The NGDLE's Relevance to Community and Technical Colleges

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Published:

      Monday, July 17, 2017

Key Takeaways

- Today, the typical **learning management system** serves as little more than a **virtual resource storage site**, facilitating access to material rather than inspiring and enhancing the actual learning process.
- In contrast, the **Next Generation Digital Learning Environment** focuses on **personalization**, **tool integration**, and **content exchange**, thereby serving as a launch pad for **new learning experiences**.
- Because it is **standards-based**, NGDLE **eliminates interoperability problems** that often plague higher education institutions.
- One such institution is the **Kentucky Community and Technical College System**; its encouragement of **faculty innovation** has resulted in successful tool use and teaching approaches — as well as **a mash-up of tools** that is **straining the limits** of its existing LMS.

Like many two-year college systems across the country, the [Kentucky Community and Technical College System](#) (KCTCS) struggles to manage the numerous diverse tools and apps that have flourished across the 16 colleges in its system. This innovation, encouraged at the highest levels, has begun to severely strain the limits of the KCTCS learning management system (LMS). To address this, we are exploring NGDLE.

According to the [EDUCAUSE Learning Initiative report](#) on the Next Generation Digital Learning Environment (NGDLE),[1] the learning management environment must address five domains of core functionality:

- Interoperability and integration
- Personalization
- Analytics, advising, and learning assessment
- Collaboration
- Accessibility and universal design

Here, we describe our experiences at KCTCS, focusing on standards, personalization, and accessibility. We also discuss NGDLE's potential contributions to online teaching and learning at community colleges and by extension all educational institutions.

KCTCS: Innovation and LMS Strain

The KCTCS has a large population of students and faculty across 16 individually accredited community and technical colleges. Each of our 16 colleges encourages faculty innovation through the use of the latest technology tools and apps for their respective disciplines. As a result, KCTCS's "mash-up" of tools, Learning Tools Interoperabilty (LTI) integrations, personalized learning requirements, on-demand programs, and a competency-based modality are straining the limits of what our learning management system (LMS) is capable of doing. At times, the situation can feel like death from a thousand cuts when considering the myriad integrations and interfaces custom-developed to keep our technology ecosystem running.

Further, performance-based funding's new focus on learner analytics and student success will soon make change imperative. Given these pressures, we believe that community colleges — and higher education in general — will soon consider the NGDLE concept not only appealing, but also a necessary step forward to keep current with demands placed on our ever-evolving technology footprint.

KCTCS has a rather traditional technology ecosystem, with an LMS, a student information system, and collaboration tools — all from large, well-known vendors. While these vendors are beginning to deliver their next generation of cloud-native enterprise packages, other compelling players are entering the KCTCS fold. Already, this has led to a greatly diversified and sometimes overlapping technology portfolio that has been challenging to tame. Although some existing integrations are standards-based and easier to maintain — examples here include LTI and Common Cartridge, both from the IMS Global Learning Consortium — many are proprietary, single-use integrations, which are extremely challenging compared to the robust interfaces possible with the latest interoperability standards.

NGDLE Benefits

The path for a new LMS is paved by the desire to let educators unbundle all of the components of a learning experience and remix open content and educational apps in unique and compelling ways.[2] Indeed, as the LMS era wanes, the NGDLE is proposed as the answer to "What's next?"[3] For KCTCS, the NGDLE will cut through some of its pain by leveraging standards-based interoperability and integration standards.

Interoperability Standards

The linchpin of the NGDLE is *interoperability* — that is, the ability to integrate tools and exchange content and learning data that enables everything else.[4] The value proposition of interoperability standards cannot be stressed enough when it comes to community and technical colleges, which are stretched for both human and financial resources. In many cases, the LMS "team" at two-year institutions consists of one or two people, so resources are at a premium.

It previously took us 12–16 weeks to tightly integrate a narrowly focused and proprietary interface; today, thanks to standards that enable a loosely coupled and robust solution, it takes us a few hours. For example, an integration with a third-party content provider and our LMS originally took a developer nearly three months to complete. After our LMS and content providers adopted an IMS Global standard, the new interface — started from scratch — was

built, tested, and moved to production in three business days. A conservative estimate on the savings? Roughly $40,000.

Standards also bring shorter implementation times and let institutions shift their focus from custom "wiring" to innovation. Interoperability standards allow institutional agility and the power of choice, and best-of-breed becomes more feasible by getting away from vendor lock-in on proprietary monolithic stacks. The new IT architecture must enable an instructional environment in which technology "gets out of the way" and becomes highly supportive of teacher and student needs.[5] Simply put, standards help level the playing field for smaller support staffs when pitted against larger staffs at better resourced schools.

Personalization

Personalization, which is highly dependent on interoperability, is NGDLE's most important user-facing functional domain.[6] For example, as is true at colleges across the country, many students come to KCTCS needing remedial education in at least one subject area. All too frequently, we see students who aren't fully ready for college-level learning, and many of these students struggle and ultimately drop out. When we factor in these remedial needs for online students and the digital literacy requirements for succeeding in a virtual environment, the challenges rise exponentially.

At KCTCS, the Distance Learning group is actively working with colleges to pilot the use of a co-requisite model for remedial courses. A *co-requisite course* lets developmental courses "blend" with credit-bearing courses in the same semester. Students can thus gain credit while also remediating in the same course, saving financial aid and time-to-degree in the process. Many of the common obstacles this pilot faces involve the need to mash up or integrate disparate technologies not readily available in the LMS as an interoperable platform.

Personalization strategies can also improve student retention, which is an especially important issue for colleges and universities that have experienced a substantial drop in enrollment.[7] Personalization not only supports student retention, it also gives faculty the ability to build courses in an ecosystem of choice. As we discuss later, as long as the resulting content is compliant with the Americans with Disabilities Act (ADA), instructors can build their courses with any tools they see fit, including personalized and adaptive content.

The US Department of Education endorses competency-based education as one avenue for offering personalization:

Transitioning away from seat time, in favor of a structure that creates flexibility, allows students to progress as they demonstrate mastery of academic content, regardless of time, place, or pace of learning. Competency-based strategies provide flexibility in the way that credit can be earned or awarded, and provide students with personalized learning opportunities.[8]

In online courses, personalization in competency-based or traditional modalities can be accomplished in various ways, including through blended learning, flipped classes, dual credit, and project-based or competency-based mastery; it also offers students multiple pathways to

graduation.[9] Several K–12 schools are already exploring the removal of the Carnegie unit, originally designed as a way to compensate teachers, and focusing instead on the personalized pathways needed to address student success. KCTCS is actively working with our colleges to create more personalized learning paths for our students in distance learning course modalities.

Accessibility and Universal Design

Leaving the moral dilemma aside, recent judgments against higher education institutions for ADA violations are hitting them heavily in the pocketbook.[10] With community and technical colleges often strapped for cash, and penalties in the hundreds of thousands of dollars, this is not something that can be ignored.

Universal Design for Learning is an inclusive philosophy which holds that all spaces (learning spaces and learning technologies included) should be inherently accessible for all users.[11] This is another area where interoperability and integration standards can ensure accessible content. A new-generation digital learning environment must not only include the tools to identify accessibility issues but also the interoperability necessary to build a compliant ecosystem.

Discussion: Teaching and Learning in the NGDLE

KCTCS's evolution into technology-based and enhanced teaching and learning is not unique, as the majority of colleges today offer online instruction. However, KCTCS has offered online courses in the competency-based modality for nearly 10 years and has a unique perspective on the complex needs of the virtual learning environment.

Choice of a learning management system and the virtual environment as a whole have become imperative considerations now that a large percentage of instructors and professors are expected to use technology in their college classes, whether online or not. This creates a need for an NGDLE that not only adapts to infrastructure requirements but also to new pedagogies.

NGDLE and Competency-Based Learning

Clearly, any NGDLE must have an adaptable and symbiotic relationship to the teaching and learning occurring either within the LMS or as a result of its use. Nowhere is this more apparent than in the KCTCS LMS's competency-based education, which we have offered since 2008.

Distance learning at KCTCS and at most US institutions of higher education is growing at an exponential rate. Competency-based offerings are also growing in response to both student needs and the increasing focus on provable learning competencies and outcomes in online courses. However, the CBE modality requires a complex virtual environment for maximum benefit for the student and faculty experience, as well as a repository for mining of available data. Most LMS's to date cannot fully achieve these needs as a stand-alone entity. KCTCS is actively working toward implementing a new business model for distance learning that focuses on CBE-based modalities for all distance learning supported by learner analytics and a quality assurance process for all online courses. The level of interoperability and analytics required for this robust endeavor will likely strain limits of the present LMS and require several levels of third-party

platforms to create the virtual environment needed. Any NGDLE should be capable of creating a virtual environment highly adaptable to the evolving needs of the competency-based modalities as they continue to grow and change for online learning.

LMS vs. F2F Environments

According to a recent [EDUCAUSE Center for Analysis and Research](#) survey, 85 percent of faculty members use an LMS. If we consider the question of this usage in light of the LMS as a virtual environment comparable to virtual real estate, what does this mean? If we asked face-to-face (F2F) faculty how often they used a physical classroom, we would expect their answer to be 100 percent of the time they are teaching. Why then do we see the LMS as a vastly different space for learning in relation to the F2F classroom physical environment?

KCTCS presently offers more than 4,000 online-only courses within the Blackboard LMS and the regular Learn by Term (LbT) semester. KCTCS also offers programs and approximately 1,200 courses connected to online-only programs in our Learn on Demand (LoD) competency-based modality. Many technological impediments are apparent when IT staff and faculty attempt to modify the often-restrictive LMS to suit the needs of these online courses and the modality in which they are offered.

Innovation and Interoperability

As teachers in a constantly evolving 21st century techno-centric profession can attest, beneficial cutting-edge innovation in teaching and learning is often found pushing — or even straining against the constraints of — an LMS-dependent infrastructure. Issues with interoperability occur often in LoD or LbT courses when publisher-based or other integrated tools must feed learning analytics and assessment information into the LMS in order to provide student support and performance evaluation. Typically, these integrations are nonexistent or too difficult for faculty buy-in. The end result is increased faculty resistance to using new, beneficial tools and/or an inability to use important learning analytics, which are lost due to inoperability among systems.

Teachers need useful, coherent digital learning environments that can support integrated learning analytics for personalization, analytics, advising and learning assessment, collaboration, and accessibility and universal design. The complexity of this need is compounded when instructors choose useful Web 2.0 tools al a carte for the physical classroom only to find that they are unable to integrate the tools into their online classroom's LMS or to share their learner analytics.

Accessibility and ADA compliance

Added to these already high-stakes needs is the ever-present issue of equal access and ADA compliance. The risk here grows as instructors increasingly access innovative apps and tools — often with encouragement from the administration — but without oversight or ensured LMS interoperability. The benefits of NGDLEs for student success and instructor innovation is as important and real as the risk of a cobbled-together environment that could violate basic standards of efficiency, not to mention compliance laws. ADA compliance in distance learning is

a high-stakes risk that no college can afford to lose. It is imperative that a NGDLE can adapt and even identify and correct issues with ADA compliance.

Conclusions and Next Steps

Unlike current LMSs, an innovative new learning space could signal to faculty when to provide equal access, resources, or intervention. It could also track and monitor success for the course and each student. The NGDLE standards-based approach puts interoperability and faculty choice at the forefront.

In the future, NGDLEs could be a launching pad for students' online learning experiences rather than simply a virtual gathering place for resources. To get there, the old LMS may need to evolve to an NGDLE as part of a personalized teaching structure that can virtually house interoperative, scaffolded, accessible, and just-in-time learning environments based on learners' personalized needs. Using personalized learning and varied and seamless tool integrations, such a dynamic environment could essentially fashion itself to fit the student at the point of need just as that need materializes.

Notes

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