdle's PARS framework:** Instruction is grounded in user experience to ensure that it is **personal, accessible, responsive, and strategic.** All four PARS terms are discussed in this chapter.
- **Council of Writing Program Administrators (CWPA), National Council of Teachers of English (NCTE), and National Writing Project (NWP) Framework for Success in Postsecondary Writing:** Instruction encourages *persistence*, "the ability to sustain interest in, and attention to, short- and long-term projects."

GUIDING QUESTIONS BEFORE YOU BEGIN READING

- How can a strategic push notification program improve course design and help scaffold students through the work of the semester?

- How can push notifications help students persist in completing course assignments?
- Why should instructors carefully consider the timing and frequency of push notifications?
- How can instructors ensure their push notification program aligns with the PARS approach, which values being personable, accessible, responsive, and strategic?

INTRODUCTION

We are bombarded constantly with push notifications. Emergency notifications from our institutions. Weather alerts. Calendar reminders about upcoming meetings. Social media notifications about who just posted or what news is trending. Resisting the urge to click into those notifications depends largely on how compelling the message is and how important the information is to us in that moment.

And, whether we realize it or not, many of us are already using push notifications when we send out messages from our LMS.

One morning on the way to campus, Tess got stuck in a traffic jam due to an accident and realized she would not make it on time to her first class of the day. After initially panicking, she remembered she had the power to immediately alert her students. She got on the mobile app for the LMS and sent an announcement to students with the subject line: "Class canceled: Stuck in traffic." When she arrived at the classroom 15 minutes late, she was relieved that not one student had shown up for class or sent an email asking where she was. Everyone had received the message.

While that example shows the advantage of push notifications for late-breaking news, we can also use push notifications to create a better practice for online instruction, one that would more effectively establish teacher presence and improve student engagement.

Stumbling Upon the Use of Push Notifications for a Fast-Paced Online Course

In January of 2019, Tess began teaching a 21-day online version of a required advanced communication course for business students offered during a mini-semester just prior to the start of spring semester. An obvious downside of such a short time frame is the intense workload for both students and instructor. Aside from a couple of synchronous small group meetings for team projects, the course was mostly asynchronous, which created communication challenges.

Course materials were set up on the institution's Canvas LMS prior to the start of the course, so much of the day-to-day work for the instructor focused on feedback, grading, and responding to many student emails throughout the day. Tess quickly discovered that she was spending too much time either following up on missed assignments or answering emails from students who were asking about information that was already provided. Students seemed to be going directly into the Canvas calendar or "To Do" list to get to assignment forums, bypassing the supporting resources in the modules.

Tess realized that students were not always on their laptops, but they did tend to have immediate access to their mobile devices. She began to wonder if sending daily reminders that went directly to their mobile devices would be a pre-emptive move to reduce confusion about tasks. This assumption that students might download and use the app soon became a core part of the course design.

When she taught the course again in the summer of 2019, Tess set up a series of delayed-release Canvas Announcements that provided links to the assignments due each day and a link to the module. She added a statement directing students to go to the module for additional resources related to those assignments. Creating this series of messages ahead of time forced Tess to continually revisit the schedule, which helped her to recognize and adjust points of assignment overload or inadequate lead times for drafts.

Once the course began, reminders were automatically pushed out daily at 8:00 a.m. That semester Tess noticed fewer questions about where to find information and fewer missed assignments. Students received consistent, transparent communication and a daily reminder that they were taking a course with an instructor who was present. The reminders also provided support to students who struggled with time management or struggled to manage the rapid pace of a mini-semester course.

Tess had downloaded the instructor version of the mobile Canvas app, which notified her of student submissions and the release of announcements. One benefit of delayed-release announcements that Tess had not expected was experiencing, first-hand, her own enhanced teacher presence in the course. As she sipped her morning coffee, in a kind of out-of-body experience, Tess received the same alert on her mobile device that students received, which was herself reminding everyone about the tasks for the day. She began to look forward to the messages "past Tess" set up once she was immersed in the day-to-day tasks of running the course. She found it helpful to be reminded of what to expect students to be working on, especially when focused on responding to drafts or grading assignments already completed.

Fast forward to Fall 2020. Our state university, which is a mostly residential campus, had moved courses online for the first five weeks of fall semester, with

students choosing to live on campus or complete the semester fully remote. The semester had unique challenges because, in addition to teaching four sections of technical writing, Tess was mentoring graduate assistants teaching the course for the first time—who were also teaching online for the first time. To accommodate university requirements in Fall 2020 that synchronous sessions be offered at least in some manner, they met with their students in small groups for weekly sessions of about 30 minutes. With the less-frantic pace of a 15-week semester and the weekly class meetings, Tess did not immediately think to use the system of delayed-release announcements.

Neither the undergraduate students nor the graduate teaching assistants had signed up for an online experience, which resulted in confusion, discomfort, and some resistance.

Tess noticed that students still needed an extra nudge to help them find the information and do the work—whether readings for discussion or assignments they needed to post. She returned to the practice of using delayed-release announcements, which proved valuable throughout a semester of shifting circumstances from online, to partially face to face, and back again to online as COVID-19 cases rose. Despite all the confusion, students could count on her presence through those push notifications.

STUMBLING THROUGH ONLINE INSTRUCTION FOR THE FIRST TIME DURING COVID-19

For the Fall 2020 semester, A.J. was one of the doctoral students[1] teaching online for the first time. Prior to 2020, his lack of online teaching experience had not been much of a concern. While he had taught many courses at different colleges before that semester, A.J. had never needed to teach an online course.

To complicate matters, that fall was the first semester A.J. taught technical writing. Part of the stress of teaching this new course in this new context was alleviated by the existence of a master course for the online version of technical writing, which Tess designed the previous summer. Although this master template was intended for the six-week online version of the course, it was easily adapted for the full semester, and it did provide support on two levels: should an instructor have become sick, another could take over their class without much hardship or adjustment needed; also, major assignment descriptions, as well as suggested daily activities, were included. Even with this fairly well-organized course template, though, students had trouble remembering where to look for activities or guidelines they would need.

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1   Update: A.J. completed his PhD in Composition and Rhetoric in 2023.

As these types of problems emerged or issues needed to be addressed, A.J. would communicate with students. For A.J., this communication took the form of announcements sent out through Canvas to explain whatever the problem was. A student had a question about an assignment? Other students might have the same question, so send an announcement. A due date needed to be changed for whatever reason? Send an announcement. A link in the course page was broken or a page was unpublished? Send an announcement. Some of these messages would end up being fairly long, and, particularly as the semester went on, A.J. would end up sending announcements multiple times a week, if not daily, with no real strategy or planning behind these messages. The lack of organization and the erratic timing of his messaging resulted in confusion for both students and instructor.

Changing Practices to Address Changing Habits of Interaction

The experiences of Tess and A.J. led them to reconsider how students were accessing and engaging with course content and to think more strategically about how to communicate with students in digital forums. Not only did they want to increase student engagement and success, but they also wanted to focus their time and energies more productively.

With increased student engagement as a goal, and increased teacher presence as a strategy to achieve that goal, our chapter provides guidance for strategically communicating with students through regular, consistent messaging designed to keep students on track to successfully complete the course. Instructors can plan and set up messages ahead of time, saving themselves time and stress once the course gets underway. If those pre-scheduled messages can be edited right up to the release time (as they can in Canvas), then instructors are also in a better position to respond flexibly to needed adjustments in the course.

SCHOLARSHIP, THEORIES, AND PRINCIPLES THAT GUIDE OUR APPROACH

The theory informing our practice is the **Community of Inquiry Framework,** developed by D. Randy Garrison and colleagues (2000), which considers how **social presence, cognitive presence,** and **teacher presence** intersect to create the educational experience in online any time text-based environments.

Garrison et al. (2000) noted that, from the collaborative constructionist point of view, "Collaboration is seen as an essential aspect of cognitive development since cognition cannot be separated from the social context" (p. 92). The social presence and cognitive presence within a course depend on how effectively teacher presence is established (Garrison et al., 2000). The crucial role of teacher

presence has evolved over time, as technology has advanced from asynchronous, text-only capabilities to more synchronous interactions through text messaging, real-time collaborative document editing, and videoconferencing. The strategies we use to communicate with our students must also evolve to keep up with the changing ways in which they interact with course materials.

Instructor-created push notifications promote **social presence** by emphasizing that teachers—and students—are real persons in a collaborative working relationship with one another, a fact that can be forgotten in the asynchronous online classroom. Push notifications promote **cognitive presence** by reminding students about assignments and directing them to information that can be accessed from their mobile devices. Push notifications can establish **teacher presence** if messages are clearly written by the instructor, even if that instructor is teaching from a course template designed by someone else.

Our practice also follows Jessie Borgman and Casey McArdle's (2019) PARS framework of Personal, Accessible, Responsive, and Strategic course design and teaching practices. The PARS framework suggests that instructors have a duty to be personal and personable, accessible to students, responsive to student requests for help, and strategic in their pedagogy, course design, and administration. The practice of strategic messaging—whether through push notifications or some other means—is aligned with the PARS framework in notable and important ways. Strategic course design is just the beginning of teacher presence: publishing a course with assignments mapped out and activities and readings already accessible allows for the instructor to focus on being personable and responsive—but only if students are proactively engaging with the course. Proactively establishing teacher presence through push notifications helps ensure that messaging stays focused more on encouragement and course progression than on frustrated or missing students.

The Global Society of Online Literacy Educators' (GSOLE) *Online Literacy Instruction Principles and Tenets* (2019) also work in tandem with the PARS framework. Principle 1 states that "Online literacy instruction should be universally accessible and inclusive," and under this larger umbrella exists the tenet that the "Use of technology should support stated course objectives, thereby not presenting an undue burden for instructors and students." The use of push notifications requires careful consideration of timing and frequency to ensure they are a help, not a burden.

A system of strategic messaging also aligns with *persistence*, from the *Framework for Success in Postsecondary Writing*; in particular, push notifications can encourage students "to follow through, over time, to complete tasks, processes, or projects" (Council of Writing Program Administrators et al., 2011). While some could consider these constant reminders enabling, we instead look at them as a gentle reminder for our students who are often juggling multiple courses,

jobs, volunteerism, and other commitments, providing them with the ability to remain persistent in their work.

COURSE CONTEXT AND LESSON

Both Tess and A.J. teach in the department of English at a midsize state university in the midwestern United States. The campus is primarily residential. The courses we have recently taught are designed to satisfy the advanced writing requirement for majors such as engineering, computer science, business, statistics, and data analytics.

At our institution, three-week online courses are offered during the winter session and four- or six-week online courses are offered during the eight-week summer session. Only occasionally are online courses offered during regular semesters at the main campus. For instance, in the Fall 2021 semester, the department offered seven sections of technical writing (the course that A.J. was teaching). Two of those sections were offered as online courses; both were asynchronous and taught by an adjunct instructor. Tess has occasionally taught technical writing online or in a hybrid format during the regular semester to accommodate a long student waitlist or the constraints of limited classroom space.

Our institution uses Canvas as its LMS for all courses. Canvas offers a number of features, including the Canvas mobile app that is available for students and faculty, along with the push notifications that can be sent via this app. Push notifications can be a useful tool in addressing one of the biggest challenges for online instructors: maintaining presence in a course with limited or nonexistent synchronous interactions. Even web-enhanced in-person courses today require strategies for maintaining presence for those students who miss class meetings, particularly in an era of less stringent policies on attendance and a movement towards more flexibility in attendance requirements.

As previously mentioned, push notifications have become a fairly common medium for communication. The teacher version of the Canvas mobile app automatically sends push notifications to alert instructors of student submissions, and it allows instructors to create push notifications through the Announcements function. Announcements are automatically sent to a student's email, and they are also sent out as push notifications to the student's mobile devices, provided the student has downloaded the Canvas app. This direct messaging can go a long way to help students remember important assignments and deadlines, as well as direct them to useful course materials that are already available to them.

With our past experiences in mind, we were curious as to how many students were using the Canvas mobile app. An informal raise-of-hands survey of our Fall 2021 students at the beginning of the semester seemed to indicate that most students

had downloaded the Canvas app and relied on their mobile devices, at least periodically, for accessing and receiving information about their courses. We conducted an IRB-exempted survey of our students at midterm to find out where students were going to find out about upcoming assignments and how they rated the helpfulness of our push notifications about upcoming assignments and due dates.

We had 20 respondents out of the 97 students who received the survey (23 students in the in-person technical writing course section taught by A.J. and 74 students in four hybrid business communication course sections taught by Tess). Out of those 20 respondents, 18 reported using the Canvas App; 16 rated Canvas Announcements as "very helpful" or "helpful"; and two rated the announcements as "neither helpful nor unhelpful" (n=20). None of the respondents rated Canvas Announcements as "somewhat unhelpful" or "very unhelpful."

The survey also asked students to identify all the places they go to find out what assignments are due. The results seem to confirm our suspicion that students often bypass the Canvas course site and go directly to the Canvas To Do list, which appears on the Canvas dashboard and shows students what is due for all their courses.

- The To Do list came in first, with notifications through the Canvas mobile app coming in second. Canvas email notifications and the Canvas calendar tied as the third most accessed. Of interest to us is that the To Do list and the Canvas calendar require a student to proactively seek out the information those forums provide. Notifications through the Canvas mobile app or through student email are passive sources of information.
- The Canvas Announcements forum itself ranked a distant fourth as a place to find out what assignments were due (all announcements are saved in a forum on the Canvas site; students can also access the forum from their mobile device).
- The last place students looked for course information was the Canvas Course Summary, which lists all published assignments in order of due date (published assignments also populate the To Do list and the Canvas Calendar). This result was surprising to Tess because, during the initial years following the university switch to Canvas in 2015, direct student feedback consistently showed a strong reliance on the Course Summary. Perhaps preferences have shifted as students have shifted to using the mobile app.
- The Canvas To Do list shows up on the Canvas Dashboard and within the Canvas course; however, students are more likely to go to the Canvas Dashboard version of the To Do list, where they can find upcoming

due dates for every class they are taking, not just ours. We believe that push notifications can provide the "nudge" students need to successfully complete assignments for our course. The messages can direct students into the course site and help students understand that their teacher is a human being who is present for them and accessible to them.

Our experience—and our survey—suggested that a strong reason for considering the use of push notifications is that the way students access information today may be changing. They may have been conditioned to wait for reminders or may be contending with information overload. Perhaps future studies will confirm a change in the cognitive processes of students, which will help instructors to understand why students seem to have difficulty finding information on course sites, even when the organizational pattern is explained to them. In the meantime, students are using their mobile devices more than ever to access course materials and even to complete assignments—and that is true for all delivery platforms, including web-enhanced in-person courses.

Establishing the Purpose of Push Notifications

In order to demonstrate the usefulness of push notifications, we can apply the Transparency in Learning and Teaching (TILT) framework to describe the purpose of this practice, the tasks involved in the practice itself, and the criteria that would make this practice successful. As mentioned earlier, the theory informing our practice is the community of inquiry framework, developed by Garrison et al. (2000), which considers how social presence, cognitive presence, and teacher presence intersect to create the educational experience in asynchronous online environments. Research on push notifications in online instruction is limited, but existing studies do point to possibilities that would serve our purpose: to enhance student engagement, increase student perception of teacher presence, improve course accessibility, and help online teachers better manage their workload. Among these studies, the following themes emerge:

Accessibility of Course Design Helps to Ensure Push Notifications are Effective.

The best way to achieve presence in an online course is through frequent announcements that remind students of the importance of reading instructor-provided resources, while ensuring that assignment instructions are clear and provided in both written and audio format (Fendler, 2021). For us, this means designing our Canvas pages for optimal use with screen readers and providing short, captioned video introductions for each module.

Even in a web-enhanced in-person course, oral announcements in class are sometimes followed by reminders sent digitally, so instructors must consider how students are accessing and experiencing digital messages. A user-centered design "places the student experience at the heart of the course" (Greer & Skurat Harris, 2018, p. 22). The multiple ways students access course content also suggests that "digital" and "device" must be considered together and separately:

- **User-centered design for digital environments**: Whether designing assignment prompts, syllabi, or course calendars, instructors need to be wary of simply replicating the kinds of documents and distribution practices used in the in-person classroom. Jessie Borgman and Jason Dockter (2018) have argued that, in online spaces, how course materials are created, included, and accessed within a course is just as important as the content of those materials. Abdulsalam Alhazmi and colleagues (2021) noted that student engagement is often improved by integrating updated text, audio, and video features in the LMS, making it important to consider what adjustments or updates may be needed to our course sites.

- **User-centered design specific to mobile devices**: A survey of 64,536 students at 130 higher education institutions found that 95 percent of students had smartphones (Galanek et al., 2018). Similarly, Pew Research Center (2021) reported that 96 percent of Americans ages 18–29 own smartphones. Given that some students rely mostly on their mobile devices, instructors should design a course that welcomes all students, no matter how they access course materials (Baldwin & Ching, 2020). That requires going into the mobile app to find out how announcements look on a smaller screen and how students can interact with the course site and its materials. For example, tables tend to get cut off in the mobile app, but a vertical listing format works well on both large and small screens.

The appearance and functionality of a Canvas Announcement can shift, depending on the digital platform from which it is accessed and on the type of device used by the viewer, e.g., a laptop computer or mobile device. Figures 1.1, 1.2, and 1.3 show how a message with embedded video is displayed differently when viewed on a laptop screen through the Canvas Announcements forum, on a laptop via Gmail message, and on a mobile device via push notification on the Canvas App. In the Canvas Announcement forum, the video is immediately visible and ready to play by clicking on the start arrow (Figure 1.1). In the Gmail message, the video link disappears: Students must click "View Announcement," which takes them into the Canvas Announcement forum (Figure 1.2). In the Canvas mobile app, the video is accessed by clicking on the "Launch External Tool" button (Figure 1.3).
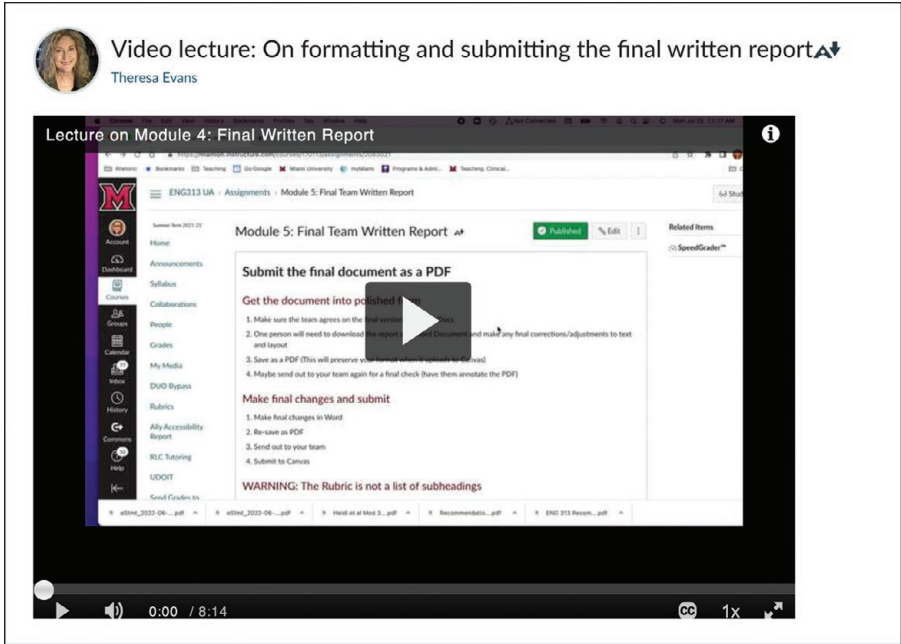
Figure 1.1. How a message looks when viewed from the Canvas Announcements forum on a laptop.
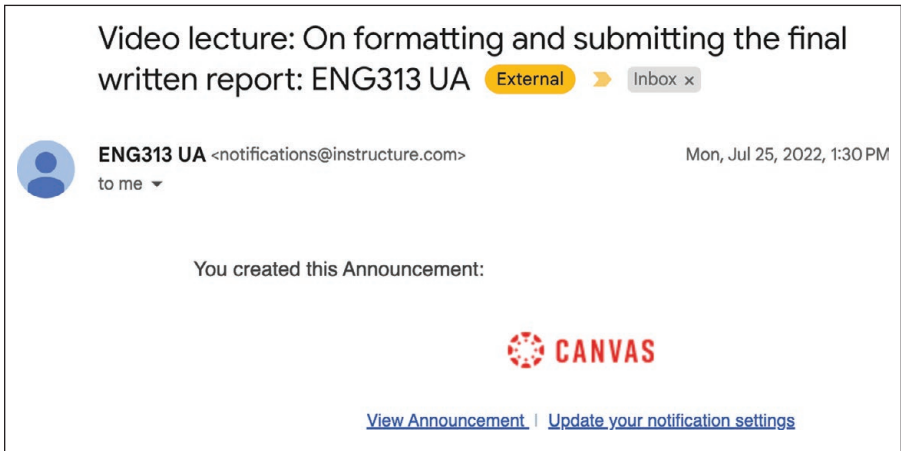

Figure 1.2. How the same message in Figure 1.1 appears in a Gmail message on a laptop. Note: The message appears to come from the system rather than the instructor; students click the "View Announcement" link to get to the Canvas Announcement that hosts the video.
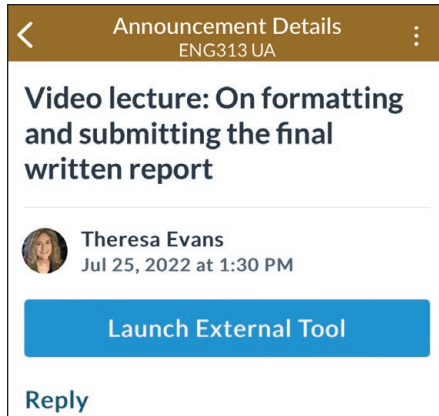
Figure 1.3. How the same message from Figures 1.1 and 1.2 is viewed on a mobile device via push notification from the Canvas App. Note: Students click on the "Launch External Tool" button to get to the video player.
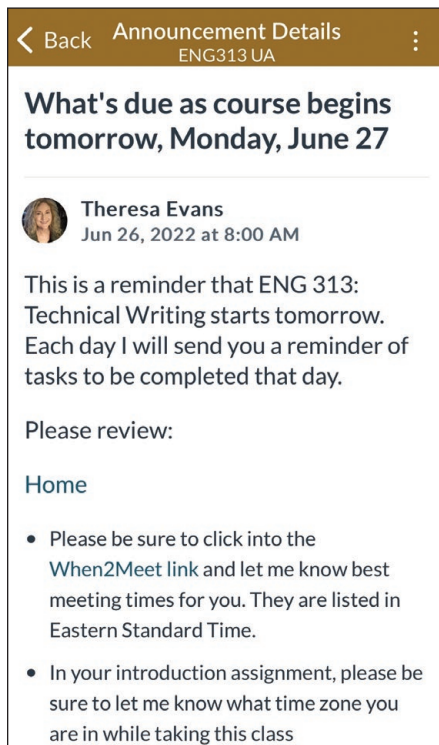
Figure 1.4. Push notifications can increase the perception of teacher presence in the course.

A study conducted by Cathy Stone and Matthew Springer (2019) found that course design and instructor presence are the top two criteria students use to rate the quality of online instruction. Themes emerging from a study by Logan Rath and colleagues (2019) also suggested that students want effective communication from the online instructor and clear course organization.

Kathleen Sitzman and Debra Woodard Leners (2006) have argued that announcements can do more than provide information: They can express empathy for students, demonstrate the teacher's expertise, and encourage students in their efforts. Students sometimes confuse automated notifications from the LMS (grades released, for example) with instructor-created notifications, so messages should be written in such a way that they are clearly coming from the teacher, rather than a system.

Broader research on the use of push notifications has led to insights that can assist teachers in developing a system of consistent messaging:

- **The subject line of a push notification should grab attention and compel students to tap into the message.** A study by Atilla Wohllebe and colleagues (2021) found that compelling subject lines positively correlate with users tapping into messages, which suggests that subject lines should clearly indicate need-to-know information.
- **Optimal timing and frequency of push notifications may be an art in itself.** Xuan-Lam Pham and colleagues (2016) have argued that engagement increases with the use of push notifications; however, too frequent notifications can have the opposite effect. Decisions about frequency may depend on the length of the course and the particular student cohort. It is worth noting, again, that Tess's push notifications went out regularly at 8:00 a.m. each morning, with only sparing use of notifications otherwise.
- **Push notifications can help ease instructor workload.** In a study on faculty perceptions of workload and the value of efficiency, Lori J. Cooper and colleagues (2019) reported that both adjunct and full-time faculty agreed that push notifications to students beyond the online classroom were helpful in improving student engagement and managing instructor workload. A planned communication strategy takes some up-front labor, but it does save time during the run of the course.

Outlining Tasks and Criteria for Strategic Communication

What follows are tasks and criteria for strategic communication using the Canvas LMS platform, based on our own practice (see Figures 1.1, 1.2, 1.3, and 1.4). While our own practice is based on the Announcements function in Canvas, which, in turn, syncs with the function of push notifications in the mobile app,

This also explains why students may miss resources they need to do their work: If links to the module do not appear within the assignment, some students may not think to seek out those resources. We now embed links to relevant Canvas pages and other resources within each Canvas Assignment, which also helps streamline the effort to create push notifications.

Some might wonder why we go to all this effort; however, we believe it is crucial to create and schedule messages to establish our personal presence in the course.

After working out the course schedule and publishing assignments, we consider the following tasks as we schedule push notifications:

- **Deciding how many messages per week are needed.** For a regular semester course, we encourage students to vote for the best days and times for releasing push notifications. For courses with a shorter time frame, we let students know ahead of time how often and at what times they can expect to receive notifications (see Figure 1.3).
- **Using a combination of scheduled and unscheduled push notifications.** A mix of spontaneous and scheduled messages can increase our presence in the course from the perspective of students. These messages can also continually remind students that they are indeed taking a course and have tasks to complete.
- **Informing students that we may need to send additional notifications.** They should not be surprised to receive notifications when the schedule changes at the last minute or if other urgent information needs to be sent out.
- **Avoiding information overload by avoiding constant notifications.** We try to make each message count so students will pay attention. If we need to announce additional information, we consider whether that information could simply be added to an existing delayed-release notification. As A.J. discovered, noticeable confusion and frustration about assignments may be a sign that too many notifications are going out or that the timing is erratic, causing students to either ignore or miss the messages.

Encourage Students to Use the Canvas Announcements Forum as the Course News Feed

The Announcements forum on Canvas is on the main course menu and students can click in to find any messages they might have missed or want to revisit; the forum is also available through the mobile app. We make clear that students are responsible for reading all messages, even if they have ignored the notification or edited settings to keep the LMS from sending notifications to their email or mobile device. An example announcement is shown in Figure 1.6.
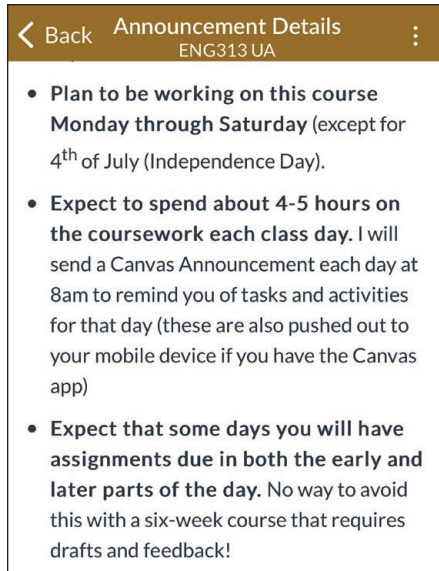
Figure 1.6. Announcement of plan for scheduled course reminders and due times for assignments. Note: The use of "I" clearly signals this is the instructor's notification, rather than an automated notification from Canvas.

Figure 1.7. How a Canvas Announcement appears on the screen of a mobile device.

Consider the Tone and Style of the Message

Informational content of the message is just a starting point for consideration: We like to aim for a positive—or neutral—tone and style (see Figure 1.4). We

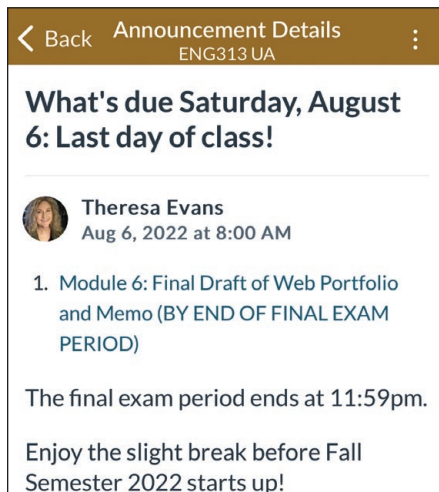also aim for brief and concise messages, often just a sentence or two to introduce a list of tasks or to announce late-breaking news. Messages should reflect the instructor's personality, expertise, and care for the students. We consider the following:

- **Being mindful of language use.** We want our "presence" perceived as helpful and friendly, not annoying or intimidating. We may "feel" the attitude—positive or negative—once we also start receiving the messages, so we adjust as needed. This adjustment could be as simple as rephrasing an accusatory "You must post your peer response by 11:59 p.m. or you will NOT receive credit" to a more neutral "Peer responses must be posted by 11:59 p.m. to receive credit" or even polite, "Please post your peer response by 11:59 so you receive credit."
- **Keeping messages as short as possible.** We do this by embedding direct links to published items in Canvas, where students can find more details. If this is not possible with an institution's LMS, then the instructor should clearly state where students can find the information. Using links does keep messages more concise. The less text in the message, the more likely the message will be read. It's best to focus on what students need to know at that moment.
- **Reviewing each message at some point prior to release to make sure it is still the message we want to send.** This is also the time to add new information, so that we do not overload students with too many notification alerts.

An example message is shared in Figure 1.7.

Maximize the Affordances of the Technology Platform

When setting up messages, we consider how our specific technology works and take advantage of its affordances, while working around the constraints:

- **Setting release date and time before composing the message.** Imagine students receiving a semester's worth of push notifications in one day! On a published Canvas course, a saved message is a sent message—unless the message is first set for delayed release. To avoid this embarrassing scenario, we set up the delayed-release date and time before writing the message. Otherwise, the message will be released to all our students immediately as soon as we hit "save." To eliminate that risk, we can leave the Canvas course unpublished until we have completed the scheduled messages, but there's a catch: If we forget to add the release dates or accidentally set release dates that occur before the course is actually published, those message will not be pushed out to students at all. The

messages would be available in the Announcements forum, but they would show up in the forum all at once, which is also not ideal.

- **Using consistent subject lines for scheduled messages.** For simplicity's sake, we use a generic heading such as "What's due today" for a fast-paced online course or "What's due this week" for a regular semester course. Adding a specific day and date is also especially helpful, so that messages are distinguishable from one another in the Canvas Announcements forum (see Figure 1.8). A consistent subject line allows students to immediately recognize the type of message they are receiving; however, a long list of messages with the same subject line will frustrate students who need to quickly locate a particular message.
- **Considering how many links are necessary.** One purpose of push notifications is to get students into the LMS module, not to help them avoid or minimize their presence in the course site. We have tried several ways to get students into the Canvas modules. One method is to place a link to the entire module, with a reminder that students need to access additional resources. Another option, one that also ensures push notifications are consistent with items on the To Do list, is to embed the necessary Module links within each Canvas Assignment or Discussion. This practice reduces the number of links required in our message and leaves us more space to be present as the instructor. The fewer the links, the fewer the links we need to test. Another advantage is that we can update information within Module pages without worrying about updating information in the assignment.
- **Considering how the message will show up on laptop screens and on mobile devices.** The message may look slightly different depending on where the Canvas Announcement is accessed. We check the message before it goes out, but also review it again on a laptop and mobile device after it is released.
- **Proofreading the text and testing all links.** Once we have set up the message—and every time we make changes to the message—we save the message, reread, and test all the links.

Enhance Communication with Additional Technologies

We take advantage of whatever technologies are available to enhance our communication practices, focusing on technologies students are already using whenever possible. Sometimes we need to check for any restrictions our institution may have placed on use of particular technologies, due to security concerns or privacy issues. We also must consider whether additional technologies will help or hinder students.
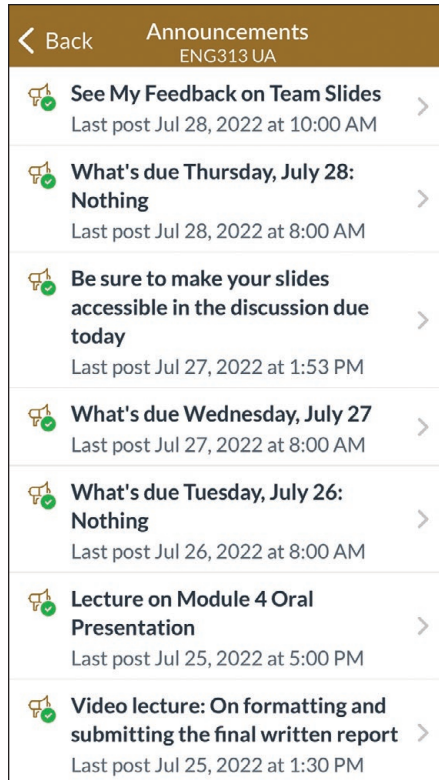
Figure 1.8. Subject lines for scheduled messages. Note: Consistent subject line "What's due today" helps students recognize the type of message, while the added date helps them locate the message later. Delayed notifications appear on the instructor version of the Announcements page, but not the student version.

Our institution uses Gmail, so we can use Google Calendar to schedule Zoom meetings, which sends out its own push notifications to students. When inviting the entire class to a Zoom meeting, we can use Canvas Announcements to send the link. If the meeting is required, we can also post it as an Assignment in Canvas so that it shows up on the Course Summary, the Canvas Site Calendar, and the Student To Do List. These features allow us to provide greater clarity as to where and how meetings may take place, what is due, and when it is to be turned in.

When sending messages to individual students, particularly about missed classes or assignments, we use the Canvas mail system so that messages are kept within each course and not mixed in with other messages in our Gmail accounts. This practice makes those messages easier to track when necessary. If students

contact us via our Gmail accounts, we can add labels to those messages with the name of the course for easier retrieval later.

REFLECTION ON PRACTICE

Push notifications can be scheduled in advance, yet they can still feel very present—and even urgently present—the moment they are received. They can also feel very personal, as push notifications seem directed specifically to each individual recipient.

Affordances of the Practice to Promote a Community of Inquiry

Key benefits of this practice include the ability to alert students to upcoming assignments, wherever those students are, as long as they have their mobile devices with them. This practice increases opportunities for students to be regularly reminded about assignments, which they can also access right from their mobile devices. If students benefit from push notifications, then instructors benefit, too, because they will spend less time fielding questions and following up on missing assignments.

Challenges We Can Foresee When Using This Practice

As mentioned earlier, students can use the To Do list to go directly to assignments and simply follow whatever prompt is in the assignment forum. If our push notifications merely provide links from the To Do list, students could still miss the information they need to successfully complete their work.

The results of our survey raised more questions about how students perceive push notifications. Comments provided by respondents suggest that some students confuse announcements created by instructors with automatic notifications sent out by the LMS. This point of confusion makes it important to add more personality to messages to ensure students recognize the message as coming from their instructor.

We are not certain how many automatic notifications students receive from the LMS and whether that number depends on an institution's particular contract with Canvas or the particular implementation of Canvas. We do know our students can opt out of some or all automatic notifications. We also know that our students can opt out of having Canvas Announcements forwarded to them, and we try to make them aware that we use this feature, encouraging them to leave it turned on.

A major challenge we have already experienced and foresee will continue is that technology is always changing; platforms are updated or new platforms

replace or enhance existing platforms. We have our vantage as the instructor rather than as the student, both in terms of how we conceive the arc of the course and how we see things in the LMS itself. Some instructors may lack experience using the LMS, which can lead to disorganization and confusion. Instructors may not be notified about updates to the LMS—or notified in time to adjust the course design.

Students—and instructors—are increasingly overloaded with information. This overload plays out beyond any updates in course objectives and outcomes: technology creates considerable information overload through the need to constantly fix bugs and update technologies. Changes in technology lead to shifts in how students engage with course sites, which further mandates an update in pedagogical practices. The lag time between each of these phases creates its own problems, including how quickly instructors migrate and adapt to new technologies, how much time passes before students shift to new ways of engaging with the technologies, and how much more time passes before instructors become aware of changes in student engagement to even determine what has changed and why.

Refining Tasks and Criteria to Ensure Student Success

Over time, as we continue to gain experience as instructors and as users of this LMS, we have refined our approaches to using the technologies available to us. The following is not a comprehensive list, but it does sum up major areas where we have identified room for improvement:

- **We Sought Out Student Input on the Timing and Frequency of Notifications**. Student input is not a foolproof strategy, as some students will be unhappy with whatever choice the group makes or will discover later the push notification schedule does not work for them. Seeking student input on the schedule is also not useful for shorter courses that require daily reminders. Finally, going forward, we need to become more aware of how often the Canvas system is sending students automated notifications to ensure we do not overload students with notifications to the point where they ignore our messages.
- **We Worked on Making Messages More Personable.** Students are more likely to communicate with instructors who present themselves as approachable. Style choices in subject headings and body text can help to immediately identify the message as coming from a real person, who has content expertise and empathy for students. For example, we might reference a discussion from a recent synchronous session, say something about the weather or current events, or embed a video of ourselves providing whole-class feedback on a recent class

activity. As we become more comfortable with this practice, we are starting to share more humor in our messages, such as a meme or video related to course content.

- **We Worked on Making Messages More Concise**. Our goal is to reduce the number of links required in a message, which would save labor and reduce the need to test so many links. Broken links are likely to cause students to focus on the instructor's failure to provide a live link rather than their responsibility to keep up with assigned tasks. At the same time, we recognized the need to direct students into the module so that they see all the resources available to them. We have come to realize that assignments themselves should include links to necessary module pages. That way, through one link to an assignment, students can find resources easily, whether they actively access assignments from the To Do list or passively retrieve them through push notifications. We continue to consider how to better leverage the relationship between the published assignments that populate the To Do list and the push notifications we send out through Canvas Announcements. More careful consideration of the text and links to include in assignment prompts may allow us to minimize links in the push notifications and ensure consistency of messaging.

- **We Began to Use Push Notifications for In-Person Web-Enhanced Courses**. We recognized that some students really do depend on their mobile devices. This observation was supplemented by a show of hands during an early in-person synchronous class session that showed how virtually all students in our classes were using the mobile app. Given this change in the manner that students interact with their courses, we cannot emphasize enough the point that even web-enhanced in-person courses are becoming less fully reliant on in-person interactions. Also, the need to be accessible to and stay in touch with students who are absent seems to make scheduled notifications a logical way to do this, while maintaining boundaries on instructor time and labor.

CONCLUSION

Planning out course announcements as push notifications can help instructors, both new and experienced, to become more organized. When teaching from a course template in particular, setting up messages ahead of time can also serve to reinforce the instructor's familiarity with the course structure and timeline. Having reminders set up ahead of time can alleviate stress once the semester gets

busy because the instructor no longer has to remember to send them or take time to create them.

Additionally, planning out a course's communication strategy in advance provides a foundation for successful interactions with students; however, this practice also demands flexibility. Instructors must be willing to adjust the approach, based on direct student feedback and evidence of student learning. For example, the instructor should review upcoming messages to ensure the information is still relevant and useful as the course progresses and revise them accordingly if the need arises.

The goal of this practice is to benefit both students and instructors. However, a significant potential drawback is the creation of new expectations for teachers, making them responsible for actively reminding students about upcoming due dates. Instructors benefit from this practice only if they are able to spend more time on course concepts and less time on administrative tasks, such as following up on missing assignments—and missing students.

To summarize, push notifications are one part of a user-centered design, which must consider the use of mobile devices to access and interact with course materials. Push notifications need to be more than informational; they need to reflect the instructor's personality, expertise, and care for the students. Push notifications must also emphasize the importance of tapping into and reading the instructor-provided resources, which is especially critical for students who rarely or never click into the online course modules or who rarely or never interact with the course on a desktop or laptop screen. Finally, the frequency of push notifications and the subject lines of push notifications must be carefully considered to ensure that students respond to them, rather than ignore them. Ultimately, we believe this to be a worthwhile practice for instructors to use and adapt for the benefit of both students and themselves.

MOVING BETTER PRACTICES ACROSS MODALITIES

- **In-Person, Real-Time Learning:** A push-notification program can be created—with input from students about timing and frequency—to send personable instructor messages that remind students about tasks due for class meetings.
- **Online, Real-Time Learning:** A push-notification program can remind students of tasks to complete prior to each class meeting, and each message can also include the link to the scheduled video call.
- **Online, Any time Learning:** A push-notification program can establish and strengthen a sense of teacher presence in a course without

real-time meetings while also scaffolding the assignments and reminding students of day-to-day tasks they need to complete.

- **Hybrid Learning:** A push-notification program can help reduce confusion by reminding students of the scheduled learning modalities for each week, in addition to reminding them about assignments to complete prior to real-time meetings.

REFERENCES

Alhazmi, A. K., Imtiaz, A., Al-Hammadi, F., & Kaed, E. (2021). Success and failure aspects of LMS in e-learning systems. *International Journal of Interactive Mobile Technologies, 15*(11), 133-147. https://doi-org.proxy.lib.miamioh.edu/10.3991/ijim.v15i11.20805

Baldwin, S. J., & Ching, Y. H. (2020). Guidelines for designing online courses for mobile devices. *TechTrends*, *64*, 413-422. https://doi.org/10.1007/s11528-019-00463-6

Borgman, J., & Dockter, J. (2018). Considerations of access and design in the online writing classroom. *Computers and Composition, 49,* 94-105. https://doi.org/10.1016/j.compcom.2018.05.001

Borgman, J., & McArdle, C. (2019). *Personal, accessible, responsive, strategic: Resources and strategies for online writing instructors.* The WAC Clearinghouse; University Press of Colorado. https://doi.org/10.37514/PRA-B.2019.0322

Cooper, L. J., Laster-Loftus, A., & Mandernach, B. J. (2019). Efficient online instruction: Maximum impact in minimal time. *Online Journal of Distance Learning Administration, 22*(3), 1-9. University of West Georgia, Distance Education Center. https://ojdla.com/archive/fall223/cooper_lasterloftus_mandernach223.pdf

Council of Writing Program Administrators, National Council of Teachers of English, & National Writing Project. (2011, January). *Framework for success in postsecondary writing*. https://wpacouncil.org/aws/CWPA/pt/sd/news_article/242845/_PARENT/layout_details/false

Fendler, R. J. (2021). Improving the "other" side to teacher presence in online education. *Online Journal of Distance Learning Administration, 24*(1), 1-16. https://ojdla.com/authors/richard-j-fendler

Galanek, J. D., Gierdowski, D. C., & Brooks, D. C. (2018). *ECAR study of undergraduate students and information technology.* Educause Center for Analysis and Research. https://tacc.org/sites/default/files/documents/2018-11/studentitstudy2018_0.pdf

Garrison, D. R., Anderson, T., & Archer, W. (2000). Critical inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education 2*(2-3), 87-105. https://doi.org/10.1016/S1096-7516(00)00016-6

GSOLE Executive Board. (2019, June 13). *Online literacy instruction principles and tenets*. Global Society of Online Literacy Educators. https://gsole.org/oliresources/oliprinciples

Greer, M., & Harris, H. S. (2018). User-centered design as a foundation for effective online writing instruction. *Computers and Composition, 49,* 14-24. https://doi.org/10.1016/j.compcom.2018.05.006

Pew Research Center (2021). Mobile fact sheet. *Pew Research Center.* https://www.pewresearch.org/internet/fact-sheet/mobile/

Pham, X.-L., Nguyen, T.-H., Hwang, W.-Y., & Chen, G.-D. (2016, July 25-28). *Effects of push notifications on learner engagement in a mobile learning app* [Conference session]. 2016 IEEE (Institute of Electrical and Electronics Engineers)16th International Conference on Advanced Learning Technologies (ICALT), Austin, Texas, United States. https://doi.org/10.1109/ICALT.2016.50

Rath, L, Olmstead, K., Zhang, J., & Beach, P. (2019). Hearing students' voices: Understanding student perspectives of online learning. *Online Journal of Distance Learning Administration, 22*(4), https://ojdla.com/archive/winter224/rathbeacholmsteadzhang224.pdf

Sitzman, K., & Leners, D. W. (2006). Student perceptions of caring in online baccalaureate education. *Nursing Education Perspectives, 27*(5), 254-259.

Stone, C., & Springer, M. (2019). Interactivity, connectedness and "teacher-presence": Engaging and retaining students online. *Australian Journal of Adult Learning, 59*(2), 146-169. https://files.eric.ed.gov/fulltext/EJ1235966.pdf

Wohllebe, A., Adler, M. R., & Podruzsik, S. (2021). Influence of design elements of mobile push notifications on mobile app user interactions. *International Journal of Interactive Mobile Technologies, 15*(15), 35-46. https://doi.org/10.3991/ijim.v15i15.23897