NMC **Horizon Project**

NMC Horizon Report

2014 Higher Education Preview

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The Horizon Project Preview is a high-level summary of an upcoming edition's findings used to elaborate on the particular definitions and framings to be used in the report, and to provide a snapshot of the topics that will be explored in the final edition. The contents of this Preview are a work-in-progress.

I. Key Trends Accelerating Ed Tech Adoption in Higher Education

II. Significant Challenges Impeding Ed Tech Adoption in Higher Education

III. Important Developments in Educational Technology for Higher Education

I. Key Trends Accelerating Ed Tech Adoption in Higher Education

Fast moving trend likely to create substantive change (or burn out) in one to two years

Online, Hybrid, and Collaborative Learning

Education paradigms are shifting to include online learning, hybrid learning, and collaborative models. Students already spend much of their free time on the Internet, learning and exchanging new information. Institutions that embrace face-to-face/online hybrid learning models have the potential to leverage the online skills learners have already developed independent of academia. Online learning environments can offer different affordances than physical campuses, including opportunities for increased collaboration while equipping students with stronger digital skills. Hybrid models, when designed and implemented successfully, enable students to travel to campus for some activities, while using the network for others, taking advantage of the best of both environments.

Fast moving trend likely to create substantive change (or burn out) in one to two years

Social Media Use in Learning

Social media is changing the way people interact, present ideas and information, and judge the quality of content and contributions. More than one billion people use Facebook regularly; other social media platforms extend those numbers to nearly one third of all people on the planet. Educators, students, alumni, and even the general public routinely use social media to share news about scientific and other developments. The impact of these changes in scholarly communication and on the credibility of information remains to be seen, but it is clear that social media has found significant traction in almost every education sector.

Mid-range trend likely to take three to five years to create substantive change

The Creator Society

The shift continues towards becoming a creator society. Today, society is increasingly mobile and continues to demonstrate evidence that creation is gaining traction over consumption. The Maker movement, user-generated videos, self-published eBooks, personalized domains, and other platforms have all seen steep increases in recent years. Higher education is now in a position to shift its curricular focus to ensure learning environments align with the engagement of creator-students and foster the critical thinking skills needed to fuel a creator society. Courses and degree plans across all disciplines at institutions are in the process of changing to reflect the importance of media creation, design, and entrepreneurship.

Mid-range trend likely to take three to five years to create substantive change

Data-Driven Learning and Assessment

There is a growing interest in using new sources of data for personalizing the learning experience and for performance measurement. As learners participate in online activities, they leave a clear trail of analytics data that can be mined for insights. Learning analytics is a collection of tools to process and analyze that data stream, and use it to modify learning goals and strategies in real time. As the field of learning analytics matures, the hope is that this information will enable continual improvement of learning outcomes.

Slow trend likely to take more than five years to create substantive change

Agile Approaches to Change

There is a growing consensus among many higher education thought leaders that institutional leadership could benefit from agile startup models. Educators are working to develop new approaches based on these models that stimulate top-down change and can be implemented across a broad range of institutional settings. The Lean Startup movement that is currently taking place in Silicon Valley is offering

such a path toward using technology as a catalyst for building and measuring change in a rapid, cost-effective manner. Pilots and other experimental programs can be developed for teaching and improving organizational structure, and then evaluated quickly using scientific methods.

Slow trend likely to take more than five years to create substantive change
Making Online Learning Natural

Asynchronous voice and video tools are humanizing online learning. Historically, one of the major concerns people have expressed about online courses is the lack of interaction. People desire digital learning opportunities that mimic face-to-face experiences. Learning management systems and other services are beginning to incorporate recording features that allow both faculty and students to communicate more authentically online. For example, Canvas includes audio recording from text and Blackboard enables recordings that upload directly to YouTube. Media production and sharing is already inherent in a host of other free, easy-to-use social media platforms, such as Vimeo, Instagram, and Vine. Increasingly, faculty are creating videos for more than just lectures; they are using them as tools to introduce themselves, make announcements, and provide brief background or examples of assignments.

II. Significant Challenges Impeding Ed Tech Adoption in Higher Education

Urgent challenge that we both understand and know how to solve
Low Digital Fluency of Faculty

Faculty training still does not acknowledge the fact that digital media literacy continues its rise in importance as a key skill in every discipline and profession. Despite the widespread agreement on the importance of digital media literacy, training in the supporting skills and techniques is rare in teacher education and non-existent in the preparation of faculty. As lecturers and professors begin to realize that they are limiting their students by not helping them to develop and use digital media literacy skills across the curriculum, the lack of formal training is being offset through professional development or informal learning, but we are far from seeing digital media literacy as a norm. This challenge is exacerbated by the fact that digital literacy is less about tools and more about thinking, and thus skills and standards based on tools and platforms have proven to be somewhat ephemeral.

Urgent challenge that we both understand and know how to solve
Relative Lack of Rewards for Teaching

Teaching is generally (or at least often) rated lower than research in academia. In the global education marketplace, a university's status is largely determined on the quantity and quality of its research. According to the *Times Higher Education's* World University Rankings methodology, research and citations account for 60% of a university's score, while teaching is only half that. There is an overarching sense in the academic world that research is first, while teaching is an obligation that must be performed. Because of this way of thinking, efforts to implement effective pedagogies are lacking. Adjunct professors and students feel the brunt of this challenge, as teaching-only contracts are underrated and underpaid, and learners must accept the outdated teaching styles of the university's primary researchers. To balance competing priorities, larger universities are experimenting with alternating heavy and light teaching loads throughout the school year, and hiring more adjunct professors.

Difficult challenge that we understand but for which solutions are elusive
Competition from New Models of Education

New models of education are bringing unprecedented competition to the traditional models of higher education. Across the board, institutions are looking for ways to provide a high quality of service and more

learning opportunities. MOOCs are at the forefront of these discussions, enabling students to supplement their education and experiences at brick-and-mortar institutions with increasingly rich, and often free, online offerings. At the same time, issues have arisen related to the low completion rates of some MOOCs. As these new platforms emerge, there is a growing need to frankly evaluate the models and determine how to best support collaboration, interaction, and assessment at scale. Simply capitalizing on new technology is not enough; the new models must use these tools and services to engage students on a deeper level.

Difficult challenge that we understand but for which solutions are elusive

Scaling Teaching Innovations

Our organizations are not adept at moving teaching innovations into mainstream practice. Innovation springs from the freedom to connect ideas in new ways. Our schools and universities generally allow us to connect ideas only in prescribed ways — sometimes these lead to new insights, but more likely they lead to rote learning. Current organizational promotion structures rarely reward innovation and improvements in teaching and learning. A pervasive aversion to change limits the diffusion of new ideas, and too often discourages experimentation.

Wicked challenge that is too complex to even define, much less address

Expanding Access

The global drive to increase the number of students participating in undergraduate education is placing pressure across the system. The off-cited relationship between earning potential and educational attainment plus the clear impact of an educated society on the growth of the middle class is pushing many countries to encourage more and more students to enter universities and colleges. In many countries, however, the population of students prepared for undergraduate study is already enrolled — expanding access means extending it to students who may not have the academic background to be successful without additional support. Many in universities feel that these institutions do not have sufficient time and resources to help this set of students.

Wicked challenge that is too complex to even define, much less address

Keeping Education Relevant

Many pundits worry that if higher education does not adapt to the times, other models (especially other business models) will take its place. While this concern has some merits, it is unlikely that universities as we know them will go away. There are parts of the university enterprise, however, that are at risk, such as continuing and advanced education in highly technical, fast-moving fields. As online learning and free educational content become more pervasive, institutional stakeholders must address the question of what universities can provide that other approaches cannot, and rethink the value of higher education from a student's perspective.

III. Important Developments in Educational Technology for Higher Ed

Technology to Watch: Time-to-Adoption: One Year or Less

Flipped Classroom

The flipped classroom refers to a model of learning that rearranges how time is spent both in and out of class to shift the ownership of learning from the educators to the students. After class, students manage the content they use, the pace and style of learning, and the ways in which they demonstrate their knowledge, and the teacher becomes the guide, adapting instructional approaches to suit their learning needs and supporting their personal learning journeys. Rather than the teacher using class time to lecture to students and dispense information, that work is done by each student after class, and could take the

form of watching video lectures, listening to podcasts, perusing enhanced e-book content, collaborating with their peers in online communities, and more. Students can access this wide variety of resources any time they need them. In the flipped classroom model, valuable class time is devoted to more active, project-based learning where students work together to solve local or global challenges — or other real-world applications — to gain a deeper understanding of the subject. Teachers can also devote more time interacting with each individual. The goal is for students to learn more authentically by doing, with the teacher guiding the way; the lecture is no longer the expected driver of concept mastery. The flipped classroom model is part of a larger pedagogical movement that overlaps with blended learning, inquiry-based learning, and other instructional approaches and tools that are meant to be flexible, active, and more engaging for students. It has the potential to better enable educators to design unique and quality learning opportunities, curriculum, and assessments that are more personal and relevant to students' lives.

Technology to Watch: Time-to-Adoption: One Year or Less

Learning Analytics

Learning analytics is an educational application of "big data," a science that was originally used by businesses to analyze commercial activities, identify spending trends, and predict consumer behavior. The rise of the Internet drove research into big data and metrics as well as the proliferation of web tracking tools, enabling companies to build vast reserves of information they could study and apply to their marketing campaigns. Education is embarking on a similar pursuit into data science with the aim of improving student retention and providing a high quality, personalized experience for learners. Learning analytics research uses data analysis to inform decisions made on every tier of the educational system. Whereas analysts in business use consumer data to target potential customers and personalize advertising, learning analytics leverages student data to build better pedagogies, target at-risk student populations, and assess whether programs designed to improve retention have been effective and should be sustained — outcomes for legislators and administrators that have profound impact. For educators and researchers, learning analytics has been crucial to gaining insights about student interaction with online texts and courseware. Students are beginning to experience the benefits of learning analytics as they engage with mobile and online platforms that track data to create responsive, personalized learning experiences.

Technology to Watch: Time-to-Adoption: Two to Three Years

3D Printing

Known in industrial circles as rapid prototyping, 3D printing refers to technologies that construct physical objects from three-dimensional (3D) digital content such as 3D modeling software, computer-aided design (CAD) tools, computer-aided tomography (CAT), and X-ray crystallography. A 3D printer builds a tangible model or prototype from the electronic file, one layer at a time, through an extrusion-like process using plastics and other flexible materials, or an inkjet-like process to spray a bonding agent onto a very thin layer of fixable powder. The deposits created by the machine can be applied very accurately to build an object from the bottom up, layer by layer, with resolutions that, even in the least expensive machines, are more than sufficient to express a large amount of detail. The process even accommodates moving parts within the object. Using different materials and bonding agents, color can be applied, and parts can be rendered in plastic, resin, or metal. This technology is commonly used in manufacturing to build prototypes of almost any object (scaled to fit the printer, of course) that can be conveyed in three dimensions.

Technology to Watch: Time-to-Adoption: Two to Three Years

Games and Gamification

The games culture has grown to include a substantial proportion of the world's population, with the age of the average gamer increasing with each passing year. As tablets and smartphones have proliferated, desktop and laptop computers, television sets, and gaming consoles are no longer the only way to

connect with other players online, making game-play a portable activity that can happen in a diverse array of settings. Gameplay has long since moved on from solely being recreational and has found considerable traction in the worlds of commerce, productivity, and education as a useful training and motivation tool. While a growing number of educational institutions and programs are experimenting with game-play, there has also been increased attention surrounding gamification — the integration of gaming elements, mechanics, and frameworks into non-game situations and scenarios. Businesses have embraced gamification as a way to design incentive programs that engage employees through rewards, leader boards, and badges, often with a mobile component. Although more nascent than in military or industry settings, the gamification of education is gaining support among educators who recognize that effectively designed games can stimulate large gains in productivity and creativity among learners.

Technology to Watch: Time-to-Adoption: Four to Five Years

Quantified Self

Quantified self describes the phenomenon of consumers being able to closely track data that is relevant to their daily activities through the use of technology. The emergence of wearable devices on the market such as watches, wristbands, and necklaces that are designed to automatically collect data are helping people manage their fitness, sleep cycles, and eating habits. Mobile apps also share a central role in this idea by providing easy-to-read dashboards for consumers to view and analyze their personal metrics. Empowered by these insights, many individuals now rely on these technologies to improve their lifestyle and health. Today's apps not only track where a person goes, what they do, and how much time they spend doing it, but now what their aspirations are and when those can be accomplished. Novel devices, too, are enabling people to track their lives automatically, such as the Memoto, a camera worn around the neck that is designed to capture an image every half minute. As more people rely on their mobile devices to monitor their daily activities, data is becoming a larger part of everyday life.

Technology to Watch: Time-to-Adoption: Four to Five Years

Virtual Assistants

As voice recognition and gesture-based technologies advance and more recently, converge, we are quickly moving away from the notion of interacting with our devices via a pointer and keyboard. Virtual assistants are a credible extension of work being done with natural user interfaces (NUIs), and the first examples are already in the marketplace. The concept builds on developments in interfaces across the spectrum of engineering, computer science, and biometrics. The Apple iPhone's Siri and Android's Jellybean are recent mobile-based examples, and allow users to control all the functions of the phone, participate in lifelike conversations with the virtual assistant, and more. A new class of smart televisions are among the first devices to make comprehensive use of the idea. While crude versions of virtual assistants have been around for some time, we have yet to achieve the level of interactivity seen in Apple's classic video, Knowledge Navigator. Virtual assistants of that caliber and their applications for learning are clearly in the long-term horizon, but the potential of the technology to add substance to informal modes of learning is compelling.

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