

Thriving While Going Online in Times of Crisis

How Can Universities Face a Radically New Present and Future

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INTRODUCTION

It has been a long time since the University of London became the first university to offer distance learning degrees in 1858. Since then, the evolution of technology has allowed a significant number of students to access to higher education degrees without having to move to a university campus or wrestle with the constraints of rigid schedules that are often incompatible with students' professional and personal responsibilities.

The booming popularity of online education is visible globally. According to the National Center for Education Statistics of the U.S. Department of Education, during 2019 more than one-third of university students in the US took all or a part of their university courses online. Until now, online higher education was well accepted, fully recognized, and regulated in some countries. In other countries online education presents regulatory restrictions, such as the request that official exams take place face to face, or the limitation of the number of online credits students can take (often up to 20%). There

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are countries where online education is not regulated, and until now it is not officially allowed in some of the least-developed countries.

Despite the difference throughout the world, online education has become a global disruptor of higher education. The quality of online education is likewise improving, with an increasing number of accredited online institutions and programs, improved student retention, graduate and employment rates, and growing student satisfaction in many of them. The use of data analytics enables levels of personalization that face-to-face education cannot provide; and despite the lingering perception of lower quality, there are evidences of equivalent, and sometimes even better, student outcomes than those corresponding to face-to-face education. Arizona State University in the U.S. is an excellent illustration of this, where multiple comparative studies confirm their success.

GOING ONLINE OVERNIGHT

The COVID-19 pandemic has severely affected the world. Public health, economic systems, social habits and conventions, and the form of

life for millions of people has been threatened.

Understandably, education was one of the first activities to be affected, since it generally relies on physical presence, cannot guarantee social distancing, and is typically focused on

the young population, who have been defined as extraordinary contagious vectors. The COVID-19 crisis has locked down one-third of the world

in the first quarter of 2020, forcing countless universities to close their physical campuses. Overnight, face-to-face institutions became distant educators. They are making strong efforts that should be appreciated—without their determination, millions of students around the world would have been left idle, with reduced opportunities to grow.

Universities are doing their best to survive this significant disruption. They have faced a number of questions, including: What is best for the students? How can we implement changes, and how quickly? But hesitation has not been an option.

During recent weeks, it has been noted that the Covid-19 crisis is not a sprint but a marathon. We believe it is both: the short-term, agile responses have been crucial, but the need of ongoing quality experiences will require a constant focus on quality improvement and the definition of longer vision strategies. There is a bright, new future to discover.

Some universities were prepared with the resources and often enough online experience to successfully adapt: They had a basic learning management system (LMS) to work with and/or faculty members who were prepared to teach online or at least on a blended modality. Their students were likewise ready, with computers, access to the internet and the necessary skills. Technology availability—from internet penetration and device availability to computer literacy and systems readiness—became a crucial support of this dramatic online shift and enabled education

continuity. Some elite institutions' readiness enabled them to adapt to the change with amazing agility.

For others, this was not the case. Thousands of institutions throughout the world—many of them operating in developing countries—do not have such resources to implement online delivery. For instance, their students live in remote places, with limited access to the internet, they may even have challenging family situations that will impede them in continuing their academic experience. Aware of those challenging conditions, some countries took a flexible approach and allowed students to decide

whether they wanted to continue their studies or temporarily suspend their matriculation and resume when the original conditions were re-established.

For traditional institutions that have transitioned online, they may have discovered advantages that

well-established online universities have not previously had—for example, faculty members know their students personally, which makes it easier for them to create more humanized interactions from day one. They already have developed content—or at least have identified it and planned its delivery. Plus, students' availability and possibly their dedication should be higher than for typical online students. Further, faculty who may have been hesitant about change and online delivery will find themselves facing a new unescapable reality,

a driving force. There may even be a sense of adventure and excitement of something new; and institutions can tap into the many interesting practices from existing, well-planned online initiatives.

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DELIVERING QUALITY EDUCATION IN A NEW ENVIRONMENT

Similar to before COVID-19, universities should be faithful to preparing students to have a successful professional career and to become responsible citizens who can make the world a better place. Regardless of the modality, delivering quality education implies that institutions will provide students with the necessary conditions to learn effectively. Those quality conditions pertain to the curriculum and delivery method, the learning resources and learning environment institutions create, and—more than anything—the role that faculty plays in the entire learning experience. In the online environment, technology will play a crucial role;

it is the skeleton that supports and through which institutions conduct activities.

During this time of profound change, some institutions may not have been well resourced or experienced, but with solid technical support and strong leadership, they have been able to select strategy and technology, notify their students, train their faculty, and be online—all over the course of a weekend. Not all institutions may be as bold or agile; some may have taken weeks to make this change. And unfortunately some institutions may have chosen the painful option of suspending classes.

After this rapid transformation to online, multiple questions may have arisen: What was implemented? Is this online education? Why do institutions spend significant resources planning, developing, and deploying online education if it can be done over a weekend?

Initially, numerous institutions have switched to a model where students are connected at the same time and for the same length as their regular in-person class, making the transition quite natural. Doing so requires considerably little technological support: a conference solution like Zoom or Teams and ideally an LMS like Canvas or Moodle to manage assignments. Faculty still deliver lectures and manage materials on an ad-hoc basis with a wide range of consistency. Institutions may have left exams, proctoring, and other solutions for a later step, and in many cases they are still exploring labs.

In contrast with this synchronous model, in most standard online programs, the courses

are a sequence of materials that include videos, readings, cases, quizzes, projects, and asynchronous collaboration tools. That model enables students to choose when to sign on and for how long. There are typically weekly deliveries but no need to be in front of the computer at a specific time. Many of the institutions that quickly migrated, led by more experienced faculty, are already taking steps toward asynchronous activities—recording videos, uploading materials, selecting optional connection times, and allowing for more flexibility.

Next let's explore some of the key components of online quality education.

Resources for QA in online education:

<https://www.qualitymatters.org/qa-resources/rubric-standards>

FACULTY'S ROLE

Faculty members are one of the most crucial elements of higher education institutions. They play a key role in curriculum development, guiding students' learning and driving their engagement, conducting research, and the institutions' overall success. Regardless of online or in-person delivery, faculty members are the engine of higher education. Their value lies not only in what they know—since universities' body of knowledge is no longer what matters most—

but in their contribution to progress through the growth of their students and the generation and co-creation of new knowledge and advanced solutions that benefit society.

Changes in society were already occurring quickly—such as a much more diverse profile of higher education students, the evolving needs of employers, and the role that technology plays in instruction. But the idea that there could be something as aggressively disruptive as the COVID-19 crisis was unthought of. More than ever, faculty members' pedagogical skills are a critical component of their professional effectiveness and success, and the situation requires that institutions provide them with the support they need to be the best possible educators.

Institutions should encourage faculty to become a learning community themselves and the protagonists of an exciting experience. Institutions should provide faculty with learning resources and development opportunities and provide guidance and positive support. Further, they should ask for self-evaluations and reflections on their practices and help faculty identify and exchange best practices. And institutions should recognize and celebrate faculty's excellent work.

Numerous recommendations are also available to help faculty address the challenges with online education. All note the importance of being present: not just to respond timely to students (which is fundamental) but also to be an active participant who shows up daily to facilitate discussions, share relevant resources,

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offer explanations, provide feedback, and engage with students. Their presence is fundamental to humanize the learning experience and incorporate the right amount of synchronous and asynchronous activities.

Faculty members should record and provide videos to better connect with students, and they need to ensure students feel part of a learning community. Interaction is an essential component. Just as in face-to-face classes, online instructors must find the right balance

between activities for the whole class, for small groups, and for individuals. In online education, the rules and expectations, the assessment criteria, course rubrics, and short-term planning must be evident, because faculty do not have the regularity of face-to-face classes to remind students of what they need to do to achieve the course's learning outcomes and be successful. As in any new initiative, it is crucial to ask students for feedback regarding what works in the course, what does not, and even what should stay after the physical campuses are open.

Reis, R. (2019): Ten Best Practices for Teaching Online

<https://tomprof.stanford.edu/posting/1091>

Benito, A. & Scott Milligan, F. (2018): Hearing the Voice of Faculty: Global Recommendations for Faculty Recognition in Higher Education Institutions

<http://dx.doi.org/10.18870/hlrc.v8i2.433>

INSTRUCTIONAL DESIGN

Higher education has historically relied on faculty members' knowledge and their ability to share that knowledge with students. Yet, it is now broadly accepted that knowledge is not the only necessary outcome of education—not even the most important. Knowledge is not what matters the most in a good teacher; rather, it is the individual's ability to help students learn effectively. As in so many professions, higher education is beginning to incorporate new roles and skills into its productive process, and many universities understand that professionalized instructional design can add value to the quality of any learning experience.

Instructional design is based on learning and instructional theory to ensure instructional quality. It starts with understanding the learning needs and goals followed by planning the structure of the learning experience and its components. Finally, individuals develop the delivery system that will best generate effective learning and achieve the learning goals. Instructional designers play an essential supporting role to subject matter experts, advising, guiding, and helping define course delivery. Together they are a stronger team to ensure students' success.

LEARNING RESOURCES

Regardless of modality, a variety of learning resources and activities are necessary to provide quality learning experiences that allow learners of different styles to maximize their academic experience. The list of possible online learning resources is endless. Some are the same as face-to-face resources—such as books, databases, or scientific articles—or a clear equivalent in the face-to-face learning, such as laboratory experiments or the presence of an invited speaker. Others belong exclusively to the online world, including adaptive learning tools based on data analytics and personalized student profiles. Depending on the nature of the course, some are more suitable than others. Our goal is not to provide an exhaustive list, but here are several important options:

- Audiovisual contents, as simple as a video or as sophisticated as a virtual reality (VR) session that immerses students in some historical or scientific context.
- Case studies, problems, and real projects that provide students with engaging opportunities for active learning.
- Quizzes that check knowledge or skills before or after another activity has taken place, that change learners' rhythm, require their full attention, and provide relevant feedback to them.
- Discussion boards that connect and engage the whole learning community, set rules and expectations, scaffold, guide, and amplify the learning process.

- Adaptive learning tools, which similar to an effective tutor, will address every student's unique needs through just-in-time feedback and provide learning experiences and resources that are adapted to their prior learning and learning pace.
- Labs, which are key in some programs:
 - Simulated labs, which can be as simple as video recordings of faculty experimenting and providing data to students who then answer questions regarding the procedure and write a lab report as if they had completed the experiment. Some free and commercial products are also available, with interesting software simulations. VR and augmented reality are additional options.
 - Sending experiment kits to students (such as dissection kits, electronic boards, and components) or asking them to use easily available products and equipment so that they can carry out an experiment at home. The students complete the experiment, record themselves, send the video to the instructor, and author the corresponding report.
 - Remote-control experiments, where students activate existing equipment in the lab and get the data.
- Experiential learning opportunities, also referred to as learning by doing or learning through action, which implies an integrated process of experimentation, reflection, conceptualization, and testing (Kolb's learning cycle). As in the case of face-to-face education, experiential learning occurs outside the online classroom, through experiences such as online internships or social responsibility projects, two learning experiences that employers most value.
- E-portfolios can also enhance the learning process and students' employability. They enable students to collect evidence **that demonstrates their knowledge and** skills and are opportunities for differentiation. Students can learn more effectively, since they have an effective tool to reflect on their education. This is also an opportunity to integrate their prior learning and better focus on developing critical competencies. Students could be more employable, since they will have a better understanding of their interests, capacities, skills, and strengths; and they will be better equipped for a job search and may be more successful in finding suitable jobs.

LEARNING ENVIRONMENT

Research has demonstrated the importance of creating a positive environment to enhance the effectiveness of learning. In particular, incorporating positive leadership as a pedagogical approach has been tested and proven to constitute an effective mechanism that can—among others—humanize the teaching and learning process, increase faculty and student engagement, boost student satisfaction, reduce attrition, and improve learning effectiveness and overall academic outcomes.

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Although technology can help create the right conditions, the most impactful component will be the necessary leadership of the faculty member. Sometimes, simple practices—which should be systematic, not anecdotal—can be extremely helpful:

- Create a participative environment, call students by their names, ask questions, and make engaging comments.
- Make every student feel valued and provide them with a degree of personalized attention.
- In every class, keep the 5:1 ratio for positive comments. Provide negative feedback in a positive, supportive, developmental manner.
- Ask more questions to replace instructions and direct conclusions.
- Double-check written language for constructive expressions and positive remarks.
- Focus on behaviors and performance, not on the person or the individual's skills or limitations.

- Practice and teach students to use supportive communication: descriptive versus evaluative, problem-centered versus person-centered.
- Involve students in peer-to-peer assessments, and help them provide constructive feedback to each other.
- Generate opportunities for mutual recognition among students.

Benito, A. et al. (2019): Expanding the Limits of Positive Leadership into the World of Higher Education

<http://ijlter.org/index.php/ijlter/article/view/1347/pdf>

ASSESSMENT OF STUDENTS' LEARNING

Assessing students' learning means collecting evidence and making judgments regarding their achievement of the learning outcomes for a topic, subject, or program. Assessment is an important component of the learning process. It is the mechanism to confirm whether students can perform to required standards. Likewise, it

is an opportunity for students to enhance their learning experience by understanding their level of performance and defining strategies that will help them acquire knowledge or develop skills, competencies, and values more effectively.

The same approaches and principles of high-quality assessments apply in face-to-face and online education.

- Assessment criteria should be transparent and clear to students; the use of rubrics is necessary. Incorporate assessment moderation so that the judgments about student performance are consistent and decisions are valid, reliable, and fair.
- The assessment should be coherent with the nature of the subject—the more authentic, the better, since it will be able to reflect the kind of learning that was defined as the desired outcome. This aspect is closely related to the validity of the assessment, which implies that the assessment tools produce valid, reliable, and sufficient evidence to make reasonable judgments as to whether students have met the course learning outcomes or requirements.
- Define the right balance between formative and summative assessment.
- Incorporate constructive feedback, providing students with the necessary awareness of achievement levels, guiding them, and motivating them toward further learning.
- Additionally, the multisource assessment—consisting of a self-assessment, peer assessment, and instructor assessment,

which can complement each other—can enhance the learning process.

Although these principles apply to both in-person and online education, integrity is of greater concern in online education. Dishonesty can occur in any setting, but fear of the unknown is a human response that institutions need to address so that the credibility of the online assessment process is not questioned. Some recommendations to enhance integrity in the learning process and ensure authenticity of the student completing the assessment can include: addressing current topics, working on real problems and projects, and linking tasks to the class experience or to the students' personal reflections and opinions. Drafts and iterative improvement of assignments are proven to contribute positively to discouraging dishonest behaviors.

Fortunately, when it comes to exams, there are numerous alternatives to face-to-face exams that can provide as much rigor to the assessment. Various communication tools enable students to take online tests with their cameras on. Students present their photo ID before the test starts, and then exam supervisors monitor them for the duration of the required tasks. As an additional measure, for small groups of students, the faculty member may randomly select several students and interview them, individually asking them to provide an oral response to one of the questions that they correctly answered on the test. Beyond creative solutions, other sophisticated tools are easy to install and automatically check identity through biometrics, which will check the physical conditions surrounding the student and which can effectively identify examinees' suspicious behaviors.

ENABLING TECHNOLOGY

Most of the immediate technological changes we have seen are in the realm of distance education. Initially, institutions moved from face-to-face interactions to remote interactions with some level of support using a video platform and an LMS. Even those with mature online operations maintain a distinct concept of remote education versus online education, characterized by one being more synchronous with limited pre-built materials and the latter being asynchronous with mature and complete pre-developed courses. Quickly, institutions may recognize that they have additional needs around assessments, laboratories, and quality assurance for a comprehensive online education.

Depending on how long the pandemic lasts, additional tools will surface as necessary to develop a new reality. Engagement systems usually supported by an ecosystem of customer relations management (CRM), social integrations, and predictive analytics will likely emerge as required, not only to augment the enrollment processes that heavily depended on face-to-face interactions but also to support students who may gradually lose the initial momentum and may require additional help to be successful.

Finally, and likely after the crisis is averted, the weight and clarity of the increased importance of technology in education will possibly trigger a newly born interest in checking the backbone applications of the institutions, the student information system (SIS), and enterprise resource planning.

Trending tools for distance education

Two basic tools for moving to remote education are an LMS and a videoconferencing solution.

The LMS's main functions are to provide a secure structure for the content of each course and the assessment by managing assignments and their grading. There are thousands of additional capabilities in an LMS, but without content management and grading, there is no LMS.

Ironically, a videoconferencing solution has not been widely adopted in online education before this crisis. Only some universities used the model of synchronous online education. Because the majority of fully line students are working adults who require additional flexibility, asynchronous models are the common model, in many cases without any tooling for synchronous contact other than messaging quickly back and forward, or infrequently used office hours.

With the lack of pre-developed content and the expectation of familiarity moving from face to face to online, the default understanding is that a video tool is necessary, if not, the most critical tool for delivery in the remote synchronous model. We explored the capabilities and adoption of some of the most widely adopted technologies in higher education during this crisis.

Zoom

Zoom has become the new operating system of society. From remote classrooms to business meetings to virtual happy hours and birthday parties, Zoom is now the de facto universal tool. Its simplicity of use, efficient execution, and capabilities are far ahead of others.

Zoom enables groups to continue a natural sense of continuity via webcams and video conferencing with little effort. Of course, it is not the same, and clearly it has its limitations, but the wide availability of internet access at video-capable speeds, devices, and the new cultural expectation of turning on the video camera have enabled this new way of working and studying.

Eric Yaun and his team created Zoom in 2011, incorporating all the lessons they learned from WebEx and Jabber. Like many other Silicon Valley stories, they solved a concrete technology problem. Videoconferences did not work. Yet, since the first click on a Zoom app, it is easy to see a significant difference compared to the rest: It worked. Since then, many competitors have improved their platforms.

Microsoft morphed a lot; many would agree too much. On the consumer side with Skype, it drastically lost its space to FaceTime, WhatsApp, and other mobile apps. On the education and business side, the evolution of Communicator/ Lync, then Skype for Business, to Teams has been an incredible and necessary strategy that Satya Nadella has pushed since day one of his new role as CEO of Microsoft, yet the platform has not yet been able to deliver a stable tool long enough and with consistency.

Other meeting competitors that so commonly used “content first/screen share” in the last decade like GoToMeeting, WebEx, Blue Jeans, or even the capable Google Hangouts have evolved to the point that, technically, many of them are likely to do very similar functions; yet none of them have demonstrated the simplicity and

efficiency of Zoom. This edge may be achieved by subtle details, like not requiring registration to join a meeting or enabling cameras by default. Vendors may argue they are equal or better, yet the public has voted.

Google Classroom

Many institutions already had some LMSes. Common adoptions are Canvas, which has been leading in the market; Blackboard with a significant base; Moodle, which has been widely adopted for its low cost; Desire to Learn, an emerging competitor; and many others.

Google Classroom has one key advantage: It is free. Not freemium, no open source that you must host and maintain, but free. Not only that, it is also readily available to deploy in seconds. Also, if your institution has been using Google suites for students in any way, then you already have it.

Google Classroom is not a complete, full-fledged LMS, but it has enough functionality to cover the most important aspects of distance education, including publishing materials and assignments and hosting chats within a well-structured course inventory managed by a particularly good security scheme. Some advance features also exist and may not be used as much. For example, as more long-term solutions emerge, Rubrics is a great faculty time-saving feature. Google has this feature available in the Google Assignments product, but it requires the use of a separate Google app, lowering its adoption.

Another element is that the experience using Microsoft editors like Word, Excel, and PowerPoint seems a bit unnatural. Google is

extremely well integrated across its suite, from Classroom to Docs, Sheets, and Slides; however, not many people know that Docs is the name of the word-processing tool, and even fewer may have adopted it as their core tool. While this may be more natural in K-12, in higher education, there is still a big predominance of Microsoft Office editors, primarily driven by faculty and administrators who are used to that and not technology. When using a mixed set of Microsoft Office tools with Google Classroom, opening and creating files and submitting assignments are not as natural as using the comprehensive G Suite, and that may cause confusion as individuals inevitably end up with a mix of file types and user questions.

Google Classroom may have one significant limitation. Unless it is hidden, it does not offer Learning Tools Interoperability (LTI) integrations. This drastically limits the cross-functionality with content and tool providers in the higher education space. This can quickly become a limitation, driving its initial fast adoption for a replacement by a more traditional LMS. Also, traditional LMSes still have a significant set of features above Google Classroom, including complex grade books, exception management, notification options, course management, conditional content release, and advance assessments. But institutions may rethink the importance and value of those features (80%-20% rule) versus the cost and easy pragmatism of Google Classroom and find themselves considering keeping it as their new core solution or even replacing older solutions.

Microsoft Teams

Microsoft Teams has seen a significant adoption as a remote education tool. The key benefits of Teams is that it combines synchronous tools that act like Zoom with asynchronous features that act like Slack, with a veneer of a light-LMS like Canvas, Blackboard, or Moodle. It is all in one box, so it is easy to deploy. Additionally, because many institutions with a comprehensive Microsoft agreement already have the users created, deployment may be quite simple and efficient.

However, like a swiss army knife that has many tools, each one usually falls short compared to the dedicated specific competitors. For videoconferencing, the inability to show more than four cameras in a screen has been its Achilles heel. Microsoft has been working overnight to increase this to nine screens and eventually more; yet Zoom and others already display up to 49 videos in one screen effortlessly. Additional elements such as low-bandwidth management and high CPU use could be harder to detect but also exist. In asynchronous collaboration, Slack has been the leader, with technology companies as main adopters, but it's making its way to widespread use in companies and some level of adoption in education. Features are quite similar, and while Slack may still have an edge on adoption and capacities, Teams can be equally good or simpler and superior for some audiences. The LMS capabilities remain basic, and the fact that they are not readily and easily visible to commercial customers is a deterrent to the discovery of those basic yet valuable

features. Finally, the perception of reality that the tool is not as friendly to use as a task-dedicated tool may affect its adoption too.

Regardless of its limitations, Microsoft Teams is a formidable tool, easy to deploy for those who have Microsoft authentication for other reasons and comprehensive enough to operate the initial waves.

FROM A SIMPLE COUPLE OF TOOLS TO AN ECOSYSTEM

Institutions used to online education have learned that online education requires a village. That means that while faculty can remain centric in the delivery, the additional set of needs to replace face-to-face experiences quickly evolve into a considerable number of additional technologies and vendors that deliver specific solutions that the more general systems do not cover. These tools are both focused on the delivery of knowledge as well as assessment, and they include virtual laboratories, proctoring, collaboration enhancements, video streaming,

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course content management, and more. They may also include bundled content, offering a complete course experience or augmenting

course learning objectives or assessments.

For example, Arizona State University uses more than 130 technologies to deliver its fully online education, and it has recently implemented remote education for immersion students. You can see them [here](#).

Other powerful solutions embrace different educational models, such as adaptive learning and competency-based education. Due to the increased complexity of change, mostly around the pedagogical model, institutions are less likely to consider these tools as an immediate replacement, but it is equally possible that they become strong options when the time to evolve a new normal begins.

Here are some of the core examples of technologies institutions are adopting for a complete education.

Proctoring

Proctoring, at least partially, resolves how to ensure that students do not cheat during exams. In fully online mature programs, the assessments typically incorporate several activities—like discussion board participation, assignments, and quizzes—multiple times per week, and the final grade reflects the addition of many formative assessments within cases final projects or portfolios. The face-to-face model—and by inference, remote education—in many cases continues with a clear set of higher-

stakes mid-term and final exams. Regulatory frameworks also sometimes impose this.

Proctoring solutions reduce common cheating possibilities, and they are primarily implemented to control the exam delivery. They use and combine different methods, from locking the web browser to enabling a webcam during the exam to requiring students to show their surroundings before beginning the assessment. There are typically several levels of service driven by the number of hours dedicated to monitoring, live monitoring versus recorded exams, and the ratio of exams versus those monitoring them, among other factors. The most advanced systems use face recognition technologies and artificial intelligence to detect fraud and then alert a person to review or directly warn the faculty member.

Some of the most used vendors include ProctorU, RPNOW, Respondus, Examity, and Mettl.

Virtual laboratories

A significant challenge, sometimes real but even at times used as justification to not go online, is laboratories. Computer labs have been easily transferred online. Most server or appliance-based solutions are networked natively, such as Cisco devices. Some software such as AutoCAD have evolved to have online versions, and for that few software remaining trapped in computers for the time being, like SPSS, institutions can consider local open-source versions. Finally, virtualized desktops using VMWare and other tools have enabled more expensive local computer software to be consumed remotely.

Now, there are many labs where the equipment is quite specific and hard to replicate for distance education. Fortunately, while not a complete answer, increasingly technology is closing that gap. Today, top research institutions daily are online delivering programs including physics, electrical engineering, biology, and many more that were usually labeled as “cannot do online.”

Here are some of the examples of virtual labs that can help bridge that gap:

Labster has one of the biggest sets of laboratories for biology, chemistry, engineering, medicine, and physics. Not only can it deliver many of the usual dry and wet lab experiences online, but it can also do so via VR. Those labs work on a laptop, and VR is just an option—and has not been widely adopted yet—but what would be a better way to bring students closer to the face-to-face reality?

Another virtual lab is Praxilabs, with a set of similar labs in biology and physics; so is Evolve from Elsevier, which is applicable in nursing and health sciences.

Finally, there are alternatives in those countries where shipping is reliable to dispatch physical kits for students. Some vendors prepare these kits with all necessary materials to perform labs, from dissection to electronic board. There are many ways to implement these solutions, from guided exercises to synchronous work in teams to video recording the student work and delivering it via LMS.

Holscience is an example that combines purely virtual labs with the option to ship a physical kit, attached to online instruction and evaluation in a comprehensive solution. Other simple solutions can be implemented, down to the level of asking students to use household items with clear instructions. While limited in scope, this can solve some of the more basic needs.

Collaboration

VoiceThread and Yellowdig are examples of add-on solutions to enhance LMS collaboration between peers and with faculty. Different in nature, VoiceThread enables individuals to more easily record videos and post them in a discussion forum, while Yellowdig presents a more collaborative structure to asynchronous collaboration via posts.

There are thousands of LMS add-ons, most of them connected via LTI, which makes plugins that are on the majority of SaaS services to be rapidly implemented and adopted. Because they are relatively fast and inexpensive to experiment, they can also be replaced or decommissioned if the expected results are not achieved.

SUPPORTING STUDENT AND INSTITUTIONAL SUCCESS

Once the core needs of the teaching and learning delivery are covered, institutions will quickly realize the need for efficient tracking of students,

both for retention purposes as well as for enrollment.

For those students now taking distance education courses, new challenges will present, including motivation; lack of adaptation to the new model; or financial challenges from supporting family members or themselves, furloughing, or self-employment. Some universities are already well equipped to support students and have university-wide implementations of systems and remote services, including CRMs, retention analytics, and support services from financial advice to counseling. Others may still be, until the time of the COVID-19 crisis, relying on face-to-face interactions with little to no tracking.

On top of this, not only is education moving online, many of the critical steps of the natural enrollment cycles are now transferred to a remote experience. As enrollment projections start to materialize for the following intakes, this issue will take a stronger priority.

Dozens of tools are available in the market for these needs. We will highlight some of those that are most used in higher education.

CRMs: Education has many particularities, even its own lexis. But because education is still a service, the CRM solutions can leverage many things from other industries. Most CRMs for higher education today can be a combination of a core platform that benefits from the investment of the general industry and a higher education add-on that extends the functionality and configuration to solve for the specific needs. Yes, the core technologies can be used natively, but

the effort these companies made on top of the core products is significant, and replicating that work at the institution may not be efficient.

TargetX on top of Salesforce: Salesforce is a market leader. In fact, many institutions used Salesforce natively for their CRM needs and even created several satellite functionalities in this extensible platform. TargetX brings the higher education models into Salesforce. Some can ask about HEDA (Higher Education Data Architecture), which is a core and included initiative that comes with Salesforce. One of the strengths of Salesforce—and therefore TargetX—is the number of partners and plugins available to extend it. HEDA, is a good option for very simple projects and with limited adaptations that can be used for basic implementation or pilots but it would require a significant effort to reach a fully adapted higher education CRM capabilities. Institutions might need to consider adopting Target X or recreating a lot of its functionalities over plain native Salesforce or Salesforce + HEDA.

Engage by Campus Management: This is another extension, in this case of Microsoft Dynamics. Dynamics native is widely adopted in higher education outside of the U.S. Campus Management added a lot of the specific higher ed needs, as well as a pre-selected ecosystem of add-ons to deliver the core needs of a higher education CRM. Microsoft also offers a basic plug in to Dynamics called Higher Education Accelerator, but similar to HEDA, it is too limiting for a real full deployment. An excellent feature of Dynamics is its natural and easy integration in Microsoft environments, from working leads

from Outlook to authentication to Excel work. The platform integrates well. Extensions via partners are not yet as strong as Salesforce, but with a growing number of members and the possibility of easily connecting to PowerBI, it is becoming a competitive tool.

Tivenos CRM on top of Zoho: This is a relatively new product, mostly deployed in Latin America. Zoho CRM is a comprehensive product built and serviced from India, and it has grown rapidly from being a small-business product to a solid CRM, including a group of native Zoho functionalities or apps that cover a surprising number of needs. While Tivenos CRM may be less mature than other solutions, it also benefits from its early age with some key quick-move advantages like full integration with WhatsApp and two-way work with social media, where others may fall short.

HubSpot CRM: This has grown from its marketing automation origins to be a usable CRM solution. No higher-education-specific extensions are widely adopted, so while it may have a strong heart with some marketing teams, it may be viable but harder to implement to become a comprehensive solution.

SugarCRM: This is a solution that, similar to Moodle, started from the concept of being open source and free. Now, SugarCRM is used in several institutions and commercially supported. Yet, like HubSpot, the implementation may require more work to reach the full spectrum of higher ed needs.

Analytics

The value of retention, both on financial returns as well as a positive impact on society, has taken some good momentum lately.

Vendors on this space include Civitas Learning, UPlanner, CampusLabs, and Discourse Analytics. Most of these solutions are used to identify students at risk. However, only some recommend specific actions that may increase retention based on the best pattern of behavior of each student. However, in the end, all these solutions focus the attention and automate some activities, but the most vital component remains human, which is the proactive interaction of student support and faculty when a student is struggling.

Implementation of these tools may sound complex, but vendors are used to connecting to the usual key sources of information such as SIS, LMS and—if available—CRM and then work from those to connect the dots and understand each student profile or behavior at a scale and detail that may be unviable by just having support groups.

SECURITY IS A REAL CONCERN, BUT IT CAN BE ADDRESSED

In any violent change, decisions and implementations must be made abruptly. This brings huge benefits to avoid hesitation and get things done, but it also brings flaws in the execution, including some potential and, in some cases, significant security concerns.

One of the simple and most talked about cases are uninvited guests joining Zoom meetings. This has been mostly not hacking but simply the equivalent to showing up uninvited. The default settings of Zoom favor simplicity of use and natural replacement of rooms versus increased security. While in a face-to-face environment it may be OK to have an office building and meeting room doors unlocked during business hours, online this may not be accepted, and additional simple steps may be needed, like password-protected meetings and enabling a forced lobby of guests.

Universities range of security implementations have a huge range; from a small institution with an IT director running most systems, to others with official CISO and whole security departments. Those most advance might be forced to flexible their processes to accelerate change, and play a bit of catch up after implementation.

However, for those with less capacities, other more meaningful security issues are likely to emerge, based on simple implementation flaws. For example, when creating massive amounts of users, institutions may, still today, choose the use of prescriptive passwords for students like birthdates that can easily be guessed without technical knowledge, allowing others to impersonate. This is even worse if used for faculty, where uninvited individual could enter or change grades.

More advanced risks are probable when change is implemented this fast, but fortunately, most systems today, are deployed as SaaS in the

cloud, delegating the core security aspects to vendors who already have processes and standards hard to achieve by institutions that used to choose to deploy their systems. Focusing on a secure implementation avoiding the most common errors, and leveraging vendors for more advanced security during a time of accelerated change can help cover the immediate risks, allowing for a more sophisticated scan and remediation. This process might allow the necessary changes to be implemented with some level of increased risk, but remaining acceptable for the institution.

BACK TO A NEW REALITY

Although the timing is unknown, eventually the COVID-19 lockdown will end and students and faculty will be able to return to physical campuses and classrooms. It is difficult to predict what the new reality will be like. We will find profound changes and even a new way of life. Hopefully, some of the good aspects that this situation has helped us discover—or re-discover—will remain, including the necessary support to developing economies, for which an utterly severe event like this one has represented an additional barrier to deliver meaningful education to millions of people.

For many, they may have learned lessons the hard way, but one shared lesson is the importance of being prepared for extreme situations. Universities should wisely develop more robust recovery and transition plans for the

future, secure stronger technology, and better prepare staff and faculty.

Moreover, after a period of rapid change and adaptation to an unknown environment, where new resources and pedagogical approaches were introduced, faculty will find a great opportunity to evolve and improve their teaching practice for the future benefit of their students.

Likewise, universities should ask students and faculty for feedback and determine whether any of the online learning components should remain. Some may not want to return to their campuses or may request a reduction in contact hours and an increase in the digital component. If that happens, it will mean that universities handled the crisis well. Hopefully not too many students were exposed to low-quality implementations or developed a perception that online education is a poorly managed set of remote sessions with little to no prepared materials and a loosely connected set of confusing external resources.

Before this event, online education for a typical high school student was almost nonexistent. Many of them are now exposed to its possibilities and its challenges. Millennials grew up through the internet revolution, but Generation Z was born with a tablet in hand. Gen Z high schoolers now have tasted the combined option of increased efficiency with the time invested in education, reduced common social pressures, and increased daily online hours. Some are loving it, despite this comes at a huge cost of increased isolation and lack of new experiences and social skills development. Regardless of the positive or negative impact, this new

audience may question the value of a face-to-face education versus the possibility of “doing it like we did during COVID-19.”

It seems very possible that from now on, students and their families will not only broadly accept and demand online education, but hopefully institutions and regulators will support it. In the future, students may want to enroll in programs where there is an online component, not only because of the quality of learning but also because online can provide a safer alternative to traveling abroad for international learning experiences, which will lend to the more open international universities the opportunity to partner with local institutions and provide high-quality online learning experiences to students globally.

Coming out of the COVID-19 crisis, we believe 2020 will be highlighted in the history of higher education as a year of radical innovation, a year that started a new way of understanding education—a new phase where digital learning will be the protagonist, and where access and quality of higher education will rise at an unprecedented speed.

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