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Critically Analyzing the Online Classroom: Blackboard, Moodle, Canvas, and the Pedagogy They Produce

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Abstract: Working from the crossroads of critical pedagogy and software studies, this study analyzes the means by which teaching technologies—in particular the popular learning management systems (LMS) Blackboard, Moodle, and Canvas—support a transmission model of education at the expense of critical learning goals. I assess the effect of LMSs on critical aims via four key critical pedagogy concepts: the banking system, student/teacher contradiction, dialogue, and problem-posing. From software studies, I employ the notion of affordances—what program functions are and are not made available to users—to observe how LMSs naturalize the transmission model. Rather than present a deterministic look at teaching technology, this study calls for closer examination of these tools in order to rework teaching technologies toward critical ends.

The day leading up to Spring Break 2020, my home university of UMass-Amherst made the decision to close campus for the remainder of the semester and shift to an all-digital format. Our situation was no doubt a common one across U.S. colleges: professors, many of whom had never taught online, now had roughly a week to redesign their in-person courses to a fully digital format. In response, many faculty in our department began to send around articles and other resources outlining best practices for teaching online. The advice was appropriately practical: How to manage your class by keeping up with attendance, building detailed rubrics, and communicating project instructions clearly (Center for Teaching and Learning, 2020); How to translate standard classroom practices to the digital space by restructuring PowerPoint presentations, making online materials visually engaging, and following digital accessibility

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standards (Darby, 2019); How to best present yourself by ensuring your webcam lighting was good, making lots of eye contact, and keeping thoughts short (Moore & Hodges, 2020); and What to make of new online teaching terminology like (a)synchronous, MOOC, and learning management system (Hetsevich, 2016). Each article offered functional pragmatic advice. And for the most part, each was unconcerned with the role of critical thought in the online space.

None of this should be too surprising. Quick and dirty solutions were the order of the day; instructors needed to act, not reflect. However, our sudden move to online teaching is unlikely to be just a flash-in-the-pan. The trend toward online classes in higher education has been underway for well over a decade now. As of 2019, at least 34% of college students took one or more classes online, with 17% taking all their classes without stepping foot on a traditional campus (Lederman, 2019). Many predict that "pandemic pedagogy" will push even more classes into this format, as universities invest heavily in online systems and the training to operate them (Blumenstyk, 2020; Lederman, 2020). Where platforms like Blackboard, Moodle, or Canvas once played a blended role alongside in-class activity, they will likely govern a larger role in our courses going forward. Both the scope and speed of this shift demands that we cast a more critical eye at online teaching tools. As Manovich (2013) notes, no technology is neutral. Like any medium, these tools always assert some degree of influence over content. So to what degree are these online platforms affecting the way we teach?

This study works from the crossroads of critical pedagogy and software studies to analyze how the technology through which online courses are facilitated influences critical thought. My analysis focuses on the three most popular learning management systems (LMSs) currently used in American higher education: Blackboard, Moodle, and Canvas (Edutechnica, 2020). These platforms, I argue, perpetuate a transmission model of education in which knowledge is unproblematically transferred from teacher to student (Freire, 1970). Although this "transmission logic" has long been a hegemonic force in education, LMSs threaten to naturalize the model via our everyday use of these technologies. Left unchallenged, our increased reliance on LMSs could foreclose critical opportunities to use the classroom space as a platform from which to challenge hegemonic knowledge structures and formulate new understandings of the world.

I operationalize "critical" via four Freirean (Freire, 1970) concepts central to critical pedagogy—banking education, student-teacher contradiction, dialogue, and problem-posing—analyzing how each concept is either upheld or undermined within Blackboard, Moodle, and Canvas. From software studies, I employ the concept of affordances, or what a given piece of software does or does not allow users to do (Manovich, 2013). By analyzing LMS affordances such as permission settings, learning analytics, grading tools, and other functions, I demonstrate how these teaching technologies ultimately promote a transmission approach in opposition to Freirean pedagogical ideals. To avoid a deterministic view of LMSs or teaching tools in general, I conclude by calling for educators to attend more closely to LMSs and the manner in which they influence pedagogical teaching practices. From this standpoint, we may begin to develop strategies for redeploying these technologies toward more critical ends.

Critical Pedagogy in the Online Classroom

Though software studies and critical pedagogy have not been integrated frequently, together they offer a uniquely powerful set of tools for analyzing learning management systems. Critical pedagogy in

particular provides a lens through which to assess and reimagine how teaching occurs in the online space. Freire (1970) first identified and critiqued the "transmission model" of education, a mode of classroom instruction in which knowledge is transmitted from teacher to student. The four Freirean concepts analyzed for this study outline both how to understand the logics behind the transmission system as well as how educators might replace it with critically-minded pedagogy:

1. *The banking system*: This skill-and-drill approach positions teachers as holders of knowledge and students as empty receptacles into which the teacher deposits knowledge. As Freire (1970) notes, the performance of both teacher and student is gauged by their adherence to these roles. "The more completely he fills the receptacles, the better a teacher he is. The more meekly the receptacles permit themselves to be filled, the better students they are" (p. 58).
2. *The student-teacher contradiction*: The teacher, as the clear authority in the classroom space, authorizes what does and does not count as true knowledge, typically in order to perpetuate hegemonic understandings. Critical pedagogy looks to resolve this power imbalance, or the student-teacher contradiction, by acknowledging both groups as co-producers of knowledge.
3. *Critical dialogue*: Working from the equal position as knowledge co-producers, students and teachers share and build on their collective understanding of the world to recognize connections between their individual problems and the social context. For Freire (1970), "only dialogue, which requires critical thinking, is also capable of generating critical thinking" (p. 81).
4. *Problem-posing approach*: After building mutual understanding through dialogue, students and teachers move from reflection on the problem into concrete action. This transformation thus requires not just a building of critical understanding of the world but the empowerment to go into the world and change it.

As both a critique of the transmission model and a conceptual framework for offering an alternative, critical pedagogy acts less as a set of structured teaching strategies than a meta-questioning of pedagogical practice itself (Sholle & Denski, 1994). My use of these four key Freirean concepts functions in a similar fashion, offering less a set of hard criteria than a questioning framework by which to observe how LMS affordances support critical or transmission style pedagogical approaches.

Software studies provide the tools necessary to adapt Freire's (1970) original critique to fit online learning environments. Originating from McLuhan, Kittler, Hayles, and other media ecologists' focus on how media technologies shape cultural practice, software studies places critical attention on the form (or platform) in which content is transmitted (Manovich, 2013). Unlike previous mediums such as radio or television, which exerted relatively small influence over most classrooms throughout the 20th century, software has dramatically reshaped educational practice (Buckingham, 2013; LeBlanc, 2013). Software's ability to act as a meta-medium—capable of simulating a typewriter, encyclopedia, television, or almost any other pre-existing media form—made it highly adaptable to most classroom spaces (Manovich, 2013).

Software also overcame the material restrictions of these earlier mediums, allowing users to access content outside the classroom space. Starting from introduction of the PLATO computer-assisted instructional system in 1960, software began to shift the means by which students encountered class materials, their instructors, and their classmates (Watson & Watson, 2007). By 2014, over 99% of higher education institutions implemented a content-management system (CMS) of some kind to handle assignment

submissions, attendance logs, gradebooks, and other administrative tasks (Rhode et al., 2017). While CMSs and other related tools worked within the context of an in-person class, LMSs shifted the entire class experience online, providing "the framework that handles all aspects of the learning process" (Watson & Watson, 2007, p. 28). Since the onset of the pandemic, I argue that LMSs have become normalized in higher education, a reversal of its former reputation as the domain of "less prestigious" institutions such as for-profit colleges (House-Peters et al., 2019). Instead, developers built sizable and profitable markets in the corporate world, with business-oriented LMSs including Blackboard for Business, Moodle Workplace, and Bridge hosting leadership development, certification, and other training courses. More recently, attitudes toward online teaching have been shifting within higher education, pushed in part by Harvard, MIT, and Stanford's heavy investment in online platforms like edX and (more likely) the demonstrated earning potential that online classes offered (House-Peters et al., 2019; Lewin, 2012). To meet demand, developers largely repackaged corporate LMS systems to higher education, ensuring that much of the same DNA remained (Coopman, 2009).

As a universal language and infrastructure for how our world now runs, software exerts huge, often invisible cultural influence. Moreover, Manovich (2013) and other software studies theorists contend that ignoring the cultural dimensions of LMSs allows educators to understand only "the output that appears on a computer screen rather than the programs and social cultures that produce these outputs" (p. 9). To denaturalize this often-unseen influence, software studies conceives of LMS technologies not as tools merely used by educators, but as environments that actively reshape the encounter between student, teacher, and content. Tracking the affordances given to students and instructors on Blackboard, Moodle, and Canvas offers perhaps the clearest means of making visible this reshaping influence, demonstrating how software directs the user within a given LMS environment based on what functions it does or does not make available (Manovich, 2013).

Williamson's (2020b) investigation of learning analytics tools documents Canvas's implementation of predictive algorithms to provide study recommendations, real-time performance feedback, and personalized learning experiences for students. Such affordances actualize a datafied ideal of education—the "smart campus" or "University 4.0" as they are often referred—in which the LMS provides not just the teaching environment but conducts much of the actual teaching as well. The push toward this centralized, neoliberal model funnels funding toward the private firms that develop LMSs, with universities paying up to 50 to 60% of student enrollment fees to license a platform like Canvas (Williamson, 2020b). Martínez-Guillem & Briziarelli (2020) further track how LMS affordances such as shell classes, in which the content from an online class can be cloned and retaught in subsequent semesters, has recomposed academic labor. Faculty become "mere producers of marketable instructional commodities that they may or may not themselves deliver," a further advancement in this neoliberalization trend in education (Smith et al., 2018).

These and other related studies identify online learning environments as critically compromised: set in a transmission model that makes it increasingly difficult to challenge hegemonic knowledge structures. In the following section, I further analyze these forces at play within Blackboard, Moodle, and Canvas. I chart how the affordances of these tools support the transmission model by advancing the banking system and student-teacher contradiction, while inhibiting critical dialogue and problem-posing approaches.

Analysis

Results of this analysis are arranged into four pedagogical concept areas. These are the banking system, the student/teacher contradiction, dialogue, and problem-posing. As illustrated in the following paragraphs, unexamined use of LMSs as mere tools for instruction poses a threat to critical pedagogy in higher education.

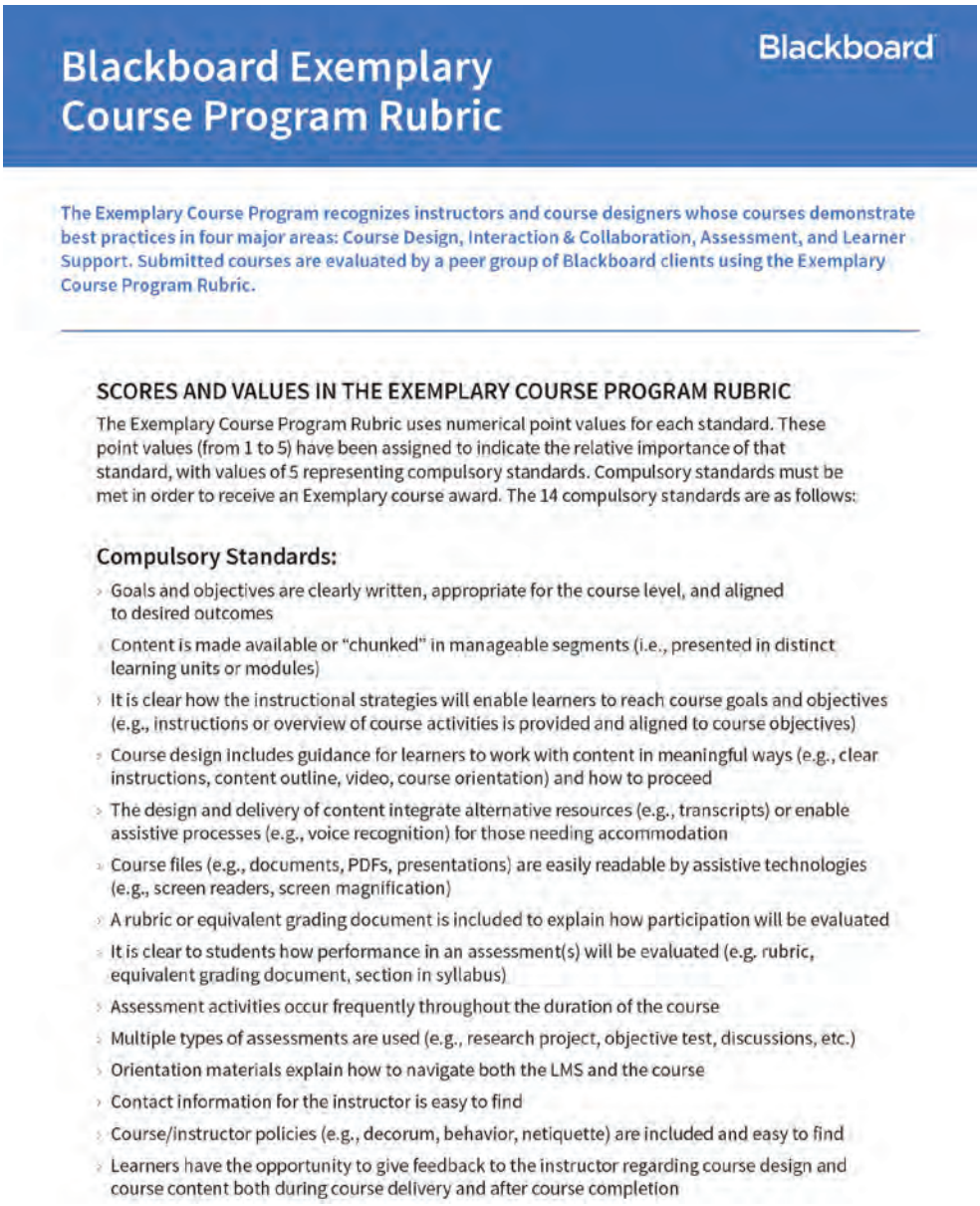
Concept 1: Banking System

For critical pedagogues, the classroom provides a space for "pedagogical practices capable of creating the conditions for producing citizens who are critical, self-reflective, knowledgeable, and willing to make moral judgments and act in a socially responsible way" (Giroux, 2011, p. 3). The biggest obstacle to this goal is what Freire (1970) calls the banking system of education. As the underpinning of the transmission model, the banking system sets the educational encounter on the empirical model of data transfer: The effectiveness of a class can be judged on the quantity of information transferred to the student. So to what degree do LMSs implement the banking system?

In analyzing the rhetoric Blackboard, Moodle, and Canvas use to describe themselves, there is a clear emphasis on language such as efficiency, workflow, actionable data, reliability, and flexibility. As pieces of software, it makes sense that these programs would implement the terminology of technical performance. What's more interesting is the means by which they apply this same logic to educational performance.

> Blackboard (2020a): "With a modern, intuitive, fully responsive interface, Blackboard delivers a simpler, more powerful teaching and learning experience."
>
> Canvas (2020a): "Open, intuitive, and born in the cloud, Canvas streamlines all the digital tools and content that teachers and students love, for a simpler and more connected learning experience."
>
> Moodle (2020a): "Moodle is a learning platform designed to provide educators, administrators and learners with a single robust, secure and integrated system to create personalised learning environments."

In highlighting the importance of responsiveness, security, intuitiveness, streamlining, and robustness, these descriptions offer a window into the value system at play in each platform. There's a distinctly corporate flavor of much of this language, an artifact perhaps from the business-oriented LMS platforms from which these higher education versions were adapted (Coopman, 2009). Beyond corporate jargon, the neoliberal ideology of the corporate world is also applied here. Education is framed in the language of the market, as a transaction of knowledge between instructor and learner (Svensson & Wihlborg, 2010). Both teacher and student are treated as consumers, receiving the "content they love" (i.e., personalized environments, responsive interfaces, streamlined tools, etc.). LMSs offer the ideal infrastructure for this flow of knowledge from teacher to student to occur, a neoliberal vision of the university as "high-tech, digitally-driven, data-intensive, and partly automated" (Williamson, 2020b). We can see the transmission logic further illustrated through Blackboard's (2020b) "Are Your Courses Exemplary?" rubric:



Blackboard Exemplary Course Program Rubric

Blackboard

The Exemplary Course Program recognizes instructors and course designers whose courses demonstrate best practices in four major areas: Course Design, Interaction & Collaboration, Assessment, and Learner Support. Submitted courses are evaluated by a peer group of Blackboard clients using the Exemplary Course Program Rubric.

SCORES AND VALUES IN THE EXEMPLARY COURSE PROGRAM RUBRIC

The Exemplary Course Program Rubric uses numerical point values for each standard. These point values (from 1 to 5) have been assigned to indicate the relative importance of that standard, with values of 5 representing compulsory standards. Compulsory standards must be met in order to receive an Exemplary course award. The 14 compulsory standards are as follows:

Compulsory Standards:

- Goals and objectives are clearly written, appropriate for the course level, and aligned to desired outcomes
- Content is made available or "chunked" in manageable segments (i.e., presented in distinct learning units or modules)
- It is clear how the instructional strategies will enable learners to reach course goals and objectives (e.g., instructions or overview of course activities is provided and aligned to course objectives)
- Course design includes guidance for learners to work with content in meaningful ways (e.g., clear instructions, content outline, video, course orientation) and how to proceed
- The design and delivery of content integrate alternative resources (e.g., transcripts) or enable assistive processes (e.g., voice recognition) for those needing accommodation
- Course files (e.g., documents, PDFs, presentations) are easily readable by assistive technologies (e.g., screen readers, screen magnification)
- A rubric or equivalent grading document is included to explain how participation will be evaluated
- It is clear to students how performance in an assessment(s) will be evaluated (e.g. rubric, equivalent grading document, section in syllabus)
- Assessment activities occur frequently throughout the duration of the course
- Multiple types of assessments are used (e.g., research project, objective test, discussions, etc.)
- Orientation materials explain how to navigate both the LMS and the course
- Contact information for the instructor is easy to find
- Course/instructor policies (e.g., decorum, behavior, netiquette) are included and easy to find
- Learners have the opportunity to give feedback to the instructor regarding course design and course content both during course delivery and after course completion

FIGURE 1 Blackboard Exemplary Course Program Rubric (2020b)

The standards provided here—goals "aligned to desired outcomes," guidance provided for learners to work "in meaningful ways," orientation materials explaining "how to navigate both the LMS and the course"—all emphasize structure and control, ensuring a smooth transfer of knowledge from instructor to student via technology. In practice, Blackboard's notion of an "exemplary" class differs a good deal from the banking system Freire critiques: we have no authoritative teacher drilling knowledge into docile students in the traditional sense. Yet the top-down orientation of learning remains. As a mediator between teacher and student, LMSs in many respects heighten the tendency toward the banking system by conditioning students on the correct means of "orienting" themselves in the online space to achieve "desired outcomes."

The physical framing of the teacher–student encounter may change, yet the standard of a set sender and receiver or knowledge remains intact. Opportunities for students to become more than a receptacle for

knowledge by reversing this one-way flow of information requires working upstream against Blackboard's desired outcomes.

Blackboard's course standards also demonstrate an empirical rationalization of epistemology. Knowledge is framed as a discrete object, with effective pedagogy situated as a process of increasing the acquisition of knowledge objects. Knowledge itself is not questioned, but it is naturalized as an accepted truth. As Giroux (2011) notes, "Under the guise of neutrality, scientific knowledge and all theory become rational on the grounds of whether or not they are efficient, economic, or correct" (p. 33). In this way, classrooms reproduce hegemonic social, political, and cultural beliefs, unable to offer the critical space needed to challenge knowledge claims or systems of power (Darder, 2003).

The descriptor "intuitive" used in Canvas and Blackboard promotional language gestures toward this reproduction tendency. The intuition to "know what the user wants" isn't about knowing the user, but in knowing what the user is supposed to do: complete assignments easier, grade faster, and so forth (Blackboard, 2020c). The ideal online classroom constructed in these materials thus reproduces not just the transmission model, but the logic of ideal software performance by transferring information from sender to receiver as efficiently as possible. As Martínez-Guillem & Briziarelli (2020) note, the transmission framing of the classroom reflects a larger neoliberal push toward theorizing classes as commodities. "LMSs channel a normalization of connectivity by remediating foundational worldviews of current capitalism, such as free circulation of commodities information, commodification of knowledge, or the logistic annihilation of space by time" (p. 13).

This "annihilation" of spatial and temporal constraints of the traditional classroom afforded by LMSs is not an altogether negative quality for many scholars. For Agarwal (2013), these systems allow higher education to reach students that might not have had access to the privileged spaces of residential campuses. Classes can also be scaled and repackaged in new ways that have not been available before, affording hundreds or even thousands of students the ability to enroll in a single course (House-Peters et al., 2019). Yet giving more students access to the classroom does not equate to empowering them within it. Students are still largely framed as passive receivers of knowledge. It's the teacher's role that changes most in the LMS environment, shifting from the authoritative knowledge provider of the Freirean model to the more sidelined role of online course facilitator. The scalable courses House-Peters et al. describe don't just allow for enrollments well beyond the bounds of a traditional lecture hall; they can also be reused by institutions over and over again. The emergent cottage industry of course building has risen to build these "course shells," with "master teachers" building courses and selling their intellectual property to institutions for a one-time fee (House-Peters et al., 2019; Martínez-Guillem & Briziarelli, 2020). In place of a traditional professor or instructor who formulates the content of the course, these classes can then be run by a "facilitator," a deskilled role in which instructors oversee large, multi-section courses with the majority of content already set in place. These changes shift authority not from teachers to students, but to the course shell, and, by extension, the platform on which it is hosted. As House-Peters et al. (2019) note:

> In some cases, 50 percent of gross tuition revenue has gone to the private firm before any money is returned to the higher education partner. This drives not only the need for very large student enrollment numbers, but also puts increasing pressure on instructional costs, forcing many institutions to further 'adjunctify' their teaching workforce with inexpensive, contingent labor. (p. 11)

Adjunctifying is not only a cost-saving measure, it also strips instructors of their own critical capacity to challenge knowledge structures. LMSs are not necessarily weakening the banking system as restructuring it. Knowledge is not banked from teacher to student, but from system to student, with the teacher taking a tertiary role of facilitator (House-Peters et al., 2019). LMSs sell this reimagined transmission model of education to institutions as offering optimal efficiency, allowing the most knowledge to be transferred to the most students using the least number of instructors. Further, the push to mediate (and increasingly automate) all classroom encounters through the LMS further naturalizes hegemonic ideas, mystifying the process by which knowledge can be challenged or created by students or teachers in the classroom. Left unchallenged, LMS systems will heighten the use of transmission approaches in education by further reducing students to mere receivers of content and deskilling teachers such that they too have little control over what or how content is taught.

Concept 2: The Student/Teacher Contradiction

Resisting a transmission approach requires a resolution of what Freire (1970) calls the teacher–student contradiction. Teachers no longer maintain authority over their students by imparting facts to them in a top-down model, but "reconcil(e) the poles of the contradiction so that both are simultaneously teachers and students" (p. 59). For scholars like House-Peters et al. (2019), LMS platforms help resolve the contradiction by destabilizing the power dynamics of teacher and learner. Students, for example, can move through online spaces in ways that were unavailable in traditional classrooms, selecting how, when, and at what pace they wish to engage with course materials, instructors, and classmates. LMSs also decenter the teacher, breaking from the spatial standard of the instructor standing at the head of a class, lecturing down at students that has long typified educational practice. For Gilchrist-Petty (2018), the online environment supports this decentering of teacher authority, with online roles such as discussion leader, content presenter, and peer reviewer affording students "the privilege of having autonomous ownership in the classroom experience" (p. 103).

Even with these advantages, there are other equally powerful ways in which LMSs reinforce the teacher-student contradiction, or more accurately, the student-system contradiction. The most prevalent of these measures is the use of clearly defined roles within the learning environment, including facilitator, course builder, student, instructor, and grader. Roles provide a clear hierarchy within the online teaching space, and are constantly reified through functions such as permissions settings, assessments, and tracking tools. As owners of the course, instructors are able to assign and withhold permissions related to what students can and cannot add or edit within the platform. Through separate student and instructor views, platforms create separate environments for teachers and students to inhabit, providing different affordances for individual users depending on their ascribed role. Interstitial roles such as facilitator and grader further complicate the LMS ecosystem, ensuring that questions of who does or doesn't have power within the online space are always present for users.

Following this emphasis on power and oversight, platforms like Blackboard and Moodle provide a huge range of tools for instructors to "keep track" of students. The Performance Dashboard tool, for instance, offers "pertinent information about each user's progress and activity" including time of last course access, quantity of discussion board posts, and "review status," a metric used to track students' progress on reviewing specific items (Blackboard, 2020c).

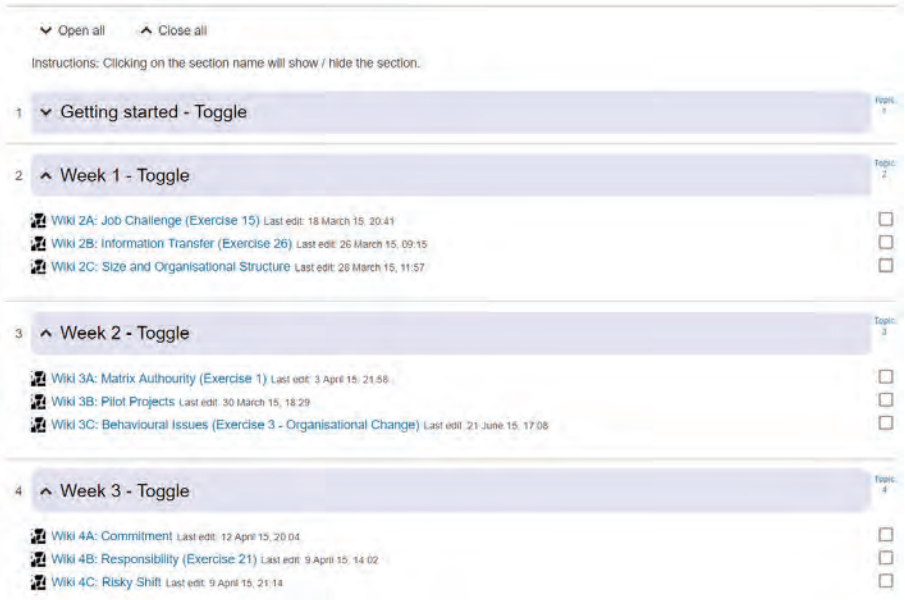


FIGURE 2 Blackboard's Retention Center sends alerts to instructors triggered by missed deadlines, low grades, minimal activity, not logging in (2020c).

Moodle further provides tools such as "Competencies and Activity Completion" to track "the level of understanding or proficiency of a learner in certain subject-related skills," as well as positive reinforcement functions such as badges and other progress-based awards (Moodle, 2020b). Williamson (2020a) records that these sorts of "student surveillance technologies" have been further adopted to "monitor students' virtual attendance, 'proctor' examinations, assess social-emotional learning and well-being, and enable schools to fulfil their safeguarding responsibilities" (para. 13).

In terms of affordances, tracking tools are among the most robust functions on all three LMSs. Appropriately, these functions are perhaps the most visible selling point to universities, with platforms like Blackboard pitching their education analytics tools as helping institutions to "overcome barriers to student success" and "keep(ing) learners on-track to optimize institutional outcomes" (Blackboard, 2020h). In line with the transmission model, metrics like "student success" and "institutional outcomes" are predetermined not by the student or even the teacher. Resolving the student-teacher introduction becomes an even more elusive process within the LMS-mediated class as the top-down authority shifts from an embodied instructor to an abstract online system. Instead, teachers and students become more alienated as "automation creep(s) into the pedagogic encounter between educators and students" (Williamson, 2020a, para. 12).

Tracking and analytics tools are no doubt helpful for instructors, especially given the difficulty of maintaining student engagement in online learning spaces. Yet they further reflect a hegemonic logic of control, one far removed from the critical goal of questioning power (Apple, 2012; Giroux, 2011). Rather than resolve the contradiction between teacher and student so that both might become co-producers of knowledge, power is exerted even more prominently through the top-down authority of the LMS itself, rendering students and teachers less able to collaboratively question hegemonic knowledge structures. LMS platforms may afford new modes of interaction for teachers and students; however, the tracking and constant evaluation of student movement by teachers makes it difficult to view these new modes as enabling greater agency or equality between both groups.

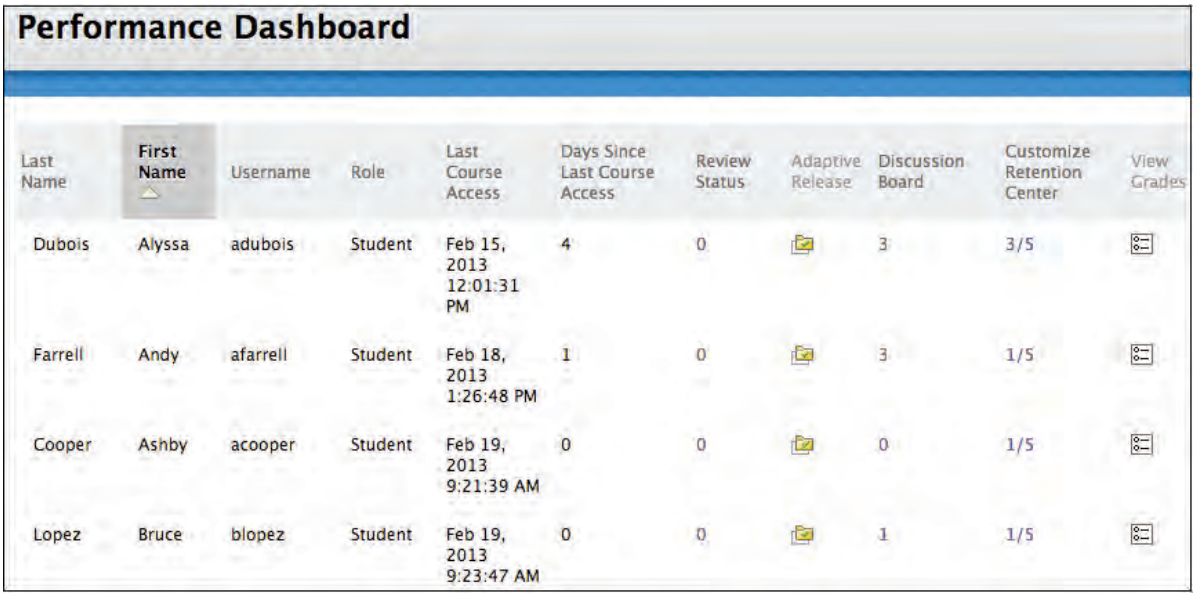
Concept 3: Dialogue

For Freire (1970), dialogue acts as a means of engaging students as equals, a full resolution of the teacher–student contradiction in which "teacher-of-the-students and the student-of-the-teacher cease to exist" (p. 67). Framing students as equal participants within the classroom space requires educators to value the cultural and experiential knowledge they hold. For Orelus (2013), "knowledge is acquired through social, cultural, and historical transactions with people and exposure to varying sources of literature" (p. 12). It is through dialogue that knowledge must be "continuously expanded on, re-examined, questioned, and constantly put to tests" (p. 12). Dialogue must then function as a critical process that creates multiple understandings, while moving students and teachers to "often uncomfortable places of learning and unlearning" (Wink, 2005, p. 48).

For proponents of LMSs, the online format affords new opportunities for interaction not available in traditional classrooms. Communication functions including Announcements, Blogs, Discussion Boards, Direct Email, Group Chats, Journals, and Wikis provide a range of structures for student-to-student, student-to-instructor, and class wide messaging to occur. House-Peters et al. (2019) note how these tools expand classroom communication possibilities "by facilitating multiple opportunities for engaging in shared learning processes, shifting the computer from a coldly rational information source to a communication medium" (p. 92). LMS messaging functions allow for dialogue between individuals to be unrestricted by physical proximity, opening the academy to many populations who might otherwise be excluded.

Communication is also unrestricted by time. Platforms can mimic the in-person classroom through synchronous learning, staging discussions in the moment (House-Peters et al., 2019). However, the majority of messaging functions on Blackboard, Moodle, and Canvas work asynchronously, a format that is often preferred by many students (Caplan, 2005). In expanding classroom communication options, new affordances available through LMS platforms can address some of the more salient critiques of critical pedagogy. As Ellsworth (1989) notes, setting dialogue as a pedagogical ideal disciplines students who might feel uncomfortable expressing their ideas in a crowded class situation. For Bali (2014), the high value placed on dialogue is a deeply Western concept, one that has the potential to punish students of different cultural backgrounds for whom such participation is not expected. By contrast, asynchronous means of communication remove the pressure of needing to perform dialogue in the moment, allowing students and teachers to engage in discussion at their own pace. Video and audio recording tools also expand the modes by which students can engage in dialogue, allowing a degree of agency to students not often available in traditional classrooms (Proszak, 2019).

Dialogue in critical pedagogy, however, is not just about the format of the discussion, but in its content. So can LMS platforms enable critical dialogue? All three platforms certainly provide functions for this sort of dialogue to thrive. For instance, in Blackboard's Reflective Learning feature, "students can use a journal or blog to collect observations, thoughts, concerns, notes, progress, and opinions that may not be shared otherwise" (Blackboard, 2020d). Moodle and Canvas's Wiki functions likewise allow students to contribute their own knowledge to the course: "There is usually no central editor of a Wiki, no single person who has final editorial control. Instead, the community edits and develops its own content. Consensus views emerge from the work of many people on a document" (Moodle, 2020c). Functions like the Wiki feature offer the potential to destabilize rigid teacher/student roles within LMSs as well as offer the opportunity for student-driven dialogue to flourish in the online space.



Performance Dashboard

Last Name	First Name	Username	Role	Last Course Access	Days Since Last Course Access	Review Status	Adaptive Release	Discussion Board	Customize Retention Center	View Grades
Dubois	Alyssa	adubois	Student	Feb 15, 2013 12:01:31 PM	4	0		3	3/5	
Farrell	Andy	afarrell	Student	Feb 18, 2013 1:26:48 PM	1	0		3	1/5	
Cooper	Ashby	acooper	Student	Feb 19, 2013 9:21:39 AM	0	0		0	1/5	
Lopez	Bruce	blopez	Student	Feb 19, 2013 9:23:47 AM	0	0		1	1/5	

FIGURE 3 Moodle's Wiki feature allows students and instructors to post new articles, edit each other's contributions, and add content. Wikis are self-contained within the class Moodle page (2020c).

For all these potential benefits, LMSs' emphasis on grading dialogue seems to undercut many opportunities for critical engagement. Blackboard champions grading discussions and other vehicles for classroom dialogue as "encourag(ing) thoughtful contributions" and "let(ting) them know how they performed and can shape the improvement of future interactions" (Blackboard, 2020e). There is certainly a practical logic to rewarding certain students for posting thoughtful responses or punishing others for writing only a few words to collect participation points. Grading discussion posts also acts as a means of ensuring that students participate in classroom dialogue at all, often a difficult task in online courses when instructors make posting voluntary (Burke & Fedorek, 2017).

Yet graded discussions, like many LMS features, reflect an empiricist logic of knowledge acquisition. Discussions are not a mode of self-expression, but a task requiring a correct demonstration of information. For many reading response-style posts, the pressure to receive full points compels students to summarize the text rather than offer their personal interpretation on, problems with, or misunderstanding of it (Mintz, 2020). Grading reinscribes teachers and the authorized text as the ultimate authority, foreclosing opportunities for students to speak back or engage on their own terms. From a critical pedagogy perspective, authentic dialogue at the level of student and teacher is impossible so long as these power dynamics remain in play.

There are other problems to consider with the student-to-student dynamic as well. Dialogue, as Freire (1970) conceives it, is a process of relationship building, of forging understanding. Given this, it's worth considering the quality of dialogue generated through LMSs. Graded discussions often work against this ideal, with students incentivized to collect points by posting rather than engaging with each other's ideas. The introduction of grading tools for discussions and other assignments further hinders authentic dialogue by automating the assessment process. For example, Blackboard's AI-assisted "discussion analysis" function provides metrics including length of post, sentence complexity, critical thinking level, and word variation, all means by which instructors can more easily calculate grades (Blackboard,

2020e). Such tools reinforce the notion that the value of a given post is predicated on the students' ability to reproduce information from the course rather than challenging or elaborating on this knowledge they receive.

The scalability of LMSs can also counteract their ability to provide a platform for dialogue in which understanding can be achieved. Within a large online class, it is easy for students to feel anonymous, or perhaps worse, unaccountable, a trend seen recently with "zoombombing" and other trolling efforts to disrupt classes (Lorenz & Alba, 2020). Considering the many affordances LMS platforms offer for teachers and students to interact, there is great potential not only to recreate in-person dialogue, but also to conceive more inclusive means through which dialogue can occur. Tools like Wikis and Discussion Boards point to this promise, allowing students to pool collective knowledge and build and share their own experiential and cultural knowledge on a range of subjects. As Gilchrist-Petty (2018) notes, taking participation grades can be a valuable tool for building classroom dialogue and understanding, given that instructors provide students with a wide range of outlets through which students can participate. However, this form of dialogue must be given a place to thrive within online learning spaces, an effort that will require educators to work against many of the affordances that are offered by LMS developers.

Concept 4: Problem-Posing

In opposition to the transmission model, Freire (1970) offers the problem-posing method of education. Through the process of problem-posing, students name the problem, reflect on it, and formulate actions that set out to resolve it. Action might take many forms, be it challenging harmful representations by producing alternative media texts or resisting oppressive policies through political organizing efforts. For Suoranta et al. (2005) the power in problem-posing comes in the ability "for human beings to apprehend their reality as social beings and to equate knowledge with power. Knowledge should not passively reflect the real world but rather knowledge should allow the human being to actively influence reality and its development" (p. 200). Problem-posing is at the heart of transformative movements such as Critical Activism Pedagogy, which aims to "put meat on critical pedagogy's theoretical bones" by "providing students with real-life opportunities to act collectively against injustice" (Frey & Palmer, 2017, p. 26). The problem-posing approach aims to push students away from the passive role of learner and toward that of community organizer, social justice advocate, and change agent (Artz, 2017).

One of the more powerful ways LMS platforms support problem-posing methods is by affording the use of multimedia tools. As a metamedium, online teaching software naturalizes the use of video, social media, and web texts, making it particularly easy to bring the sorts of media content that plays a significant role in most students' everyday lives into the classroom (Coiro, 2003). Beyond modernizing classroom materials, the integration of multimedia also offers students the chance to "assess, analyze, and evaluate messages across different media" (Proszak, 2019, p. 128.) For House-Peters et al. (2019), the opening of who can be in a class and what content be deployed within it also has powerful potential for research-based courses:

> The creation of new kinds of integrated publics—in classrooms, in communities, in networks—can offer sites for engagement and learning while, at the same time, function as research contexts for considering issues of identity, globalization, and the tacit barriers inhibiting meaningful understanding within and between diverse groups of people. (p. 95)

Bringing in multimedia texts cannot be a gimmick with which to attract student attention, but must act as a means of opening up conversations around representation and identity (Share, 2009). The

integration of video, audio, and other multimodal tools also allows students to create projects outside of the traditional essay while engaging subjects that affect their communities and lives more closely. Goodman (2003), Morrell et al. (2013), Share (2009), and other critical media literacy scholars have demonstrated the power of multimedia projects as a form of student action, offering students the ability to speak back to hegemonic representations through the production of their own texts. LMS platforms offer an infrastructure through which video and other assignments can be submitted and evaluated, opening opportunities for instructors to integrate more multimedia assignments into their teaching. By giving students an "active role in sharing video, audio, and text materials," these affordances can build media literacy skills and prompt critical reflection (Proszak, 2019, p. 128).

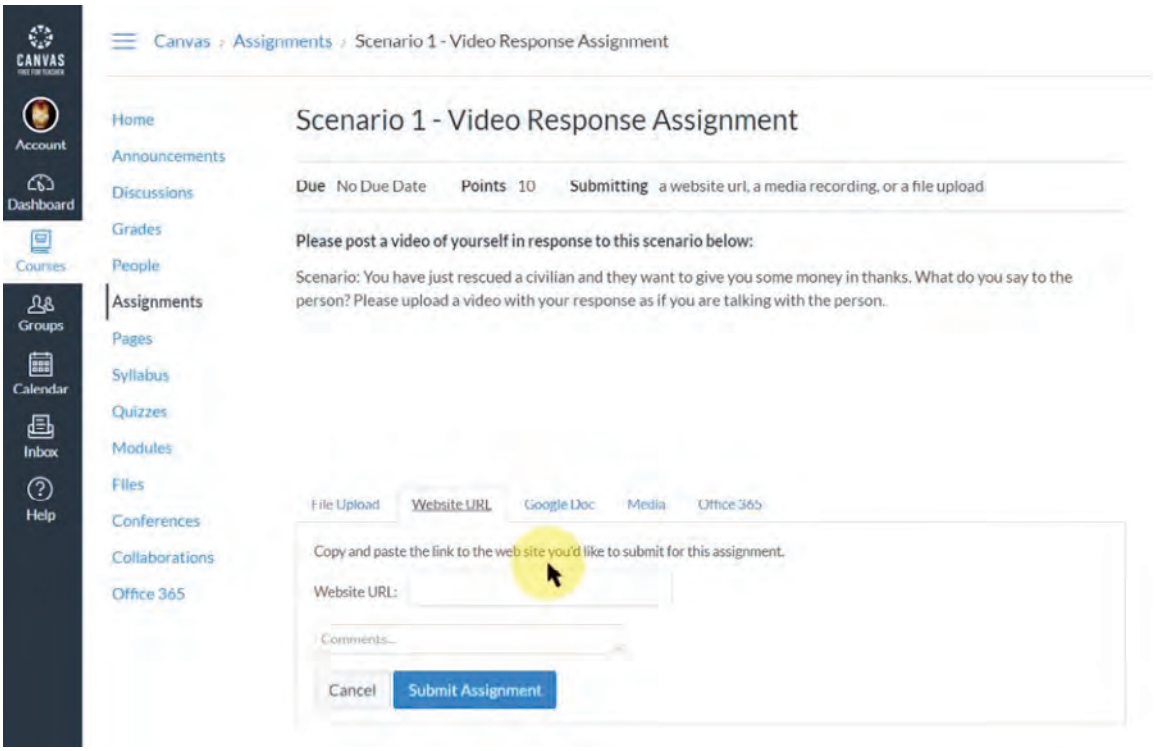


FIGURE 4 Canvas's (2020b) video response assignment function, which allows students to upload video footage from a range of sources including YouTube, Google Drive, or local files.

Yet despite the capability of LMS platforms to host multimedia content, these affordances are directed primarily at instructors and course builders. For students, there are relatively few opportunities to contribute their own multimedia content within the LMS environment. Posting a video on a discussion board to Moodle or Blackboard requires students to upload an existing video file rather than providing the tools to record it within the platform. Adding audio or image content may also be hampered by file type or size restrictions. For assignments, multimedia functionality is limited even further. Only Canvas currently offers a dedicated function for multimedia assignments that allows instructors to view video content or mark up images within the system (Canvas, 2020b). On Blackboard and Moodle, the submission process for a video assignment requires students and instructors to use third-party apps to create, view, and store content. These workarounds make it difficult for students to utilize multimedia within the given structure of the LMS, let alone afford them an active role in sharing video, audio, or digital materials within the online course environment.

By contrast, all three LMSs afford a range of functions for submitting and grading text-based content. Integrated assessment features like TurnItIn, SafeAssign, and ULTRA provide plagiarism detection and faster workflow between graders. Blackboard, Moodle, and Canvas also come stocked with pre-set templates for quizzes and essays that give instructors multiple options for creating text-only assignments. Emphasizing text-based forms makes business sense. For one, doc and pdf files are far less taxing on LMS servers than gigabyte-sized video or audio clips. Text is also easier to analyze, making it the ideal format for the predictive grading tools and learning analytics that LMSs are eager to have universities adopt (Williamson, 2020b).

So while it is possible to implement multimedia projects in the online space, LMS platforms direct users away from multimedia usage by affording limited functionality to these tools. By contrast, the robust functions offered for creating, receiving, and assessing text-based assignments normalize these forms as the standard student "work" on the platform.

There are also issues of efficacy and ethics to consider in looking to transform the world through problem-posing approaches via an online class. While online courses may seem to offer an ideal space for the "integrated publics" House-Peters et al. (2019) describe to emerge, it's worth questioning how these new publics can offer any meaningful action. For Dean (2005), this issue is one of communicative capitalism. Online communication tools may provide means of connection, yet action is foreclosed in the digital space, where it is unable to affect real-world change. While Dean offers a relatively pessimistic view of online activism, her critique points to the need to ensure "transformative" actions result in meaningful change in the physical as well as the digital world.

There is then the matter of whether LMSs provide a safe environment for any problem-posing action to occur. For one, the institutional relationship between universities and LMS providers means these platforms have access to students and teachers' personal data. From Blackboard's (2020f) Terms of Use:

> Any information that you provide to Blackboard, including first name, last name, email address, and any other information including personal information you have provided, may provide, or may be collected by us in connection with your use of the Products will be collected, maintained and used in order to provide the Products to you or your institution. (para 8)

As the company's Privacy Statement further details, Blackboard retains the rights to "share personal information with partners and other third parties," "transfer information outside the country," and use personal data to "conduct marketing to promote our products and services" (Blackboard, 2020g). Beyond personal data, there is also the issue of content students might create and upload to the platform. From Blackboard's (2020f) Terms and Services:

> By submitting, posting or displaying Content on or through the Products, you grant us a worldwide, non-exclusive, royalty-free license (with the right to sublicense) to use, host, store, copy, reproduce, process, adapt, modify, publish, transmit, create derivative works from, communicate, display, and/or distribute such Content in any and all media or distribution methods (now known or later developed) as part of providing any of the Products. (para 11)

Of the three platforms, Blackboard is an outlier in its claims to user data. From Canvas's (2020c) Terms of Service Agreement:

> When you use our Service, you provide us with things like your files, content, messages, etc. ("Your Content"). Your Content is yours. You represent that you have all necessary right, power, and authority to use the Service and share Your Content and will comply with all applicable laws when doing so. (para 3)

While this is good news for those whose institutions use Canvas (Moodle lists similar protections in its Terms of Service), the choice of whether or not to consent to sharing personal information or work is typically not one instructors or students are given. As Williamson notes (2020b), the ability of LMSs to collect data is the basis of their value. This datification approach ensures LMSs can automate many of the roles once ascribed to the instructor via predictive grading, virtual attendance records, and engagement scoring. The increased adoption of these tools will further make the LMS indispensable to institutions. By extension, it is necessary for students and instructors to participate on whichever LMS is provided by their university, with no chance to question their privacy or intellectual property rights. So while platforms may offer a feasible platform for students to engage in potentially radical or social change-oriented activities, the monitored nature of these environments raises difficult questions as to whether these are safe contexts for learners or educators to pursue transformative work.

Conclusion

As courses in higher education increasingly migrate online, LMS will play a more pronounced role in shaping educational practice. The direction of this influence is toward a transmission model of education, a force exerted tacitly via the affordances these technologies extend to students and teachers. In emphasizing a streamlined transfer of information via their software, LMSs advance a banking model of education in which students are treated as empty receptacles of knowledge rather than producers of it. The optimal online classroom functions as a portal through which knowledge is transferred as efficiently as possible, against the Freirean vision of the classroom as a space in which to challenge hegemonic knowledge structures and build collaborative understandings. LMSs do not resolve the student-teacher contradiction but shift authority from the teacher to the system itself. Through permissions and defined roles, LMSs antagonize and alienate both teachers and students from forging common understanding. The robust learning analytics, engagement scores, and tracking tools afforded by LMSs also advance the empiricist logic of the transmission model. Education is framed as a process of acquiring knowledge objects, a datafied ideal in which the platform ensures users perform correctly in their given role. Knowledge itself is naturalized in its transmission, foreclosing opportunities for both students and teachers to question the hegemonic beliefs underpinning the information being transferred.

Multimodal and asynchronous discussion tools afford new ways for dialogue to occur in the classroom; however, the potential for this dialogue to achieve critical pedagogy goals of sharing personal experience, creating new understandings, or challenging hegemonic beliefs is undermined by an insistence on graded responses. When augmented by AI-assisted grading tools, LMS grading functions privilege the reproduction of old-school assessment and tracking standards, rewarding students for rehashing pre-coded responses instead of expressing divergent or original views. Finally, the ability to enact change via a problem-posing approach is sapped by a lack of robust student creation tools as well as a perpetuation of traditional text assignments as "real" student work. LMS data collection practices further make platforms dubious spaces from which to engage critical reflection or stage transformative action.

Left unchallenged, LMSs will likely reproduce a transmission model of education, rendering it difficult to stage critical reflection or action. Yet while platforms like Blackboard, Moodle, and Canvas do exert

great influence, they need not dictate all educational practice within the online learning environment. Rather than adopt tools as they emerge, educators must work to adapt these tools to fit their own pedagogical goals. Taking pedagogical control first requires a critical appraisal of the LMS platform itself, one requiring an understanding of the technical, ethical, and legal dimensions of the tool. For example, if the goal is to create authentic dialogue, an instructor can adapt the permission settings on a standard discussion board so that students are able to post new threads, upload multimedia content to posts, and edit their own content. In line with Gilchrist-Petty's (2018) recommendation, instructors can assess engagement in classroom dialogue not by word count or the metrics provided through default "discussion analytics" functions, but via a range of alternate participatory actions also available on the platform such as replies to other posts or peer feedback activities. If the goal is to empower students in the classroom, instructors must stay vigilant to the LMS tendency toward datafication, surveillance, and automation. So while grading assistants like TurnItIn or Discussion Analytics may potentially save time, these tools rarely reward the sorts of critical responses teachers may value. If the goal is to have students create transformative work, instructors might have to dig deeper into the platform to find tools aligned with these goals. Collaborative features like Wikis break out of the transmission model by giving value to the information students contribute within the online classroom environment. Proszak's (2019) use of peer review discussion leader roles, while often complicated to set up, can also provide students a valuable sense of agency often missing in the LMS-sanctioned transmission model. Or given the technical and privacy issues of many LMSs, Green and Chewning's (2020) suggestion of using primarily open-source software—while relegating LMS usage to the minimum degree mandated by one's institution—might be necessary to better achieve critical goals.

Adapting LMSs to support critical goals is uphill work. The bevvy of assistive features and learning tools Blackboard, Moodle, and Canvas offer to instructors do make teaching easier. And given the rushed introduction many had to these platforms post-pandemic, it makes sense to go along with what the tool offers rather than challenge it at every click. Yet as LMSs settle into a more permanent role within higher education, going along is less an option, especially for educators who value the classroom space as a critical platform from which to challenge harmful representations, build collective understanding of the world, and empower student voice. We must build out from a commitment to these critical teaching practices and employ online teaching tools in ways that enable authentic dialogue, critical reflection, new understanding, and meaningful transformation to emerge.

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