University of Wisconsin System Learning Environment Needs Analysis (LENA) Project Report

Prepared for:

University of Wisconsin System Learn@UW Executive Committee

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Background/Purpose

PROJECT OVERVIEW

The Learning Environment Needs Analysis (LENA) project is sponsored by the University of Wisconsin System Learn@UW Executive Committee (L@UWEC) and financially supported by all UW institutions through Common Systems Review Group funding. The LENA project is a continuation of a multi-year UW System effort to: 1) understand the current and future learning technology landscape, 2) uncover the wants and needs of UW System institutions with regard to academic technologies that support teaching and learning, and 3) identify gaps that exist in supporting teaching and learning through academic technology.

The overarching purpose of the LENA project is to better equip the L@UWEC with information needed to assess campus needs regarding the support of teaching and learning. Specifically, the LENA project assessed the needs related to academic (rather than administrative) technology. The work of the LENA project is also intended to provide information to UW System Administration leadership for their planning purposes. While there have been ongoing, smaller-scale activities in process to help chart the way forward with regard to learning technologies, the LENA project is the first attempt at a broad-based, system-wide level to identify academic technology needs in the UW System. LENA is also the first major collaborative project to involve both the UW System Office of Professional and Instructional Development (OPID), the longstanding UW System faculty development and assessment of student learning program, and the UW System Office of Learning and Information Technology Services (OLITS), which supports academic systems and instructional technology innovation, development, and support.

MOTIVATORS FOR INITIATING THE LENA PROJECT

It is important to recognize that some catalysts for this project are embedded in business realities, including the upcoming **license expirations** for the learning management system (i.e., D2L, rebranded "Brightspace") and the web conferencing service (i.e., Blackboard Collaborate [BbC]). The current D2L contract expires on June 30, 2016 with the option to extend in two one-year increments—the first of the two one-year extensions has been scheduled to begin on July 1, 2016. The BbC contract expires June 30, 2016 and L@UWEC has opted to pursue a Request for Proposal (RFP) process, which began in January 2016, to address web conferencing needs in the instructional space. As we write this report, the disposition of the web conferencing service – critical to supporting a system wide collaboration tool that supports all forms of instruction (particularly online and blended/hybrid)—does hang in the balance, since budgetary issues may force a system wide cut to the funding of this centralized service.

In preparing to conduct the LENA project, it was important to recognize the role and outcomes of past L@UWEC initiatives intended to advance the understanding of our future as a system with regard to academic technology and our learning management system, D2L. Key, past initiatives include L@UWEC Learning Management System (LMS) Task Force reports and the strategic direction outcomes that emerged from the 2014 *Academic Roadmap for the Future (Roadmap).*

Since 2011 and 2012 there have been ongoing efforts to explore the LMS marketspace via the LMS Taskforce Reports. The initial charge of the LMS task force was to:

- Study the status of the current LMS (D2L) at UW campuses from faculty, student, and program perspectives. Gather the unmet needs and requirements for D2L as an effective e-learning environment

- Scan the current LMS environment, the upcoming e-learning trends, and ascertain how D2L compares to other learning management systems.
- Determine areas that should be addressed by the LMS or via other strategies to meet the need of online learning in the next five years or beyond
- Make recommendations to the L@UWEC and the UW System CIO regarding the next steps in LMS planning

As a result of task force work, general satisfaction with the LMS service was determined. Unmet LMS needs were reported and the D2L contract was renewed for three years (2014-2016). Unlike previous contract renewals, the current contract includes the option to renew for two additional years in one-year increments. It is worth noting that the previous contract renewal period was five years; however, the task force recognized the changing nature of future learning environments and opted to shorten the contract length with D2L in order to provide UW System with additional flexibility. More detailed information regarding the task force work and its outcomes are available at the following website: https://www.wisconsin.edu/systemwide-it/projects/lms/

In reviewing L@UWEC learning environment efforts to date, a key consideration is the L@UWEC Roadmap effort, which (in large part) seeded the groundwork for the LENA project. The Roadmap was a significant, unified effort to reach across the UW System to begin a dialog among UW System stakeholders (See the Appendix for list of stakeholders articulated in project documentation (Learn@UW Executive Committee, 2015) around the topic of learning technology needs. The Roadmap process yielded important information including values and strategic directions that helped frame the LENA project. The full report is available at the following website https://www.wisconsin.edu/systemwide-it/projects/academic-roadmap/.

The Roadmap, and other L@UWEC initiatives, are important to recognize as contributions to the UW System learning environment needs analysis process. It is also important to look outward and externally at national organizations in higher education which helped to guide the LENA project. EDUCAUSE, "a national, nonprofit association whose mission is to advance higher education through the use of information technology[2]," conducts extensive research and analysis in the academic technology space. The EDUCAUSE whitepaper "The Next Generation Digital Learning Environment: A Report on Research" by Brown, Dehoney, and Millichap, published in April 2015, "explored the gaps between current learning management tools and a digital learning environment that could meet the changing needs of higher education.[3]" This report was on-point, and most helpful in framing the UWS LENA listening sessions and focus interviews.

Methodology

The LENA Steering Committee decided that hosting on-campus, focus-group listening sessions was the best method to gather qualitative data from three major participant groups: administrators, faculty, and students. For the purpose of this report narrative, the "faculty" participant group included tenured and non-tenured faculty, and academic instructional staff. It is important to note that the administrative groups in particular were very diverse, which led at times to some disparate responses. In order to provide UW System constituents with a framework upon which they could reflect, the committee engaged consultant Don Norris of Strategic Initiatives, Inc. to develop a reading list. This reading list was created to help campus participants prepare for the discussions. The director of the UW System Office of Professional and Instructional Development (OPID), the faculty development arm of the system network, was invited to collaborate on this project to provide an in-depth, scholarly perspective about pedagogy, assessment, and faculty development.

LAUNCHING THE LENA PROJECT

In August of 2015 the UW System provosts/vice chancellors endorsed the study and gave the L@UWEC permission to meet with participants on their campus. Recruitment of campus listening session participants was accomplished by campus administrators, primarily support staff from the Provosts' offices.

RESEARCH QUESTIONS

The research questions were developed based on data from the L@UWEC Roadmap and the "Next Generation Digital Learning Environment: A Report on Research" whitepaper (Brown, Dehoney, & Millichap, 2015) published by EDUCAUSE.

Although the question topics for the listening sessions are the same, each question set was tailored for each of the three participant group categories (administrators, faculty, and students) to be more relevant to participant role.

Administrator Questions:

1a) How do you see your area of work evolving? What changes are happening in your area of work that create the need for new/different or advanced tools (strategies, approaches, techniques)?

1b) Please share your observations about how teaching and learning have changed in the last five years. What future possibilities can you imagine?

2a) Please describe which strategies or technologies you are using to collaborate. How have collaborative strategy and technology impacted your work?

2b) How does your campus address accessibility and universal design? What future needs do you anticipate or imagine?

Faculty Questions:

1a) How has your experience as an educator evolved? What changes are happening within your discipline that create the need for new or advanced strategies and approaches to learning? What is the role of technology to these changes?

1b) Please share your observations about how your teaching experience has changed in the last five years. What future possibilities do you imagine? What impact has technology had on that experience?

2a) Please describe what strategies or technologies you are using to collaborate with your students, peers, and/or administrators. How have collaborative technologies impacted your work experience?

2b) How familiar are you with resources for accessibility and/or universal design? What future needs do you anticipate or imagine for yourself, as an educator, and your students in providing inclusive access to the learning experience offered at your UW institution?

Student Questions:

1a) How has your experience as a student and learner evolved? What changes in education are happening that create the need for new or advanced strategies and approaches to learning? Does technology have a role in influencing these changes?

1b) Please share your observations about how your learning experience has changed in recent years. What future possibilities in education can you imagine? What impact has technology had on your educational experience?

2a) Please describe the strategies or technologies you are using to collaborate with your peers and/or faculty. How have collaborative technologies impacted your learning experience?

2b) How familiar are you with resources to support student accessibility and/or universal design? What future needs do you anticipate or imagine for yourself or your peers in receiving inclusive access to the learning experience offered at your UW institution?

FOCUS GROUP FACILITATION

Listening sessions were scheduled and facilitated by Pfeifer-Luckett and Cornell-Swanson with all three participant groups at all 11 comprehensive institutions and two Research-1 institutions. UW Colleges has 13 regional campus locations and UW-Extension has a presence in all 72 counties in the state of Wisconsin. In an effort to reach all UW Colleges and UW Extension locations and to make the project manageable, the campus provosts were consulted for guidance. For the UW Colleges, Pfeifer-Luckett and Cornell-Swanson met with central administration (deans, associate deans, and chairperson groups) as well as a diverse subsection of faculty and students from four campus locations that were in small rural and large urban settings. For UW-Extension, Pfeifer-Luckett and Cornell-Swanson met with identified members of the UW System "Flexible Option" degree program.

The process of focus group facilitation was designed to solicit answers for each question from each of the participants present. During each listening session, participants were requested to keep their discussions focused on teaching and learning needs, rather than technology tools. Cross-group dialogue was discouraged in order to keep participants focused, to avoid participants from influencing other participants, and to manage time in order to hear from all participants in attendance. It should be noted that although we requested manageable size focus groups, at times the group size was quite large (15+ participants). As a result, some listening sessions ran over the allotted time and in one case the last question was not addressed. During sessions with ample time, key themes observed in the discussion were shared back with the participants. Each session was attended by at least one facilitator (with a majority attended by two) and one note taker. The notes captured from each session were sent to two professionals hired to code and analyze the data.

DATA ANALYSIS AND CODING

Flora McMartin, president of Broad-based Knowledge, LLC and an expert in evaluating technology innovations in higher education, and Sarah Holsted, an expert in qualitative data analysis, were engaged as consultants to assist in determining the best course of action for coding, analyzing, and theming the data generated during the listening sessions. Holsted conducted two rounds of open coding on ~49 transcripts that were gathered from three populations across the UW System: administrators, faculty, and students.

During the first round of coding, participant statements were separated into cognitively discrete segments (i.e., one statement with three idea segments). Each segment was then coded by the "time" it referred to (e.g., past,

present, or future) and the "type" of idea it reflected (e.g., opinion, observation, or desire). Combining "time" and "type" allowed ideas to be grouped into "future desires" that participants would like to see going forward and "present observations" or "present opinions" that provided context for understanding the current environment and practices of participants.

The intent for the first round of coding was to rapidly surface participant needs; at the same time, a set of content-related themes emerged, which led to a second round of coding. These themes provided a way to summarize participants' ideas in more detail, coding along themes such as: access, analytics, assessment, changes in infrastructure, changes in students, communication, deduplication, content, vendors, pedagogy, personalization, reporting, and teaching context. Grouping statements around these themes helped to identify not only issues shared by all participants regardless of their role (i.e., "future" "desire" regarding "access") but also issues specific to a population (i.e., "present" "observations" by faculty on "changes in students"). Analysis data was organized in spreadsheets. Findings, themes, and summaries were discussed via phone conference and informal written summary reports.

Questions 1A & 1B: Summary of Results

An observation throughout the study was that all participant groups focused more on the current learning environment and their interactions with technology and less about the future landscape of teaching and learning. As a result, responses to questions 1A and 1B at times were blurred. This section will address both questions.

QUESTION 1A: IMPACT OF TECHNOLOGY ON TEACHING AND LEARNING:

TEACHING CONTEXT/PEDAGOGY

Faculty participants described radical changes in learning environments during their teaching careers. They responded to many of the focus group questions with specific ideas and stories about their teaching, including how their pedagogical styles have changed and/or how the learning management system (D2L) could be improved. Many faculty participants used phrases like "flipped classroom" and "active learning" to describe teaching context and provided examples of how they integrate a variety of technologies in their everyday teaching. The responses from faculty indicate that the difference between online and hybrid/blended course format seem to be blurring.

For faculty, the pedagogical shifts were found mostly in the practice of engaging students. Although faculty seem pleased about the different ways they currently reach and teach students, technology has not made their work easier overall.

Student responses suggest that they understand neither the differences between learning contexts nor the effects that their choices (e.g., opting to enroll in an online rather than a face-to-face course) have on their learning. Students are motivated by external pressures and will often select courses based on "what's easiest (or most convenient) for me." This doesn't imply that students don't want to learn, but rather that they have busy lives (with work, family, social pressures)—especially adult students who are not enrolled full-time and make their choices based on such factors.

STUDENT LEARNING

Both faculty and students described their learning experiences as permeated by technology, although not seamlessly. Both participant groups observed changes in learning, describing learning content as being more transactional, with a focus on "access to content", rather than "engagement with learning." Furthermore, faculty described a "disconnect" between what students want (e.g., instant access to content, answers, faculty, technology) and students' ability to incorporate, integrate, and synthesize these materials once the students obtain what they want.

There were positive reactions from faculty and students who have engaged in "technology enhanced" active learning classroom spaces. While the reviews of such spaces were positive, it was clear that support for learning how to teach in these spaces was necessary. For example, one faculty member said, *''A couple weeks ago I subbed for a course in the WisCEL [Wisconsin Collaboratory for Enhanced Learning] space (this is a high-tech active learning classroom). It was the best experience I ever had with teaching 90 students. I was able to walk around, talk to students, and engage them. You need a certain kind of personality to teach in such spaces. Some faculty will hide behind the podium, so instructor training is needed to teach in such spaces. My dream is to have a class of 100 calculus students and teach in a space with round tables, where I can walk around and have the students interact with me."*

Students described generalized ideas of preferred learning styles in response to what influences their perceptions of technology. They want to succeed, so they have opinions about what has been successful in the past and what might help them succeed in the future. Students didn't distinguish between technology platforms or resources when they talked about learning; they don't necessarily know the *source* of their help. When they need assistance, they often select the most readily available source. For example, students mentioned D2L as a conduit to faculty lectures or notes, Lynda.com for its collection of technology training videos, and Khan Academy's videos for supplemental instruction.

Faculty, students, and administrators expressed shared concerns about student and faculty proficiency in effectively using technology for teaching and learning. Faculty observed that their students' strengths in personal technology and social media use do not readily transfer to the learning environment. Students' skill level in navigating learning technology is highly variable, due in part to their past experience and training (or lack thereof) with the technologies.

Faculty are being asked to accommodate a higher number of students, even as those students need more individual attention. Students aren't as adept with technology as one might think; they need more remedial instruction in content and technology before they can begin learning. Faculty are questioning how to split their time between teaching content and teaching technology use and etiquette, which can be a distraction, at best, or a major disruption to learning (depending on students' skill, access to technology, and readiness to learn). For example, one faculty member commented "*I have good strategies to help students read closely. I've been experimenting with having them look something up online, but they become distracted by all the other rich things available. The norms for reading is difficult to model. I can't stand over their shoulder when they are reading at home."*

Some faculty expressed a deep concern about the pressure to alter learning environments, the move away from quality instruction to accommodate the increased number of students enrolled in classes, and the demand to put more courses online. This trend creates concern for them about how public universities that have held outstanding reputations are being separated from the more elite/private universities that continue to support investing time in deep learning.

Faculty, especially those at two-year colleges, expressed a desire that their students be work-ready. Faculty would like to have students engage in the type of group work encountered in job situations, but collaboration is difficult due to a plethora of tools and students' differing schedules.

Students' opinion about the usefulness and pervasiveness of technology in education run a continuum from those who wholeheartedly embrace how technology is used in their classes to those who grudgingly do what's necessary to complete the class.

Based only on focus group responses from those we interviewed at Research-1 (R-1) institutions within the UW system, it seemed that students at R-I institutions are more aware than their peers at some of the comprehensive institutions and two-year colleges about the expectations and benefits of using technology in classrooms designed for active learning. R-1 institution students seemed more readily able to express ideas about the process of learning in active learning environments. While this is an important observation, it should be noted that this result may be influenced by the student population attracted to participate in the listening sessions, as well as the varying levels of access and resources for such learning spaces. Not every UW System institution is equipped with "active learning" spaces, and few have invested resources needed to equip faculty to teach effectively in these environments.

LEARNING TECHNOLOGY INFRASTRUCTURE & SUPPORT

Impressions of Technology Infrastructure and Related Policies and Their Impact on Teaching

It is clear from the results of this study that faculty don't shirk educational technology use, but technology is not seamlessly interwoven throughout their practices and is influenced by the campus infrastructure and policies related to learning technology. Examples of these campus infrastructure- and policy-driven influences include:

- Limitations articulated in campus technology policies (e.g., who can apply software upgrades; data download and storage quantities, data sharing restrictions)
- Availability of technology (e.g., limited access to "smart" classrooms; the elimination of computer labs, LMS feature/tool availability)
- Lack of technology interoperability (e.g., software for science classes doesn't "talk" with D2L; software for PCs versus Macs)
- Functionality challenges (e.g., interruptions of technology functionality; learning space design is not adequate and in some cases projection screens cover a smartboard)
- Lack of access to data (e.g., learning technology does not provide information that can be used to enhance learner support)

Faculty members are frustrated that the learning technology available, such as the LMS, is not what students will encounter in the real world.

Faculty members are apprehensive about being evaluated on "how much" they use technology rather than on "how", "how richly", or "how effectively" they use technology in teaching. There is, of course, a substantial difference between the differences concerns that faculty face at UW System institutions. While more money for better tools and access to more services may help faculty use technology more effectively, smaller campuses serve different audiences and play a different role in their communities. Evaluations of faculty should be nuanced enough to reflect these environmental factors.

Some faculty reported mastery level goals for integration of technology in learning. For these faculty, the tensions are about limited access to advanced tools, flexibility of choices, tools that meet the demand from their disciplines (e.g., STEM disciplines and professional majors, in particular), and student resistance.

The student data provided myriad examples of how and to what extent technology is embedded in their learning contexts: in managing assignments and group work; in how content and instruction is delivered; and how, or whether, resources are accessed. Even though technology is pervasive throughout the learning process, if not integrated seamlessly, and students have varying reactions to how their peers and instructors use these tools. Students want seamless integration with *their* tools and the immediacy of help, which could be interpreted more broadly as access rather than as learning.

Students' experiences in high school, no matter how recent or how far in the past, influence their perceptions and expectations of learning with (and without) technology. Older students described how they learn more effectively when taking notes by hand while more recent high school graduates described Smart Boards as the pinnacle of technology in classrooms. Some expressed surprise that UW faculty didn't have access to Smart Boards or know how to use them. To some extent, vendors and publishers in the K-12 environment are driving and setting the technology expectations of UW students coming directly from high school. To predict what future students will expect from technology in higher education, it is useful to consider at technology expenditures and the extent of vendor-supplied technology in K-12 school systems.

Administrators' comments acknowledged their awareness that changes in technology, and role of the LMS, in learning are confusing to students. Administrators wonder if faculty and students really know how to put these changes into context. In the administrative group, contextual terms like "interoperability" and "integration" were used along with "allocation" and "design" when discussing changes in infrastructure that are impacting decisions around learning technology. There is agreement that no one LMS can meet all learning needs. Some administrators would like to see a change toward an ecosystem model that provides a variety of technological components in what our recommended reading referred to as a "Lego set" Next Generational Digital Learning Environment (NGDLE) (Brown, Dehoney, & Millichap, 2015). Other administrators expressed reluctance to any changes in the current LMS system during the current budget crisis due to lack of resources to support such a change. Many online programs have been built in D2L and to redesign and move those courses to another platform is a daunting effort to consider.

Infrastructure: Impressions of the Current Learning Management System(s)

According to faculty feedback, D2L does not meet all of their needs. It is often described as "clunky" and "less effective" for engaging students. Accordingly, D2L is described as much less useful for science and math courses as it is for humanities courses, particularly due to the inability to use certain math and sciences resources within the D2L environment.

Administrators describe D2L as useful and may have more administrative features than anything else, but even those features don't seem to meet the needs of a majority of the focus group participants in that category. Administrators told us that the pressure to adopt new technologies reach them from different sectors of users. The pressures felt by Administrators include: the desire to keep up with the ever-changing advances in learning technology and what is being marketed by vendors; the fear that any major change in the LMS might not be manageable, given the status of the UW System budget; and the task of managing the increase in products being sold to faculty from publishing companies and other outside vendors.

Learning Technology Support by Information Technology (IT) Services

It is without question that campus- and UW System- level learning technology support services are valued by all of the participant groups. Among those in the faculty and student groups, concern was expressed over the loss of support available as the budget cuts are leading to a reduction of computer labs and staff positions that support IT services. Students are very aware that some of their peers do not have the resources to own updated devices that can interface with the technology needed for their learning, and that any such reductions in campus resources could hinder the learning process for such students.

Instructional Technology and Instructional Design Services

Instructional Designers (IDs) and learning technology technical support staff told us that, in their roles, they are finding themselves caught between administrators' technology purchases and faculty who need varying degrees of support. IDs want to do the right thing in supporting faculty, but many feel squeezed in their ability to do so. In a way, they're on the front line in helping execute the administrative vision, but they cannot compel faculty members to do what they'd suggest as best practices.

Faculty described positive interactions with IDs when being helped to put their classes online. Some faculty mentioned reaching a point where they felt comfortable doing for themselves some of the activities an instructional designer would provide. Concern was expressed at many of the institutions that have been reducing or removing instructional design services as a result of the budget cuts.

Within the category of support, there were also responses from administrative staff about supporting students around advising, accessibility, and changes in their preparation or readiness to learn. Administrators see the need to help students chart a learning path to give them an overview of requirements, dependencies, and outcomes -- an area in which administrators, faculty, and students agree about activity-related needs.

"Computer access" was a topic that generated fragmented responses for administrators, instructional designers, faculty, and students alike. For example, recent decisions to close computer labs were met with conflicting opinions. Administrators determined computer labs were not as necessary due to a reduction in the use of the computers within the labs, and a perception that the majority of students come with their own personal devices. It is important to recognize that students identified labs as important resources—several students mentioned that they didn't want to carry around a laptop and that some faculty do not allow the use of laptops in class. Faculty and students viewed the loss of access to updated computer labs as a bad decision. Not all students have access to devices, not all personal devices are compatible, and limited access to rental laptops does not meet student needs. Students interpreted the reduction in computer labs as an action that widens the achievement gap, particularly for students from lower socioeconomic backgrounds – a growing percentage of the student population in UW System and nationally, per the UW System Accountability dashboard.

Data/Data Analytics

The availability of data and data analytics are themes that are quite complex and seemed to be of greatest relevance to administrators. The continuum of responses in the administrative group ranged from "we need more data because more people want reports about students and programs," to "the current systems don't provide the right kind of data—the data we do have has to be cleaned," and "we have more data then we know what to do with." The lack of interoperability between data-collecting systems was a concern that was raised system wide by all participant groups.

Overall, administrators want IT systems to be better integrated to allow student data to be shared, to provide a means for generating more complex reports for their functional area for marketing and university relations activities, and to have the ability to personalize learning. Some of the desires for student data create ethical questions about how that data may or may not be used to profile a student's potential for success, based on projections derived from historic data. For example, a desire was expressed to use the data for developing student success profiles to be used in the admission process.

Faculty had differing perspectives on the value of the data generated by the LMS in particular. Gathering data through the LMS from quiz and test scores may be more efficient, but it should not replace the holistic assessment of student learning that has been built into their curriculum and pedagogy.

Students' discussions did not yield any significant findings around a need for data, other than wanting anytime/anywhere access to their grades in the LMS.

Surprisingly, in all three participant groups, there was very little discussion of data security and privacy issues when talking about the need for data.

QUESTION 1B: FUTURE POSSIBILITIES

During the needs analysis discussions, it was observed and supported by the responses that all of the participant groups had difficulty producing a vision of teaching and learning for the future. They preferred to continue the discussion on their current experiences both good and bad. When redirected, responses seemed to be about what would be lost in future learning environments, the faculty-student relationship in particular. For example, one student described the loss as disconnection: "*Technology has brought the world to our living room but it's isolated us to our living room.*" Some students envisioned that higher education in the future would be delivered entirely online, with one student describing a scenario where higher education would be entirely self-taught with online tutoring, and another said, "*In the future if you want to meet with a live, faculty member you will have to schedule and pay for office hour visits.*"

However, there were faculty that talked about the future in terms of next projects, curriculum design, and their desires to teach in learning spaces designed to be interactive. In many ways, looking to the next semesters and anticipating course revisions were ways in which to observe the changes in progress. For example, one faculty member said, "*I am placing more emphasis on collaborative learning, with collaborative projects that ask students to think methodically about the audience for their project. Next semester we are starting a project that goes beyond one semester by creating an open access, open source textbook*."

Some faculty also discussed the desire to incorporate more high-impact practices and experiential learning opportunities into their curriculum. One faculty said "*Students want to see the added value of a class and (in the future) these technologies will be able to help the students see that.*"

Question 2A: Collaboration

Focus group participants addressed the idea of collaboration by talking about the tools they used to communicate, the situations in which they collaborated (or tried to), and their processes for communicating and collaborating. One common theme that was expressed across all focus groups was that regardless of role (administrator, faculty, or student), people are torn about the tools or methods for communicating. Many of them prefer face-to-face interactions but also see the value of using online tools. A wide range of tools are embraced, and people use these tools based on audience, message, and comfort level with the technology.

ADMINISTRATORS

Administrator focus groups included participants holding a variety of positions: instructional designers, instructional technology staff, instructors, librarians, faculty members, deans, institutional research staff, Teaching and Learning Center directors, Student Services staff, and occasionally Provosts, CIOs, financial services staff, Registrars, and others. Administrators' collaborative work crossed functional and physical boundaries within and outside of their institutions, but it is unclear from the responses if this split was weighted in one direction or the other based on the activities involved in meeting the responsibilities of their position. It was also unclear from the responses to which extent people value collaboration within peer groups or with groups with a cross-referenced population.

Most participants described the process of collaboration and communication preferences instead of describing actual collaborative strategies. They reflected on the barriers to and positive outcomes of collaboration. Cited barriers included lack of time, too many communication tools to choose from, colleagues' lack of experience using tools, perceived imbalances in budget and space allocations, and the tension between centralized and local control. A set of responses suggested that collaborative activities be directed specifically towards working together on shared needs across institutions (i.e., content creation and delivery).

FACULTY

Faculty responses indicate that collaboration is integral to working with peers and students, but no one seems entirely satisfied with how collaborations are going. Technology is just one of the barriers to collaborating. Faculty responses about collaboration can be grouped into three thematic areas: learning in groups, communicating with students and peers, and file sharing.

Learning in Groups

Many faculty members structure class assignments so students work collaboratively in groups. Faculty members suggested that they value these activities because this is what students will encounter in the real world of work. However, both faculty and students are frustrated with attempts to incorporate collaborative work in their classes and to have successful collaborative assignments.

Communicating With Students and Peers

Barriers to communicating with students include uncertainty in establishing boundaries. Some students' demand for 24-hour access to faculty is daunting. Some of the attempts to meet the demands that permeate personal boundaries for faculty and their families included keeping office hours on Skype in the evenings and shifting a sleep/wake schedule to be available when students emailed at midnight. Another blurred area of communication was having to help students understand the difference between the demand for intensive tutoring sessions and a meeting during regular office hours. Overall, boundaries between work and personal lives are blurred for faculty as

illustrated from the following faculty statement: *"I work all the time and because I have access to these files all the time. I feel compelled to work at every minute of the day. It's both a blessing and a curse. For me, it's a push/pull of collaborative capabilities—it's increased expectations of my work output.*"

Other barriers to collaboration include finding the right tool or mode for addressing student needs, which fall along a continuum from brief transactions to in-depth assistance. Faculty members value face-to-face interactions but recognize that student schedules aren't always compatible with established office hours. There is no preferred communication tool. Faculty, like students, pick the familiar tool that is most appropriate for the audience and formality of the message, as well as what system consistently works as expected.

File Sharing

This topic was mentioned frequently by faculty members as a subset of communicating and working with both peers and students. While there are a plethora of communication tools that work well, there are a patchwork of policies and platforms across the UW System about what has been determined to be accessible, secure, and appropriate for file sharing. Such an environment can pose as a barrier to file access and sharing (and collaborative editing), especially when employees and students are off-campus, or if collaborators are not affiliated with UW System.

STUDENTS

Students are divided on the utility of technology for collaboration, and often do not separate collaborating with communication. There is a continuum of collaboration approaches, with one end preferring only face-to-face and the other end preferring only online instruction, with multiple "blended" approaches in between that are largely based on ease of use and need. Students use many services or apps for communicating with one another, including Facebook messenger to schedule meetings or exchange phone numbers for text messaging, texting, Skype, Google Drive, and Dropbox for file sharing. Students connect with faculty primarily through email or face-to-face methods and sometimes Skype; rarely do students send text messages or use Facebook with faculty members. Regarding D2L for collaborating, the student view is nuanced. D2L is not "immediate" enough since students may not check or contribute to the platform regularly. However, D2L is sometimes preferred for discussions over email because messages can become "lost" in email.

Student participants select technology based on what works for them. There are very few requests for help with learning how to use collaborative technology. No one questioned (in the positive reporting) that technology enhances their group work. At the same time, students report that they like face-to-face meetings, which still have a place in their learning and work; use of face-to-face meetings varies by students' availability.

Question 2B: Accessibility

Focus group participants (administrators, faculty, and students) had disparate understandings of how they conceptualize what "access" and "accessibility" mean in the context of this report. All groups were encouraged to consider a broad definition of accessibility with views to people of various genders, race/ethnicities, ages, parities, sexual orientation, and people with disabilities (physical, emotional, or cognitive). In addition, respondents were asked to describe their familiarity with Universal Design (UD). Responses from the faculty and students reflected broad definitions of accessibility, while the administrator participant group focused primarily on access for students with physical disabilities.

Overall awareness of issues associated with UD were fairly high. Although students generally don't have the language to describe UD, their responses indicate they regularly notice and experience it. Consistently, student responses indicated they want their classmates and friends who have a disability to be able to fully participate in classes. Students, particularly from the UW Colleges, expressed an awareness and appreciation for how inclusive their learning environments were. They were also very aware and concerned about the potential losses of the tutoring labs and TRiO student support services due to the budget reductions and consolidation of administrative activities occurring at the time of our listening sessions.

Many but not all of the faculty participants had more understanding of the wording associated with UD, and they reported feeling like they work hard to accommodate students with disabilities in particular**.** Both faculty and administrators acknowledged that they tend to be more reactive than proactive in their approach to accommodating students with disabilities. Faculty tend to make accommodations when students ask them to or when they receive a referral from the office for students with disabilities. Administrators prioritize students that have formally self-identified as requiring accommodation to be successful.

Faculty, administrators, and, to some extent, students are frustrated by the lack of services to help faculty teach in ways to meet diverse needs, be it with or without technology and in face-to-face and online environments. Many faculty indicated they didn't have appropriate training, and administrators wished they had more resources to support accessibility. Closed captioning was the major accomplishment (or desire) that administrators pointed to in terms of supporting accessibility**,** and was also identified as the area with the least amount of resources to support.

ADMINISTRATORS

Administrators worry more about compliance at the campus level. Administrators defined the accessibility problem space to include the following factors:

- Campus liability associated with not being compliant with Americans With Disabilities Act (ADA) codes
- Needing to provide services to students with mental, behavioral, and emotional difficulties (e.g., PTSD, ADHD and autism) but not knowing how to determine what is needed and what is required by law
- Worrying that students don't have access to campus non-academic information (i.e., do students have the tools, ability, or knowledge about where to go to access to the information they need?)
- Moving away from a reactive to a proactive approach in accommodating student needs
- Currently, individual staff and faculty are accommodating student needs
- Although there are services, the services are either under-utilized or under-funded
- Needing to convince vendors (and users of free services like Google Docs) that UD is good for everyone and required by some
- There is a concrete need for closed captioning of all public events, websites and learning materials
- eTextbooks publishing vendors and other third-party tool providers are not in compliance with the ADA laws in the United States
- There are not enough resources to equally deal with the wide variety of physical, mental, and emotional disabilities
- Students are all very different. As a population, they may bring multiple devices and expect a level of personalization and support that is difficult to provide at scale

FACULTY

The faculty responses ranged from not knowing what to do or how to make an accommodation (in face-to-face and online courses) to knowing a lot and using UD principles upfront when designing their courses. Faculty defined the accessibility problem space to include the following factors:

- Need for staff support; they don't have time to do their own UD (e.g., an overwhelming need for assistance to caption videos that they and their students' create
- Need to learn more about accommodations; faculty do not have training and expertise in how to recognize a learning disability and how having one affects learning
- Concerned with the lack of "out of the box" accessible learning materials from vendors especially with regard to online course materials
- Their response to needs for students with disabilities is reactionary. In some cases they don't know they have to make something accessible until a student requests it and it takes significant time to respond to a request, particularly for captioning
- Not familiar with resources (e.g., people, campus services, online help, training) available to help them and their students
- Those who do know how to handle accommodations in face-to-face courses rely on campus support centers for help
- Online courses are different, and faculty don't know who can help them prepare an online course to be accessible. They feel more or less like they have been left on their own in that situation when teaching online. Faculty comments included: How do you reduce the isolation for the online students and build community to help them become a part of the campus and feel like they are a student here? How does one refer an online student to the campus writing center?

STUDENTS

Students defined the accessibility problem space to include the following factors:

- Type of technology used (e.g., laptop or tablet; having access to technology off campus)
- Awareness of "haves" versus "have nots" in terms of owning devices or having necessary technology skills to fully participate. Students think there should be a "level playing field."
- Mobile devices: desire for D2L access anywhere, anytime, since students already have easy access to things like Facebook, Google, and other cloud-based and social media apps
- Being inclusive in terms of race, gender, and age
- While they didn't know UD terminology, students describe how all would benefit from a proactive approach
- Students recognize and support accommodations for people with disabilities

Discussion of the Results

The data from this learning environment needs analysis illustrates differences in understanding between faculty, students, and administrators as to the value and role of learning technology in teaching and learning (between now and 2020) and whether or not D2L meets the current teaching and learning needs.

The perspectives shared by faculty and students during the listening sessions fall along a continuum of satisfaction and dissatisfaction that are influenced by discipline, training, experience, access, and support. Based on the responses, all three groups are not completely satisfied with D2L, although the administrative group had the most favorable opinion of the platform. The responses also highlight that not all of the faculty members are aware of the full capabilities and features of D2L, and/or have taken advantage training to benefit from all of its features (assuming training is available in some format at all institutions). This finding is supported by administrative responses that reveal that some campuses, either by policy or other deciding factors, have not made available access to all of the features offered in D2L. Decisions to disable (or not enable) features could be related to security concerns or a simple lack of resources needed to support certain functionality at the campus level. Responses also reveal that the lack of resources (or knowledge of, or access to resources) that provide the professional development and ongoing support for both faculty and students is a significant factor.

We cannot ignore that D2L does not have the full ability to support activities and content characteristics needed in all of the disciplines. For example, it was expressed quite often by those in the STEM disciplines and professional majors such as nursing and communication sciences & disorders that using D2L requires added third-party tools. Furthermore, D2L cannot adequately support the use of formulas and equations for teaching mathematics and the sciences.

Students' main issue with the LMS is that it is not mobile-friendly; they want to have comprehensive access to all of D2L's features and functions on their mobile devices.

A relevant motivation for staying with D2L was based in fear about the costs to campuses in particular, including, but not limited to, the staffing resources that would be needed to move and redesign entire online programs and content for all of the courses and train faculty and students to use the technology. However, allowing barriers to be the primary motivator to avoid change does not meet the needs of the respondents either. Currently, some of the costs for the additional third-party technology tools being used by faculty are unaffordable and have been directly passed on to students. Fear of change does not allow us to remain current as learning technology advances and students' need for more advanced technology to enhance their learning grows. Planning for the future generations of students and considering the impact on the learning that is already occurring in the K-12 system due to the advancements in learning technology must be carefully planned for and considered.

During the needs analysis process, it was observed and confirmed by the responses that all of the participant groups had some difficulty pondering a vision of teaching and learning for the future. They preferred to continue the discussion on their current experiences both good and bad. There were references to themselves or future students as next generation digital learners, though the definition of a next generation digital learner as described in (Malcolm et al., 2015) did not fit their description of our current student generation of learners. Students often referred to the next generation of digital learners in the context of their siblings, and that those siblings participate in Chromebook or tablet initiatives at their K-12 school. It is certain that students are growing increasingly adept at using social media and supplemental technologies. It is imperative that our systems continue to evolve to meet the changing demands.

As participants talked about the new tools being incorporated into teaching and learning in the K-12 system, it seems wise to learn more about the early adoption of technology in the elementary schools to help guide decisions about which technologies to select for the learners that will arrive at UW institutions in the next ten years. The most pertinent question seems to be: How can we develop both a plan that is flexible enough to serve our current users and yet able to adapt over the next five to ten years? Are there systems and tools currently ready for such change?

The topics of data and data analytics were only raised by administrators and faculty. This is one of the areas that emerged in the study as problematic, with conflicting responses to this topic when it was raised. It appears that the motivation for data collection is much different for faculty than it is for administrators. Policies that address the ethical issues of using students as data products do not seem to have been addressed but are relevant for faculty. There is a distinction between data that informs us about learning (learning analytics) and data that is needed for academic reporting (administrative analytics). Key variables in data analytics include data definitions, control & security, data ownership, integration standards, and infrastructure. We also need to directly engage with students (perhaps via student governance bodies) about their data and what should be done with it. Data collection is currently costly and inefficient in terms of interoperability. Future questions should begin by clarifying: What are the benefits and ethical considerations for collecting student performance data? How can analytics help make learning visible and thereby measurable?

Currently, the majority of responses about collaboration fell under communication and document sharing. Overwhelmingly faculty and student participants are utilizing free, cloud-based tools. It is apparent that the need to provide collaboration technology for conferences and meetings continues to be important, especially for administrators and faculty peer groups statewide, nationally, and internationally. While challenges and frustration have been consistently reported about the current common system web conferencing solution, Blackboard Collaborate, this tool is still important to enable online group work—a feature not supported robustly by free, cloud-based tools.

Collaborative pedagogy continues to be a challenge for faculty and students. Currently the most effective learning spaces identified have been the interactive classrooms designed to support high levels of student engagement. Not all of the UW institutions have such designed spaces. How to truly engage students collaboratively in online courses continues to perplex us. Both areas of identified needs for collaboration require investments in professional development to be more effective.

In the area of accessibility it is apparent across the UW System that our primary approaches to accessibility are, at best, reactionary. There is limited knowledge about what UD is, how to implement a UD in the curriculum, and how to make tools and materials sufficiently accessible for all students. This was identified as an area that needs policy and professional development, with support from multiple administrative and instructional units. This responsibility needs to be addressed in partnership with both administrators and faculty, and should not be borne by either group alone.

During the Learning Environment Learning Analysis project both faculty and students in particular expressed being both surprised and pleased that they were invited to provide input about their learning environment and their relationship with technology. All participant groups described the conversation as having value and hoped there would be future opportunities for similar discussions.

Recommendations to the Learn@UW Executive Committee

Guiding questions: *"How does a decision we make now impact the Next Generation Digital Learner?" and "How will the results of this study inform us in making compelling recommendations?"*

Based on our interpretation of the results, we recommend the committee charter the process for planning to move into a next generation learning environment for the UW System. Through this process, we will discover potential paths forward to support such an environment.

In so doing, the next question for the committee would be "How do we produce and implement a thoughtful plan that includes a balanced and legal approach to addressing three key areas: pedagogy, the digital infrastructure needed to support an NGDLE, and the physical infrastructure to support active learning?"

References

Learn@UW Executive Committee. (2015, July). *Learning Environment Needs Analysis Project (2015) Timeline and Stakeholder Engagement Matrix*. Retrieved from https://www.wisconsin.edu/systemwide-it/download/it-projects/le-rfp-2015/LENA-Matrix-5.pdf

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Appendix: UWSA Stakeholder Engagement Matrix

Stakeholder Group	Nature of Engagement
Provosts	Provide input, assist by providing campus contact to help identify key stakeholders on their campuses, and review project results.
Accessibility Coordinators Instructional Designers	Develop a short list of key needs that learning technologies may be able to facilitate in terms of providing a learning environment that is conducive to all students.
Assessment Professionals Accreditation Professionals	Identify key needs that learning technologies may be able to provide for, in terms of learning environment data that can be harnessed to help with the assessment and accreditation process.
Continuing Education Professionals	Identify key needs that learning technologies may be able to provide in terms of non-traditional course data that can be harnessed to help with the continuing education community.
Learn@UW Utility Staff	Identify key issues in supporting a learning technology environment; determine the needs from a support perspective.
Learning Analytics (Kim Arnold)	Met June 10, 2015
Learning Technology Development Council (LTDC)	Met April 2015
D2L Site Administrators	Met April 2015
IT Professionals to include: Technology and Information Security Council (TISC) Educational Media Technology Council (EMTC) Identity Access & Management (IAM) & Technical Advisory Group (TAG) Information Technology Management Council (ITMC)	Identify key needs that learning technologies may be able to provide in terms of general IT. We seek to ensure that the voice of all IT are heard.
Librarians	Foster a renewed collaborative effort to enable librarians to manage content acquisition and generation. We seek to ensure that the voices of all librarians are heard.
Office of Professional and Instructional Development (OPID)	Fosters excellence and support for innovation in teaching and formative assessment of student learning at all UW System institutions. We seek to ensure that the voices of all UW System Teaching and Learning Centers are heard.

Appendix: UWSA Stakeholder Engagement Matrix (continued)

Registrars Student Information Systems (SIS)	Identify key needs that learning technologies may be able to provide in terms of learning environment data that can be harnessed to improve the student experience and administrative effectiveness.
UW Campus CIOs	Identify key needs that learning technologies may be able to provide in terms of learning environments, perhaps to support technology training and access to content and provide an effective technology environment.
UWSA Chief Info. Security Officer, Campus Data Security Officers	Address data governance & policy for learning analytics. Identify key needs in terms of security policies and data governance to ensure compliance.
Faculty and Instructional Staff	Engage during Fall 2015 semester. Help faculty and instructors envision what is possible to support teaching and learning, as well as faculty development. Identify key needs to support teaching methods.
Students	Engage during Fall 2015 semester. Identify key needs that learning technologies may be able to provide in terms of learning environment to support skills building, learning, and growth.