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AMCIS 2017 Panel Report: Experiences in Online Education

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Abstract:

In this AMCIS 2017 online education panel, five experienced business school professors from differently sized public and private institutions in three different countries (USA, Mexico, and Spain) discussed how online education (i.e., eLearning, technology-mediated knowledge transfer) occurred in their institutions. They presented low-budget and high-budget examples and described what they have found to be best practices in eLearning at both the institution and the instructor level. They also demonstrated that one can accomplish online education in many different ways and with varying budgets, but, as long as one bases it on solid educational principles and mastery of the technology, it can be as effective as (if not more than) traditional face-to-face education. This report builds on their presentations and additional information gathered from the literature.

Keywords: eLearning, Online Education, Distance Education, Teaching, Technology-mediated Knowledge Transfer, Doctoral Programs.

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1 Introduction

In the past two decades, technology-mediated knowledge transfer (eLearning) has grown exponentially (Seaman, Allen, & Seaman, 2018), while overall enrolments in higher education have decreased (Allen & Seaman, 2015; Seaman & Seaman 2017). In 2012, online programs accounted for over six percent of all U.S. baccalaureate degrees (Deming, Goldin, Katz, & Yuchtman, 2015). By 2016, over 30 percent of higher education students took at least one online course (Seaman et al., 2018), and 80 percent of all higher education institutions offered many online courses even if they were not part of an entirely online program (Goodman, Melkers, & Pallais, 2016). However, most of the growth has occurred in the least selective institutions—particularly the for-profit ones (Deming, Goldin, & Katz, 2012).

Higher education costs a considerable amount, and its price has increased steadily (U.S. Department of Education, 2018). However, eLearning can reduce education's cost by increasing student to faculty ratio (without lowering the interaction's quality), reducing physical plant costs, and reducing transportation costs. Indeed, state legislators and public institutions find the possibility that they could lower costs and increase the number of educated alumni via eLearning an appealing prospect appealing (Bowen, Chingos, Lack, & Nygren, 2014). Evidence shows that eLearning has positively affected the number of students pursuing higher education (Goodman et al., 2016). However, findings also show that tuition for online courses often costs more than for face-to-face courses (Jeffrey & Chien, 2016).

With eLearning, students and educators can work together without having to be in the same place (colocation) at the same time (synchronously), which opens the classroom to students and instructors from all over the world. However, eLearning comes with many challenges (Gillett-Swan, 2017; Palvia et al., 2018). For instance, it slows down the interaction (Mariano & de la Rosa, 2004) since asynchronous communication occurs more slowly than synchronous communication and people can typically speak more quickly than they can type. It also hampers open expression (Sandanayake & Madurapperuma, 2013) since the recording of the event might lead to self-censorship. It increases cultural diversity (Coldwell, Goold, & Craig, 2007). Finally, it reduces the number of cues that individuals exchange with one another (Cantoni, Cellario, & Porta, 2004), and the options for cheating explode (Hollis, 2018; Underwood & Szabo, 2003).

However, face-to-face communication and online communication represent two extremes on a continuum. As such, hybrid communication options exist as well, such as where some interactions occur in the physical face-to-face world and others in the virtual, online environment. Many argue that hybrid options even surpass their two extreme counterparts (Powell et al., 2015; Ryan, Kaufman, Greenhouse, She, & Shi, 2016). Hybrid options have many names, such as "blended learning", "hybrid learning", "technology-mediated instruction", "Web-enhanced instruction", "mixed-mode instruction", and the popular "flipped classroom."

While universities create and disseminate knowledge, students typically attend universities for three main reasons: 1) they want to acquire new knowledge, 2) they need a document that certifies that they have such knowledge, and 3) they want to live a specific social experience that enhances their personal network and provides them with valuable social capital. We already have institutions that do not educate but only assess students (i.e., credit for prior learning). They certify that the student has the knowledge but do not specify when, where, or how they obtained it. In addition, some provide free online courses; however, they all charge for these examinations. And clearly, these institutions do not provide any social or networking benefits to their students. Some universities provide a mixed model: they impart some classes and use this credit for prior-learning (examination-only) model for others.

Designing a course requires the designer to define the content, objectives, activities, and assessment. One can continue to design a face-to-face course as one delivers them; however, one cannot do so for online courses. Online courses require additional pedagogy, graphical design, and leading-edge technologies (Elliott, Rhoades, Jackson, & Mandernach, 2015), and the instructor may not have expertise in the technology, graphical design, or the teaching techniques the courses use. Thus, designing online courses requires several specialists that aid the subject-matter expert in designing a technologically feasible, visually attractive, and pedagogically coherent course (Alanis, 2003).

1.1 Panel Overview

Different countries and different institutions approach eLearning in different ways. Given those differences, the AMCIS 2017 panel included international faculty from different countries and different types of

institutions. Panelists also came from for-profit and not-for-profit institutions from public and private institutions with different budgets and different sizes.

The panelists discussed how institutions could leverage eLearning. They also tried to debunk some common myths regarding eLearning that relate to quality, costs, synchronicity, workload, and ease of deployment. In addition, the panelists also planned to discuss how the IS discipline could leverage eLearning to further several areas of research. Unfortunately, this last discussion did not occur.

First, the panel introduced the audience to the topic, the issues, themselves, and the modus operandi. Then, each panelist presented their experience in eLearning followed by a question and answer (Q&A) session. After the panel finished, the panelists and the audience took part in engaging conversation. These conversations represent one reason why we wrote this report, which includes the material not only from the presentations but also from the discussions during the panel.

1.2 Panelists

The panel included five faculty from two public and four private institutions. Two of the private institutions are selective and mid-sized, and have substantial funding available for eLearning. Another is considerably smaller in both size and budget. The last private university is the only for-profit institution and the only completely online one. Though the two public institutions differ in size (one small and one large), they both have open enrolment and limited budgets. The panelists came from universities in Spain (two private universities), Mexico (one private and one public), and the USA (one small state university and one larger, private, and for-profit university).

In particular, the panel included the following panelists:

- Dr. Macedonio Alanís González from Tecnológico de Monterrey in México. He described the evolution of eLearning at his institution and how to leverage eLearning for an international experience that reaches busy and distant students.
- Dr. José Esteves from IE business school in Madrid, Spain. He discussed how to provide a hybrid worldwide elite experience, provided recommendations for better eLearning, and discussed the need and use of bleeding-edge technologies.
- Dr. Juan M. Gómez Reynoso from Universidad Autónoma de Aguascalientes in México. He discussed how to develop eLearning tools (with a small budget) to better serve students who live in spread-out areas.
- Dr. Indira Guzman from Trident University in the USA. She discussed online doctoral programs at a private, for-profit, and accredited online institution.
- Dr. Carlos Ferran from both Universidad Ramon Llull La Salle Campus in Barcelona, Spain, and Governors State University in Illinois, USA. He discussed some critical issues for developing high-quality online programs on a small budget. He also moderated the panel.

Panelists emphasized the different requirements for the different programs and the need for high quality no matter the budget or the audience. They discussed the advantages and disadvantages of face-to-face, hybrid, and online courses and programs. They also discussed the different reasons their institutions started to participate in eLearning and highlighted how, with eLearning, one can accomplish goals that one would find difficult or costly to accomplish in the traditional face-to-face environment. In addition, the panelists discussed universal (i.e., not unique to an institution or specific audience) online education requirements.

2 Tecnológico de Monterrey

Macedonio Alanís González from Tecnológico de Monterrey presented first. He has taught face-to-face and online for over 20 years. Based on his experiences at Tecnológico de Monterrey, he presented how:

- Distance learning represents a viable alternative for delivering higher education.
- Students who take properly designed online courses can perform on standardized tests as well as students who take the same course in a traditional setting.
- The hybrid format tends to be better than both the purely face-to-face and purely online formats.

- Designing online courses requires more than a subject-matter expert. It further requires supporting specialists to design a technologically feasible, visually attractive, and pedagogically coherent course.
- No single best model for eLearning exists. In designing effective and efficient online learning courses, the designer must consider such as students who will take them, resources' availability, and the supporting team's expertise.
- Online courses require continuous updates in not only the subject matter like every other course but also in the technologies used to deliver it.

2.1 The Institution

Tecnológico de Monterrey, founded in 1943, is a private Southern Association of Colleges and Schools (SACS)-accredited, nonsectarian, and coeducational institution based in Monterrey, Mexico. It has 33 campuses in 20 states. Its programs reach not only Mexico but also most of Central and South America. Tecnológico de Monterrey continuously innovates in order to improve its programs' quality. The Tecnológico de Monterrey has engaged in high-quality distance education for the past 25 years throughout which it has tested different techniques for teaching face-to-face but also remote courses. It has experimented with many different technologies and developed hybrid and online courses.

2.2 Introduction

Given the Tecnológico de Monterrey has tried different delivery methods for distance education throughout its history, it has realized that not all methods work for all programs. Thus, it has chosen different methods for different programs. Moreover, in 25 years, technology has evolved; thus, its methods and tools have also evolved. It has used land lines, satellites, and the Internet. It has used static and dynamic content. It has conducted synchronous and asynchronous courses.

2.3 Technologies and Learning Modes

In this section, we describe several models that the Tecnológico de Monterrey has used. It has experimented with synchronous satellite (or Web) transmission, semi-synchronous Web-based classes, and asynchronous online classes. Some courses and programs required a combination of models and some included a face-to-face component (hybrids). Table 1 illustrates the characteristics of different distance education models that the institution has tested. The table compares the distance education models with the traditional classroom face-to-face lecture model.

Table 1. Characteristics of Different Distance Education Models Compared with the Traditional Classroom Face-to-face Teaching Model

Model	Face-to-face	Distance			
Synchronicity	Synchronous		Semi-synchronous		
Location	Classroom	Transmission room	Transmission room	Online	Online and classroom
Technology	Classroom	Live satellite full sessions	Live satellite discussions	Live Internet discussions	Live Internet discussions and face-to-face opening and closing sessions
Lectures	Full lectures	Satellite broadcast of full lectures	Prerecorded clips	Prerecorded full lectures	Prerecorded clips
Interactions with students	Full lectures	Full lectures	Short live satellite discussion	Short live Internet discussions	Short live Internet discussions
Face-to-face sessions	Yes	No	No	No	Opening and closing
Cost	Low	Very high	High	Low	Low and travel
Reach	Very limited Requires residency	Broad Several locations	Broad Several locations	Very broad Any place	Limited Requires travel

2.3.1 Face-to-face, Synchronous, Traditional Classroom

To define a point of reference, in Table 1, we first describe a traditional face-to-face classroom model in which students attend full lectures at a set time in a given physical classroom. This model, the traditional model that educators have used for centuries, has limited reach since it requires physical presence in a given room. As such, it also requires students to live nearby for the course's duration. The classroom itself might contain little or much technology (from chalk to smartboards and sophisticated equipment). The instructor might use the available technology or not.

2.3.2 Synchronous Model with Live Satellite Broadcast of Lectures

Distance education started with correspondence courses (though we do not discuss that modality here), and the new models start with synchronous technologies. Educators designed these courses to mirror a regular classroom as much as possible. Instructors taught courses synchronously and broadcasted the full class live via satellite to students in the different campuses who could participate in the class via phone or two-way teleconference (or videoconference). Therefore, only a small number of campuses could participate. The model required an expensive production setting and technical personnel, but it provided an experience as close to a traditional classroom as possible for students in remote places. As such, the institution could offer advanced courses to students in small campuses who would not otherwise have access to specialized faculty without their needing to leave their community.

Tecnológico de Monterrey initially broadcasted an e-commerce course live to 500 undergraduate students in 16 cities across Mexico. This model allowed the instructor to develop a close relationship with students at a level that resembled a regular course. The instructor could call on a particular student and expect an answer during the live discussions. However, the model required expensive production and broadcasting equipment, and it had limited reach due to the satellite transmission's technical limitations.

2.3.3 Semi-synchronous Model with Prerecorded Clips and Satellite Sessions

Given the high costs associated with full satellite broadcasts, the Tecnológico de Monterrey developed a new, a semi-synchronous model as an alternative. As such, the new model used prerecorded video clips in addition to some satellite sessions. However, these video clips (basically pre-recorded lectures) still required expensive production equipment and specialized support staff.

Tecnológico de Monterrey designed an e-government seminar tailored to working practitioners using prerecorded clips with online exercises and complemented it with biweekly synchronous satellite broadcast sessions to discuss cases and receive lectures from special guests regarding their e-government experiences. This seminar, which the World Bank and the Office of The President of Mexico co-sponsored, reached over 1,000 information technology (IT) specialists in nine countries. This model proved a good fit for part-time geographically disperse students who could not attend a regular course but still benefited from personal contact.

2.3.4 Semi-synchronous Model with Prerecorded Clips (or Prerecorded Full Lectures) Discussing Weekly Topics and Optional Online Webex Sessions for Case Discussions and Questions

Next, the institution designed a semi-synchronous model with prerecorded clips on weekly topics that used online WebEx technology rather than satellite transmissions. The institution mostly used WebEx sessions for case discussion, Q&A sessions, and one-to-one meetings between the instructor and individual students. In some cases when appropriate, the institution used the prerecorded lectures or the WebEx technology to deliver an entire class session.

The institution still uses this model for some e-commerce and technology courses. It includes a comprehensive course-shell prepared in its course learning management system (LMS) (Blackboard) with pre-recorded clips on topics and readings for each week/module. The model includes weekly activities such as case analysis, special projects, and short quizzes that students need to complete individually and in teams. Students do not need to attend the live (synchronous) online sessions and can also watch them later since the institution records them.

This alternative only became available when high-bandwidth Internet connections became the norm across the country. The course has minimal transmission costs since it uses the Internet as a delivery platform; however, the course still requires production facilities and specialized support staff to develop

high-quality professional videos. Currently it is not clear if the additional expense required for high-quality professional videos is worthwhile. A few years back, the preference was for personal low-cost YouTube videos that provided a richer and more personal interaction between instructors and students. Nonetheless, business school students tend to equate a video's quality and formality with the course's and institution's quality. Given the value of the Tecnológico de Monterrey's brand name recognition, it still produces high-quality professional videos for its courses.

2.3.5 Semi-synchronous Program with an Opening and Closing Face-to-face Seminar

The MATI/MSIT Dual Graduate Degree Program, which the Tecnológico de Monterrey conducts in collaboration with Carnegie Mellon University (CMU), represents one of the former's most successful online programs. The program attracts accomplished professionals from many countries in Latin-America and starts with a one-week face-to-face seminar in Pittsburgh at CMU. Subsequently, students undertake online semi-synchronous courses (half from CMU and half from Tecnológico de Monterrey) for two-and-a-half years. The degree concludes with a one-week seminar in Monterrey at Tecnológico de Monterrey where students present their final projects. Students receive two master degrees (one from each institution).

This type of seminar has been very successful. The initial face-to-face seminar allows students and instructor to gain a good degree of intimacy that later allows them to develop rich online interactions. They also develop many cues that they can later use to more quickly and clearly communicate. Alumni have commented that they also find the closing face-to-face seminar useful in cementing their relationships, which, in some cases, have lasted for years. As we state above, educational institutions can provide education, a certificate, and social capital. However, purely online programs tend to have much less social capital than in purely face-to-face programs. A hybrid program can provide social capital even among students who otherwise would not usually connect given their distant geographical location.

2.4 Findings

eLearning constitutes a viable alternative for delivering higher education. At the Tecnológico de Monterrey, students who have taken well-designed online courses have performed on standardized tests as well as students who have taken the same course in a traditional setting. Nonetheless, the institution has found the hybrid format to outperform either pure form. Indeed, rather than compromising the two pure forms, the institution has found that hybrid programs gain from synergies between them.

Experience showed that designing an online course requires special preparation and consideration for the material, the teaching methodology, and the technology available for interaction. In addition to the usual challenges in defining the course content and objectives, when designing an online course, one requires leading-edge technology and top-quality support materials. However, the instructor may not even have expertise in video technology, graphical design, or the necessary teaching techniques. To overcome these obstacles, designing online courses requires several specialists that aid the subject-matter expert in designing a technologically feasible, visually attractive, and pedagogically coherent course.

No single model works best for eLearning. In designing effective and efficient online learning courses, one must consider factors such as the students who will take them, resource availability, and the supporting team's expertise. In addition, technology continues to evolve, and students expect courses to incorporate bleeding-edge technologies. One cannot use the same course model forever, and new versions of a course will require new technology. Today, we need to not only use personal computers but also incorporate mobile phones and tablets. For the future, we still do not know which technologies eLearning will use the most, but they will certainly be new ones.

3 IE Business School

José Esteves from IE Business School in Spain presented second. An accomplished online educator, he has posted several viral educational YouTube videos that many courses around the world use as their introduction. In his presentation, he discussed:

- Major challenges that the IE Business School and its instructors and students face.
- How time-consuming eLearning is for both instructors and students (which he identified as one of the biggest challenges for eLearning).
- Different eLearning scenarios with their advantages and disadvantages.

- Potential mechanisms for improving the asynchronous eLearning method.
- A series of recommendations (see Table 3) derived from his experience teaching cases online.
- A showcase of two bleeding-edge technologies that the IE business school uses to offer top-quality online education.

3.1 The Institution

IE Business School resides in Madrid, Spain. It offers undergraduate, graduate, and doctoral programs. It is a top-ranking institution founded in 1973 under the name Instituto de Empresa. Given its success, in 2009, it changed its name (IE Business School) and became a complete university (IE University) that offers degrees in many other areas. IE Business School offers BBA, MBA, executive MBA, master's degree programs in finance and management, executive education programs, PhD programs and DBA programs.

Given IE Business School's name recognition, it needs to provide and be recognized for providing high-quality programs. Moreover, IE Business School's programs are not cheap. In fact, IE Business School had the highest budget for developing and delivering online programs among all the schools that the panel showcased. It used this budget to develop and deliver the best online courses but also to test new and viable technologies that can improve the learning experience. Nonetheless, as in many other cases, the latest does not always constitute the best or most appropriate; thus, IE University needs to be a careful innovator.

3.2 Introduction

In today's eLearning scenario, main types of eLearning exist: synchronous, asynchronous, and a mix (blended eLearning). Synchronous eLearning involves real-time online studies through chat and videoconferencing, whereas instructors can conduct asynchronous learning even while students remain offline. Typically, instructors deliver asynchronous eLearning courses via Web-enabled discussion boards where students complete the course at their own pace and at a time they find convenient (Skylar, 2009; Piotrowski, 2010; Sun & Chen, 2016).

An asynchronous elearning environment gives students more time to reflect and collaborate with their peers and provide peer feedback (So & Brush, 2008; Brindley, Walti, & Blaschke, 2009; Harris, Mishra, & Koehler, 2009; Lin, Hong, & Lawrenz, 2012; Simonson, Smaldino, Albright, & Zvacek, 2014; Pendry & Salvatore, 2015; Shahabadi & Uplaneb, 2015). The asynchronous method has become most popular eLearning method because many free and easy-to-use eLearning tools that require minimal guidance and minimal hardware exist (Meloni, 2010; Simonson et al., 2014). It also has other benefits. It forces every student in the class to participate in the discussion. It makes it easier to participate for students who are shy and not comfortable with face-to-face discussions. And it holds individual students accountable and responsible for their own learning. Moreover, in this asynchronous learning model, the instructor becomes a facilitator instead of a lecturer, which positively influences the learning experience.

3.3 Top-ranked Online Graduate Programs

Regularly featured among the top business schools in the world, IE Business School has offered purely online and blended graduate programs since 2004. During all these years, IE Business School has learned and adapted its eLearning methodology; thus, Esteves proceeded to showcase several IE business school online graduate programs (see <https://www.ie.edu/business-school/>). During his showcase, Esteves discussed the following issues:

- What makes IE Business School's eLearning strategy so successful
- Asynchronous online learning's benefits and challenges, and
- The next innovations in eLearning.

Among its eLearning graduate programs, IE Business School provides the Global MBA program, which the *Financial Times* ranked as the number one online MBA in the world in March, 2017. The MBA overwhelmingly attracts international students (95%), who need three years of professional experience at minimum to apply to it. It takes students 18 months to complete (see Figure 1) and prepares business leaders to disrupt and transform. The program takes place over two face-to-face periods on campus and three core virtual periods. This hybrid offering provides the best of both worlds. The face-to-face part helps

students bond among themselves and with the instructor. This bonding facilitates online communications and provides a social capital that would otherwise not exist. The online part allows students to obtain a graduate degree while staying at work. The course kicks off with the first immersive on-campus period, and the second wraps it up. The course’s creators purposely use face-to-face interaction to start the end the program. The kick-off creates connections among the students, and the wrap-up consolidates them. As an institution, IE Business School provides its students with an excellent education, a highly coveted degree, and considerable social capital; thus, its programs need a design that ensures they provide all three.

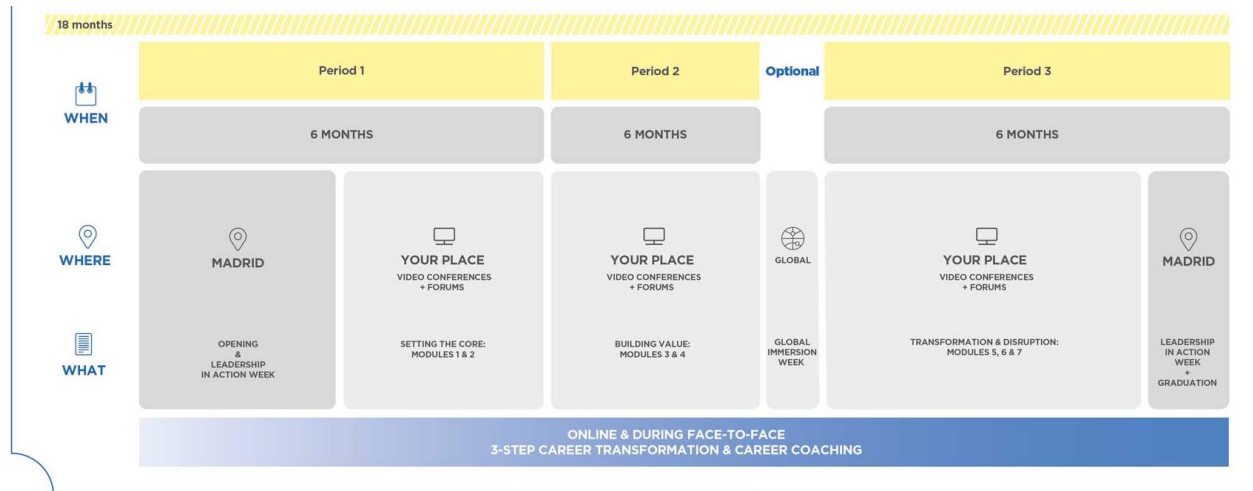


Figure 1. IE Business School Global MBA Program Journey

The online sessions comprise three modules over three terms. They combine real-time virtual conferences with asynchronous forums (see Table 2) where students engage in group discussions in a dynamic educational environment with diverse international professionals.

Table 2. The Blended Methodology with Video Conferences and Asynchronous Forums

Videoconferences	Asynchronous forums
<ul style="list-style-type: none"> • Two 90-minute long real-time (synchronous) videoconferences every Saturday at either a morning or afternoon session. Once students enroll, they may choose one schedule that fits them best. • Live interactive meeting with all participants connected at the same time. • Participants can interact in real time using chat (just writing and/or webcams and microphones) with video and audio. • IE Business School records videoconferences to allow students to revise work they do during class time. 	<ul style="list-style-type: none"> • Online sessions take place through active asynchronous forums that students can access 24 hours a day from Monday to Thursday. • Students enjoy flexible participation as they access the debates without limitation from anywhere in the world. • To ensure fluid debates, students can post only up to five posts per week. • The debates’ format (i.e., in writing) allows students maximum time to reflect and think critically about each topic. • Instructors usually teach two or three subjects in a blended program in the same week.

IE Business School uses Blackboard as its LMS. Online asynchronous classes take place through active asynchronous forums that students can access 24 hours a day from Monday through Thursday. Students enjoy flexible participation as they access the debates without limitations from anywhere in the world. To ensure fluid debates, students can post only up to five posts per week. The debates’ format (i.e., in writing) allows students maximum time to reflect and think critically about each topic According to eLearning best practices, a critical challenge in eLearning involves engaging students in online discussions. In online discussion forums, students often feel pressure to post a given number of posts per session even if they had nothing new or valuable to add to the conversation and, as a result, often post comments just to meet the required number without using higher-order thinking. In some extreme cases, students can post too much and make it difficult for other students to follow the discussion. Asynchronous eLearning also poses some challenges regarding teaching style. Research has repeatedly shown enthusiastic instructors to be more effective than lackluster instructors in traditional classroom settings (Day, 2004). While non-verbal behaviors play an important role in traditional teaching, they have little to no

use in asynchronous environments. However, the extant literature on asynchronous learning shows that this method has a significant impact on instructor workload (Chang, Shen, & Liu, 2014, Bezuidenhout, 2015).

3.4 Recommendations

Table 3 below shows some recommendations to improve online courses based on IE Business School's eLearning case experience.

Table 3. eLearning Recommendations

<p>1: Negotiate student's online participation beforehand</p>	<ul style="list-style-type: none"> As a forum moderator, the instructor must negotiate and communicate online participation rules before the course starts. Agree on the expected contributions from each student to avoid disappointment and problematic collaboration and evaluation. In terms of participation evaluation, instructors need to provide clear guidelines about their expectations for online participation (see third recommendation). They often also need to present such expectations in an engaging manner (e.g., during an initial graded and brief course discussion or in a brief introductory quiz) rather than simply write them in the syllabus.
<p>2: Limit the number of posts to a reasonable amount</p>	<ul style="list-style-type: none"> Instructors need to define the number of posts they expect students to make either beforehand or in negotiation with the class. They need to motivate students to not post all the posts in one single day but to spread their comments along the asynchronous session to allow better discussion to emerge rather than a series of monologues. <ul style="list-style-type: none"> Instructors also need to structure and control the number of threads. There is no established limit for the number of threads in an online session; however, too many threads could be overwhelming and can compromise the quality and depth of each discussion thread.
<p>3: Prioritize quality over quantity</p>	<ul style="list-style-type: none"> Instructors need to prepare open-ended questions, focus on a problem that students need to solve, and reinforce the message that students need to focus on quality over quantity when writing posts. Students can go off-topic when writing a post more easily than when they respond to a live question. Thus, instructors should create rules about post length and explain the importance of relating the content to the discussion and the reading materials.
<p>4: Use online discussions to build a community and maintain an informal tone</p>	<ul style="list-style-type: none"> The instructor's role must shift from a lecturer to a facilitator. The instructor should build a visible presence by participating when needed by providing guidance, encouraging student participation, and redirecting the discussion when it goes off-topic but never by dominating the discussion. New forms of digital communication and new tools such as emoticons help individuals transmit enthusiasm and emotional tone in these new environments. Accordingly, they have enriched what used to be a poor medium. Instructors need to gain proficiency in the new online language to assure not only richer communication but to avoid common misunderstandings. Furthermore, using multimedia material such as videos and podcasts can increase student engagement. Many eLearning environments also use gamification to increase student engagement and improve their learning experience.
<p>5: Institutions need to change and invest in eLearning resources</p>	<ul style="list-style-type: none"> The IE Business School has learned that asynchronous eLearning constitutes a significant investment for any educational institution. Indeed, eLearning requires additional resources such as eLearning platforms and "24/7" availability and support. eLearning can change the way individuals work (e.g., it gives individuals more flexibility but sometimes demands more from them. While an online course has less geographical restrictions on instructors, it also requires more dedication. Therefore, salaries need to be calculated differently to adjust for additional work hours and irregular schedules. Moreover, one cannot simply teach effective online courses with only subject-matter knowledge—such courses require specialized pedagogy and andragogy. Some universities have begun to develop new contracts to handle online courses and offer training programs for their faculty to prepare them to meet eLearning's unique requirements.

3.5 Testing and Introducing Cutting-edge Technologies

Information technology evolves quickly. Students expect top institutions to use the latest technologies, and they often equate old technology to antiquated knowledge. Thus, top-ranking institutions such as IE Business School need to continuously test and leverage the latest (even cutting-edge) technology.

During the past few years, educators have tested new technologies such as augmented reality, virtual reality, and artificial intelligence in eLearning environments. In October, 2016, IE Business School launched its WOW Room, a futuristic learning space that combines the school's teaching excellence with the latest technologies. With this project, unique in Europe, IE Business School further strengthened its commitment to innovation and broke with traditional on-site, blended, and online education models. The WOW Room transforms the learning experience through elements that include artificial intelligence, simulations in real-time, big data analysis, interactive robots, emotion recognition systems, and the presence of experts using holograms.

The WOW Room simulates real situations. Inside, students make decisions under pressure, find themselves amid business crises, define production processes in factory environments, negotiate war situations, and resolve diplomatic conflicts between countries. Professors can either be physically present in the WOW Room or be projected in hologram form and moved around the room by a robot in order to interact with students. In addition to simulations, professors can use artificial intelligence and big data analysis on large screens. They receive student participation statistics and propose votes on debate subjects to promote collaboration. The room records all classes to enable students to subsequently access and review content.

The WOW Room, a physical space, resides on IE University's Madrid campus with 48 screens that comprise a digital tapestry of 45m² in the form of a "U" with up to 200 degrees of vision. The hardware includes two tactile screens and cameras for recording and editing sessions in real time. The WOW Room team works with the latest-generation computers, SyncRTC servers, robots, and holographic projectors. The WOW Room benefits from a SyncRTC video collaboration platform customized explicitly for the project and advanced video-collaboration solutions that require low broadband so students can participate with any kind of device anywhere in the world.

The institution has also begun to test content analysis (text mining) to analyze discussion forum content and help instructors wrap up at the end of lessons. Content analysis helps one identify the main topics and keywords in a text. One can use sentiment analysis to examine a text's tone. Text mining can significantly decrease the time and effort instructors spend on analyzing discussion forum posts analysis, which enables them to spend more time on designing, structuring, and managing them.

4 Universidad Autónoma de Aguascalientes

Juan M. Gómez Reynoso from Universidad Autónoma de Aguascalientes (UAA) presented third. He teaches highly practical classes, and his students develop real-life applications that the institution or local companies find useful. He also involves them in small research projects. He based his presentation on a tool that his students developed and a study on its effectiveness. He showed that:

- Standardized learning management systems do not yet include all the elements that all schools need and they cost too much for some institutions.
- Custom developed learning management systems are not less expensive; however, on some occasions, educational institutions can leverage their faculty and staff to develop tools that can improve the educational process.
- The tool his students developed decreased the number of students who failed the courses.

4.1 The State and the Institution

Aguascalientes, a state in north-central Mexico, resides around 300 miles from Mexico City. It has around 1.3 million people spread out in an area of 2,112 miles squared. It is known for vineyards and hot springs. Universidad Autónoma de Aguascalientes was founded in 1973. It is a large, not-for-profit public institution. It is based in the city of Aguascalientes and has several campuses across the state. They provide mostly face-to-face instruction but, given the state geography, also deliver online. Their online delivery has increased over the years.

4.2 Introduction

By leveraging eLearning, students can take courses from all around the state and at their own pace. The courses include material in electronic format such as videos, PowerPoint presentations, documents, and so on. Students can interact among themselves and with the instructor using a standard LMS that provides email, wikis, forums, blogs, chat, and other communication tools. Students can submit projects or class related work using hot potatoes, SCORM packages, questionnaires, and other means. eLearning has allowed the university to reduce the number of students who fail distance education courses from 40 percent to eight percent because, eLearning, unlike traditional distance education, demands interactive, hands-on-participation from students.

As an educational tool, eLearning leverages information technology (IT) to allow people to learn anywhere and at any time. In addition, eLearning allows learners to easily share all types of material in electronic formats such as videos, presentations, and documents. Aparicio, Bacao, and Oliveira (2014) assert that educators first used eLearning in 1983 and White (1983) defined it as “learning by using electronic sources such as TV, computers, videotape recorders, Teletext, and videotext, among others”. Therefore, eLearning merges teaching and learning with technology. It uses forums, email, messaging, videoconferencing, podcasting, webpages, and many other communication technologies. With eLearning, educators can create engaging environments that allow them to develop activities that enhance knowledge-creation and knowledge-sharing activities. One needs to consider that the lecturer’s role changes in online courses (Bezuidenhout, 2015). Higher education institutions constantly seek innovative ways to apply knowledge (Siadat et. al, 2015) in order to improve teaching and research (Alterio & McDrury, 2003). Therefore, in today’s constantly changing and evolving environment, educators need to support teaching and learning activities using new and innovative information technologies (IT). Past research argues that online courses offer the “opportunity to create a highly social learning environment, characterized by participation and interactivity for both students and instructors” (Brindley et al., 2009).

Rocco and Michael (2018) argue that eLearning students first need to perceive the approach as useful; therefore, educators need to clearly communicate learning paths, objectives, and outcomes. Then, one can enhance users’ disposition to engage in this learning approach by promoting a sense of “community”. Finally, educators need to clearly stipulate the digital skills and competencies that students must have before starting the eLearning experience.

Mexican universities face significant challenges in trying to implement eLearning initiatives. These challenges sometimes make it difficult or impossible to create eLearning programs. Some such challenges include cost, time, technology availability, and resistance to change (Ali & Magalhaes, 2008). In the UAA, we have also faced challenges as Table 4 shows. In the table, we also briefly explain how we have tried to solve it.

Table 4. eLearning Initiatives Challenges (Adapted from Ali & Magalhaes, 2008)

Challenge	Explanation	Probable solution
Cost	Mexican public universities operate on a tight budget. At UAA, money to operate comes from the federal government (54.5%), the state government (25%), and from their own resources (the rest). However, they do not have many available resources for new initiatives, which imposes much pressure in trying to update/enhance eLearning/teaching tools.	Collaborate to develop our own eLearning tools with projects led by one or two professors where students from ITCs related programs develop the systems. Costs were further reduced by waiving tuition to participating students and allowing lecturers to allocate time for their participation.
Time	Time constraints put pressure in our eLearning initiative. UAA has about 1,550 lecturers, and they all need training in using new teaching technologies. However, such training requires much time, and some lecturers have other jobs, which puts more pressure on the training programs.	We have addressed this issue by asking a group of lecturers to learn these teaching technologies. Then, these trained lecturers can replicate the training course to other lecturers in parallel courses. In this way, we can train more lecturers at the same time, which reduces the time required to train them all.

Table 4. eLearning Initiatives Challenges (Adapted from Ali & Magalhaes, 2008)

Technology availability	This issue relates to costs issues. UAA has the available infrastructure; however, it mostly focuses on management processes. UAA has updated some of the infrastructure to accommodate eLearning/distance-learning programs.	Software (rather than hardware) represents the main issue. UAA uses Moodle as its the primary LMS. As such, Moodle constrains courses. We addressed this challenge by creating versatile projects where students and lecturers participate addressing special needs.
Resistance to change	UAA has faced this challenge because it has mandated the use of Moodle. Therefore, we have no choice but to use it. However, "old school" lecturers often complained about why they should change given that their current methods work.	One can address resistance to change by having lecturers participate in the development projects . That way, they would have ownership over the project, feel part of the solution, and could even motivate other lecturers to use the new tools.

4.3 Developing Custom eLearning Tools

In the past years, IT has increasingly affected and changed the way we teach and learn. Today, we reside in an inflection point where institutions (educational or not) must face and manage the teaching processes, particularly in regards to distance education. Nowadays, distance education must include the Internet as a medium (García-Peñalvo & Pardo, 2015), and distance education has started becoming eLearning that includes highly interactive and media.

The traditional educational system uses an instructor-student model where instructors prepare and deliver a lecture in front of the students inside a classroom. Recently, educational institutions' structure has undergone major changes; the initiative to extensively use technology stands out. Past literature reports that educational institutions have increasingly begun to adopt and use technology (Aparicio et al., 2014). On the other hand, educational institutions have not completely accepted new technology since many do not see it as a fundamental part of education's critically needed expansion, strengthening, and diversification. Here, education tools such as eLearning could an easier and more flexible approach (Singh, O'Donoghue, & Worton, 2005). eLearning is about not only adding technology to the educational process but also changing old strategies and creating new learning methods to disseminate content (Aparicio et al., 2014).

Off-the-shelf eLearning solutions lack specific features that a particular group might be familiar with or that their learning style requires. Therefore, off-the-shelf eLearning solutions do not provide optimal outcomes. However, off-the-shelf eLearning tools cost less than custom ones and serve as a good starting point to test options. Thus, UAA used them as a first option. These tools enhanced how lecturers delivered content and kept in contact with their students, while students benefited from having a single point of delivery for all the material in their courses.

Each semester, the university offered training on using the eLearning tool in order to enhance its adoption; however, few lecturers used it. Therefore, the university implemented a policy that mandated that they had to perform some clerical activities through this platform. Unfortunately, neither action increased its use since many instructors did not want to adopt and use it and students did not like its interface or its features. Thus, the tool did not deliver the expected outcomes.

Given the off-the-shelf eLearning tool's failure and the necessity to move forward toward effective eLearning, the university looked for other options. Meanwhile, universities in developing countries continue to struggle for obtain higher budgets, and Universidad Autónoma de Aguascalientes did not differ in that regard. eLearning tools require considerable investment, and designing one's own own tools requires even more. Therefore, while eLearning constitutes a route to better and more education, it does not constitute an easy option for universities in developing countries. Thus, as always, we require creative solutions to solve this issue.

With this idea in mind, a group of students from the computer systems bachelor degree program and its instructor (the panelist) developed a custom eLearning/knowledge management/social network tool that supported the specific needs that instructors and students identified. The development took a full academic year. They developed the tool based on information gathered from 147 students from programs related to information systems and information technology. These students answered a questionnaire that asked them for their desired features and for the content that the platform had to store.

Just as with the off-the-shelf LMS, in this custom-designed LMS, instructors can deliver content such as videos, documents, PowerPoint presentations, and other digital content to students. In addition, other tools allow instructors and students to contact each other. These tools include wikis, forums, blogs, chats, and social networks. Students can deliver projects or other class-related material using hotpot, SCORM packages, and questionnaires. However, this tool does not suit all types of educational activities. Therefore, the panelist argued that educators need to adapt eLearning tools to different types of students and different types of knowledge (Nonaka & Takeuchi, 1995) to provide optimal outcomes.

After developing the tool, it was used in two sections of two courses (interface design and distributed databases) to deliver and to retrieve content, provide feedback, and communicate with a total of 52 students. Further, 95 percent of the participants added at least two different files, 85 percent actively participated in discussions using forums, and all students graded each other's contributions. After finishing the semester, results showed that only one student failed the interface design course (1.9%) and none failed the distributed databases course. Comparing these results with the previous year, we found that, with the same instructor, about 11 percent failed the interface design course and 14 percent failed the distributed databases course. The custom-developed eLearning/KM/SN tool constituted the only significant difference between the groups. Thus, although the sample size was small, we can argue that such a tool makes a difference by allowing students to study not only in the classroom but anywhere at any time. Nonetheless, we need further research to support such a finding.

In addition, we developed an online tool intended to teach workers how to use statistical process control (SPC). When educators teach this particular subject using face-to-face lectures, participants require previous knowledge about statistical topics such as dispersion analysis and central tendency measurements. However, the main issues in teaching this subject include scarce training materials, training costs, trainees forgetting what has been taught, time constraints, and expertise availability. The eLearning tool addressed these issues since it included algorithms for anomalies that use fuzzy logic rules, increased the number of examples that students could solve during the training sessions, interpreted the charts, and identified and illustrated where anomalies (if any) resided. We developed two versions of such tool: one included expert systems capabilities (expert system for training (EST)) and the other did not (information system for training (IST)).

In order to test outcomes, we (presenter and unnamed colleagues) used a three-group study. Each group had five training sessions about SPC using different training tools. The study had only one instructor in order to control the effects of teaching styles and to avoid compensatory coaching for any group. The three groups received the same notes for the course. One group (ESTG) used the EST, while the second group (ISTG) used the IST. The instructor trained the third group (NOSG) using traditional means (i.e., blackboard, markers, and so forth). We organized sessions into three parts. In the first part, we told trainees in the ESTG and ISTG groups to review instructions provided online and on paper, while the NOSG group reviewed a lecture. In the second part, students solved and presented cases, and, in the final part, the instructor asked them to explore their own data sets, which the instructor collected on paper (ISTG and NOSG) or in text files (ESTG). At the end of the day, the researcher examined how the trainees' solved examples to assess their motivation to learn. In all three groups, trainees' results demonstrated a high level of motivation. We compared performance results for the three experimental groups to assess which group learned the best. The study measured the training's effectiveness (dependent variable) via an exam at the end of the training course. We conducted the three training courses on a daily basis for five consecutive days.

We offered each course during the same time frame over three consecutive weeks. Participants could freely enroll in any of the three courses. Enrollment occurred on a first-come, first-served basis. After students had enrolled, we randomly assigned the training type (EST, IST, traditional) to each course. We offered ISTG the first week, ESTG the second week, and NOSG the third week.

We administered an exam at the end of the fifth session for each group. The exam comprised of 15 exercises. Some exercises contained anomalies, and some did not. We graded each exercise in two parts depending on exercise type. Correct anomaly identification comprised two actions: 1) identify an anomaly correctly and 2) identify which points contribute to the anomaly. Based on that, we graded an exercise with anomalies as follows: we awarded a point to participants when they correctly identified a particular anomaly (part one) and another point when they correctly marked the points that contributed to the anomaly identified. We graded an exercise without anomalies as follows: we awarded a point when participants correctly identified the chart as free from anomalies (part one).

At the end of the quasi-experiment, we administered a questionnaire to participants.

All participants completed all five sessions and answered the final exam. By comparing overall grades, the analysis shows that the three groups performed differently. ESTG subjects performed best; in fact, the distribution for the ESTG was not normal with 11 of 25 subjects scoring a perfect 10. The ESTG group mean (9.29) was one full point higher than the ISTG group mean (8.29), and 3.6 points higher than the NOSG group mean (5.69). In addition, on average, ESTG subjects required less time to complete the final exam. Thus, overall, subjects in the ESTG had the best performance and required less time to answer the same exam.

4.4 Conclusions

Educators should use eLearning more extensively in our educational system. eLearning enhances the learning experience and reaches learners that cannot attend a traditional institution due to geographic or time constraints. Further, people can learn at their own pace. Lecturers can make content available to students to learn anywhere at anytime. For some students, eLearning provides a better educational or training experience. At UAA, it has also reduced the number of students who fail courses from about 40 percent to around eight percent (when compared to distance education courses) because it requires hands-on student participation.

In addition, this model of leveraging student learning activities to develop practical and useful tools generates better-prepared graduates who have more job opportunities and a higher quality of life while reducing the cost of education. In our universities, we cannot have empty exercises that we execute over and over again; rather, we need productive learning activities that generate value.

5 Trident University International

Indira Guzman, Director of Doctoral Programs of the College of Business Administration and Professor of Management Information Systems at Trident University International, presented fourth. She discussed her specialty: online doctoral programs. Specifically, she discussed their characteristics and what makes them successful. Furthermore, she discussed the challenges in administering, teaching, and studying at a fully online university in the United States. In her presentation, she showed that:

- We can have successful online doctoral programs
- Online doctoral programs will continue to grow.
- Information systems constitute a key tool for delivering and managing online education.
- Instructors and administrators of online programs should increase how often they use visualization tools, such as interactive dashboards.
- These tools allow educators to better monitor and gain rapid insights into students. They also help to improve retention and graduation rates.

5.1 The Institution

Trident University International, a regionally accredited institution, resides in Los Angeles, California. However, it has students all around the world. Trident conducts classes fully online. It was founded as a private for-profit institution. Trident University offers undergraduate, graduate, and doctoral programs. Doctoral students have full responsibility for most or all of their tuition and have access to very few scholarships. Thus, the university's success depends on affordability.

5.2 Introduction

Online universities go through the same accreditation process as brick-and-mortar universities. Accrediting agencies apply the same standards to all institutions regardless of their modality. However, in an online university, information systems fully mediate students' experiences. Moreover, all the individuals who participate in the educational process must consistently engage in it and understand the nature of online communication. Just like everywhere else, the departments and individuals who interact directly with students play a critical role in the latter's success. This online interaction between departments, instructors, and students directly affect students' experience and performance.

Research universities have traditionally offered four-year doctoral degrees with the expectation that students will pursue the degree on a full-time basis, live in or close to the campus, and will work for the university. Online doctoral programs, on the other hand, allow students to pursue this advanced degree with more flexibility by doing it on a part-time basis and/or with reduced residency requirements. While this structure applies to all academic programs, we discuss only doctoral programs in this section.

Table 5. Individuals/ Departments Participating in the Educational Process

	Primary activities			Support activities
	Students	Instructors	Academic administrators	Other university departments
Examples of roles and responsibilities	Review course materials, engage in discussion forums, conduct independent research, synthesize findings, engage in critical analysis, and prepare and submit written assignments by their published due date.	Deliver content, provide feedback, promote continuous engagement, grade.	<ul style="list-style-type: none"> • Quality control • Teaching assignments • Assessment • Library • Student advisement 	<ul style="list-style-type: none"> • Registrar • Financial aid • IT support

Given the advantages in pursuing a doctoral degree online, the demand for these programs has increased in the last decade. According to the 2016 report from the Survey of Earned Doctorates (NSF, 2016), an average of 46,882 people earned a doctoral degree from American universities every year since 2000, and the number keeps growing. In the last few years, we have seen a rapid increase in the number of doctoral programs offered online and a growing interest among doctoral candidates to complete doctoral programs online and on a part-time basis (Paliktzoglou & Suhonen, 2011). Online doctoral programs will continue to grow and mainly cater to those adult audiences.

5.3 Motivations for Pursuing Online Doctoral Programs

Adult learners between 40 and 60 years old who have an average of 20 years of work experience and have retired or near it make up most students who seek online doctoral degrees in the US. We need to understand why applicants apply to doctoral programs. For example, students enroll because they:

- Have completed already graduate degrees and want a terminal degree.
- Want to conduct and publish research in an area of their practical expertise.
- Want a degree that will increase their credibility as consultants or advisors and legitimize their extensive current expertise.
- Want a promotion at their current place of work where they need research skills.
- Want a degree that allows them to give back to society after retirement by teaching or consulting.
- Want to make their family proud by exemplifying perseverance and hard work.

Making sure that students select the program that better fits their motivation and educational goals will guarantee their success in the program. For instance, a traditional doctoral program in business that emphasizes research may be a better fit for individuals who want to do more research versus a professional doctorate in business administration (DBA) program that emphasizes applied research, which may suit individuals who plan to make contributions to practice. Nonetheless, both options are available online.

5.4 Characteristics of Online Doctoral Programs

Like traditional doctoral programs, online doctoral programs have two phases: an initial phase with regular coursework and a second phase dedicated to developing a dissertation. Just like all other programs, doctoral programs have highly structured coursework (which does not imply that they have a pre-determined course list). However, they have a much more flexible and unstructured dissertation phase. It is the case that many doctoral students never finish their dissertation because they get distracted and

change interests, the doctoral mentor or advisor needs to assure that the student stays on track and finishes the dissertation. Ensuring students finish their dissertation becomes more difficult with online programs because mentors and students interact less frequently because the part-time student will have many other responsibilities. However, an excellent online doctoral program can leverage IT to surmount this hurdle.

5.4.1 Doctoral Coursework

Trident University offers pre-dissertation courses through the LMS, and these courses require significant planning and preparation. Unlike face-to-face courses, one needs to completely develop an online course before one delivers it on the first day. Subject-matter experts develop course content in collaboration with instructional designers and editors. Individuals who develop the courses might never deliver them. The instructors (those who deliver the courses) must have the required expertise and need to familiarize themselves with the course according to its design. Table 6 compares the coursework between online and face-to-face programs.

Table 6. Doctoral Coursework: Online versus Face to Face

Online programs	Traditional face-to-face programs
<ul style="list-style-type: none"> • Asynchronous research webinars • Students communicate with instructors and classmates mostly in writing • The course developer and the instructor may not be the same person. • Students submit all assignments online. • Students have responsibility for most of the tuition • Students who do not work for the university are research or teaching assistants. • Students may never meet their peers and professors in person • Courses require an LMS for one to offer them • Students have extensive work experience • Pursuing the doctoral degree may be third in the priority list • Doctoral faculty may be part-time employees • The LMS records academic activities such as grading or participation in discussions in the LMS, which means administrators can monitor them 	<ul style="list-style-type: none"> • Synchronous research seminars • Students communicate their ideas in writing and verbally • Usually, the instructor provides both the content and teaching • Students may submit assignments on paper • Most students receive university funding that will cover tuition • Students who work for the university are research or teaching assistants • Students meet their peers and professor in person • One can deliver courses without an LMS • Students may not have work experience • Pursuing the doctoral degree may be first or second in the priority list • All doctoral faculty are full-time employees • An LMS may not record academic activities such as grading or participation in discussions, which means administrators cannot monitor them

At Trident University, students have 24/7 access to course content that includes readings, background information, course materials (e.g., PowerPoint and video presentations), modular assignments, and an asynchronous discussion. The university also offers live webinars for core courses, which are recorded for the students who cannot attend synchronously. Students review course materials, engage in discussion forums, conduct independent research, synthesize the findings, engage in critical analysis, and submit written assignments by the expected due dates.. The LMS records all these interactions, and instructors grade them in the LMS as well. When the course begins, the instructor needs to communicate the course expectations and structure to students, provide useful feedback via standard rubrics that assess learning outcomes, and provide written or verbal feedback on all assignments and communications that students submit.

Traditional doctoral programs usually benefit from having cohorts, but this approach does not necessarily work, nor does it benefit students in online programs because they reside in various locations and work at different paces. Adult learners in online doctoral programs may need to take breaks because they have family and work priorities. Online doctoral students have a strong motivation and expertise, but pursuing the doctoral degree usually comes in third or fourth place in their list of priorities. Instructors in doctoral programs must know their students and understand their particular circumstances. They need to find a balance between being flexible with students and challenging them to produce rigorous and quality work. Usually, online doctoral students appreciate the challenge. However, one needs to remember that, given their maturity, older doctoral students (in comparison with the younger undergraduate student) better understand the importance of learning in order to earn the doctoral degree. Moreover, most doctoral

students made the voluntary decision to study for a doctoral degree and appreciate and enjoy the learning experience.

5.4.2 Dissertation Work

Universities generally expect doctoral students to contribute to knowledge through original research using scientific methods that culminate in a doctoral dissertation or thesis with that contribution. To make a relevant contribution, students must pursue a dissertation topic related to their area of expertise.

During the dissertation phase, students engage in independent research under their dissertation chair's (advisor's) supervision. Depending on the institution, the doctoral student in the second phase might only pay a *continuing registration* fee or enroll in a dissertation course that might or might not have a grade. The student might need to just enroll in that course every semester until the student defends the dissertation, and the course might not have any specific deliverables. However, most institutions have a limit on the number of semesters that a student can stay in that phase. This work has the same independent nature in both face-to-face and online doctoral programs. In both cases, the quality of the individual's research determines its defense and approval readiness. However, advisors might need to agree with students on some course deliverables every semester in online and part-time doctoral programs to assure that students stay on track. Table 7 compares dissertation work between online and face-to-face programs.

Table 7. Dissertation Work: Online versus Traditional Face to Face

Online programs	Traditional face-to-face programs
<ul style="list-style-type: none"> • Students meet with their dissertation chair online (i.e., via Skype, Zoom, Blackboard Collaborate). • Students defend their proposal/dissertation online. • A dissertation committee reviews and approves the dissertation. 	<ul style="list-style-type: none"> • Students meet with their dissertation chair in person. • Students defend their proposal/dissertation in person. • A dissertation committee reviews and approves the dissertation.

One challenge in this stage of any doctoral program concerns tracking the dissertation's progress and documenting the interaction between students and their chair because this interaction can occur in different formats (phone, video conferences, email, and even actual face-to-face meetings).

Again, at Trident University, our online students benefit from our intensely using IS to manage the doctoral program. A systematic approach to the dissertation phase becomes even more effective due to students' maturity (Davis, Parker & Straub, 2012). One needs to embed this systematic approach to the dissertation work needs in the LMS. Our LMS has features that manage and track whether students complete every doctoral dissertation milestone (i.e., qualifying exam, dissertation prospectus completion, proposal defense, IRB approval, dissertation defense, etc.). The LMS also provides an electronic portfolio that highlights students' teaching and research philosophies and social networks and wikis to engage students and share knowledge. A structured approach to the dissertation work can improve doctoral students' performance and improve their confidence in conducting and completing research projects.

Students need to complete a doctoral dissertation in a reasonable amount of time that follows their program's expectations. Students identify and update a dissertation completion plan in the LMS, which serves as a foundation for their overall graduation strategy. The tracking system captures data about their progress with their dissertation and each milestone and makes this data visible to the student, the dissertation chair, and the administrative staff in the program. All stakeholders know the latest status of the dissertation, use information consistently, and can collaborate to help the student complete each milestone in a timely manner. Visualization tools allow instructors to gain rapid insight into students' progress via using interactive dashboards that administrators monitor to assess dissertation progress and provide support when needed. All these system tools and initiatives focus on improving retention and graduation rates.

5.5 Summary

Doctoral programs will continue to grow in the US and worldwide. Online doctoral programs will also continue to grow in number. Information systems play an essential role in helping educators deliver coursework and students manage their dissertation work. The information systems that educators use to deliver online doctoral education must align with dissertation research's goals and must directly involve the doctoral student, the dissertation chair, and administrators. Online program instructors and

administrators must increasingly use visualization tools (such as interactive dashboards) in order to better monitor and gain rapid insights into their students. Experience at Trident University has shown that using these tools can also improve retention and graduation rates.

6 Governors State University & La Salle Barcelona (URL)

Carlos Ferran presented last. He also served as the moderator. He is a professor at Governors State University and, the year before this presentation during his year-long sabbatical in which he studied eLearning in Europe, he was a visiting professor at La Salle Barcelona (Ramon Llull University). His presentation, based on his experiences in both institutions, focused on complementing the prior panelists and discussed how:

- Students and faculty have different and sometimes opposing assumptions.
- Instructors must disclose all expectations and rules the first day of class or earlier.
- Online courses have two phases: design and delivery.
- Designers must finish the design phase before day one of the delivery phase.
- Developing online courses takes more time and resources than developing face-to-face courses.
- Online course design requires a subject-matter expert, an educational designer, and an IT professional.
- eLearning requires good pedagogy/andragogy.
- MOOCs represent a new type of textbook and will not replace instructors just as the original textbook has not replaced instructors.
- MOOCs can improve traditional courses by flipping the classroom and having a local subject-matter expert that leads and facilitates class discussions and grades assignments.
- Online courses allow for several optional activities for each learning outcome. If one designs each activity for a different type of learner (visual, auditory, or kinesthetic), then it will be easier and faster for each learner. The learner must do at least one for each learning outcome.
- Online courses must include individual and team activities.
- Making online courses feasible for many (but not all) individuals with disabilities represents a viable but expensive proposition. However, today, doing so constitutes a requirement, not an option.

6.1 The Institutions

Governors State University (GSU), the smallest of the Illinois state universities, caters mostly to non-traditional students, although it started a traditional program three years ago. It offers high-quality education at the lowest price possible. GSU was founded in 1969 as an experimental and innovative institution. During its beginnings, it focused on innovation (particularly in distance education). As time passed on, it became a more traditional institution, and it progressed to offer online education. However, GSU has a minimal budget though still focuses on providing high-quality education. Not long ago, the university's college of business created its first fully online supply-chain management MBA. Before starting the program, the college did its homework and examined the requirements for effective eLearning.

La Salle Barcelona, a small, coeducational, private Lasallian higher education institution affiliated with the De La Salle Brothers (a Roman Catholic religious teaching order), resides in Barcelona, Spain. It is a university inside a university; that is, it forms part of Ramon Llull University). Its mission includes providing high-quality education, and its faculty, staff, and administrators focus on doing so. La Salle Barcelona leverages eLearning and works with another fully online institution that resides in Andorra. Students at La Salle come from many different countries (from Europe and abroad), most speak more than three distinct languages, and they are technology savvy.

6.2 Introduction

The experiences in both of these institutions included many threads common to the ones that the prior panelists presented. Thus, Ferran primarily discussed issues that they did not discuss or that did not emerge as important in their institutions: students', faculty's, and administrators' expectations for

eLearning; MOOCs; the different requirements for course preparation and faculty workload; flexible solutions that better fit the different learner types; and how to better serve students with disabilities.

6.3 Elearning Expectations

Online education does not require colocation; however, many students that live on campus still want to take one or two online courses since they can complete them according to their own schedule (Young, 2017). However, online education is not always asynchronous. Online courses can have the same scheduling restrictions that face-to-face courses have. In fact, many instructors want and expect to teach online that way. Thus, one can offer online courses synchronously or asynchronously, but one needs to advertise the course correctly. When students see a course offered online, they should also see if it will be synchronous or asynchronous. Students should not find out this information on the first day of class. Note that most students assume that online courses will be asynchronous, while many instructors assume that it will be synchronous

Students and instructor tend to have different expectations for online courses. Findings from interviews that Ferran has conducted with faculty and students about their views on eLearning have shown that:

- Students assume that the instructor will be available 24/7, while the instructor might expect to be available only twice a week for around three hours and another 10 to 20 minutes for three more days. Faculty have widely different expectations about their weekend availability.
- Students tend to expect that an online course will be easier and often less rigorous than the face-to-face counterpart, while instructors tend to have the same expectations for all courses.
- Students expect to invest less time in online courses than in face-to-face courses; however, many find out later that they actually require more time to complete online courses.

Therefore, instructors need to disclose their expectations by the first day of class or even earlier. Misunderstandings on the above issues tend to decrease students' satisfaction with a course (and the instructor) and increase the number of students that drop out of the course.

Traditionally, universities hire subject-matter experts with terminal degrees and throw them into the classroom without any prior pedagogical training. They expect them to land on their feet and deliver engaging and interactive lectures that enlighten students. Traditionally, instructors would write a brief outline about what they expect to teach and what the students have to deliver—in other words, the syllabus (which can have much or little detail depending on the instructor and the institution's regulations). This process usually works because professors are brilliant and/or have sage in the stage. However, this strategy does not work for eLearning. While a face-to-face course might only have a delivery element, an online course has two clear parts: design and delivery. Designing on the go does not work.

Designing online courses consumes a lot of time and resources. Ferran recounted how he had designed several online courses (unfortunately by himself) and invested over 600 hours of work in each one, and he considered none as good as they could be. Furthermore, each course section also required a "setup", which, depending on the course, could take a couple of minutes to 10 hours of work. In some institutions, a special department creates each section, but, in others, the instructor does it. Some courses adopt a design that allows one to easily copy them (master course shells), while others do not. Furthermore, when the courses leverage various eLearning platforms rather than only one LMS, creating a new section becomes even harder.

Designing online courses also requires pedagogy and andragogy (Adebisi & Oyeleke, 2018). While many universities have a college of education, other colleges often disregard their findings and their importance. K-12 teachers must study how to educate, but higher education professors do not. One cannot develop a good online course with subject-matter expertise alone. Therefore, either the university professor needs to study education or acquire an education expert's or educational designer's assistance. Furthermore, eLearning requires bleeding-edge technologies, which neither the professor nor the educational designer will likely have mastered or have proficiency in. Therefore, eLearning requires a third team member: someone with IT knowledge. In summary, designing an excellent online course requires three types of expertise: subject matter, pedagogy/andragogy, and IT/IS.

An excellent online course engages students and provides relatively quick feedback to learners (Vai & Sosulski, 2015). Learners can engage with the computer (student-to-computer interactions), with other learners (student-to-student interactions), and with the instructor (instructor-to-student interactions). An excellent online course provides all three interactions, although, depending on the design and the subject

matter, a course might have more of one than another. However, these interactions must be relatively quick and, in the case of instructor-to-student interactions, will depend on the delivery and not the design.

Although many students expect to interact with cutting-edge technology, more technology or more expensive technology does not always equate to better results. The technology must align with the subject matter and students (Sun, 2016). Many institutions also expect that all students already know how to use the technology. However, while millennials are familiar with technology, not all students are millennials, and, while they may be familiar with technology, it might differ from the technology that the course uses. Instructors must provide clear instructions (and maybe boot camps) on how to use the technology that the course uses. They need to clearly specify expectations about what the students must know and have at the start of the course (or earlier). Moreover, one needs to remember that non-traditional students could be less familiar and less comfortable with the technology.

To implement an online program, GSU decided to adequately train its faculty in pedagogy, andragogy, and the etools that the program would require. Such training represented no easy task. Professors do not like to be told what to do and much less that they do not know something. Furthermore, training is not cheap, and professors require an incentive to take the course. Therefore, GSU decided to pay for course design. Professors were (and generally are) paid for delivering courses, not for designing them.

6.4 Massive Open Online Courses (MOOCs)

Massive open online courses (MOOCs) represent a special type of eLearning. MOOCs differ from other forms of eLearning because anyone can freely access them, they have thousands of students with only one or two instructors, and they do not provide certification or social capital. In 2011, Christensen and Eyring (2011) predicted that MOOCs would lead to disruptive innovations in higher education. Today, MOOCs come in many variants, and educators use them in many different forms. However, they do not constitute a silver bullet.

MOOCs basically represent “textbook 3.0” (Lee, Cho, & Kim, 2015), and, unfortunately, the third version has not revolutionized education as much as the first one. Gutenberg’s invention constituted a radical change, and it has revolutionized education. Audio recordings, video recordings, tapes, CDs, DVDs, the Internet, cellular phones, and tablets have all incrementally improved that original textbook. MOOCs or some version of them such as small private online courses (SPOC) might replace the traditional textbook, but they will not make up the whole eLearning experience. In fact, while MOOCs have affected higher education, they represent just one more tool for education (Porter, 2015; van Valkenburg, 2018).

At the start (just like with any other technology), many feared MOOCs. Many heated discussions have occurred regarding MOOCs in faculty senates across the country (Kolowich, 2013), and some have even voted to ban them from their campuses. Many professors thought that, as legislators said, MOOCs could replace them. However, they have not replaced professors and they never will. Unfortunately, 10 percent of students who take MOOCs never learn the subject matter. Graciously, 10 percent will learn the material without the help or intervention of the instructor, and the other 80 percent will continue to need some form of a master, mentor, or instructor to help them understand the material.

Many institutions continue to develop MOOCs. Today, the most renowned institutions in the world develop them for marketing purposes. In other words, institutions use them as showcases and to remind people about their stature. However, those same institutions barely use them for teaching purposes. On the other hand, we have seen a trend in which smaller institutions that lack the name and the big pockets to leverage those MOOCs to make their programs better (Sahami, Martin, Guzdial, & Parlante, 2013; North, Richardson, & North, 2014; Richardson & North, 2016; Pérez-Sanagustín, Hilliger, & Alario-Hoyos, Kloos, & Rayyan, 2017). In other words, widely known institutions develop and finance MOOCs, while smaller ones use them as a tool in their classes. However, they do not use them in a manner that leaves students to themselves; rather, a local facilitator supports them (the course instructor in the smaller university) who guides, supports, and evaluates the student.

La Salle Barcelona exemplifies an institution that leverages MOOCs to improve its courses. There, instructors search for the most applicable MOOC and assign it to the class. They provide no lectures, but they do have class discussions about what students find and do in the MOOC. Thus, while in a MOOC, students grade students and often the blind leads the blind; however, at La Salle Barcelona, an instructor facilitates the course, grades the work, and leads the students.

Using the MOOC in a course for which its creators did not design it poses a difficult task. The designer needs to be creative. Using MOOCs actually implies more rather than less work for instructors. Instructors who leverage MOOCs in a course need to prepare adequately and be highly knowledgeable in the subject matter. They do not deliver pre-packaged lectures but answer questions from better-prepared students who have already viewed the lectures and the discussions in the MOOC. In reality, this process resembles what some call “flipping the classroom.”

In interviews with administrators regarding this methodology, Ferran found a general inclination towards believing that, in these cases, the instructor would not need to be such an expert in the subject matter but an excellent facilitator. However, the interviews with faculty who had used this methodology indicated that they felt far more challenged with respect to their knowledge about the subject matter in these MOOC flipped classes than in the standard ones because students came to the classroom far better prepared, asked much more sophisticated questions, and had more time to participate in these interactions.

Flipping the classroom transforms passive lectures into dynamic and interactive conversations with students. Some researchers have thought flipping the classroom to increase students’ academic achievements (Chen et al., 2018). However, flipping the classroom does not represent a new phenomenon. Ferran recounted how, at his dinner table (with parents who had been professors for several decades), he often heard tales about how every seven years the student would “revolt” at their university and demand a change from their professors about providing lectures (or reading the textbook aloud) during class time because students could not answer questions if they had not first heard the lectures. Seven years later, students demanded that professors not give lectures that textbooks already said because the students had already read it. Faculty should engage students in discussing the material. Unfortunately, seven years later, students would revolt again to reinstate back the lectures since they lacked preparation for the conversation. This seven-year flip cycle has occurred for over 50 years.

6.5 Preparation and Workload

Faculty have a much higher workload in an online (or hybrid) course than in a face-to-face one (Tomei, 2006; Mupinga & Maughan, 2008; Taft, Perkowski, & Martin, 2011; Wright, 2014; Owens, 2015), and improvisation will not work. Rather, eLearning requires much more pedagogy/andragogy than face to face. Improvisation might work for some in the stage (of a classroom or theater), but it will not work in the online classroom. One cannot easily move a successful face-to-face course to the online environment. That is, one cannot simply record and pass on an engaging, face-to-face, 45-minute master lecture to online learners. Videos do not yet capture the richness that face-to-face interactions provide, and face-to-face audiences, while potentially anonymous, cannot as readily and politely stand up and leave the auditorium.

The material used for eLearning requires much more thought than for face-to-face courses. A PowerPoint presentation differs from an experienced and articulate presenter that leverages it in the background. PowerPoint represents only a small part of the whole experience; thus, the online class needs much more than simple copies of those files. Moreover, online students do not find old textbooks (or basic scanned PDF files) acceptable. eLearning requires rich media that students can search and bookmark. Today’s online student requires more than one single source of authoritative knowledge. Just like a Google search returns many possible pages that might contain the information one has searched for, an online course should provide the student with several sources for knowledge. Moreover, these sources should not all be of the same type or format but should also cater to the different learners (see Section 6.6).

Online course designers need to look for many more sources of information and activities for students. They need to look for engaging activities that students will want to engage in. Further, they need to make sure that the course contains material and activities for all the course’s expected learning outcomes.

Experience has shown that students need to commit more to online courses. A synchronous face-to-face course forces the student to go to a specific classroom at a specific date and time every week for several weeks. If students go to that place at a different time or to a different place, they know that they have missed the opportunity (the class). They can easily mark a calendar for the class times and make sure to attend. However, marking one’s calendar for “some time” this week in “any place” that fits involves much more difficulty. Thus, students need to have more motivation and discipline to follow an online course. The “push” signal that exists in the scheduled face-to-face classroom becomes a “pull” signal that needs to come from the student on a regular basis. eLearning is not for everyone. Moreover, most students will need to learn how to do eLearning, so most higher education institutions need to develop boot camps for eLearning in a similar way that they have boot camps for first-year students.

In Ferran's experience, most online-only institutions separate design from delivery. They tend to have teams that include a subject-matter expert, an educational designer, and an IT person developing the courses. However, most traditional brick-and-mortar institutions still keep design and delivery together. Thus, most instructors are not paid for the time and effort invested in designing the online course shells.

6.6 Different Types of Learners

While some recent studies argue that different learner types do not exist (Willingham, Hughes, & Dobolyi, 2015; Truong, 2016; Kirschner, 2017), many still propose theories that describe different learner types. However, many different theories classify learners in many different dimensions (Cassidy, 2004). The visual, auditory, and kinesthetic (VAK) learning style model represents one of the most popular and used one. The model argues that individuals have a preference for one learning style and tend to be more effective or more efficient in one mode than in the other, though the same individual can learn through several styles (Dunn & Dunn, 1978). Therefore, a course that includes the preferred mode will in itself be more effective and efficient for that specific individual.

The pedagogy literature indicates that instructors should include activities of all types so that everyone has an opportunity to learn in their preferred mode. The current trend is to have some learning objectives covered with visual activities, other objectives with auditory activities, and the rest with kinesthetic ones. Unfortunately, these courses are neither effective nor efficient for anybody and provide an average experience at best. These courses at the end discriminate against everyone (equal opportunity discriminator) rather than against a few or no one. However, eLearning can differ entirely.

An ideal online course should contain three activities (one visual, one auditory, and one kinesthetic) for each learning outcome. One should not require the learner to do all three activities but at least one. The learner should decide which one to use to accomplish the given learning outcome. Of course, implementing such options equates to developing three courses rather than one, but it undoubtedly represents the most effective solution.

To complicate the issue, learners might also have a preference to learn in a social or in a solitary environment. However, that preference might in some cases counter what really works for them. In other words, some introverts might need to interact with others in order to understand and learn specific material, while some extroverts might need time to think and digest the material rather than argue about it with others. Thus, courses should have activities that students do in teams but also activities that they do individually. Thus, unlike learning styles where learners themselves should choose which one to do, courses require both team and individual activities.

6.7 Serving Students with Disabilities

Preferred learning styles have nothing to do with learners with a disability. Some students cannot see or hear the material. Further, other students have disabilities that do not allow them to concentrate for extended periods of time or that mean they need more time to understand communication. Nonetheless, these learners have the same rights as everyone else to gain knowledge from any course. The American with Disability Act (in the US) and the European Accessibility Act (in Europe) enforce such rights. These legislations ensure that people with disabilities have equal access to education (and other services).

Depending on disability that an individual has, an online course might constitute a more appropriate solution to learning (though not always). Unfortunately, we have not found viable solutions for all disabilities, but, for those that we have, the law stipulates that we make it available. For example, "easy" solutions for deaf people or people who cannot hear well exist: interpreters for face-to-face classes and transcripts for audio material in an online class. For people with color blindness, one can differentiate material in ways beyond color. However, for completely blind individuals, the solution becomes much more complicated.

At this stage of eLearning, educators should provide transcripts, alternative tags, and differentiation in charts and pictures that do not rely only on color. However, one cannot easily implement these options. Providing transcripts for lectures might itself amount to a taxing task. The instructor can type the material. The instructor or institution could pay someone to transcribe the material. Alternatively, systems that automatically generate the transcript could process the material. Ferran discussed how he used Dragon Dictate, Watson + Amara, and the PopUp archives—none of which proved that successful. Finally, he presented an existing facility inside YouTube that automatically generates closed captions for short videos. That option proved the most effective of all of them, but it worked only for YouTube videos.

In the US, courts have enforced disability laws and required universities to provide such transcripts for all their material. At first sight, that would seem positive for society; however, the opposite sometimes arises. In one instance, a judge required the University of California Berkeley to provide transcripts for more than 10,000 educational videos that they offered online for free. Given the cost to significantly generate those transcripts, the university opted to comply with the law by eliminating all the videos from public access. While a “fair” solution (since the university no longer discriminated against anyone), it meant no one could benefit from the videos.

As instructors and educational designers, we have to carefully comply with all the regulations that pertain to our activity. As legislators, we need to strive to write non-discriminating laws that help as many citizens as possible. We need understand technology’s limits. Ethically, we need to develop courses and laws that will benefit everyone equally as efficiently and effectively as possible. However, if we are not able to develop a course that can help everyone, should we then restrain from doing one that will only help some? This becomes an ethical dilemma and its solution differs based on the ethical framework one uses.

Ideally, individuals can access education anywhere and at any time in a style they find most comfortable. However, we have not reached that technical reality as yet, and we need to make sure that we do not compromise rigor and effectiveness for expediency, efficiency, or illusionary justice. Nonetheless, eLearning has proven effective and efficient and need not be expensive.

7 Summary

One can use eLearning as an effective way to transfer knowledge. The Internet constitutes a viable format for delivering higher education, and its use continues to increase across the world (Seaman et al., 2018). The demand for online education has also increased (Nguyen, 2015); nonetheless, it has to be effective to deliver expected outcomes. Thus, educators and researchers need to understand its effectiveness. This panel discussed eLearning best practices based on their experience. As Reynoso found, if one uses the right tools, one produces better courses and can reduce how many students fail. Moreover, students attending online courses can perform on standardized tests as well as students who take the face-to-face course (like they did in Tecnológico de Monterrey). Doctoral programs do not particularly differ. According to Guzman, online doctoral programs can also be successful, but information technology plays a more critical role for delivering and managing them.

Past research (Nguyen, 2015) argues that online education could be an effective tool in reducing education’s cost because institutions can spread the cost over more students compared to traditional education settings. However, one needs to remember that online courses generally have higher preparation costs.

Learners attend universities to acquire new knowledge, receive a document that certifies that they have such knowledge, and to live a specific social experience that enhances their personal network and provides them with valuable social capital. At this time, online education does not provide all three of these benefits. However, some eLearning models can provide two. Today, eLearning offerings have swamped the market (Johnson, 2006). Some are legitimate, but some are scams (Brown, 2006). Unfortunately, students cannot easily differentiate between them until they have already invested substantially in one option.

Further, eLearning cannot replace the instructor entirely because, as some studies have shown (e.g., Serdyukova & Serdyukova, 2013), most students prefer to take instructor-led classes. The debate about eLearning versus traditional learning environments should not involve only radical technocentric or technophobic positions; rather, it should include an understanding of the context in which each one can improve education (Bernard, Borokhovski, Schmid, Tamim, & Abrami, 2014; Saghafi, Franz, & Crowther, 2014). Education should be available to all individuals equally, which includes individuals with disabilities. The US and Europe have laws to assure students with disabilities can access education (Edmonds, 2004). Making online courses feasible for many (but not all) individuals with disabilities represents a viable but expensive proposition. However, doing so constitutes a requirement, not an option.

As Estevez mentioned in his presentation and Webb, Gill, and Poe (2005) have discussed, one can feasibly teach online in the case modality either synchronously (using videoconferencing technologies) or asynchronously (making heavy use of discussion boards). Table 3 provides recommendations for teaching cases asynchronously online.

Given all the examples presenters presented in this panel, we can conclude that no single best eLearning model exists. It can be synchronous or asynchronous. Further, no universally best ratio for student-to-student, student-to-instructor, or student-to-computer interaction exists. Further, to design effective and efficient online courses, designers must consider factors such as the students who will take them, resources' availability, and the supporting team's expertise.

Online courses must have the same rigor as face-to-face courses (Ausburn, 2004; Swan, Day, Bogle, & Matthews, 2014; Nortvig, Petersen, & Balle, 2018). However, as all the panelists experienced, developing rigorous online courses takes more time and resources than developing face-to-face courses. Analogously, experienced online students recognized that, while they appreciated eLearning's flexibility, they had to invest more time to complete the tasks.

Developing an online course requires more investment than developing face-to-face courses; however, as the panelists experienced, it does not have to be prohibitively expensive. Online education requires both institutions and instructors to make a considerable investment. Institutions require the relevant infrastructure, tools, qualified personnel, and norms to develop and deliver courses (Lister, 2014). Sophisticated videoconferencing rooms with dozens of screens, professional audiovisual studios, and specialized audiovisual personnel can provide outstanding and luxurious eLearning, but, as the examples from the panel illustrate, educators do not need such things to provide excellent online education.

Teaching face to face is much more forgiving than teaching online. Developing online courses requires pedagogy (Sderyukov, 2015). Technology does not replace good teaching nor planning (Nilson, 2016). eLearning can provide customized experiences that include several optional activities for each learning outcome. If each activity focuses on a different type of learner (visual, auditory, or kinesthetic), then it will be faster and more efficient for each learner. However, the learner must do at least one activity for each learning outcome. Nonetheless, just like face-to-face courses, online courses must include individual and team activities (Bernard et al., 2014).

Courses have two phases: design and delivery. In face-to-face courses, one can merge the, and they do not need comprehensive design as much as online courses do. In online courses, one must finish the design phase before one begins the delivery phase. Further, subject-matter experts (typically the instructor) design face-to-face courses. On the other hand, designing technologically feasible, visually attractive, and pedagogically coherent online courses also requires supporting specialists (Chen, 2007): a subject-matter expert, an educational designer, and an IT professional. Online course delivery focuses on the instructor promoting, supporting, and managing student-to-faculty interactions. Online courses require one to continuously update both the subject matter and the technologies used. Institutions, instructional designers, and instructors have to continuously scan the market for new technologies ripe for incorporation into new or existing online courses.

The students who take and faculty who provide online courses have different and sometimes opposing assumptions. Some relate to the synchronicity, rigor, workload, pace, and the importance of deadlines. Past research (Saadatmand & Kumpulainen, 2014) has identified that online courses often overwhelm students. Therefore, instructors must inform them about all rules and expectations on the first day of class or even earlier.

Information systems constitute a key tool for delivering and managing online education. Online program instructors and administrators should increasingly use visualization tools, such as interactive dashboards. These tools allow them to better monitor and gain rapid insights into students and faculty performance. Prompt and timely feedback represents a critical success factor in eLearning (Chen, 2007; Gedik, Kiraz, & Ozden, 2013). Such feedback also improves retention and graduation rates.

Standardized LMS do not yet include all elements that all schools need, and their high cost prohibits some institutions from adopting them. Some open source LMS (such as Moodle) exist, but institutions still need to train and implement them at considerable cost, and they often do not include as many options as commercial ones. While custom developed systems cost just as much if not more than commercial ones, educational institutions (as in the case of UAA) can leverage their faculty and students to develop tools that can improve the educational process.

Massively open online courses (MOOCs) (and their variants) represent a new type of textbook and will not replace instructors just as the original textbook has not. Institutions can successfully use MOOCs to improve traditional face-to-face course by flipping the classroom and having a local subject-matter expert (instructor) lead and facilitate the class discussions and grade students' deliverables.

In the past two decades, online education (eLearning, technology-mediated knowledge transfer) has grown exponentially (Seaman et al., 2018), and evidence suggests that it has positively affected the number of students who pursue higher education (Goodman et al., 2016). Still, many challenges associated with it remain (Gillett-Swan, 2017; Palvia et al., 2018), and we still lack a comprehensive educational framework for eLearning (Nickols, 2011). Nonetheless, the number of institutions leveraging it continues to increase amid a confusing market where fraudulent offerings also continue to rise. In summary, one can accomplish online education in many different ways and with varying budgets. However, as long as it builds on solid educational principles and technology mastery, it can be as effective as (if not more than) traditional face-to-face education.

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