

# Implications of Artificial Intelligence on Business Schools and Lifelong Learning

By Jennifer Stine, Anne Trumbore, Toby Woll,  
and Heber Sambucetti

**Final Report**

**November 4, 2019**



We, the authors, thank AACSB, EMBAC, and UNICON for sponsoring this research. Exchange of experiences and approaches among the AACSB, EMBAC, and UNICON members provides a remarkable opportunity for mutual learning. We hope that this report will stimulate additional research and many conversations going forward. As one of our interviewees said, tackling the potential disruption AI poses to management education is too hard to do alone.

The following report represents the opinions and interpretations of the authors and does not necessarily reflect the viewpoints of the sponsoring organizations.

### **About AACSB**

AACSB International, The Association to Advance Collegiate Schools of Business, is a global, nonprofit membership organization of educational institutions, businesses, and other entities devoted to the advancement of management education. Established in 1916, AACSB International provides its members with a variety of products and services to assist them with the continuous improvement of their business programs and schools.

### **About EMBAC**

The Executive MBA Council's vision is to be the preeminent global voice of the Executive MBA industry by increasing the scope of influence of EMBAC, its members, and the EMBA industry by offering relevant content and thinking that serves key constituents and stakeholders. EMBAC's mission is to advance the cause of EMBA programs by providing necessary thought leadership, serving as a facilitator of best practice sharing and knowledge dissemination, and fostering a community among high-quality programs.

### **About UNICON**

UNICON's aspiration is that its members are the most relevant, most successful, and most sought-after learning partners for leaders and organizations who want to improve their performance. Through participation in UNICON, the leaders, managers, and team members of its member organizations gain new knowledge, inspiration, new perspectives,

capabilities for enhancing the effectiveness of their operations, and a global network of colleagues. They stay at the forefront of the industry, and together help create the future of the executive education industry.

# Contents

- 1 Introduction.....5
- 2 Challenges that AI Presents to Business Schools ..... 9
- 3 Responses Schools Are Exploring and Barriers They Face ..... 19
- 4 AI in Marketing, Recruiting, and Admissions.....31
- 5 AI in Business Courses, Programs, and Degrees .....35
- 6 AI and the Student Experience .....43
- 7 AI in Business Research.....53
- 8 AI in Lifelong Learning and Executive Education .....56
- 9 Conclusion .....61
- APPENDICES .....63

# 1 Introduction

Our research uncovered the beginning of what appears to be a sea change in how schools are imagining and delivering business education — one that is driven externally as the schools race to keep up with a rapidly transforming business environment in which artificial intelligence (AI) is emerging as an important business trend.<sup>1</sup>

Our global sample suggested that AI is on the minds of many.<sup>2</sup> Countries where several of our interviewees reside (notably China and Singapore) are treating AI as a national priority, and they are betting on job creation and technical advances driven by AI. In other regions, including the Americas and Europe, industry rather than the government is embracing AI’s potential and driving interest. In both contexts, AI is providing the backdrop of conceptional, operational, and strategic discussions for all kinds of enterprises, including business schools.

Changing the business school curriculum to reflect the current and future reality of AI-augmented work is seen as a necessary first step for the majority of schools. MBA students will need to know how to manage AI technologies in the workplace once they

“I believe **AI will enhance** in ways we will yet discover...we are finding **interesting ways of it taking part in our humanity, rather than taking it over.**”

– Business School Dean

---

<sup>1</sup> Today, “artificial intelligence” is an umbrella term frequently used to refer to data science, machine learning, and artificial intelligence. For simplicity, we use AI to refer to all three throughout this report. For additional detail on the different components of AI, see Appendix II.

<sup>2</sup> The names of the 29 schools represented in our sample appear in Appendix III, and the research methodology is described in Appendix I. The sample was selected based on geography and either current activities related to AI and/or a willingness to share perspectives on its impact. Our sample is not representative of all business schools. However, we believe it does a good job of capturing a breadth of different approaches and initiatives that are being considered and tried globally.

graduate. They will need both theory and hands-on experience with AI, and they will need new, human-focused skills to remain relevant and to temper the potential threat that AI applications pose.

The majority of the schools we spoke with are also experimenting with initiatives that leverage student data, machine learning, and, in some cases, artificial intelligence to enhance specific processes or activities. These initiatives, seen in aggregate in this report, touch many of the different points in the life cycle of business education — from recruiting and admissions, to program delivery, to executive education and lifelong learning.

A few schools have broader initiatives or top-down commitment to exploring the use of AI in education and lifelong learning. Leveraging both commercial platforms and proprietary systems, they have built AI-enhanced systems for delivering personalized education to students, alumni, and corporate partners. These initiatives suggest possible new business models for business schools, but there will be stiff competition from platform providers, “edupreneurs,” and corporations.

Deploying AI to take on the more mundane tasks of teaching (grading, course selection, broad career advising) was viewed as both desirable and possible within the near future across many schools. That said, while most business schools see the importance of AI, very few have the resources to implement AI themselves. Deans cite lack of data, budget, data scrubbing, data skills, staff talent, and faculty acceptance as obstacles to adoption. A few of the schools we spoke with have formed an alliance or consortium to pool resources and ideas which may help offset these challenges, at least at the early adoption stage.

“Traditional Education **can’t move fast enough** to satisfy the coming need.”

– Corporate Learning Executive

Broad-scale adoption of AI within the business school setting appears unlikely for most of our university respondents in the near term. In sharp contrast, our corporate respondents

are actively using AI in human resource functions and either planning or experimenting with it in learning and development processes.

Finally, there was a small but vocal minority of schools who believe that AI is overhyped and poses no significant threat or disruption to the traditional way of doing business in business schools. We found some evidence to support this claim. For instance, about 40% of European AI companies do not use AI at all.<sup>3</sup> One source of the “hype” is the broad definition of AI. In addition, even among our respondents, not all had a workable understanding of the topic. We hope to provide that in this report.

Ultimately, although we found significant interest in and many thoughtful approaches to AI in business education, many business schools do not have the resources to pursue widescale adoption of AI technologies. All of the schools said they could develop new curricula or revise existing ones to prepare their students for an AI-enabled workplace. However, faculty development and the traditional pace of knowledge creation are barriers to quick action. On the other hand, corporations and platform providers are working much faster to invent and adopt new AI technologies to improve and validate skills acquisition and learning. This disconnect or discrepancy of adoption may be the greatest threat that AI currently poses to business education.

Our report describes the insights and data provided by our interviews. The first two chapters provide an overview and synthesis of the major themes, first mapping out the challenges AI presents to business schools, then describing their responses and barriers. Subsequent chapters provide a deeper dive into what the schools we interviewed are doing or thinking about doing today. These later chapters (4–8) follow the business education life cycle. We start by discussing AI in the marketing, recruiting, and admissions processes. The next section addresses AI’s manifestations in business courses,

---

<sup>3</sup> <https://www.technologyreview.com/f/613078/about-40-of-europes-ai-companies-dont-actually-use-any-ai-at-all/>

programs, and degrees. Next, we explore what we heard about how business schools are deploying AI to enhance or augment the student experience. The role of AI in the business school faculty's research, the lifeblood of business education, is covered next. The final student life-cycle section looks at how the interviewed schools are using AI to address the needs of the lifelong learner and its role in executive education offerings.

## 2 Challenges that AI Presents to Business Schools

Foremost among the challenges that AI presents is its potential to reshape businesses, industries, competitive landscapes, and in its wake, business education. This transformation is affecting business school curricula, but more importantly, it is also

“The **market** is going to continue to **demand skills as opposed to the degree.**”

– Vendor

calling into question the MBA as the cornerstone credential companies look for to remain competitive in an increasingly digital future.

Degrees are valued, but it is anticipated that degrees will become less valuable to employers, who are increasingly looking for skills, not courses of study. Because corporations are developing catalogs of skills and the content to develop those skills, and because they are deploying AI on top to tie these skills to learning pathways and to match individuals with the business

and behavioral traits for specific jobs and roles, the MBA degree may lose its value as a signal of employability. As one vendor described, *“AI can unlock more credible signals of bottom-up education, thus infusing non-degree credentials with more signaling value. Degrees are a proxy for content knowledge; AI can be used to measure people’s skills and create measurable value for non-degree credentials.”*

A degree is backward-looking, a summation of prior experiences, while the future will demand continuous learning in the flow of work. The market for non-degree credentials such as MOOC certificates, bootcamp certifications, and executive education certificates could all benefit from this new demand. The question is: Will they come at the expense of the traditional executive education and degree programs?

The appetite for credentials and digital badges is an emerging trend.<sup>4</sup> If it turns out that credentialing is important to the market and there is a movement away from degrees, it will tilt the scale toward business schools willing to provide that level of certification. Some business schools reported that the market for digital credentialing is tepid. The appetite for credentials may be latent at present, but it is projected to increase in the future. It is also possible, however, that new providers may be proactively addressing this market and siphoning off demand. One dean we interviewed went so far as to suggest we will see many business schools disappearing in the face of this trend.

Beyond the existential challenge AI presents, another overarching consideration that will be playing out in the coming decades is the way in which expectations of business students will change over time. The new generations of business students, who have been exposed to AI-enabled education from kindergarten through university, will likely have a much greater comfort with and appetite for machine-moderated education. It stands to reason that they will expect at least the same level of “learning automation” that they have already experienced. Business schools may find that they are being pushed by their new student bodies and future alumni to offer AI-powered apps that support the students’ experience in addition to the new curricular areas.

“If you can **take modules online and do an in-residence six months anywhere in the world, we could be in trouble**...employers [are] accepting different types of credentials.”

– Business School Dean

---

<sup>4</sup> “[Understanding the Implications of the Digital Generation on Business Education. Phase 3: Attitudes and Usage Study, 2017, Quantitative Report.](#)” by Percept Research, Commissioned by: AACSB/EMBAC/UNICON.

The generation gap may pose an even greater challenge for the lifelong learner. Consider executive education that will cater to managers needing to comprehend and embrace the Fourth Industrial Revolution<sup>5</sup> who will be in class with millennials, or the even the next generation of newly minted leaders, for whom AI-mediated processes have been a fact of life. The discrepancy in life experience of business students may prove a very interesting challenge.

A critical new role in an AI-enabled future is the “human in the machine” — people who can “check the math” of the AI algorithms to provide transparency on decisions, intervene against bias, guide insights, and use AI-generated information ethically.

In our research sample, platform providers and corporations were highly aligned on the risks AI presents in educational and work settings. They cited similar concerns:

“Human intervention will have a role...**We need diligence and discipline to “check the math” of the algorithms** so we don’t have a Max 8 situation.”

– Vendor

transparency of algorithms, ethics, privacy, quality of training data, and data security.

Universities shared concerns about bias and ethics, but also raised questions about the dangers of the “*hype*” around AI, its effect on learning behaviors, its potential to amplify social inequality, the potential erosion of the scientific method in research, and the need for governance in this area.

Both sets of concerns are valid. Additionally, the issues raised by corporations and platform providers are

---

<sup>5</sup> The phrase “Fourth Industrial Revolution” was first introduced by Klaus Schwab, the executive chairman of the World Economic Forum, in a 2015 article in *Foreign Affairs*, “Mastering the Fourth Industrial Revolution” and was the theme of the World Economic Forum Annual Meeting 2016 in Davos-Klosters, Switzerland.

informed by an experience-based understanding of the current capabilities of AI in education and workforce development.



Within these broad themes, there were a number of concrete challenges that came out in our interviews which we will touch on briefly in the following sections, including data privacy, ethics, bias, training data, creating knowledge, social inequality, governance, and hype. These are important, and we urge business schools to take a leadership position and grapple with them rather than wait to see how they are resolved by others.

## Data Privacy

Who owns the data that describes you? AI can analyze vast amounts of data and make recommendations for content or learning behaviors that will help you succeed, but should you have the right of consent to having data about you used in this way? Is the data you generate in online platforms owned by you, the platform, your employer, or your school?

“Do I **scan your email** and search for **things that might be useful to you?** Is that ethical, or creepy?”

– Corporate Executive

One institution informs students that their data will be collected and used and gives students a chance to opt out, but this approach could result in an incomplete set of training data.

Privacy is protected if data is anonymized and not traceable to an individual, but then the individual may be subject to recommendations that could be harmful. For example, one corporation we spoke with said it can predict resignations and terminations of its employees. Broadly speaking, these predictions will be correct. But without human oversight of the machine determination, someone who fits the behavior pattern for

termination may be unjustly fired because they are exhibiting the suspect behaviors for other, more individual reasons that lie outside the pattern.

AI is not compassionate. This makes human compassion more valuable and necessary. Business schools will have to address this issue head on. It will likely be a discussion that has to occur at the university level.

## Ethics

Business schools have a significant role to play in educating their students about how to deploy AI in an ethical manner. Performance management, learning and development, and hiring processes, among others, present multiple gray areas for AI applications. Being able to ask questions about AI systems, understand how it works, and assess the risks and benefits of deploying AI across company sectors are all critical skills future business leaders need to develop.

“We give really granular data to employers, but **we worry** that they may use that **data to control their employees.**”

– Vendor

In their own educational settings, business schools must be attentive to the ethical challenges raised when AI is applied to recruitment, marketing, admissions, mentoring, career services, and placement. While these processes have potential to be made more powerful by AI, they also present ethical challenges around data privacy, amplification of bias, and data integrity, among others.

“A lot of people think AI has a lot of biases, but **equally it can help reveal biases** that we have because it systematically analyzes what you’ve done and what the red flags are.”

– Business School Dean

## Bias

AI both scales and reveals biases. Human oversight and insight are critical to correct bias, but human decision-making is also subject to bias.

Platform providers were especially concerned about AI scaling biases in educational institutions, particularly about scaling inequalities in admissions processes and perpetuating bias in career advising.

While most respondents cited bias as a concern, only a few business schools or platform providers were able to describe any corrective measures they are taking to address it. Identifying and correcting bias in AI systems, AI training

data, and AI results are significant challenges for business leaders. These are all important areas that must be part of what business schools cover when educating industry leaders.

## Training Data

The initial data set that AI learns from to create algorithms, whether supervised or unsupervised, is called training data. This dataset is the most important dataset for AI because any bias within this set becomes part of the algorithm.

Schools and employers must consider several issues with training data whether they make their own AI or buy it from someone else. If a university or organization creates its own AI, they run the risk of scaling previous biases. However, if they buy AI from another institution or from a vendor, they should understand the parameters of the dataset the AI was trained on. For example, AI trained to identify underperforming students in Cambridge, MA may not correctly identify underperforming students in El Paso, TX, or Shanghai, or Addis Ababa.

**“Student data  
being used to train  
AI is concerning**

...Schools need to be very careful with their data or AI could do tremendous harm.”

– Vendor

While the quality of training data was cited as a concern by almost all platform providers and some corporations in our sample, of the universities we interviewed only universities that were deep into implementing AI systems remarked on this issue.

## Knowledge and Education

Several universities expressed concern about what students and researchers will do when AI becomes more powerful and commonplace. Some universities report that their faculty’s research is informed or enhanced by AI, while others express concern about the ability of AI to write research papers at the undergraduate level.

“What are **critical thinking skills** in the age of AI? ...You can see the day where **students could take a picture of a story problem** and have **the computer solve it**. What is **the role of the student in that scenario?**”

– Business School Faculty

Besides concerns about AI encroaching upon the role of faculty and student, there are also concerns about how effective delivering learning to students in this model will be. A professor we interviewed commented, “*More students are demanding small chunks of information instead of having to evaluate what’s important. As we go to AI, we are going to [have to] make sure we teach people how to learn whatever is intrinsic to the person and can’t be outsourced to a machine.*” This idea was shared by platform providers as well: “*I’m afraid we are not educating kids for the world we will face; with so much uncertainty, we need to enable them to solve problems themselves...We can use AI to improve the systems we have, but I hope we use them to make a*

*real impact.*”

## Social Inequality

Concerns about AI widening social inequality were expressed, particularly in Africa. “*How are we going to ensure that Africa’s citizens don’t become part of digital slavery?*” For these schools, questions about the relevance of their learners on the global stage — and how to get them there — were paramount. These schools were also concerned about how to focus the impacts of their educational efforts on the economic growth of their region and providing more access to goods and services, for example, healthcare.

“[Our] biggest worry is that **AI is going to exacerbate the gap between rich and poor**, haves and have-nots.”

– Business School Dean

## Governance

At present, there are no uniform, agreed-upon standards to guide AI adoption by business schools. Some institutions felt that a shared governance model, where institutions agree upon fair and ethical conventions about the collection of data, use of data, and rights to data, should be universally implemented. Singapore's proposed *AI Governance Framework*<sup>6</sup> was referenced by some schools as a viable working model. China was reported as having a national AI policy that is far from Europe's personal data privacy protections in the EU General Data Protection Regulation (GDPR). Universities could chart an important path by establishing an ethical framework for evaluating and deploying AI within their own education industry. Most institutions and all platform providers agreed that transparency is critical for AI. A shared governance model could help achieve that end.

## Hype

Multiple business school interviewees cautioned against the hype surrounding AI. Their charge was that *"there is far more hype than reality."* Some institutions saw this hype as created by Silicon Valley and felt that business schools should ignore it. Others believed that business schools had an opportunity to teach their students how to distinguish the hype of AI from reality. Others felt that the hype was doing AI a disservice, that it is *"emphasizing what [advantages AI] might [provide], instead of what [exists now], and [that] these [futuristic advantages] may take years or decades to realize."*

"We're a **bit skeptical** about AI at the moment... you hear keynote speeches on how AI will change the future, replace teachers, but **if you scratch beneath the surface, the actual uses are more prosaic** than that."

– Business School CIO

---

<sup>6</sup> <https://www.pdpc.gov.sg/Resources/Model-AI-Gov>

Few institutions questioned the efficacy of AI as a marketing tool used by third-party vendors, but those who did felt strongly that this could be a case of “*smoke and mirrors*.” The platform providers we interviewed made no claims about AI’s powers that were unrealistic. However, our sample included more chief technical officers and scientists than marketers, so we were less likely to be exposed to the hype which concerned institutions.

### 3 Responses Schools Are Exploring and Barriers They Face

During our interviews, we learned about several interesting responses that business schools are taking in the face of the changing external business environment and opportunities that AI presents for business education. The majority of responses are “evolutionary” rather than “revolutionary” at this stage, and the responses they described support their continued focus on mission and core capabilities. That said, there are a few initiatives focused on lifelong learning that go as far as envisioning new business models for business schools. Not surprisingly, we found that managing transformative change within an educational institution has all the hallmarks of the challenges of systemic change in any business — uneven adoption, demands on leadership, and challenges to the existing culture.

The culture of the business schools is interesting to consider as an accelerator or an inhibitor to the adoption of the AI in curricula and processes. A number of the business schools we interviewed remarked on the advantage they felt they have by being part of universities with science and technology orientations. As one business school dean remarked, *“My faculty is probably more enthusiastic around technology [than most]...we have that inclination. It is a self-selecting process. Faculty have undergraduate degrees in engineering and computer science. So, we have less resistance and more positive bias toward technology.”*

However, this was not consistent across the board. Another business school dean reported, *“The faculty all have strong technical and math backgrounds but are slow to jump in.”* It appears that it is not just the faculty member’s training but rather, more broadly, the extent to which a technical background is seen as relevant to the broader business school mission that matters.

A business school’s ability to respond to the rapidly changing external environment was often linked to the leadership role of the dean, but it also depended on the university

administration. As one dean described, *“The difference is in the imaginativeness in the school and the dean... Sometimes deans are constrained by the ancient thinking of the university — I am lucky enough that our president is trusting of our vision and will let me innovate in any way we want, no holds barred.”* Having the backing of the school and higher-level administration is central to clearing a path to innovation.

A key question — one that we cannot answer, but time will — is, “How fast is fast enough?” Many of our industry interviewees felt the business schools are moving too slowly and will be left behind.

But what industry does not always appreciate is that change works differently in a university environment. The level of AI awareness and the many experiments that are being tried suggests that a transformation is underway. As one dean put it: *“It’s changing so quickly...and yet the world keeps going around, and we are adapting...It is happening more quickly in some ways, less quickly in others. I have lived a decade as a dean and my worries haven’t been realized — we’ve found ways to do really interesting things.”*

## Extending the “Faculty”

One major shift that we understand is happening at some schools is the transformation of the student from listener to explorer and the faculty member from transmitter of knowledge to learning facilitator. The extent to which this is done varies by school, and it is perhaps more common in executive education programs than in degree programs. At some schools, this means that experts are being increasingly brought into the classroom.

“I think that **our faculty is very interested and empowered to experiment.** As Dean, I have really tried to take it on myself and the leadership team to understand the importance of digital business transformation...**I push the leadership team to buy in.**”

– Business School Dean

As one dean confirmed, “*Half of my class was taught by a VP at [a large multi-national].*

“[It is] a **dead end if you assume your faculty will be the ones who teach about the new technologies**

because no one can last more than 2–3 years at the pinnacle...[We are] **moving our faculty away from being experts to being facilitators.** It is about changing the mindset of our faculty instead of their expertise.”

– Business School Dean

*Most of our MBA classes have an industry expert from a company who will do half of a class, a quarter of a class, students like that very well. Both junior and senior faculty do this.*” This trend may likely increase as businesses lead in the development and adoption of AI technologies.

Another school is taking this a step further. It views what is needed to educate students today is an “ecosystem” of which the faculty are an important, but not sufficient, part. As described by the dean, faculty were expected to find and bring in experts to co-teach with them, moving the faculty role away from being the expert and toward that of being a facilitator. The ecosystem approach provides this school with greater flexibility, using industry experts who come and go on a much more frequent basis than faculty. It relieves the faculty of having to be expert in all of the latest technologies and benefits the students by providing the latest industry applications and intelligence.

## Cross-Disciplinary Integration

In recent years, we have seen greater cross-disciplinary collaboration and integration at business schools and within universities. The importance of AI to both curricula and research appears to be accelerating this trend. Both the technology and ethics of AI were on the minds of our interviewees and these considerations are encouraging cross-departmental integration in both courses and research, a trend at least one dean characterized as “*a disruption.*”

This effect may, in the long run, drive significant structural change to the Academy. Many deans and faculty members reported that they are engaging in more cross-campus, cross-disciplinary collaboration in order to understand the multi-dimensional aspects of AI and its effect on industry, society, and the role of education. Beyond encouraging collaboration across faculties, some universities are responding with more structural solutions. These new entities are designed to draw on faculty from across the university, including business school faculty.

Schools are being challenged by the number of students who want to take courses outside of the business school and receive credit for the courses: *“Technology...Ethics...These topics are driving integration across university departments: computer science, philosophy, sociology. This [need for integration] across the faculty is causing internal disruptions...[students] want more specialized electives. They want to go outside the business school.”*

At the University of California Berkeley, a new division was created. *“If you look at our school overall, this is a huge structural change. It is a big faculty reorganization. We created a new division: the Division of Data Science and Information,”* a division that draws faculty and students from across campus. This same school added a data science requirement for every undergraduate on campus. As the university described its new division on its website, its purpose is to *“connect programs, schools, and departments to*

“Industry says it is way too early to address negative connotations of AI. At the university, **we are going to be the first movers...This is resulting in tremendous interdepartmental [cooperation].**

[Many] constituencies are being brought together.”

– Business School Dean

*create broad, rich, and deep educational opportunities and spur groundbreaking, interdisciplinary research.*<sup>7</sup>

MIT has recently launched its new school, MIT Schwarzman College of Computing, heralded as “*the biggest institutional change to MIT since the 1950s.*” This new initiative will raise the number of MIT faculty on campus by 50 — the first significant increase since the 1970s. It is intended to serve as a campus-wide “*bridge*” across disciplines, to “*advance research in computing and computer science — especially in artificial intelligence — and enhance our understanding of the social and ethical implications of technology.*”<sup>8</sup> A school we interviewed said that it does not have the same opportunities for collaboration within its own university and mentioned building external partnerships with institutes of technology to understand and implement the new technologies in their curriculum.

Cross-disciplinary teams are engaged in building AI systems on campuses as well. A school that is currently building a large leadership-focused tracking and personalized learning system using IBM Watson has a faculty team that includes linguistics, psychology, and anthropology faculty alongside the technical and content experts.

## Learning About Learning

A key challenge schools will face in implementing AI to enhance learning is that much understanding about how business students learn is tacit and experiential knowledge held by individual faculty members. Repeatedly, our interviewees spoke about using AI to enhance learning but stressed that the greatest impediment may be their lack of knowledge about how students gain higher-level knowledge and skills.

---

<sup>7</sup> <https://data.berkeley.edu/>

<sup>8</sup> <http://news.mit.edu/2019/college-computing-working-report-0605>

One encouraging development we uncovered is that some business schools are forming alliances to share what they are discovering and their best practices. One school we interviewed is working with a vendor. Another mentioned how five business schools on

“AI-enabled learning platforms...have no idea how people learn. **We have to really understand how learning works and then leverage technology to support it, not the other way around.**”

– Business School Dean

different continents are forming an alliance for the stated purpose of “*pooling resources, knowledge, and expertise while co-developing new pedagogies and collaborating on programmes.*” The planned outputs will be “*new knowledge, pedagogical models, and technologies consistent with our vision and a range of innovative, high-quality online courses and degree programmes.*”<sup>9</sup>

Using a common platform with “*data and analytics as a big part of it,*” the alliance is looking to help its members take new technology into consideration to improve online learning experiences. These schools have decided to work together because “*as business schools we can’t stand alone — [there are] too many challenges to explore these technologies [individually], so we want to do it together.*” As one example of

collaboration between schools to learn, pool resources, and attempt new types of business together, this alliance bears watching.

---

<sup>9</sup> <https://future-management.education/#partners>

## Lifelong Learning

Lifelong learning, once relegated to continuing education organizations, has become a hot topic at business schools. In the business school context, lifelong learning means providing a place where the broader community the business school serves — from prospects to students, alumni, and corporate partners — can continually come to update their skills and knowledge. With this in mind, business schools are starting to think about their “customers” and “customer data” in similar ways to businesses: building rich profiles of skills and interests, then serving up targeted learning that will support their interests.

What is driving this interest is the idea that a lifelong learning approach may constitute a new and more stable business model for business schools going forward. Rather than focusing on providing a degree or credential, schools taking this approach are looking for “customers for life” who will stay engaged with the school both in learning and in recruiting students for long periods of time. While at this time we spoke with only a handful of schools who are actively building the systems needed to support this new model, we are likely at the front end of what may become a major trend.

A challenge in this area, though, is that these schools will be competing with commercial vendors in this space, like LinkedIn, that have huge user bases and are developing personalized services to support learning and careers. These for-profit organizations have many more resources at their disposal. It is also a race for data. Personalization algorithms are only as good as the data they have at their disposal. In the end, who will people share the most data with, either intentionally or unintentionally? Business schools have the opportunity to get substantial data from students, but their ability to engage alumni and corporate partners in ongoing online learning is yet to be seen.

“My view is that **we are done with the concept of graduation day.**

The idea of a quantum of courses and an arbitrary quota of knowledge linked to degrees is contrary to our need to keep learning.”

– Business School Dean



Our conversations also revealed that business schools face unique challenges and significant barriers in the adoption of AI. These span resources, risks, and external competition, challenges that will have to be addressed if AI has the expected impact on global business education.

### **Politecnico di Milano's "FLEXA"**

FLEXA is a new AI-driven platform that Politecnico di Milano has developed in partnership with Microsoft and is making available at no cost to prospective students, current students, alumni, interested professionals, and corporate partners with the purpose of providing "exactly the knowledge you need to pursue your career and professional aspirations faster and more effectively." It has a large repository of content, including Politecnico di Milano courses as well as content from external vendors and MOOCs. On top of this content, it offers skills assessments, personalized learning pathways, professional networking, and exposure to corporate recruiters. They are working on a corporate version of the platform for company employees.

## Faculty, Staff, and Costs

To use the language of corporate HR, to “reskill” and “upskill” talent has been on the horizon for some time as a looming impact of AI. Because university faculty are educating students not for today but for a future career that will span decades, faculty themselves may be among the first affected by this need to reskill. If AI skills were only needed for a few specialized classes, this would be less of a concern. But if AI needs to cross the curriculum, the ability to evolve the entire faculty is an important need. In fact, one of the most frequently expressed concerns in our interviews was the ability of business school faculty to adapt and evolve in the face of a rapidly changing business environment.

Concerns about the ability of faculty to adapt to the new environment and provide the needed skills and abilities were mentioned again and again. *“There are not enough faculty who have in-depth training and skills to teach the courses with an AI focus.”* As another dean remarked, *“The digital age is far away from business schools — it is happening so fast, and faculty are slow. This will take time, and it will be quite a challenge to speed up teaching training.”* A third dean described, *“It is hard for faculty...Some faculty may not follow, and that is a concern.”*

Even if faculty are willing to evolve, the speed of change is challenging the ability of a “slow ship” to turn. AI specifically, and the digital economy more generally, have created the need to refresh course content more quickly than in the past. *“We used to say a course*

“The format of having physically or virtually a set of students to go through a set of formal learning modules is not outdated. **What is outdated is that in some of the courses the content is too stale...**and the challenge for the business school is that it has to remain relevant and grow with the [external] business [environment].”

– Business School Faculty

*is good for 18 months. Now we are saying that you have to renew the curriculum every three or four months.”*

*Another lamented, “There is no way that any business school can follow what is happening in the technology world or business world. It takes a tremendous amount of work to put together a program, find professors, get it authorized by the Ministry...then find the students...the [academic] machine is not fast enough.”*

Business schools reported that they faced a similar talent problem on the staff side. As one dean described, *“We don’t have the skills needed, although we do teach them here...It is hard to recruit people [with these skills.] We don’t hire our MBAs; they are priced too high.”*

Reasons given by the business schools interviewed for why they are not doing more with AI include: lack of skills, data, and funds. As one person explained: *“The staff is the inhibitor. They don’t have the knowledge and don’t understand the techniques. Also, funds [are a problem]. It isn’t cheap. The data must be captured, and the data must be managed...Overall, there has been no big shift because of lack of data, lack of budget, lack of data scrubbing, lack of data skills.”* This was in sharp contrast to the companies who reported spending millions of dollars to retool and reinvent themselves for the digital age.

It is interesting that business schools that reported that they are part of a large university system said that there are benefits that come from size. In some cases, marketing and alumni management are handled centrally at the university. Although they did their own marketing analytics on a smaller scale, some business schools rely on the central administration for knowledge, technical capability, data analytics, and occasionally, AI-enhanced processes.

## Institutional Risks

Another challenging inhibitor reported by schools was concern about the ethics, privacy, and bias issues that AI systems raise and that were discussed in the previous section. The legal restrictions on gathering and using data from individuals differ around the world.

With so many of the business schools active in the global market for education, all the laws and standards need to be understood and respected. Privacy issues are critical to schools monitoring workers or doing employee evaluations. University unions are reported as being concerned when work is automated. In addition, there are practices that were identified as problematic. One example given by a dean was, *“Using past data can be tricky. It can be biased. Using AI for recruitment has to be very carefully monitored. If we used zip codes, for instance...there are important ethical and moral issues.”*

Our interviews did not uncover ways to minimize the ethical responsibility that business schools assumed when using AI in their processes. This challenge alone makes adoption of AI technologies rife with caution and concern. With no agreed-upon standards of practice in the educational setting, the business schools and their universities are in uncharted territory.

## Competition from Corporations, Platform Providers, and “Edupreneurs”

As the market for traditional business degrees shifts to certificates or other credentials that signal acquisition of work-relevant skills, both corporations and learners have been turning to new entrants in the education market.

Software companies are providing their own training to corporations, universities, and learners, e.g. Automation Anywhere, IBM, and Google. Corporations are providing more education to their employees while they are, in some cases, eliminating degree requirements. Platform providers such as Coursera give learners the chance to upskill themselves.

In China and Africa, “learning centers” provide human coaching and asynchronous education and reach learners who may never go to university, a model that can produce desirable workers with relevant skills without the imprimatur of a degree. Unlike the traditional models of vocational training, these workers will have more in-demand knowledge and skills than today’s typical MBA. Today, one organization in China is

offering afterschool programs to students in elementary through high school grades at about 2000 centers in 400 cities, which adds up to nearly two million students currently on their platform.<sup>10</sup>

“Corporations are **bypassing universities** to come directly to software platforms...Learners could **leapfrog from high school to work.**”

– Vendor

Finally, industry behemoths such as Microsoft and Google are jumping to “fill the gap” in education for leaders of industry and people wanting to work in the field. IBM and Microsoft are teaming up to help business schools introduce content and services to their portfolios. At the same time, Microsoft launched its AI Business School in March 2019.<sup>11</sup> It offers free, online courses of study for executives and business leaders.<sup>12</sup> IBM has extensive learning opportunities on its “Skills

Gateway” and offers courses and certificates through Coursera.<sup>13</sup> Google has partnered with Udacity and Coursera to offer the Google IT Support Professional Certificate Program<sup>14</sup> and entered the fray with its own Google AI site, where it offers education, research, and tools.<sup>15</sup>

---

<sup>10</sup> <https://www.prnewswire.com/news-releases/squirrel-ai-learning-by-yixue-group-the-first-ai-self-adaptive-education-brand-of-asia-pacific-region-turns-up-in-the-globally-largest-ai-summit-300886463.html>

<sup>11</sup> <https://www.microsoft.com/en-us/ai/ai-business-school>

<sup>12</sup> [https://blogs.microsoft.com/ai/ai-business-school/?utm\\_source=pre-amp&utm\\_campaign=81249](https://blogs.microsoft.com/ai/ai-business-school/?utm_source=pre-amp&utm_campaign=81249)

<sup>13</sup> <https://www.ibm.com/services/learning/> and <https://www.coursera.org/ibm>

<sup>14</sup> <https://www.coursera.org/specializations/google-it-support>

<sup>15</sup> <https://ai.google/>

## 4 AI in Marketing, Recruiting, and Admissions

From here forward in the report, we explore in more depth the range of AI-related initiatives that are being tried by the business schools we interviewed. This exploration follows the business school life cycle, from finding and enrolling students, through course design and delivery, to research, and finally executive education and lifelong learning. Marketing, recruiting, and admissions processes constitute the initial phases of the business student's learning experience. So, this is where we will start our narrative of what our interviewees told us about AI's potential to augment or change management education.

Business schools and prospective students have a common interest: Both want to find the “best fit” between the applicants, with their specific needs and the strengths, and the culture of the business school and its programs. The better the match made on the intake side, the greater the rate of completion, the application of learning, and the participants' personal success.

Schools' capacity to get the “best fit” has several dimensions explored in this section: (1) having data about the individual applicant; (2) having data about themselves and their own business school; and (3) having access to technology and trusted algorithms, particularly in the admissions process.

While almost every school we interviewed said that they see AI's potential, only a few have chosen to focus significant resources to use AI to improve their marketing, recruitment, and admissions processes. Many schools are considering work in this area, but they are proceeding with caution due to concern about embedding bias into an AI-enhanced system or inheriting bias through purchased systems.

That said, while many business schools are not actively using AI for their intake processes, the counterargument is that all the schools are engaged in AI marketing to the degree that they have content or courses promoted by marketing engines, including LinkedIn and Facebook. Similarly, to the extent that business school programs are

“...We are all users of AI. **AI is deployed on our behalf even though we’re not actively doing it ourselves.** We use marketing engines for open enrollment and prospecting for custom clients.”

– Business School Dean

marketed and/or delivered on one of the platform providers, “[AI] is part of the big players we all use.”

Channels like LinkedIn and Facebook are used at the front end of the intake process. They reveal who is responding to a school, and they help identify individuals who are likely to respond to a school. However, they do not tell the school who is the best fit and has the strongest potential as a candidate. As one dean pointed out, “*LinkedIn knows a lot about people but not about [our school].*” While Facebook, LinkedIn, or other such systems can, with some degree of precision, describe the pool of people who are interested in a school, their systems are not designed to select the

best candidates or applicants.

Beyond these marketing channels, schools are using AI methods to present a more effective and authentic view of the school to prospective applicants and to get a better reading of the applicants’ responses to the messaging. But before such systems can be developed, and as a first step, our interviewees emphasized the value of mapping out the school’s own existing processes: “*Our former dean asked me to lead a group of faculty and staff, and what we did was to map out all of our processes — admissions, enrollment, and research — to understand what was happening. What are the bottlenecks? Schools that are going into the use of AI need to know very clearly what their processes are. I was very surprised that there was a lot [we] didn’t know [about our processes].*”

Beyond understanding the processes, we also heard that it is important for a business school that is serious about using AI to enhance its outreach and selection, to first understand its own DNA. Each business school has areas of excellence, expertise, and research which are normal places to start. However, the opportunity to move toward “best fit” and “personalization” relies on a deeper level of analysis. Scraping applications,

letters of recommendation, inquiries, etc. for the language used can discover good matches but only if there is a clear rubric to match to.

Several schools are thinking about or evaluating personalized interchanges with prospective applicants. Using AI approaches, the business school can get a “reading” on what prospects are looking for and present a tailored view of what the business school can offer. This includes one school that is currently evaluating Hootsuite and BrandBot to engage with prospective students.

A professor we spoke with had an even broader vision: “*We would like to improve the selling experience of the online MBA to give them a sense of what online learning is like — to let them get a sense of the DNA of the program...[for example, there might be] a BOT on the website to interact with visitors, to take questions, to share experiences...and decide on matched, personalized recommendations for learning activities.*” This professor imagined that if through this process of collecting interests and providing experiences, it turned out the student was not a good match, the platform could suggest other schools and programs that might be more suitable. While this vision has yet to be realized, it suggests that one shift AI may bring is that schools are actively evaluating students, including collecting related data, with the first contacts and not just in the application process.

Natural language processing is also starting to be used to provide feedback to recruiters on their conversations with prospective students. One school is beginning work with a partner to analyze the “*emotional quotient*” in the conversations with applicants. Another professor described his school’s vision: “*Partners who work with call centers have the natural language processing and can measure voice and information flow for enthusiasm. Can we detect how the [applicant] is feeling? ...You can color-code how the conversation is going and give the recruiter feedback during the conversation or afterwards.*”

“[We asked] what was our culture, what were our core values. **If you can write them down, you can look for them** in many data sources using machine learning **to identify a pool of people who are a good fit** with [our school].”

– Business School Dean

A final example of the use of AI by business schools to improve their selection process is their use of data mining to generate inputs. Taking advantage of its own student data, one school gave the example that they are using analytics to look for “*triggers for success and risk.*” The point was made that this is just data mining, but that AI is coming. As the interviewee described their program: “*We’ve mined our data in the past to predict the characteristics...of success. We are still in more early stages than I would like, but we are getting there and starting to have [results] from these models, and [these are] one of the inputs in our selection processes.*”

Schools that are investing in their own systems and developing or customizing algorithms reported making discoveries about themselves, including uncovering their own biases in the process of developing their own applications. One school discovered they had a pattern of favoring applicants with undergraduate degrees from some schools more than others, based on personal knowledge of the schools. By using the prior students’ success rates, this picture changed. As the interviewee said, “*A lot of people think AI has a lot of biases, but equally it can help reveal biases that we have because it systematically analyzes what you’ve done and what the red flags are.*”

It is important to emphasize that while schools recognized the potential for AI to aid the intake processes, our interviewees were universally consistent in saying that the automated systems will never eliminate the human decision-making component. If the systems provide good data, they can help marketing, recruitment, and admissions people to make “better” decisions. However, as one dean explained: “*[We are]...starting to have inputs from these models [as] one of the inputs in our selection processes. We are not going to replace human beings. These models are not foolproof, and we have to make judgments.*”

## 5 AI in Business Courses, Programs, and Degrees

Business schools are thinking deeply about AI, its effect on the business of business, and the challenge it posed to their existing curricula. As one dean explained in our interview, *“I have really tried to take it on myself and the leadership team to understand the importance of digital business transition. It is an important narrative. We, as the leadership team, have to have an active conversation about the development of students and the preparation they get for success...the rapid changes of what employers are expecting means we must be incredibly proactive in that area. The value of education is only as good as [its] transition to employment.”*

Our interviewees stressed again and again that the sweeping change that is happening in business education is not driven by AI, per se, but by the digital economy and Fourth Industrial Revolution. AI will play an increasingly large role, particularly as jobs are automated and augmented, but the transformation that schools are addressing is much broader than any one technology.

The most common response we heard in the interviews was the need for business schools to rework and enhance their curricula, and the majority of business schools we spoke with are already deep into this process. Other impacts include thinking differently about the skills they need to develop in students, the importance of providing “hands-on” experiences in AI, adding online modules and programs, increasing interdisciplinary work, and extending beyond the tenured and tenure-track faculty.

### New Degrees and Courses

Most of the schools we spoke with are engaged in conversations about how the future of work, the digital economy, and the Fourth Industrial Revolution should influence the way they educate students. In response, many of the schools with whom we spoke are adding AI-related courses to their curriculum.

In geographic areas where businesses are currently focused on digital transformation — particularly the US, Europe, and Asia — schools are seeing high demand for these courses. *“AI is affecting more what we teach and less how we teach and delivery. In the last year or two, AI and ML are the most topical and in-demand courses...[There is great] interest in how digital is impacting everything in business.”*

Examples of new courses include “digital transformation,” “AI strategy,” “digital immersion,” “how you manage in a technology environment,” “accounting analytics,” “supply chain analytics,” and many others. Students want these courses to be contextualized: *“AI courses are of increasing interest...The technically oriented courses are of less interest, but they want technically oriented marketing courses. These are the #1 courses in demand.”*

AI is infusing new concepts and needs into older disciplines. For example, faculty are teaching neural networks in a finance course using AI tools. Marketing, operation research, and even leadership courses were mentioned. A professor described this trend, *“In accounting...you need to learn text mining — if you know the AI techniques, you could analyze to explore readily available data sets to do financial analysis. In marketing, same deal — online advertising, computational frameworks — they are becoming part of the standard business practice.”*

Beyond adding courses, some schools (particularly in China) have added full degrees and joint degrees, for example, an MBA coupled with a master’s in engineering.

While many schools have some courses and degrees that touch AI, a few schools are taking the position that AI should be taught across the curriculum: *“This is something we need to consider across everything we do.”* Many schools have engaged in reviews or updates to their MBAs, and one school that did such an overhaul recently put AI at the

“We still have our traditional content, but **there is a lot more emphasis on technology and AI**...People are looking for that kind of content.”

– Business School Dean

center of this update: “One of the core decisions [we made] is we don’t want to teach [AI and related fields] as a separate course but rather to look generally at technological change across all of the models... Whether you are looking at the environment and business, AI and decision making, AI and creativity, AI and strategic business, we need to sensitize our students across these.”

We did see some geographic variation in terms of why and to what extent schools are choosing to revise their curricula. In the Middle East, schools are developing this content and these courses, but the driver is the government and not local businesses. Without that government influence, in some of the other regions where companies are still working on Third Industrial Revolution skills (ERP systems, etc.), there is less of a push to develop these programs.

“Teaching will **become less about content**...less about teaching the facts and **more about analysis, how to apply the facts, how these facts show five different solutions**...In the future AI will provide the facts.”

– Business School Dean

Geography also influences the curricular approach taken to the challenges presented by the digital economy. As one African school described, “When you start looking at inter-regional issues around skills and abilities, our continent has a huge amount of catching up to do...How is the content going to deal with this? Where do we put resources? Where do we catch up? Where do we leapfrog?” These schools are challenged to contextualize AI learning in a way that can have a positive impact on the local and regional economies.

## New and Enhanced Skills

In terms of the skills that students need to develop, there were three points of view: (1) that business schools should continue to focus on the ability to see problems, analyze them, find solutions, and manage change and that AI is just the latest version of a new tool in that context; (2) that the future workplace, where AI is augmenting humans and

automating tasks, requires greater strength in uniquely “human” skills like leadership, emotional intelligence, and change management; and, (3) that AI in business requires technical expertise that not all current business students have and that this may necessitate both more technical courses and more technically oriented students.

While some interviewees felt strongly that “*the world hasn’t changed very much*” and AI is simply “*a new set of tools, and [schools] need to teach students how to apply the techniques and tools in the most appropriate way to solve problems,*” others disagreed with the idea that business school education is “*business as usual,*” although they also emphasized the importance of problem solving and change management skills.

More and more, schools are looking to prepare students for an uncertain future. As one dean described, “*Change is much more rapid now... We can’t train students to tackle [the problems] of the first hour of their first day... We need to prepare them to be able to pivot and take on increasingly complex problems.*” This focus on preparing students to manage change and transformation was echoed in other interviews: “*We need transformational learning, managers who have the new capability to proactively be ready for the next waves [of change].*”

Other schools focused more on developing the types of complementary skills that would be needed in a workplace where humans are working side by side with machines. In the workplace, as smart machines take over lower-level work, business school graduates will need to start contributing to their organizations at a higher level than previously expected of recent graduates. As one dean described, “*The traits of being human are going to become increasingly important to compete in the world of robots and machines. Universities need to focus on developing these traits, to focus on character building to out-compete computers.*”

What exactly are these skills? One school is focusing on “*emotional intelligence, cultural intelligence, leadership, [and] behavioral psychology.*” Another interviewee mentioned “*Holistic thinking, collaboration, the ability to work interdisciplinarily, sensemaking,*

*asking questions in ambiguous situations, [and] novel creative problem solving when you are dealing with unstructured chaotic situations.”*

Developing these skills may mean business schools need to adopt new methods. The same dean suggested, *“[It] means a whole different approach and pedagogy. To develop the higher level of skills...it must include hands-on experiences with consistent, regular coaching and feedback.”*

Others saw an even greater transformation in store for business schools — both in terms of the technical content that would need to be taught and the types of backgrounds students would need. They felt that business schools — either through collaboration with other departments or by hiring faculty with more technical backgrounds — need to be able to teach technically oriented courses. As a faculty member explained, *“In many areas, AI, big data, [and the] new wave of IT are redefining the field...not a fancy AI but focus on data, sensor networks, mobile computing, 5G mobile networks...To gain a good understanding of those elements would be a necessary part of training for business education leaders.”*

This, in turn, may signal a change for the types of students admitted into business schools, including requiring greater technical acumen and training. As one faculty member explained, *“[In] a traditional business school, they don’t care [about] the background of incoming students. They can come from humanities, non-science-based undergraduates. But...with the fast pace of technology, it is impossible for even the smartest individuals to make judicious decisions for a company without a background in technology.”*

Teaching students to solve less structured problems and to do higher-level work also creates the need for multi-disciplinary, problem-solving skills outside of the university walls, as well as within them. One school is choosing to address this challenge by creating cross-disciplinary teams in its MBA program to encourage these types of learning experiences: *“In the real world, data collection and analysis problems need cross-*

*disciplinary cooperation. For example, projects about sustainability require technical know-how, organizational know-how, and understanding of social and economic issues.”*

## Immersive Learning at Georgia Tech

The Georgia Tech Scheller College of Business’s approach to the new curriculum is to develop “immersive” tracks at the intersection of business and technology with a focus on technology innovation, leveraging analytics, and leading digital enterprises. The tracks combine academic coursework to build core knowledge with practical hands-on projects with various for- and non-profit organizations. The students, coached by faculty while working on projects, develop unstructured problem-solving skills and advanced applications of the knowledge gained in the academic courses.

<https://www.scheller.gatech.edu/degree-programs/mba/full-time-program/curriculum/immersive-tracks/index.html>

## Importance of “Hands-On” to Learn AI

An interesting insight from faculty we interviewed who are currently teaching AI in their classes is that it is very important to go beyond teaching students what AI is and related strategy. They advocated that they also need to provide students with actual hands-on experience with the tools themselves. More than one faculty member stressed the importance of using the actual tools, as they currently exist, and not overpackaging the learning.

Our interviewees talked about two sides to developing students’ knowledge about AI. The first dimension is providing conceptual education on AI’s capabilities and potential for use. The second dimension is providing experiential education — including both experiences working side by side with AI systems (humans and machines working together) and experience creating AI systems. As a professor explained, “*What I have*

*done in my class on digital transformation, rather than just lectures on the business practice, [is that] I insist they engage in hands-on exercises — they write their own program, they write their own chatbot.”*

Another professor emphasized, *“I have been thoroughly trained in AI...It has always been my sense that if you truly want to learn AI, you have to get your hands dirty and solve problems...In that sense, fancy, education-driven toolsets are not going to help — those will have a negative impact on the learning experience.”* The importance of direct, hands-on experience using AI tools was a strong theme in some interviews.

## Doing More Online / Digital Delivery

While many schools have, over the past decade and longer, experimented with and adopted online courses and degrees, AI is reinforcing this trend. For schools that are still focused on brick and mortar, this is likely to change. As one dean emphasized, it is difficult to predict the future, but *“what I see is things will go online, not only but online for sure.”*

The reason for this is fairly obvious: in order to use AI to enhance learning and enhance the student experience, schools need to have digital data. *“There will be more online content and tracking of online learning...It is hard to collect data in the classroom...[as of] now, we don’t have enough data about individuals. AI can be an intelligent helper.”* And, in this context, online degrees and programs are driving and will continue to drive AI-related educational innovation.

**“Our online MBA is the speed boat, the zodiac, and is a catalyst for digital transformation and change.** The MBA program is the tanker.”

- Business School Dean

At the larger scale that digital delivery facilitates, the data are rich and accessible if programs are designed to capture it. *“AI and digital learning*

*are very much tied together, and one of the big advantages of digital learning is for people [learners] to know their paths and what they are on and correcting their learning.”*

Schools that are already delivering programs online have rich student data at their disposal. For schools that do not have full online programs, some have rolled out a combination of online modules or prework, followed by in-person learning experiences. For example, one school is coupling online courses with “*lower-level learning with cases and basic understanding*” with an on-campus course covering digital transformation “*that involves unstructured problem solving, fieldwork, and lots of faculty coaching and feedback.*” While not particularly new, these “blended” solutions that combine on-campus and online delivery are likely to continue to grow. In addition to supporting the capture of some student data, they allow for different teaching approaches as well — from a flipped classroom to a deep focus on problem solving and fieldwork during in-person sessions.

## 6 AI and the Student Experience

Turning from the curricular changes to the nature of the student experience itself, we found a wide variety of initiatives underway using AI technology.

Several business schools we interviewed are using AI to enhance the student experience. Their AI programs touch many different areas of the students' experience and range widely in sophistication, scale, and intention. From these interviews, we learned that today, AI can be a knowledgeable personal assistant or a helpful scheduler but that it will not replace the role of the professor anytime soon. AI does not currently have the capability to replace faculty or fully automate learning in business schools. Perhaps more importantly, we found little appetite among universities or platform providers to do so. All felt that human interaction is needed for empathy, judgment, connection, and interaction throughout the learning cycle, even in the age of AI.

No one we spoke with envisioned a completely automated, human-free classroom. If anything, AI is seen as a way to free professors from repetitive and mundane tasks and to allow them to invest more of their time and energy in creating richer student experiences.

Offering these experiences was seen by some as a key value proposition for universities in the age of automation. By augmenting the student experience with more personalized learning and opportunities for social interaction, AI can give professors insights into how students are making sense of their classroom material. The role of the professor will certainly evolve as AI systems are put in place, and faculty will be asked to emphasize skills that are better performed by humans in the university setting. These faculty skills include coaching students, producing knowledge, and creating rich learning experiences.

“What AI will do primarily is take over the repetitive tasks, the mundane tasks, like grading and feedback.

**Professors will be required for the parts of teaching that require judgement and empathy.”**

– Vendor

Interestingly, there is an opportunity for “double-loop learning”<sup>16</sup> for faculty teaching AI topics in that, in an AI-enabled university, professors will be subjected to the same forces of automation as employees at large, that is to say, opportunities for new roles will be formed just as traditional tasks are taken up by machines.

## Connecting and Scheduling Students

Some business schools are trying new tools to enhance the student experience and support the activities that go into delivering business education. One school is using chatbots to register students. Others mentioned include X.AI to automate scheduling and Voice A’s EVA, software that listens to meetings, takes notes, and organizes issues. It is of note that one US business school dean, currently trying out these tools, came up against union issues.

A different school is using AI to facilitate the formation of student teams. The interviewee described how this was previously done by an administrative assistant who took days to accomplish it while trying to integrate across five factors. Now, there is an algorithm that does this work in seconds.

Another interesting application of AI at a European business school is that AI is currently being used to promote, rather than replace, social interaction among students and to create richer student engagements. This initiative is based on research that suggests students are very lonely. A chatbot asks students if they want to be in a group. Nineteen percent of the school’s students opted in. The same system also welcomes all students online and asks if they need help. *“We are using it to meet social needs, and we know, from research, that if students are going to succeed, they need social and academic integration.”*

---

<sup>16</sup> Argyris, C., & Schon, D. (1978). Organizational learning: A theory of action perspective. Reading, MA: Addison-Wesley.

## “Deakin Genie”

One of the most sophisticated implementations of AI we saw by a business school is Deakin Genie, developed three years ago by Deakin University in Australia. It is a smartphone-based app that serves as a “hyper-personal assistant” for students.

Deakin Genie reminds students of upcoming assignments and helps them do research. If they are working in seminar groups of 4 to 5, it will schedule a meeting, book a room, and order the correct coffee for each student.

<https://www.youtube.com/watch?v=mIogdSCjGQ8>

## AI “Tutors”

What we did not find, however, were any schools that were currently using AI to teach business-related skills. While chatbots have been successful in some areas, they have been found less so in aiding the actual classroom learning process. AI tutors have been used successfully to enhance learning for “closed” bodies of knowledge, like algebra or geometry, and in elementary and middle schools, but business schools have found them less helpful.

An AI expert we interviewed agreed: *“I can see automation and job loss in the more quantitative sciences where it is easier to tell right from wrong. Business schools are more qualitative — case studies, interactive...AI is nowhere near sophisticated enough to replace an instructor in that space.”*

One school we spoke with spent three years developing an online tutoring system to complement its online classes but has abandoned that effort because, *“at the moment, artificial intelligence isn’t very intelligent.”* While the system could answer *“very simple, factual questions,”* it was not able to *“participate in the kind of teaching dialogues that form most of the interactions between students and teachers.”* They concluded, *“We don’t think AI can replace tutors — it is so far away from that.”*

Another interviewee pointed out that, for adults, it is not necessarily a good use of their time to be tutored like children. *“It is like boring mathematics — if you make the format of the learning too fancy and interactive, it will hinder the learning of the actual concept.”*

Not everyone agreed that an AI TA is far off. One interviewee commented, *“I’m not too sure we can replace a genuine professor, but to have very customized teaching assistants based on AI should come pretty soon...for example in the common learning core such as the English language.”* Even though these systems are starting with basic knowledge and lower grades, they will learn, and they will get better. In fact, these systems may start to “learn” more about how humans learn more rapidly than we do, and the future might look quite different from today.

### “Jill Watson”

In 2016, Georgia Tech’s Computing Science program launched “Jill Watson,” its first virtual teaching assistant, as part of its online M.S. in Computer Science. “Jill” is able to answer about 1/3 of the questions that students ask about assessments, projects, and exams, which make up about 80% of the 10,000+ questions students ask each semester. Jill Watson is credited with enhancing student engagement by increasing the average comments students make from 32 to 38 each semester.

<https://www.cc.gatech.edu/holiday/jill-watson>

<https://www.cc.gatech.edu/news/609284/jill-watsons-terrific-twos>

<https://www.youtube.com/watch?v=Y3t-3YeY0sc>

## Personalized Learning

Personalization was mentioned as an important goal in many of the interviews. The interviewees felt that AI will finally allow for the type of personalization that transforms what are today's keyword searches into a highly engaging and more meaningful learning experience.

While business schools are envisioning making changes to their processes to provide personalized content or recommendations, they reported relatively slow progress. Capturing student data in a traditional classroom is a challenge. *"It is hard to collect data in the classroom...[if we used] AI and facial recognition, [the faculty might be able to] understand what is going on with individual learners."*

On the other hand, the intention to do an outstanding job of assessing, matchmaking, providing content, and recommending personalized learning opportunities is the primary promise of the platform providers. They are in the business of providing personalized learning flows. As described by a corporate interviewee, their priority is: *"The ability to use big data to build a very tailored picture of a student no matter how young or old they are, to build a holistic picture of an individual — how they learn best, what their preferences are, [and] what topics they want to learn."*

Their business model, as expressed by one of the platform providers, is to: *"Enhance personalization, auto-curation, joining jobs and roles and skills. [We want to] bridge the gap [for] companies who don't know what skills they have...then help get them from the skills they have to the skills they need. [We] use the data generated to create a curriculum delivered directly to the learner...bring[ing] the content and curation into a meaningful experience for the learner."*

The algorithms used by the major platform providers to assess needs of learners and make recommendations are proprietary. As a result, knowing the efficacy of their personalized learning recommendations is a challenge.

Today, at least, the platform providers are limited in their knowledge of or ability to recreate the business schools' offerings. The claim of one provider that *"The algorithms will be much better able to identify point of learning needs in terms of what they need to learn and also when they need it"* may be true in the future, although we did not find evidence of this today. That said, it is incumbent on business schools to both stay on top of what is possible and to continue to differentiate their value from that provided by these platforms.

"We will see **personalized predictive analytics to provide personalized instruction**, but the robots will not take over."

– Business School CIO

Overall, scaling personalized learning using AI was seen as a complement or enhancement to the teacher-student relationship, rather than a replacement for it. AI excels at finding patterns in data which are essentially undetectable by humans and doing so more quickly than any human ever could. However, humans understand the context in which to put these insights to use. For example, in career advising, machines do a better job of matching a learner's specific skills and interests to a broader set of similar learners, and on that basis, suggesting fields and job types based on those skills and interests. But humans can provide much

more nuanced and personalized career counseling on an individual level. Furthermore, there is the risk of bias being reinforced when big data is used for predictive algorithms.

One school has already rolled out a system, working with Microsoft, that scrapes alumni information to help match the alumni with career assessments, employment opportunities, and personalized learning opportunities. A second is developing a similar application, built on IBM Watson, that will gather information about both current students and alumni — their interests, programs, and information — and then channel content that is specific for their needs. As one school pointed out, highly individualized tracking, at scale, is only possible with an AI system.

A platform provider went so far as to suggest that when AI enables social interaction and peer-to-peer learning, the role of the instructor will become less important for students, particularly when they have access to personalized learning pathways. This idea aligns with the vision of AI ultimately rendering platforms themselves irrelevant, as educational content will be delivered through social channels such as Slack or Microsoft teams.

The potential of personalized delivery of content, assessment, and advice on learning pathways or skillsets is being tested by the platform providers and some of the business schools. Even so, though personalized learning is said to be the Holy Grail of the platform providers and the role of the tutor and facilitator may be taken up by machines, the platform providers themselves continue to reflect that there is still a vital role for teachers, particularly within the classroom setting.

**“There is still tremendous value in human-to-human interaction.** I don’t envision that technology will replace traditional, in-the-classroom learning...**AI can help extend and improve** online and outside the classroom, but I **don’t see a fundamental shift in how humans learn.”**

– Vendor

## The Future of Cases

Case-based learning is another area where there is experimentation and potential for AI application. In the future, faculty and students may have *“AI personal assistants [that] can work with faculty to provide case studies that are up to date...linking content to most relevant and recent cases.”* In theory, *“you can throw a case study at AI, and AI can deduce real examples that are recent and relevant to illustrate the case study.”*

One university has created special classrooms set up for networked teams of five to six students to work on cases exploring supply chain management. These systems use

industry AI tools to access and read companies' data to learn what they and their industry are doing.

Another possibility is to use virtual reality to explore and do research in a profoundly kinesthetic way. This methodology is starting to take hold in some applications in industry training. However, another of our interviewees expresses skepticism: *"I've tried some of the VR gadgets for case studies...I'm not sure if that is going to help close the gap of the learning."*

## Improving Student Performance / Interventions

"One big area of application that is being done by vendors...is **using AI and ML tools to monitor students' progress** when there are large numbers of people taking courses online...It is not like a computer tutor. It is **automatically flagging patterns of behavior to allow for human intervention.**"

– Business School Dean

Several of our interviewees described how they are using tools to enhance early identification of students who might be at risk for not finishing their courses or doing as well as they might. As one dean described, *"We are using AI in-house around student success metrics. We are using it to [identify] higher-risk students earlier. This is across the board for undergraduate and graduate students. The undergraduates are where the volume is. We have an undergraduate advising team, and they do interventions when the high risks are identified."*

A large, online program with extensive tracking capability was put in place to use machine learning algorithms to analyze student behavior. It is important to know that students can opt out of the system. The data collected is used to create groups and then map the groups in terms of career success and performance in class. The system makes recommendations on

behaviors that might bring the students more success. That said, the school was quick to

caution, *“We make suggestions, but there are always exceptions. The danger is when you are too rigid.”*

Another school found that students who took organic chemistry and advanced calculus in the same semester were one grade point lower than students who took them in separate semesters. This was a new discovery; they were not aware of this relationship until they reviewed the data. That same school is beginning to look at other indicators for success and risk. For example, by combing through zip codes, *“we can find students who are weaker in math, statistics, or writing. This allows for early interventions, study groups, [and] tutoring.”*

## Providing Feedback to Students

Several schools are thinking about and exploring ways to provide more feedback to students, particularly in large online programs. As one school pointed out, *“Students ask for more feedback than faculty can give — students have an insatiable appetite, and instructors can’t give that much.”* This school is working on an online system to address this challenge and to enable professors to grade more assignments than they normally do.

Just as AI is helping employees with their lower-skilled tasks in the workplace, business schools are exploring how AI might help students in the context of business education. As an example that everyone is familiar with, *“Calculators are now assumed for lower levels of math. What is important in writing a report? The important part is the critical, creative thinking behind the report, not just the research.”* In other words, the argument is: If an AI assistant can help students improve their research and writing skills, it will let them focus on developing their ability to ask the right questions and do the critical thinking.

We learned of several faculty using Packback as a tool in their large lecture classes. Packback uses AI to machine read discussion posts, then prompts students to revise them or put in more substance. The teacher can see what is highlighted and score it.

A dean explained, *“Even if you are not an expert [on a topic], you can tell if an essay is well written. Does it have a thesis statement? Is it interesting and coherent with topic*

*sentences?” This dean, based on his expertise in the field, believes that “it is possible to get immediate feedback and prompting on ways to improve [from AI apps]. For writing skills — communication skills — AI and natural language processing will be able to give better and faster feedback.”*

Many schools are actively looking forward to AI agents that can help with grading and feedback, and a few are trying it. One school described how it is planning “human-in-the-loop” grading and feedback features that will “scale” the human professor. Another is building RPA robots to do structured grading.

Two schools saw opportunities for online exam proctoring using facial recognition and intelligent agents monitoring the videos, and one of these two schools is in the planning stages of developing such a system to be rolled out as part of an online MBA in September.

## FDC and IBM

Joint work being done by Fundação Dom Cabral and IBM extends to the classroom where IBM Watson is used to track learning objectives and goals, and to “read” student papers and evaluate emergent leadership skills. It tracks their progress against their objectives and how they relate to their cohorts. The first cohort is mid-way, and FDC has had very positive feedback to date. The next AI-built system will serve personalized content to users, clustered around four pillars of leadership.

<https://www.mrv.com.br/institucional/pt/relacionamentos/noticias/fundacao-dom-cabral-ibm-e-mrv-inauguram-laboratorio-focado-no-ensino-de-executivos-para-o-mercado-do-futuro>

## 7 AI in Business Research

Curricular content and course delivery are under pressure to reflect the rapid changes in industry and AI-enabled education offered by platform providers, corporations, and lower-level schooling. Similarly, faculty research at business schools is also under pressure to evolve. When asked about the degree to which faculty are applying AI to their own research efforts, our interviewees' comments ranged between an increasing focus on the Fourth Industrial Revolution to *“Many of our faculty are using Big Data and AI in their research for investigations. They are using it in economics, innovation, strategy, in accounting — using ML to look at financial data, and in finance/fintech.”*

### Adoption Rates of AI Research Methods

In general, the schools reported that researchers across the business disciplines are using, and in many cases deriving, enhanced results using advanced data analytics, AI, and machine-learning technologies. As one dean described, *“AI [is having a] big impact because our faculty are using AI and ML in their research...as research tools. They are seeing really dramatic effects...AI is accelerating knowledge discovery and extension — from operations optimization to curing cancer.”*

Even if professors do not use AI as part of their research protocols, the areas of their research are being forced to keep current with the changes in the industries they are studying. At least one faculty interviewee stressed the importance of grappling with issues related to AI in order to appear in top journals: *“For the professors to publish their work in the best journals, they do need to be kept up to date. The real-world penetration of AI, through multiple disciplines, is being reflected in the business literature.”*

The business schools' description of the application of AI tools to faculty research was aligned with growth in AI published papers, as reported in The AI Index 2018 Annual

Report based on the Scopus database, which showed a greater than eight-fold increase in AI papers since the late 1990s.<sup>17</sup>

Business schools reporting increased application of AI/ML in faculty research were globally distributed. This phenomenon is matched by data from *The AI Index 2018 Annual Report* that “In 2017, 28% of AI papers on Scopus were affiliated with European authors, followed by China (25%) and the U.S. (17%).”<sup>18</sup>

Another dimension to be considered is that faculty may experience the same generational gap in their research methodologies as is seen in the students served by business schools. One example that was described highlighted the difference between the research approaches of two faculty members. In pursuit of ways to discover and measure a company’s culture, one faculty member used traditional surveying methodology. The other, younger faculty member, trained in the use of big data, used natural language processing to examine all the emails from the company to discover the nature of the company culture. Both approaches have strengths and challenges. The significance of the example is the dramatic difference between the two approaches used to gather and analyze data.

## Challenges Posed by the New Methodologies

Several of the interviewees reflected on challenges posed by the adoption of AI in research. The question was raised if “*letting the data speak*” is antithetical to the scientific method. As one dean described, “*There are [important] examples of the research methodology. There is the scientific method that starts with a hypothesis [as opposed to] getting the data and putting it through an AI/ML algorithm to see what you get.*”

---

<sup>17</sup> Yoav Shoham, Raymond Perrault, Erik Brynjolfsson, Jack Clark, James Manyika, Juan Carlos Niebles, Terah Lyons, John Etchemendy, Barbara Grosz and Zoe Bauer, “The AI Index 2018 Annual Report,” AI Index Steering Committee, Human-Centered AI Initiative, Stanford University, Stanford, CA, December 2018. p.9

<sup>18</sup> Ibid. p. 10

*Increasingly, researchers are just looking for patterns. Is this valid scientific inquiry?"*

Research review boards are seen as only partially helpful in this area because they may not understand the new technologies or methods well enough. As one interviewee pointed out, *"We need to review quantitative AI research for issues of biases, HEPA, [and] privacy. At the university...they have a model plan for the medical school doing AI research."*

If research project review boards are made up of faculty with a strong understanding of the AI methodologies and their formulation, the school will be on firmer ground. As one interviewee said, *"Our faculty understand analytics so [they] don't have a knowledge gap when sitting on research review committees."* However, it was a concern that there might be gaps in the reviewers' understanding of the methodologies proposed or a lack of protocols to govern the project review process. *"The committees reviewing research proposals could be a concern."*

A final consideration raised during our interviews was the problem that academic research takes time, particularly if it is based on data gathered from industry. To become a recognized "expert" in a field, professors need to produce juried articles that pass academic muster. If the industries that faculty are studying are evolving too quickly and if the application of AI technology is emergent or barely underway, it was said that faculty expertise through academic research will be chasing a *"moving target."*

## 8 AI in Lifelong Learning and Executive Education

Completing the learning life cycle, we turn now to the effect of AI on lifelong learning and executive education. In an age of personal brands, multiple careers in one lifetime, taking control of one's own development, carrying your credentials with you using blockchain, and corporate HR encouragement of lifelong learning, this is the era which values the “examined life.”

Whereas in the past people tended to rely on their managers to plot their learning trajectories, now there are systems in corporations and in the education industry that are primed to help anyone chart their own course. As one of our corporate interviewees described it, “[You] have to match [your]self with different roles, jobs — who [you are] and where [you] would like to go. You have the opportunity to identify every job, see the expectation related to competencies, then self-assess and try, by getting badges to show you are ready, to go there.”

“Learning in the flow” and “learning for the next step” describe the way much of business education will look in the next decades. As a dean said: “*Technology...enables interest in an examined life in a scalable way.*”

### Corporations, Platform Providers, and Digital Learning

While not directly linked to AI, an important, related trend that has swept through corporate training is the idea of providing learning through short, digital assets on an as-needed basis.

For decades, business schools have grown the market for short, non-degree programs. These short courses, as well as custom courses, were delivered by faculty and were ideal vehicles for exposing management to new research and application of theory. However, digitized content has begun to disrupt this monopoly.

As was observed by a new business school entrant into the learning market, “*With increasing digitization of content, it’s really allowing corporations to curate their own materials online...we’ve moved from “just-in-case” education to “just-in-time” learning [now that] you can go online and find what you need. You are in the driver’s seat. You can create peer groups online where you are learning from each other.*”

A similar observation was made by one of the corporate interviewees: “*We are not so sure that the traditional, in-classroom types of [classes], one-week, two-week, three-week paths for...executive education...are still appropriate as most of the knowledge transfer could be provided in short-bite, remote, digital learning. [Then, getting] together with a university expert or expert facilitator to compare different approaches [allows you to get] the best from [other] executives who have a lot of experience to put together.*”

The explosion in online learning content, the capabilities to deliver that content at scale, coupled with the personalization that AI algorithms offer are enabling corporations and platform providers to provide education to their employees/students when and where they need it.

Effectively, with AI acting as matchmaker, tracker, provider, assessor, and personalizer of “free-range” content, business schools are being disintermediated from what they teach. Companies like Degreed, Filtered, and Skillsoft are working with corporations to create taxonomies of skills, tagged content to build the skills, and algorithms to create highly relevant, personalized learning pathways for employees. While this effort is currently more data science than artificial intelligence, it has the potential to accelerate, using first machine learning and then artificial intelligence to automatically create learning experiences that allow employees to obtain the skills they need at work.

**“Companies are amassing huge libraries of content.**

AI will play a role in bringing the learning into the everyday learning of people.”

– Corporate Executive

Short modules and bite-sized pieces, delivered on an as-needed basis, provide an excellent proving ground for AI to track when there is application of what is learned. As one of the platform providers said, *“Our core insight is that learning is effective when you focus on the right stuff, if you can focus in on the stuff that is particularly relevant for what you need, then the more likely you are to apply it and retain it.”*

These trends pose a significant threat to executive education. A dean we interviewed commented that with business education, *“the value of education is only as good as [its] transition to employment.”* If it is true that most learning happens on the job<sup>19</sup>, bringing the business schools’ executive education closer to the workplace is not only a desirable development but potentially a strategic necessity.

In the view of an industry interviewee, the transformation from their point of view, learning on the job *“changes the idea of a classroom. Instead of considering it as a way to deliver or transfer knowledge...I can let people learn on a remote basis, then have a meeting for everyone to [share their insights].”* The critical question will be whether and how business schools choose to participate in these learning experiences.

## AI’s Effect on Executive Education Offerings

First, and perhaps most obviously, the penetration of AI into industry has created, in the words of a business school dean, *“an explosion of demand for courses with blockchain and Bitcoin in their titles. [Our participants want to know] what it means for [their] business, the future of the workforce, ethics, [and] social conscience requirements.”*

---

<sup>19</sup> Petriglieri, Gianpiero. “Learning Is the Most Celebrated Neglected Activity in the Workplace”. *Harvard Business Review*, November 6, 2014.

As subject matter, AI is critical to the labor market in general, not just the traditional executive education sector, and may drive more workforce-focused programs. As one faculty member said, “AI is infused into industry and labor-intensive tasks, and [workers need to be] retooled and retrained even without a degree or only with an associate degree.

“I’m **currently converting a very successful executive program** being offered to 700 to digital **so they can roll it out to 10,000.**

With these unique methods we can do things that are not possible in face-to-face.”

– Business School Dean

*This will be a large [market] for online courses. Arizona State, UCLA, [and] NY State are jumping in with workforce training.”*

A second effect of AI on executive education is its potential disruption of the business of traditional executive education programs. AI is facilitating sophisticated, digital delivery at scale. With these economies of scale, business schools are being able to deliver new learning opportunities. For example, AI is being used to provide feedback for online group work that could not be provided by human facilitation. A dean described how in executive education, his school is “creating data with automatic feedback to people on their group dynamics and group meeting mediation...It can see how the meeting is going and give feedback on the dynamics of the conversation. [We] may not need a

*human facilitator. Doing this at scale in distance learning [is] valuable.”*

Summarized by one interviewee, “You [can] reduce costs, increase impacts, and provide a better way.” When schools leverage their curriculum using AI and digital delivery mechanisms, the pricing models and value propositions are up for reconsideration.

## New Business Models / Lifelong Learning

Some business schools reported that they are developing their own capability to extend new, “after-market services.” Schools were reaching out to their alumni, customers, and potential employers to offer services such as assessing, coaching, mentoring,

recommending, making connections, and informing. As described by one business school, these integrated services of assessing needs and providing recommendations is a change in the perspective that education is episodic or periodic. *“The integrated systems will enable a more flow-based training.”*

One of the most ambitious programs we heard about was started two years ago and was conceived of to *“answer...some unmet needs from our students and especially our alumni, needs that without AI and big data would be impossible to address.”* The challenge revolves around how to keep alumni engaged with the school while giving them *“learning opportunities to...refresh their skills and achieve their career goals.”* The new business school’s outreach system was built using several partners, with Microsoft as the main contractor and other companies involved in building the user interfaces.

Having rolled it out with their own alumni, the school realized that their *“tool”* could *“improve our recruitment and marketing, so [we] are going to open it to everybody.”* As described, a person using the system *“takes...tests, has content recommended...and then our courses are recommended to increase the conversion rate between leads and enrolled students.”* Through their outreach platform, the business school provides subscribers with assessments, relevant material to study, and recommendations for further courses of study at the school and elsewhere.

Another interesting development was one interviewee’s description of their work to offer continuing business education with brick-and-mortar centers that are not tied to a university. As described by the founder, *“We are focusing on corporate learning [and] data science. We’re moving away from building out accredited universities [and] instead building lifelong learning centers where you enter at 18 and never leave.”* Taking advantage of faculty from established universities who are increasingly available as free agents, these locally based centers are expected to have the potential to meet geographically and culturally diverse needs. Digitally delivered content will greatly enhance the offering of these localized learning centers.

## 9 Conclusion

Coming to a conclusion about AI and its impact on business schools and business education would be premature. Just as the terminology is far from normalized and accurate, the innovations and adjustments to business school curricula, processes, and markets are a work in progress. If the goal of business education is to equip workforce leaders to master AI's opportunities and challenges, new linguistics, skills, technologies, strategies, ethics, and world views will have to be understood and embraced by existing management and cadres newly entering the workforce. However, the state-of-the-art AI that needs to be taught is itself just beginning to emerge: Industry practices and technological capabilities are far from established, the role of leaders is going to vary as widely as the industries they are in, and the ethics, laws, standards, and regulations have yet to be fully understood, much less codified. As a result, the traditional model of knowledge production will be playing catch-up for the foreseeable future.

What can be said from our investigation is that almost every business school we spoke with is responding to the AI challenge in some fashion, including experimenting with curricular changes and new process technologies, exploring cross-disciplinary collaborations, or even creating new schools or academic units. Some are leveraging work with the giants in the AI software industry. Others are partnering with new entrants into the education market and exploring new channels for marketing and distribution that leverage AI technology.

What can also be said is that we have only begun to see the potential, unforeseen, and unintended consequences as AI technologies are applied. In the countries where governments are making AI technology and its application a national priority, we may see remarkable progress. As platform providers use AI algorithms to market business schools' educational assets, the big may have a tendency to get bigger because recommendation algorithms are self-referential and may have an amplification effect. And in the domain of human/machine interplay, roles will be defined and redefined, mistakes will be made and remediated, new rules will be imposed and improved, and new

generations will find work and interactions with machines substantially new and different from those experienced by the generations who have gone before.

We look forward to learning more. One thing is certain: there is much that has not yet been imagined, more less tried.

# APPENDICES

Appendix I: Key Insights and Interpretations from the Authors.....	64
Appendix II: Research Methodology.....	69
Appendix III: What We Mean By AI.....	72
Appendix IV: List of Business Schools, Corporations, and Vendors Interviewed .....	76
Appendix V: Platforms, Tools, and Vendors .....	78
Appendix VI: Background Materials.....	86
Appendix VII: About the Authors and ALG.....	95

## Appendix I: Key Insights and Interpretations from the Authors

### **What does the growing global adoption of AI in industry mean for business schools?**

**The greatest threat to business schools from AI is to the relevance of the MBA.** Will MBAs educated today using methods, materials, and research from the past be employable for the jobs of the future? First, the traditional pace of knowledge creation cannot keep up with the rate of change AI is bringing to business. Business school curricula will soon be outdated and refreshing existing courses and creating new ones can be both time- and labor-intensive. Secondly, corporations and platform providers are working quickly to invent and adopt new AI technologies to both teach and validate skills acquisition with certificates and other digital credentials. As corporations become better able to provide their employees with targeted, relevant business topics at scale, the value proposition of the MBA comes into question. Rather than a robot professor disrupting the traditional MBA classroom, AI's greatest threat to business education is the widening disconnect between AI-enabled business practices, which require discrete, current, quantifiable skills, and the traditional curricula of business schools.

### **How does one manage humans and AI in this new world? What can the MBA and executive education provide?**

**A clear opportunity for business schools in an AI-enabled world is to teach the uniquely human skills that in-person MBA and executive education programs excel at providing.** Courses in ethics, data protection and security, distributed leadership, managing innovation, and AI governance, to name a few, will be highly desirable for learners and their employers. A critical new role in an AI-enabled future is the “*human in the machine*” people who can “check the math” of the AI algorithms to provide transparency on decisions, intervene against bias, guide insights, and use AI-generated information

ethically. Business schools are well-situated to provide research-based knowledge to MBA candidates and executives building new capabilities.

## Who will win the AI race?

**China will lead the way in personalizing education, followed by corporations.** In 2017, the Chinese government issued the New Generation Artificial Intelligence Plan and has committed tens of billions of dollars to pursuing global leadership in AI. China has a few key advantages over the US and Europe in becoming leaders in AI. Although all three regions have talent in the subject, only China has enormous, unfettered data stores on activity. Data privacy regulations are lax compared to Europe, the population is large, and it is possible to conduct a significant number of transactions online via mobile. In fact, the one education company we found that appears to be using AI to scale personalized instruction, Squirrel AI, is located in China.<sup>20</sup> Corporations are also putting tremendous resources into layering AI on top of the data they have on their own learners. Universities, however, face multiple barriers to creating truly personalized learning pathways, including: lack of data, data privacy issues, concerns about risks, lack of staff talent, unions, faculty resistance, and lack of institutional funding and/or commitment.

## What stands in the way?

**A universal problem of tackling AI is its fuzzy definition.** Artificial Intelligence is now an umbrella term which is used to refer to data science, machine learning, artificial narrow intelligence (smart speakers and self-driving cars), and artificial general intelligence (robot overlords, HAL, Skynet). In our research, we found many different approaches and few similar ones. Business schools are not all talking about the same topic. In fact,

---

<sup>20</sup> <https://www.technologyreview.com/s/614057/china-squirrel-has-started-a-grand-experiment-in-ai-education-it-could-reshape-how-the/>

some schools cannot even agree AI is an issue that needs attention, believing it is over-hyped. Much of the confusion and the hype around AI in the press and elsewhere is due to its broad definition, and this is slowing down adoption in some business schools.

## How are business schools using AI?

**Business schools are moving forward with small, dispersed experiments.** A handful of schools are building AI-enabled platforms to provide personalized, educational pathways for lifelong learning, to encourage course success for on-campus students, and to increase peer-to-peer interaction. However, most schools are experimenting on a lesser scale. We found multiple pilots using different technologies, such as RPA (Robotic Process Automation), chatbots, IBM Watson, and others. A few schools have created robust cross-collaborations with both corporations, such as Microsoft and IBM, as well as with other schools on campus, particularly engineering and computer science. Some schools are reaching across the university for support, and we found one instance of a multi-institution consortium focused on these issues.

## How can business schools take advantage of AI?

**AI provides the ability to improve the student experience, streamline operations, and develop efficiencies of scale.** AI technologies can make administration more efficient and improve student experience. Beginning with better identification of potential students, to the ability to create diverse and well-rounded classes, better academic and career advising, rapid feedback, and early identification of at-risk students, AI has the potential to improve the student experience while cutting operational costs. The in-classroom experience is unlikely to change very much, although AI can be deployed around the edges for tasks like grading, peer grouping, and low-level tutoring. It can also be deployed on top of pre-classroom, online modules.

**The future is augmented, not automated education.** Because AI is limited to performing specific tasks (albeit very quickly and across massive data sets), human intelligence,

particularly emotional and social intelligence, will be even more valuable than it is today. AI-augmented roles will require workers to have new and stronger skills in areas like ethics, leadership, emotional intelligence, and change management. Deeper technical knowledge and cross-disciplinary skills will also be required. Business schools will be changing curricula to develop these skills in their students. At the same time, some corporations and platform providers will be working to help employees develop these critical skills. Internally, both business schools and corporations will have to upgrade their own skills, leadership, and strategic investments.

## **AUTHORS' RECOMMENDATIONS**

- 1.** To survive and thrive in an AI-enabled world, business schools must be open to new methods of knowledge creation, e.g., collaborating with engineering school, having industry experts co-teach classes, and developing lectures on new and emerging topics before research has gone through the publication cycle. They should also be open to using learning analytics to create more personalized and effective learning experiences for students, which could enhance the value proposition of a business degree.
- 2.** School governance structures should be amended to allow for the hiring of talented staff, who should be granted the autonomy and authority to move quickly without being burdened by heavy faculty oversight. A business school's ability to respond to the rapidly changing external environment is often linked to the leadership role of the dean, but it also depends on the university administration enabling innovation, supporting experiments by faculty and staff, as well as building bridges across the university as a whole and between campuses.
- 3.** Schools should take AI technologies as seriously as the physical campus and make related investments. They must partner thoughtfully with technology partners to provide personalized learning experiences that extend marketing reach, support existing students, and offer alumni and others relevant lifelong learning. However, regardless of size, schools also need to use their own data to train AI to build

customized models for their own students. Platform providers warned us that the practice of schools buying AI “off the shelf” is dangerous.

- 4.** Be a leader in AI instead of a fast follower (or slow adopter). As platform providers use AI algorithms to market business schools’ educational assets, the big may have the tendency to get bigger because recommendation algorithms are self-referential and may have an amplification effect. Smaller, less well-known schools can still use AI to create engaging, augmented, and more personalized learning experiences for on-campus students as well as for lifelong learners.
- 5.** The challenges of AI are real, and it is critical for schools to address them rather than let them be a barrier to adoption. Developing a coalition of schools for shared governance is one promising option to explore. Faculty, talented staff, students, and experts should be empowered to work together to innovate, experiment, and develop school policies and solutions to address the concerns of ethics, privacy, quality of training data, transparency of algorithms, and data security to move into the future.

## Appendix II: Research Methodology

Our working hypothesis was that it is critical for business schools to understand the current landscape of AI, take account of the key players, and embrace ways that AI can influence and enhance the evolution of business education and lifelong learning. AI, as an accelerating and potentially disruptive phenomenon, is going to be an essential ingredient in a vibrant, global economy and personal and professional advancement in the future. We wanted to discover the degree to which business schools around the world are embracing, addressing, planning for, or waiting out the AI transformational potential in business education.

To get a multi-dimensional view of the changes being brought about by AI, we interviewed corporations, platform providers, and business schools. We sought out business schools from around the world that were willing to share their work with us and that were identified with working with AI curriculum and/or application. Our research interview guides, available upon request, were tailored to each group. They were generally designed to learn about the following dimensions:

- What opportunities does AI offer learners and employees in terms of identifying and consuming learning experiences?
- What impacts can AI have on business school processes, instruction methodologies, and curricula?
- How will AI-powered business school instruction differentiate itself from AI-powered corporate or platform-provider education?
- What is the state of the art in terms of implementing AI in learning systems today? What is planned for the next one to two years?
- How might management and executive education be enhanced by AI?
- What are the capabilities and goals of companies with AI-powered learning platforms, and how might these create either partnerships or competition with business schools?

- What strategic questions are business schools considering about the adoption and use of AI to support business education and lifelong learning?
- What are the near, medium, and long-term opportunities and threats to business schools and lifelong learning?

For this project we gathered the following:

**Background research** on academic and business press articles on AI in lifelong learning, artificial intelligence technological development, and AI's application to business education and research. This research mapped key areas that are currently being explored. It delved into research on the millennial and i-generations and the type of learning experiences they seek. The resulting bibliography of selected, representative sources is available in Appendix V of this report.

**An inventory of platform and tool vendors** in the learning space currently promoting their AI capabilities and/or being used by the interviewed business schools is included in Appendix IV.

**Interviews of leaders from three sources.** The list of interviewed organizations can be found in Appendix II. The interviewees came from four different groups:

- Academic deans or their designees knowledgeable about how AI is affecting their business schools. The deans primarily managed their degreed programs, executive education, or professional or lifelong education. A small number came from an engineering or computer science discipline.
- Business school and non-business school faculty teaching and doing research in the areas of AI's applications in industry and learning.
- Senior-level corporate learning experts responsible for AI-related initiatives in development and learning in their company.
- Founders or engineering leaders in platform companies, responsible for AI development and educational offerings delivered to their markets.

A total of forty-three interviews were conducted by videoconference or phone. These interviews included:

- eight platform providers/vendors of AI-facilitated business education;
- six regional and global companies from different industries and deeply committed to employee development and education; and
- twenty-nine deans, faculty and other academic leaders representing twenty-nine academic institutions globally.

The geographic distribution of the universities represented in the interviews is as follows:

Africa	MENA	Europe	N. America	Asia	Oceania	Latin America
2	3	5	11	3	2	3

Notes were taken by hand to enable the inclusion of anonymous, verbatim quotes in the report itself.

Our report is written to capture the essence of what we heard from the people we interviewed. As a qualitative study of AI and the state of its influence on business and management education, our report is designed to raise questions, not provide answers or roadmaps.

## Appendix III: What We Mean By AI

Today, “artificial intelligence” is an umbrella term used to refer to data science, machine learning, and artificial intelligence. For simplicity, we use AI to refer to all three throughout this report. However, much of the confusion and the hype around AI is due to its broad definition. Therefore, we will define these separate components for reference.

---

*“There is a lot of excitement but also a lot of unnecessary hype about AI. One of the reasons for this is because AI is actually two separate ideas.” -  
Andrew Ng<sup>21</sup>*

---

**Artificial Intelligence:** Artificial intelligence is a branch of computer science that focuses on programming computers to simulate human recognition and reasoning. Within this discipline are two distinct ideas: artificial narrow intelligence and artificial general intelligence. Artificial narrow intelligence refers to a machine performing one task: recognizing text, language, or pictures, for example. Self-driving cars, Chatbots, medical imaging, and smart speakers are all examples of artificial narrow intelligence. Much of the progress in artificial intelligence over the last few years has been made in artificial narrow intelligence. On the other hand, artificial general intelligence is much rarer and is the type of artificial intelligence that is subject to hype. Artificial general intelligence is what most people think of when they think of AI, refers to a machine intelligence that is capable of complex reasoning, and is as smart or smarter than humans. Examples of artificial general intelligence are almost all fictional, and include Skynet, The Matrix, and Hal from *2001: A Space Odyssey*.

---

<sup>21</sup> <https://www.coursera.org/lecture/machine-learning/what-is-machine-learning-Ujm7v>

**Machine Learning:** Machine learning is “*the field of study that gives computers the ability to learn without being explicitly programmed.*”<sup>22</sup> In other words, machine learning enables the computer to write the rules to solve a problem rather than having a human do it. Machine learning works well when you have simple decisions and a lot of data. In fact, machine learning is only possible because of enormous advances in computing power and data. However, where that data comes from and how it is grouped and assembled plays a critical role in how effective and ethical your use of AI is.

**Data Science:** Data science is a multidisciplinary field that focuses on the process of drawing insights from data. This process can be performed by humans or machines or a combination thereof. The output of a data science project is often a summary of conclusions on which people can make decisions. Data science can be seen as a subset of AI, and AI can also be seen as a subset of data science. It may be most useful to look at data science as a subset of both machine learning and AI, with additional tools to help humans put insights in context.

**Neural Networks and Deep Learning:** Neural networks and deep learning can be used interchangeably. Both refer to a set of algorithms loosely structured to mimic neural systems (a.k.a. the human brain) that are designed to recognize relationships among data. “Neural networks” was the historical term; deep learning is a better “brand name” for the same activity and is now used more widely.

**Training Data:** The data used by an algorithm to learn. Training data is critical for both the accuracy and impartiality of AI. It can be difficult and time consuming to assemble a useful set of training data and doing so requires skill, judgement, and ethical talent. Training data is the usual source of biases which are then acted upon by AI. For example, assume you want to use AI to predict which of your MBA candidates is most likely to

---

<sup>22</sup> Credited to Arthur Samuel, 1959, quoted in *ibid*.

become CEO of a Fortune 500 company. You might decide to use a historical data set of all Fortune 500 CEOs of the last 50 years as your training data set. Your AI would look at that data and find that, among other characteristics, being white and male were more highly correlated with being a CEO than being a woman or a person of color. The AI has done nothing wrong; its findings accurately reflect the historic race and gender composition of Fortune 500 CEOs. But, if you used this same algorithm, trained on this data, to rank the candidacy of your MBA applicants based on their potential to become a wealthy CEO (and a high-value alumni donor), you would end up with a class of 93% white men, thereby perpetuating bias.

**Transparency/Black Box:** Unlike mathematicians, who show their reasoning process in proofs, AI algorithms present results without outlining steps taken to achieve them. This phenomenon is referred to as the “black box.” “Transparency” is the term used to describe the antithesis of the black box.

**Computing Power:** Computing power is based on the speed at which a processor can perform an operation. In the past, computing power has sometimes been confused with AI. For example, Deep Blue’s victory over Grandmaster Gary Kasparov was popularized as a triumph of AI but is now recognized as an example of computing power. Chess, which has long been considered a game of human intelligence, can be won by using brute force; that is, doing vast numbers of calculations very quickly. (Calculations do not equal intelligence, although they can be mistaken for it.) In contrast, AlphaGo used AI, particularly reinforcement learning and neural networks, to best the world’s most highly ranked GO player, Ke Jie. Shortly thereafter, AlphaGo Zero taught itself how to play Go and handily beat AlphaGo within a few hours. AlphaGo and AlphaGo Zero are examples of both machine learning and AI.

**Automation** of processes indicates that human decisions and/or actions are completely replaced by technology.

**Augmentation** is used to describe situations where technology is used to support and improve human contributions. This can include decision making, support for tasks, and other actions.

## Appendix IV: List of Business Schools, Corporations, and Vendors Interviewed

Business Schools		
	HEM Business School	Tecnológico de Monterrey, Egade Business school
African Leadership University	Imperial College London, Imperial College Business School	The British University in Dubai
American University of Beirut, Suliman S. Olayan School of Business	Michigan State University, Eli Broad College of Business	The Hong Kong University of Science and Technology
BI Norwegian Business School	Missouri University of Science and Technology, Department of Business and Information Technology (BIT)	The University of Melbourne, Melbourne Business School
Brigham Young University, Marriott School of Business	MIT Sloan School of Management	Universidad de Ingeniería y Tecnología (UTEC)
Chinese Academy of Sciences	Politecnico Di Milano Graduate School of Business (MIP)	University of Alberta
Cornell SC Johnson College of Business	Singapore Management University, School of Information Systems (SMU)	University of Arizona
Deakin University		University of California Berkeley, HAAS School of Business
Fundação Dom Cabral (FDC)		University of Illinois Springfield
Georgia Institute of Technology, Scheller College of Business	Skolkovo Institute of Science and Technology	

University of Pretoria,  
Gordon Institute of  
Business Science (GIBS)

University of  
Washington Bothell

Vlerick Business School

## Corporations

Coca-Cola Company

Discover Financial  
Services

EF Education First

Fiat Chrysler  
Automobiles

Lenovo

The Boeing Company

## Vendors

Automation Anywhere,  
Inc.

Coursera, Inc.

Degreed, Inc.

EdTech Foundry

Filtered Technologies

IBM/Watson

Skillsoft Limited

Squirrel AI Learning by  
Yixue Group

## Appendix V: Platforms, Tools, and Vendors

	Interviewed	Mentioned by Interviewees	
360AI for Education			As an early-stage startup, focuses on machine learning, automation and AI for companies. Provides automated software solutions to corporate clients and startups with the goal to deliver data insights and optimized enterprise management flow. <a href="http://360ai.net">http://360ai.net</a>
Area9 Lyceum			Provides personalized, adaptive learning approaches to replicate one-to-one interaction in a digital environment, at scale. Area9 Lyceum adapts content of publishers, educators, and corporations. <a href="https://area9lyceum.com">https://area9lyceum.com</a>
Authess			Provides its SaaS products to employers, educators, and OPM, training and assessment vendors, via subscription, to develop and deliver problem-based challenges and assessments at scale that require high-value, in-demand competencies. <a href="http://www.authess.com">http://www.authess.com</a>
Automation Anywhere	X		Provides platforms and services to automate processes and discover new automation ideas. Their mission is to automate business using their robotic process automation (RPA) platform. <a href="http://www.automationanywhere.com">http://www.automationanywhere.com</a>

AVADO		Provides professional learning for businesses and professionals, offering digital, online education. Previously Home Learning College, AVADO is part of Blenheim Chalcot in the UK. <a href="https://www.avadolearning.com">https://www.avadolearning.com</a>
Blue Canoe Learning		Offers speech-recognition and machine-learning technology to improve English pronunciation and business communication through mobile games and activities. <a href="https://bluecanoelearning.com">https://bluecanoelearning.com</a>
Brainier		Provides the Brainier LMS, a customizable, mobile compatible, cloud-based system. <a href="https://www.brainier.com">https://www.brainier.com</a>
BrandBot	X	Provides tools to manage customers and marketing functions, including automated and scheduled marketing. <a href="https://www.brandbot.com">https://www.brandbot.com</a>
Burning Glass		Is an analytics software company that provides real-time data on job growth, skills in demand, and labor market trends. <a href="https://www.burning-glass.com">https://www.burning-glass.com</a>
CampusNexus (from Campus Management)		Built on Azure Cloud, CampusNexus provides multiple tools to manage academic programs, automate business processes, get data-driven insight, align resources, and improve student engagement and outcomes. <a href="https://www.campusmanagement.com/products">https://www.campusmanagement.com/products</a>

Carnegie Learning			Provides curricula, textbooks, and math-learning software for grades 6–12 written and designed to align to a Common Core or Integrated pathway. Its software was created by researchers in artificial intelligence from Carnegie Mellon University, led by Herbert A. Simon. Founded 1997. <a href="https://www.carnegielearning.com">https://www.carnegielearning.com</a>
Claned			Provides a cloud-based learning platform using artificial intelligence and collaborative learning to build learner-centric online courses. <a href="https://claned.com">https://claned.com</a>
Cluelabs (maintained by eLearning Company, Inc.)			A cloud infrastructure for learning enablement, provides custom-tailored, leaning solutions to develop skill and knowledge in learners. <a href="https://cluelabs.com">https://cluelabs.com</a>
Coursera, Inc.	X	X	Offers flexible and affordable courses, certificates, and degrees online from world-class universities and companies. <a href="https://www.coursera.org">https://www.coursera.org</a>
Curata			Provides Curata’s <i>Content Curation Software</i> that enables content identification, curation, and sharing. <a href="http://www.curata.com">http://www.curata.com</a>
Deakin Genie	X	X	Deakin Genie provides a voice-controlled, smartphone app that is a digital assistant designed to assist students in their organization and studies. Developed at Deakin University. <a href="http://genie.deakin.edu.au">http://genie.deakin.edu.au</a>
Degreed	X		Provides a lifelong learning platform that individuals and organizations use to discover learning content, build skills, and certify their expertise. <a href="https://degreed.com">https://degreed.com</a>

Docebo			Provides automated and personalized learning experiences on its AI-powered, cloud-based, and mobile-ready Docebo Learning Platform. <a href="https://www.docebo.com">https://www.docebo.com</a>
Domoscio			Provides adaptive learning solutions using cognitive science, Big Data, and AI aimed to consolidate knowledge and improve learning outcomes. <a href="https://domoscio.com">https://domoscio.com</a>
EdCast			<b>Provides AI-Powered knowledge cloud management for</b> discovery and curation across all external and internal knowledge sources. Offerings include its Learning Experience Platform (LXP) and MyGuide. <a href="https://www.edcast.com">https://www.edcast.com</a>
EdTech Foundry	X	X	Makers of Differ, provides communication and collaboration software with chatbot teaching assistants. <a href="https://www.edtechfoundry.com">https://www.edtechfoundry.com</a>
EF Education First	X		Provides international education specializing in language training, educational travel, academic degree programs, and cultural exchange. <a href="https://www.ef.edu">https://www.ef.edu</a>
Eightfold			Provides a talent management platform that covers the lifecycle from talent acquisition and development. <a href="https://eightfold.ai">https://eightfold.ai</a>
eLogic			Provides platforms and problem-solving methods to the manufacturing industry that apply throughout a product lifecycle. <a href="https://elogic.com">https://elogic.com</a>
e-Portfolio		X	e-Portfolios web sites built to showcase academic, personal, and/or professional growth and achievements can be created using specialized ePortfolio software or generic applications for designing web sites.

FAIR (Facebook AI Research)			<p>Conducts and publishes research to understand and develop systems with human-level intelligence by advancing the longer-term academic problems surrounding AI.</p> <p><a href="https://research.fb.com/category/facebook-ai-research/">https://research.fb.com/category/facebook-ai-research/</a></p>
Filtered Technologies	X		<p>Provides a recommendation engine for adult education. Creators of Magpie, which augments human curation with algorithms to identify skills gaps and surface educational content to fill those gaps.</p> <p><a href="https://learn.filtered.com">https://learn.filtered.com</a></p>
Google AI		X	<p>Conducts research to advance field, applies AI to Google products and to new areas, and develops tools, many of which are open source, like TensorFlow.</p> <p><a href="https://ai.google">https://ai.google</a></p>
Grammarly			<p>Digital writing tool that uses natural language processing to improve grammar and writing.</p> <p><a href="https://www.grammarly.com">https://www.grammarly.com</a></p>
Hive Learning			<p>Offers content and group-collaboration system with analytics for personalized feeds.</p> <p><a href="https://www.hivelearning.com">https://www.hivelearning.com</a></p>
Hootsuite		X	<p>Provides social media management platform and tools.</p> <p><a href="https://hootsuite.com">https://hootsuite.com</a></p>
IBM/Watson	X	X	<p>Provides open, multi-cloud platform for AI lifecycle. Enables businesses and universities to make AI from scratch or buy pre-built enterprise apps.</p> <p><a href="https://www.ibm.com/watson">https://www.ibm.com/watson</a></p>

Learning Pool		Makers of Headstream LXP, provides a learning experience platform that uses AI to deliver personalized learning to employees based on internal company data. <a href="https://www.learningpool.com">https://www.learningpool.com</a>
Microsoft Azure	X	Provides full-service AI tools for businesses and universities in the cloud, including software as a service (SaaS), platform as a service (PaaS), and infrastructure as a service (IaaS), and supports many different programming languages, tools, and frameworks. <a href="https://azure.microsoft.com">https://azure.microsoft.com</a>
Miso		Robotic and AI learning platform for food service. "Flippy" the robot can grill burgers and cook fires alongside humans, or all by "himself." <a href="https://misorobotics.com">https://misorobotics.com</a>
Mursion		Focuses on building professional practice skills like leadership, counseling, etc., using virtual reality, AI, and live interactions. <a href="https://www.mursion.com">https://www.mursion.com</a>
Obie.AI		Offers AI-enabled knowledge system that surfaces internal knowledge by "reading" communication tools (Slack, email, etc.) to create more efficient knowledge workflows. <a href="https://obie.ai">https://obie.ai</a>
Packback	X	Provides an AI-supported online discussion platform for online and in-person courses. <a href="https://www.packback.co">https://www.packback.co</a>
Pluralsight		Online education platform focused on technical skills. <a href="https://learn.pluralsight.com">https://learn.pluralsight.com</a>
Pymetrics		Creates predictive algorithms for hiring based on training data from assessments given to existing employees. <a href="https://www.pymetrics.com">https://www.pymetrics.com</a>

Realizeit		Offers a course platform and services that allows instructors to build personalized, adaptive learning experiences for students. <a href="http://realizeitlearning.com">http://realizeitlearning.com</a>
Skillsoft Limited	X	Provides high-quality, innovative, cloud-based online learning and performance support resources. <a href="https://skillsoft.com">https://skillsoft.com</a>
SkyMind		Provides AI infrastructure for machine learning at scale. Offers Eclipse DeepLearning4j/SkyMind Platform, an open-source, deep-learning library for the JVM (Java Virtual Machine). <a href="https://skymind.ai">https://skymind.ai</a>
Squirrel AI Learning by Yixue Group	X	Provides personalized K–12 afterschool tutoring. Squirrel’s AI Learning platform specializes in supervised adaptive learning. <a href="http://squirrelai.com">http://squirrelai.com</a>
Turnitin		Provides instructors with tools to engage students in writing process, provide personalized feedback, and assess student progress. Internet-based, plagiarism detection software. <a href="https://turnitin.com">https://turnitin.com</a>
Voicea’s EVA	X	An Enterprise Voice Assistant that transcribes meetings and follows up on action items. Owned by Cisco. <a href="https://www.voicea.com">https://www.voicea.com</a>
Volley		A knowledge engine to generate, synthesize, and recommend personalized content for learning and knowledge management applications. <a href="https://volley.com">https://volley.com</a>
Whatsapp	X	A cross-platform messaging and Voice over IP service owned by Facebook. <a href="https://www.whatsapp.com">https://www.whatsapp.com</a>

Wildfire		Wildfire is an extension which allows you to record your actions on pages you visit and replay those actions using a simulator, producing a log that can be reviewed and edited using an editor. <a href="https://wildfire.ai">https://wildfire.ai</a>
X.AI	X	Free scheduling software that automates meeting scheduling and integrates existing calendars and makes appointments. <a href="https://x.ai">https://x.ai</a>
Zoomi		With more than 250 proprietary algorithms, Zoomi provides personalized learning, predicts learning and performance, optimizes learning content and links learning to business outcomes. <a href="https://zoomi.ai">https://zoomi.ai</a>

## Appendix VI: Background Materials

*2019 Global Human Capital Trends | Deloitte Insights.*

<https://www2.deloitte.com/insights/us/en/focus/human-capital-trends.html>.

AACSB Collective Vision for Business Education | AACSB Research Reports.

<https://www.aacsb.edu/vision>. Accessed 3 May 2019.

Adamopoulos, Alex. “Why AI Creates Jobs and New Work Opportunities.” *Forbes*.

<https://www.forbes.com/sites/forbesbostoncouncil/2018/11/20/why-ai-creates-jobs-and-new-work-opportunities/>. Accessed 3 May 2019.

Agrawal, Ajay, et al. *Managing the Machines: The Challenge Ahead*.

<https://hbr.org/product/managing-the-machines-the-challenge-ahead/ROT333-PDF-ENG>. Accessed 3 May 2019.

*AI, Automation, and the Future of Work: Ten Things to Solve for (Tech4Good)*. McKinsey Global Institute, June 2018. <https://www.mckinsey.com/featured-insights/future-of-work/ai-automation-and-the-future-of-work-ten-things-to-solve-for>.

“AI in Corporate Learning and Development: It’s Here.” *Training Industry*.

<https://trainingindustry.com/articles/learning-technologies/ai-in-corporate-learning-and-development-its-here/>. Accessed 3 May 2019.

“AI Trends In 2019.” *CB Insights Research*.

<https://www.cbinsights.com/research/report/ai-trends-2019/>. Accessed 3 May 2019.

*Artificial Intelligence | AACSB Research Reports on Business Education*.

<https://www.aacsb.edu/publications/researchreports/artificialintelligence>. Accessed 3 May 2019.

Artificial Intelligence Index. *2018 Annual Report*. <https://aiindex.org>. Accessed 3 May 2019.

BasuMallick, Chiradeep. *3 Incredible Ways AI Will Transform Learning and Development*. <https://www.hrtechnologist.com/articles/learning-development/3-ways-ai-will-transform-learning-and-development/>. Accessed 3 May 2019.

Bernstein, Amy. “Globalization, Robots, and the Future of Work: An Interview with Jeffrey Joerres.” *Harvard Business Review*, Oct. 2016. <https://hbr.org/2016/10/globalization-robots-and-the-future-of-work>.

Bersin, Josh. *A New Paradigm for Corporate Training: Learning in The Flow of Work*, 3 June 2018. <https://joshbersin.com/2018/06/a-new-paradigm-for-corporate-training-learning-in-the-flow-of-work/>.

Burt, Ronald S. and Ronchi, Don. “Teaching Executives to See Social Capital: Results from a Field Experiment.” *Social Science Research*, vol. 36, no. 3, Sept. 2007, pp. 1156–83. *ScienceDirect*. doi:10.1016/j.ssresearch.2006.09.005.

Canonico, Massimo. *Emerging Trends: L&D and the Arrival of AI*. Docebo, 2017. <https://www.docebo.com/resource/emerging-trends-ai-ld/>.

Carnahan, Ann Claire. *The Future of Work. Why Better Education Doesn't Necessarily Translate into Better Work*. <https://www.usnews.com/news/the-report/articles/2018-12-28/the-eroding-middle-work-in-the-us-heading-toward-high-and-low-skill>. Accessed 3 May 2019.

Chatlani, Shalina. “Is AI Disrupting Higher Education?” *Education Dive*, 19 June 2018. <https://www.educationdive.com/news/is-ai-disrupting-higher-education/525130/>.

Chowdhry, Amit. “Artificial Intelligence to Create 58 Million New Jobs by 2022, Says Report.” *Forbes*. <https://www.forbes.com/sites/amitchowdhry/2018/09/18/artificial-intelligence-to-create-58-million-new-jobs-by-2022-says-report/>. Accessed 3 May 2019.

Cross, Thomas B. “Accelerating Artificial Intelligence in a Center of Excellence and Corporate University.” *Technology Rocket*, 4 Feb. 2019.

<https://telecomreseller.com/2019/02/04/accelerating-artificial-intelligence-in-a-center-of-excellence-and-corporate-university/>.

Daugherty, Paul R. and Wilson, H. James. *Human + Machine: Reimagining Work in the Age of AI*. Harvard Business Review Press, 2018.

Executive Core LLC. *Future Trends in Business Education*. AACSB, EMBAC, UNICON Research Report, 2016. [https://www.uniconexed.org/wp-content/uploads/2017/01/Future\\_Trends-Revised\\_Final\\_Report\\_Executive\\_Core-August-Jan.12.2016-v2.pdf](https://www.uniconexed.org/wp-content/uploads/2017/01/Future_Trends-Revised_Final_Report_Executive_Core-August-Jan.12.2016-v2.pdf).

*From Machine Learning to Machine Teaching*. Machine Learning Innovation Summit 2019, San Francisco, CA. <https://analyticsevent.com/mlsummit2019>.

“Gartner Survey Shows 37 Percent of Organizations Have Implemented AI in Some Form.” *Gartner*. <https://www.gartner.com/en/newsroom/press-releases/2019-01-21-gartner-survey-shows-37-percent-of-organizations-have>. Accessed 3 May 2019.

*Gen Z: The Future Has Arrived*. <https://www.delltechnologies.com/en-us/perspectives/gen-z.htm>. Accessed 3 May 2019.

“Global Skills Index (GSI) | Coursera.” *Global Skills Index*. <https://www.coursera.org/gsi>. Accessed 3 May 2019.

Goldfarb, Avi, Agrawal, Ajay and Gans, Joshua S. “What to Expect from Artificial Intelligence.” *MIT Sloan Management Review*. <https://sloanreview.mit.edu/article/what-to-expect-from-artificial-intelligence/>. Accessed 3 May 2019.

Grand-Clement, Sarah et al. *Digital Learning. Education and Skills in the Digital Age*. 2017. [https://www.rand.org/pubs/conf\\_proceedings/CF369.html](https://www.rand.org/pubs/conf_proceedings/CF369.html).

Hao, Karen. “We Analyzed 16,625 Papers to Figure out Where AI Is Headed Next.” *MIT Technology Review*, 25 Jan. 2019. <https://www.technologyreview.com/s/612768/we-analyzed-16625-papers-to-figure-out-where-ai-is-headed-next/>.

Horn, Michael. “Taming the Wild West of Digital Badges and Credentials.” *Forbes*, 12 Oct. 2017. <https://www.forbes.com/sites/michaelhorn/2017/10/12/taming-the-wild-west-of-digital-badges-and-credentials/>.

“How Executive Education Is Changing.” *Training Industry*.  
<https://trainingindustry.com/articles/leadership/how-executive-education-is-changing/>.  
Accessed 3 May 2019.

Kaplan, Andreas M. and Haenlein, Michael. “Higher Education and the Digital Revolution: About MOOCs, SPOCs, Social Media, and the Cookie Monster.” *Business Horizons*, vol. 59, no. 4, July 2016, pp. 441–50. *ScienceDirect*.  
doi:10.1016/j.bushor.2016.03.008.

Klutka, Justin et al. *Artificial Intelligence in Higher Education*. The Learning House, Inc., Nov. 2018. <https://www.learninghouse.com/knowledge-center/research-reports/artificial-intelligence-in-higher-education/>.

Knight, Will. “About 40% of Europe’s ‘AI Companies’ Don’t Use Any AI at All.” *MIT Technology Review*, 5 Mar. 2019. <https://www.technologyreview.com/f/613078/about-40-of-europes-ai-companies-dont-actually-use-any-ai-at-all/>.

Kolbjørnsrud, Vegard et al. “How Artificial Intelligence Will Redefine Management.” *Harvard Business Review*, Nov. 2016. <https://hbr.org/2016/11/how-artificial-intelligence-will-redefine-management>.

Lamson, Melissa. “The Role of AI in Learning and Development.” *Inc.Com*, 22 Feb. 2018. <https://www.inc.com/melissa-lamson/the-role-of-ai-in-learning-development.html>.

Lee, Kai-Fu. *AI Superpowers: China, Silicon Valley, and the New World Order*. Houghton Mifflin Harcourt, 2018.

*Lifelong Learning and Talent Management | AACSB Research Reports on Business Education*. 2018. <https://www.aacsb.edu/publications/researchreports/lifelong-learning-and-talent-management>.

Lyons, Richard K. “Economics of the Ed Tech Revolution.” *California Management Review*, vol. 59, no. 4, Aug. 2017, pp. 49–55. *SAGE Journals*.  
doi:10.1177/0008125617717708.

Marr, Bernard. “5 Important Augmented and Virtual Reality Trends for 2019 Everyone Should Read.” *Forbes*. <https://www.forbes.com/sites/bernardmarr/2019/01/14/5-important-augmented-and-virtual-reality-trends-for-2019-everyone-should-read/>. Accessed 3 May 2019.

McMurtrie, Beth. “How Artificial Intelligence Is Changing Teaching.” *The Chronicle of Higher Education*, Aug. 2018. <https://www.chronicle.com/article/How-Artificial-Intelligence-Is/244231>.

*Mobile and Micro-Learning | AACSB Research Reports on Business Education*.  
<https://www.aacsb.edu/publications/researchreports/mobile-and-micro-learning>.  
Accessed 3 May 2019.

Morini-Bianzino, Nicola, Wilson, H. James and Daugherty, Paul R. “The Jobs That Artificial Intelligence Will Create.” *MIT Sloan Management Review*.  
<https://sloanreview.mit.edu/article/will-ai-create-as-many-jobs-as-it-eliminates/>.  
Accessed 3 May 2019.

NASA. *The Future of Work Framework*.  
<https://blogs.nasa.gov/futureofwork/2018/11/15/the-future-of-work-framework/>.  
Accessed 3 May 2019.

Ng, Andrew. “What Artificial Intelligence Can and Can’t Do Right Now.” *Harvard Business Review*, Nov. 2016. <https://hbr.org/2016/11/what-artificial-intelligence-can-and-cant-do-right-now>.

Perea, Brenda. *Employment & Digital Credentials: The Colorado Success Story Part 2*.  
[https://resources.credly.com/blog/post/digital\\_credentials\\_cccs\\_pt\\_2](https://resources.credly.com/blog/post/digital_credentials_cccs_pt_2). Accessed 3 May 2019.

---. *Employment and Digital Credentials: The Colorado Success Story Part 1*. Credley. [https://resources.credly.com/blog/post/digital\\_credentials\\_cccs\\_pt1](https://resources.credly.com/blog/post/digital_credentials_cccs_pt1). Accessed 3 May 2019.

Power, Brad. *Artificial Intelligence Is Almost Ready for Business*. Mar. 2015, <https://hbr.org/product/artificial-intelligence-is-almost-ready-for-business/H01Y7D-PDF-ENG>.

Pulcrano, Jim. *Serving the Future Needs of Business in Management Development and Retention*. AACSB, EMBAC, UNICON Research Report, Oct. 2013. [https://www.uniconexed.org/wp-content/uploads/2016/04/AACSB\\_EMBAC\\_UNICON\\_October\\_2013\\_Pulcrano.pdf](https://www.uniconexed.org/wp-content/uploads/2016/04/AACSB_EMBAC_UNICON_October_2013_Pulcrano.pdf)

Puthiyamadam, Tom. “How the Meaning of Digital Transformation Has Evolved.” *Harvard Business Review*, May 2017. <https://hbr.org/2017/05/how-the-meaning-of-digital-transformation-has-evolved>.

Sharma, Gireesh. “Artificial Intelligence in ELearning Delivered: 10 Companies That Can Transform the Learning Management with AI.” *E-Learning Carnival*, 2 Mar. 2018. <https://elearningcarnival.com/2018/03/03/artificial-intelligence-in-elearning-delivered-10-companies-that-can-transform-the-learning-management-with-ai/>.

Shifting the Up-Skilling Paradigm: Digital Badges Help IBM Create A Diverse, Inclusive Workforce. Credley. <https://resources.credly.com/resources/case-study-ibm>. Accessed 3 May 2019.

Singer, Frederick. *Will Higher Ed Keep AI in Check?* 16 Jan. 2019. <https://www.insidehighered.com/digital-learning/views/2019/01/16/its-higher-education-keep-ai-check-opinion>.

Smith, Shelley. *Get Ready for Culture Revolution from Artificial Intelligence | CustomerThink*. <https://customerthink.com/get-ready-for-culture-revolution-from-artificial-intelligence/>. Accessed 3 May 2019.

*Study Shows Business Schools Must Adapt for Digital Generation* | AACSB International. <https://www.aacsb.edu/newsroom/2018/3/study-shows-business-schools-must-adapt-for-digital-generation>. Accessed 3 May 2019.

*Technology, Jobs, and the Future of Work*. McKinsey Global Institute, May 2017. <https://www.mckinsey.com/featured-insights/employment-and-growth/technology-jobs-and-the-future-of-work>.

“The 2019 L&D Global Sentiment Survey.” *Donald H Taylor*, 28 Feb. 2019. <http://donaldhtaylor.co.uk/report19/>.

“The AI 100: Artificial Intelligence Startups That You Better Know.” *CB Insights Research*, 6 Feb. 2019. <https://www.cbinsights.com/research/artificial-intelligence-top-startups/>.

“The Future of Jobs Report 2018.” *World Economic Forum*. <https://www.weforum.org/reports/the-future-of-jobs-report-2018/>. Accessed 3 May 2019.

“The Impact of AI on Learning and Development.” *Training Industry*. <https://trainingindustry.com/articles/learning-technologies/the-impact-of-ai-on-learning-and-development/>. Accessed 3 May 2019.

*To Empower Learning Over a Lifetime. How Academia and Businesses Can Instill a Culture of Learning for Organizational Success*. AACSB Research Report on Business Education, 2018. <https://www.aacsb.edu/publications/researchreports/chief-learning-officer>.

“Trends 2018: Speed Is the Heart of the Learner Experience.” *Training Industry*. <https://trainingindustry.com/magazine/nov-dec-2017/trends-2018-speed-is-the-heart-of-the-learner-experience/>. Accessed 3 May 2019.

“Trends 2019: Adapting the Training Function to the Complexity of Today’s Business Environment.” *Training Industry*. <https://trainingindustry.com/magazine/nov-dec->

[2018/trends-2019-adapting-the-training-function-to-the-complexity-of-todays-business-environment/](#). Accessed 3 May 2019.

Trumbore, Anne. “Micro-Credentials Give College Students More Bang for Their Buck.” *The Hill*, 24 Aug. 2018. <https://thehill.com/opinion/education/403462-micro-credentials-give-college-students-more-bang-for-their-buck>.

---. “The Business Case for Business Schools in the Year 2039.” *AACSB Blog*, 6 Mar. 2019. <https://www.aacsb.edu/blog/2019/march/the-business-case-for-business-schools-in-2039>.

“Understanding the Implications of the Digital Generation on Business Education. Phase 3: Attitudes and Usage Study.” *AACSB Research Reports*, 2017. <https://www.aacsb.edu/publications/researchreports/digitalgeneration>.

U.S. Department of Education, Office of Educational Technology. *Enhancing Teaching and Learning Through Educational Data Mining and Learning Analytics: An Issue Brief*. 2018. <https://tech.ed.gov/learning-analytics/>  
<https://eduq.info/xmlui/handle/11515/35829>.

Vermeulen, Freek. “What So Many Strategists Get Wrong About Digital Disruption.” *Harvard Business Review*, Jan. 2017. <https://hbr.org/2017/01/what-so-many-strategists-get-wrong-about-digital-disruption>.

Viberg, Olga et al. “The Current Landscape of Learning Analytics in Higher Education.” *Computers in Human Behavior*, vol. 89, Dec. 2018, pp. 98–110. *ScienceDirect*. doi:10.1016/j.chb.2018.07.027.

Vincent, James. “Tencent Says There Are Only 300,000 AI Engineers Worldwide, but Millions Are Needed.” *The Verge*, 5 Dec. 2017. <https://www.theverge.com/2017/12/5/16737224/global-ai-talent-shortfall-tencent-report>.

*Virtual and Augmented Reality* | AACSB Research Reports on Business Education.  
<https://www.aacsb.edu/publications/researchreports/virtual-and-augmented-reality>.  
Accessed 3 May 2019.

*Why Talent Development Shouldn't Fear AI*. <https://www.td.org/insights/why-talent-development-shouldnt-fear-ai>. Accessed 3 May 2019.

Zeebroeck, Nicolas van and Bughin, Jacques. "The Best Response to Digital Disruption." *MIT Sloan Management Review*, Summer 2017. <https://sloanreview.mit.edu/article/the-right-response-to-digital-disruption/>.

## Appendix VII: About the Authors and ALG

**Jennifer K. (Jenny) Stine, Ph.D.** is an independent consultant, teacher, and innovator. She is the co-founder of the Academic Leadership Group and an expert in the development of executive and professional programs, with over a decade of leadership experience at Harvard and MIT. Her current focus is developing university-corporate partnerships that lead to innovative, co-created educational experiences, including work with Accenture in this area. She conducts research in executive and professional education, and she is an instructor at Harvard Extension School, where she teaches organizational behavior, leadership, and teamwork. She is currently working on a book for corporate learning professionals on how to work with universities.

**Anne Trumbore** is the director of high-visibility change initiatives at the intersection of education, industry, and technology. Anne established and currently leads Wharton Online, a strategic, revenue-producing, digital learning initiative. She collaborates with online initiatives across the University of Pennsylvania to create best practices in design, implementation, business models, and platform relationships. As an early-stage employee at Coursera, NovoEd, and Stanford's Online High School, Anne helped pioneer new forms of student-centered online education in collaboration with high-profile universities, world-renowned faculty, and technology leaders. She analyzes and reports on data regarding learning in online environments and conducts research to identify effective teaching practices. She is currently a doctoral candidate at Penn GSE, where her research focuses on learning in MOOCs and the links to career advancement.

**Toby Woll** gained her expertise in executive and business education as a Director of Executive Education at the MIT Sloan School of Management, where she led significant custom executive education engagement teams serving large custom clients. At MIT, her focus was on how action learning and technology could be used to deliver and enhance the educational experience both on and off campus. Prior to that role, she served as the Sloan Director of Learning Technology Initiatives, developing a number of innovative digital educational products and participating in the MIT strategic task force that

developed the proposal for OpenCourseWare at MIT. Woll was previously the Director of the Sloan Fellows Program at the Sloan School of Management, and Executive Director of the Center for Quality of Management, an international consortium of companies and universities working together to study and implement management systems. She has co-authored numerous reports on executive and professional education.

**Heber Sambucetti** is responsible for the Next Horizon Talent team, which is focused on spotting the next new skills for Accenture's people, reliably measuring specialization in those skills, and pivoting its people to the new. This team includes Talent Intelligence, Certifications, Newskilling, and Accenture's emerging architecture and culture focus on Just-in-Time Skilling. Prior to this role, Heber led the Learning & Talent Development needs for Accenture's Technology & Operations business. During his almost 20 years of global experience, he had led the design and implementation of some of Accenture's most complex Learning & Talent Development strategies. These programs have addressed the need for developing global organization capability, driving Accenture cultural change, improving employee engagement and retention, and enhancing career development.

### **About the Academic Leadership Group (ALG)**

The Academic Leadership Group (ALG) was founded in 2019 by Jennifer K. Stine Ph.D. and Julie Wilson Ed.M. to provide consulting, coaching, and research services that enable higher education leaders and institutions to excel in today's challenging environment. ALG also provides services and programs to companies that are looking to engage with universities, or that are looking for research-based approaches to their organizational challenges. ALG builds directly on the founders' experience of more than 15 years as independent consultants and similar experience in administrative leadership roles at both Harvard and MIT. For more information see:

<https://www.academicleadershipgroup.com/>