

EDUCAUSE Annual Conference 2019  
Visits to University of Chicago,  
Northwestern University  
& Concordia University  
French Delegation report

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## Foreword

For the seventh consecutive year, a French delegation was formed to participate to the EDUCAUSE Annual Conference. Since 2013, this initiative has been structured around complementary profiles from the digital world of the French Higher Education, all of them being keen to open up to the international arena in order to find sources of inspiration and points of comparison, but also to highlight remarkable achievements. From an initial philosophy of simple attendance, which prevailed during the first years of this delegation, we have gradually moved to a resolutely more active approach, at various levels.

The members of the Delegation steering committee actively participate to the life of EDUCAUSE :

- The delegation communicated from 2012 to 2019 in the framework of the Annual Conference (six sessions and five posters) and the ELI conference<sup>1</sup> (three sessions).
- Three members are part of the proposal reviewers since 2015 to evaluate papers submitted to the Annual Conferences and ELI.
- One member was selected on behalf of CSIESR on the 2019 program committee.
- Since 2018, two members have been part of the panel of experts selected for the drafting of the EDUCAUSE Horizon Report<sup>2</sup>.
- Two members participate to EDUCAUSE working groups, the Learning Space Community Group, the Blended and Online Learning Community Group and the Extended Reality XR Community Group.
- Two members under CSIESR and EUNIS work in the CHEITA group which is an informal federation of sister EDUCAUSE associations around the world (Europe, Australia, France, Japan, New Zealand, United Kingdom, Netherlands).
- Two members under CSIESR and EUNIS worked for the EDUCAUSE International Task Force which met in webconference from January to October 2019 to produce a recommendations document on EDUCAUSE's international actions.

The recognition of these different levels of involvement has enabled us to forge privileged links with EDUCAUSE, and in particular its executive members (President, Vice-Presidents and Directors), and more generally within the North American University community, with whom some formal collaborations have already been established over the years. These links contribute to the achievement of our fundamental objectives: to exchange, raise awareness, inform and share in order to support the development of digital technology in French Higher Education.

Our traditional restitution is a concrete expression of this desire, and has become a major annual event that we know being appreciated. The accompanying report, for its part, is becoming increasingly widely distributed, and is based in particular on the present English translation which we quickly took note of. Outside Europe, it is expected and read every year in the United States, Canada, Japan, Singapore, Australia and New Zealand. This new edition of our report follows on from the restitution held in Paris on 12 February 2020 in the premises of the AMUE. It covers the usual three university visits (University of Chicago, Northwestern University in Chicago, and Concordia University in Montreal), and the various workshops attended at the EDUCAUSE Conference itself. It can also be supplemented by the various tweets posted by the delegation under the hashtag #EDU19fr.

We wish you a pleasant and informative reading.

The EDUCAUSE French Delegation steering committee members  
John Augeri, Yves Epelboin, Laurent Flory, Thierry Koscielniak, Dominique Verez

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<sup>1</sup> EDUCAUSE Learning Initiative

<sup>2</sup> <https://library.educause.edu/resources/2019/4/2019-horizon-report>

# French Delegation 2019



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# Introduction & Trends in the USA Higher Education Ecosystem, from a French perspective

Laurent Flory

The EDUCAUSE annual conference and the related visits to higher education (HE) establishments are a privileged time for the French delegation. They allow detecting, in advance, the emergence or disappearance of trends (sometimes buzz-Word) in the digital landscape for North American higher education. They are also opportunities to take the pulse of American society and its changes since HE is always linked to its socio-political environment.

The United States of 2019 appears as a deeply divided society with a focus on Trump administration's policies, mostly criticized by the higher education and research community, yet objectively supported by a huge portion of the population, mainly the one that is culturally more distant from HE. The model of the political consensus no longer exists in the USA, and the President is no longer the unifier that his predecessors were / tried to be. Some states (often coastal and with megalopolises that are highly open to the international scene) are in almost "open battle" with the federal administration. Legal battles over IT security, Internet neutrality, student loan financing, and accessibility of content continue between the two chambers and the electoral calendar tends to freeze everything. The HE considers itself to be "unloved" and badly treated by this administration.

Let's underline that from an Educause point of view. 2019 seems to be the inflection point, with the end of a model announced several years ago. Without being in a situation of bubble explosion with all its excesses, it is a structural crisis of inadequacy between the offer of education, that is too high, compared to a decreasing demand. The conjunction of demographics, the reduction in the flow of international students, and a crisis of motivations (resulting from the exorbitant cost of access to the HE combined with the major issue of student debt) altogether shrink the demand for HE.

Indeed, more than ever before, demographics and politics are jointly playing against demand. In the summer of 2019, the number of secondary school students enrolled in HE decreased by 1.7%, representing 300,000 fewer students than in 2018. This phenomenon has been combined with the hardening of the Trump administration's policy related to the admission of foreigners<sup>3</sup>, thus reducing the flow of international students. Between 2017 and 2019, visa problems rose from 68% to 87% of the reasons given to justify the dropping of applications<sup>4</sup>. At the same time, difficulties in securing post-graduation employment in the USA increased from 41% to 50% of the reasons for dropping out. As a result, foreign student enrolments in the US, after decades of increases, have fallen sharply and abruptly. They plunged from -3.3% in 2016 at the time of Trump's election to -6.6% in 2017 when the new administration took office. The situation appears to be "stabilizing" around an annual decline of 0.9% in both 2018 and 2019. Nevertheless, the substantial financial resources<sup>5</sup> that international students provided to the institutions are shrinking. Over the next ten years, the number of students in small institutions (the last third of institutions), most often "local" institutions, is expected to drop by 11%<sup>6</sup>.

At the level of American society, the gaps between citizens continue to widen at all levels. The unemployment rate is at an all-time low, but the poorest populations are not benefiting as much from the growth as the upper

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<sup>3</sup> With, among other things, country-specific restrictions, stricter conditions for obtaining a study or work visa after studying in the USA, but also Presidential Decree 13769, known as Muslim Ban, which is the first of its kind in the United States.

<sup>4</sup> <http://tiny.cc/ct2ejz> page #6

<sup>5</sup> International students are commonly charged more than local state students and to whom many introductory and language courses are sold in addition to their already higher tuition fees.

<sup>6</sup> <https://bit.ly/2Uc8MPd> while leading institutions are expected to see a 14%. Increased in enrollment requests

classes. Access to health care remains a major concern, and the dismantling of Obama Care<sup>7</sup> undermines the foundations of universal health protection. Life expectancy in the USA has been stagnating since 2010. It has even decreased for men since 2014, while it increased by one year between 2010 and 2016 in Canada and OECD<sup>8</sup> countries. Ghettoization and communitarianism are growing, and the Whites who will become a minority around 2050<sup>9</sup> have begun to turn increasingly conservative and on the defensive, as illustrated by the resurgence of suprematism, especially among the WASPs<sup>10</sup>. In the HE, too, these divisions between ethnic groups can be found. 65.8%<sup>11</sup> of Whites over 25 years old have studied or graduated in HE compared to 39.5% of Hispanics. As a parallel to this increasingly divided society, the gap between HE institutions is also widening. The Ivy League and its 8 East Coast institutions, among the oldest and most prestigious, the top 10 (known as the big 10) and the top 100 represent a tiny fraction of the 5,300 North American HE institutions<sup>12</sup>. While some elitist institutions<sup>13</sup> annual tuition fees have reached the \$100,000 mark and continue to have more applicants than seats offered, others, often in the bottom third, are forced to merge (or close)<sup>14</sup> due to a lack of students and financial resources. For the former, 2019 remains a "business as usual" year, where the best teachers, researchers and students are gathered. They can therefore undoubtedly continue to offer an outstanding environment, high-quality research and teaching, and finance the continued growth in operating costs through regular increases in tuition fees. Visits to the Universities of Chicago and Northwestern in the USA and Concordia in Canada illustrate this growth in investment to make the courses more participatory, whether in terms of software or technical equipment. On the other side of the scale, small institutions (often private and not-for-profit) are struggling with demographics, student debt, and declining enrolment of international students that challenge their business model.

Given this crisis of inadequacy between supply and demand, the time has come for consolidation with its load of mergers or closures<sup>15</sup>. According to estimations, between 25%<sup>16</sup> and 50%<sup>17</sup> of HE institutions may close within the next 10 to 20 years.

It is hence a race for differentiation and niche market that is taking shape. The surprising 2019 focus on e-sport, not only in the sessions but also at the exhibition illustrates this search for differentiation, attractiveness, and visibility. League of legend, Starcraft, Dota and other MMOBA<sup>18</sup> tournaments are showcased as alternative ways to develop soft skills (communication, strategy development, ability to collaborate, agility, team leadership, all under stress and cognitive workload ...) but also as a mean to position institutions on an upcoming market (following the example of South Korea). The objective is crystal clear: to become, like football or basketball, a coming driver of attractiveness and visibility. The 2019 League of Legend World Championship gathered at its peak 44 million simultaneous viewers, compared to an average of 5 million viewers per American college football match, for a cumulative annual total of 90 million "unique" viewers<sup>19</sup> for the 2018-2019 season. In addition to this attempt to push e-sport forward, another target is already identified: the 35 million Americans who do not have full degrees but do have credits from previous studies. They could represent a way of containing the decline of enrolments. It now remains to identify the tools and the methods to persuade this potential audience to return to HE and to build the economic model financially profitable both for this target and for institutions.

The IT teams are being called on to help address these new challenges. EDUCAUSE suggests to structure them in four main issues: student success, financial health, reputation and relevance, and external competition.

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<sup>7</sup> Officially named affordable Care Act

<sup>8</sup> <https://www.cairn.info/revue-population-et-societes-2019-9-page-1.htm>

<sup>9</sup> [http://www.axl.cefan.ulaval.ca/ammord/usa\\_6-7histoire.htm](http://www.axl.cefan.ulaval.ca/ammord/usa_6-7histoire.htm) section 1.1

<sup>10</sup> White Anglo Saxon Protestant: population from the first waves of settlement and immigration, that culturally forged the political and economic cultural models and references of the United States.

<sup>11</sup> <https://bit.ly/2OeFBas>

<sup>12</sup> <https://bit.ly/2tdHkFC> vs 3500 for France with yet a population 4.6 times lower

<sup>13</sup> <http://tiny.cc/nr2ejz>

<sup>14</sup> Mainly among small private institutions with fewer than 1,000 students

<sup>15</sup> <https://bit.ly/2RK7DNh>

<sup>16</sup> <https://cbsn.ws/37HZiw>

<sup>17</sup> <https://cnb.cx/38VXBym>

<sup>18</sup> Massively Multiplayer Online Battle Arena

<sup>19</sup> [https://footballfoundation.org/news/2019/6/11/2018-19\\_Attendance\\_Release.aspx](https://footballfoundation.org/news/2019/6/11/2018-19_Attendance_Release.aspx)

The IT departments are being called on to help address those challenges. EDUCAUSE is proposing to structure them into four areas: student success, financial health, reputation and relevance, and external competition.

Student success must be seen in its broadest spectrum, and over the entire life cycle of students, from enrolment to alumni, their placement and the assistance deployed to assist them. The financial challenges in this context of a supply crisis and the shutdown/merger of institutions are likely to be the most sensitive point. In the HE industry that used to believe that the growth of the last decades had no limits, how to keep on offering more and more services to students and staff, but still controlling budgets? At a time when students' ability to finance their studies is more limited than ever, when their enrollment is declining and when public funding continue to decrease, the solution can no longer be to increase budgets. The questions of brand and reputation are then one of the paths to differentiation. Inclusion concern is a good illustration of this approach<sup>20</sup>, underlined by Educause Diversity, Equality and Inclusion commitment<sup>21</sup>.

It is a full paradigm shift that all potentially at risk institutions must make. Facing this coming crisis, unprecedented in its history, which will affect a whole part of the North American HE ecosystem, digital transformation<sup>22</sup> is at the key element to drive the necessary shifts. Reading our annual report, you'll see how the Learning Spaces<sup>23</sup> become more hybrid with the "flexible space." The Top 10 priorities for 2020 highlight the steps that HE will have to take to simplify, support and innovate. It puts IT teams at the very heart of the driving engine of a new chapter in the digital transformation. A transformation that must be respectful of people, inclusive, and must ensure both privacy and security<sup>24</sup>.

AI is often at the heart of the proposed solutions to meet some of these challenges with surprising uses showing how to think "out of the box."

Finally and as a conclusion to this "introduction," let's underline the need to exchange and collaborate, within institutions, but also between institutions. Boosted by the coming crisis, many stakeholders now consider that mutualization could bring both added value and scale economies to their institutions.

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<sup>20</sup> cf. the sections "the gender gap in IT" and "USA Higher Education IT and DEI".

<sup>21</sup> <https://www.educause.edu/about/cio-commitment>

<sup>22</sup> cf. Digital transformation section

<sup>23</sup> cf. Learning Spaces section

<sup>24</sup> cf. Privacy vs Security section

# EDUCAUSE top10 IT issues 2020

Laurent Flory

Educause top 10 IT issues is the Educause annual study on IT priorities and main issues for Higher Education Institution. This study is led by Susan Grajek, EDUCAUSE vice president of data, research, and analytics and prepared by a group of CIOs and IT leaders. It is released every year in February. At the Educause conference held in autumn, attendants have the opportunity to preview the content of this study.

This Educause top 10 IT issues is a historical part of our report in French, published before December. Since the Educause official content (in English) is released by the time we translate our French Delegation annual report in English, it makes no sense to have it in this document. You will find hereafter the link to access its content and all the resources associated.

<https://www.educause.edu/research-and-publications/research/top-10-it-issues-technologies-and-trends/>.

You can browse priorities since 2000 at this URL:

<https://www.educause.edu/-/media/interactive-content/it-issues-trends/index.html?la=en&hash=9789CB2AEB76CBFA24CE9F803352132DF8DBEA40>

# Key figures on the 2019 Program Committee - Analysis of track "Exploring New Boundaries in Teaching and Learning".

Thierry Koscielniak

This paper aims to provide numerical and keyword elements on the papers that were proposed in 2019 for the track called "Exploring New Boundaries in Teaching and Learning".

The author of the paper was proposed in September 2018 as CSIESR President into the conference program committee and appointed in April 2019 as the chair of the track.

## The Program Committee<sup>25</sup>

### EDUCAUSE 2019 Program Committee



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<sup>25</sup> <https://www.educause.edu/about/mission-and-organization/governance-and-leadership/member-committees/educause-2019-program-committee>

The program committee<sup>26</sup> was composed of 21 people: 17 members appointed from EDUCAUSE member institutions and 4 EDUCAUSE staff. The composition of the committee is reshuffled every year. Two people (excluding EDUCAUSE staff) have attended previous year's committee.

#### Positions of Committee Members

7 Chief Information Officer (combined with a Vice-Presidency or Vice-Provost)  
2 Chief Digital Officer  
2 persons in charge of technologies for education  
2 persons in charge of the IS architecture  
1 Chief Information Security Officer  
1 innovation manager  
1 person in charge to IT for Research  
1 customer engagement manager  
4 staff EDUCAUSE : VP Professional Learning / VP Digital Communications and Content / Annual Conference Program Manager / Speaker Liaison

#### Members' home institutions

10 universities, including one in Canada  
2 State Universities  
2 Colleges  
1 Community Colleges  
1 American engineering school (équivalent to French École des Mines française)  
1 French institution of higher education dedicated to lifelong learning

#### Members' countries of origin (excluding staff)

15 Americans  
1 Canadian  
1 French

## The work schedule of the Program Committee

- Launch on October 24, 2018 in Web conferencing
- Meeting on October 30 in Denver during the 2018 conference
- 10 Web-conferences monthly from November 2018 to September 2019
- 2 days of face-to-face workshops in Chicago on April 25 and 26, 2019
- Réunion Debriefing meeting on October 17, 2019 in Chicago at the end of the conference

During the face-to-face meeting in April, the 9 tracks were chosen :

- Creating a Culture of Data-Informed Decision-Making
- Evolving Infrastructure and Enterprise IT
- Exploring New Boundaries in Teaching and Learning
- Leading and Partnering Across the Institution
- Making an Impact with Innovative Ideas
- Managing and Reducing Information Technology Risk
- Navigating Change
- Supporting the Institution
- Transforming the Student Experience

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<sup>26</sup> <https://www.educause.edu/about/mission-and-organization/governance-and-leadership/member-committees/educause-2019-program-committee>

For the track "Exploring New Boundaries in Teaching and Learning", it was planned to select 20 oral communications and 50 posters. This is the largest number of presentations among the nine tracks.

The deadline for receipt of proposals was the end of January 2019 and the authors were notified of the committee's choice in June 2019.

The Committee received 158 proposals for this session: 136 for oral presentations and 22 for posters.

Among the 136 proposals for the oral: 19 were chosen and 36 were converted into posters.

Among the 22 proposals for the posters: 14 were chosen and one was converted into an oral communication .

#### **Keywords analysis**

Up to five keywords were proposed per article.

All acronyms have been converted (AR ; XR ; LMS ; AI ; VR ; OER)

1. Keywords for all 158 proposals received: 723
2. Keywords of the 70 accepted: 329
3. Keywords of the 20 oral communications: 109
4. Keywords of the 50 posters: 220

The figures on the following pages are the word clouds obtained for the four previous categories.

As can be seen in Figure 1, generalist learning themes predominate in the articles received.

Figure 2: Two concepts stand out in the accepted articles: Active Learning and the Virtual Reality / Extended Reality (XR) couple (see article on page 68).

Figure 3: The Immersive Learning theme (virtual reality / 360° videos) is the majority in oral communications (see article on page 67).

Figure 4: Active Learning is the main theme of the posters.

To conclude, the themes of the accepted papers reflect current projects in American and French institutions: active pedagogies, collaborative work, EdTech, hybrid and distance learning, student engagement, teacher training. Please note that only one MOOC communication has been selected as a poster.

Immersive technologies clearly stand out as a field of experimentation and are now solutions for the production of educational resources with different technologies (virtual and augmented reality, 360° videos).



Figure 1: Keywords for proposals received



Figure 2: Keywords for proposals accepted



Figure 3: Keywords of the oral communications



Figure 4: Keywords of the posters

# Visit to University of Chicago

Frédéric Habert



This university was founded in 1890 by Rockefeller. It's a private, non-profit institution. It has about 16,000 students, whose distribution is different from the others because they have fewer students in Bachelor's (6000) than in Master's (10000). There are 2,800 teachers and 16,000 staff, including the University Hospital. It is the most expensive university in the USA with tuition fees ranging from \$60,000 and up to \$100,000. Its operating costs are covered by tuition fees and donations. The acceptance rate for applicants is 7%.

It is the site of the first atomic reactor (Fermi), and has 100 Nobel Prize winners, notably in chemistry, physics, economics and medicine. It is very research-oriented and has branches all over the world. It is regularly ranked in the top 10 universities in the world.

The issue of higher education and its cost is of strategic importance. Student debt is a problem but they offer scholarships and their students have lower debt loads than others in the region. Finally, competition from online courses is upsetting the lower end of the education market but does not affect them.

## Information System

Its operation is very decentralized. Its central IT Service has 250 people and the same number of computer scientists in the faculties. It shares Peoplesoft tools, as well as in-house developments, but the faculties also have their own software. The central IT Service offers solutions for everything, but nothing is imposed on individual departments. There are 27 server rooms on campus, and there is a desire to consolidate and secure them.

The main challenge in the ICT field is security (with Chinese threats), and they have defined a procedure for storing research data, which is mandatory for sensitive data. Furthermore data management is an important point to stay in the race for research, with more and more data to be stored, analyzed and manipulated. Given the diversity of fields (physics, etc...) the current tools are no longer sufficient for analysis. As far as administration is concerned, they use the cloud (finance, alumni,...), but also Office 365 , and Gmail for students. In addition, they have a Privacy Officer in charge of the protection of personal data.

## Use of technology for education

Dans In the field of education, especially online courses, they mainly practice hybridization and have few distance learning courses. Zoom (web conferencing) is used for continuing education on Saturdays. Generally speaking, students want to be on campus in contact with teachers. They use Canvas as an educational platform. It is used for on-campus courses, further education and also for working groups. According to their

data, 80% of the courses use Canvas (higher percentage in bachelor level) . But they do not yet know how to discriminate between types of use so that they can then provide support and advice. It is based on volunteer teachers, and there are no standard courses or models to follow. Generally speaking, they seek to simplify the student experience in terms of pedagogical information systems.

They use Panopto (video capture) for a few courses in inverted classes (based on videos and quizzes) and find that this device is more interesting and leads to more success even if it requires more work. This allows students with difficulties, or those who are not native English speakers, to view the course at will.

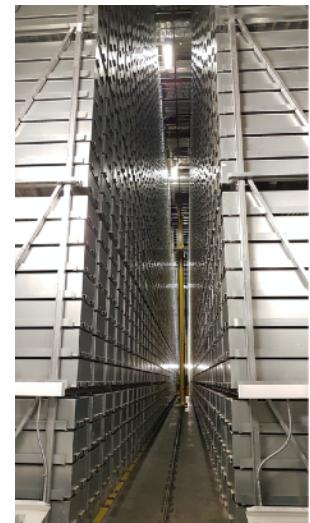
They have three course recording rooms equipped with Extron and Panopto equipment (2 hours of processing time for every hour of course recording time). The contents are then made available in Canvas. This system is also used for reruns from one room to another. They are also capturing some lectures in medical lecture halls, however they do not generalize for fear of emptying the classrooms.



In the area of facilities, there are modular classrooms with mobile furniture that allows group work, which is more motivating for the students, as well as the "tech bar" where 3 staff and volunteer students ensure a permanent presence for technical problems, repairs or purchase of equipment.



Finally, the spectacular library includes an automated storage of 3 million books.



# Visit to Northwestern University (Chicago)

Frédéric Habert

This university was founded in 1851. It's a private, non-profit institution. It has about 21500 students, of which 8000 are in Bachelor's and 13500 in Master's programs. There are 3,400 teachers. The registration fee is \$44,000. 44% of bachelor's graduates have received a public or private scholarship. The acceptance rate for applicants is 8.4%, and 20% of students will come from underprivileged classes in 2019.

The Northwestern University has 19 Nobel Prize winners and 38 Pulitzer Prizes. It is very research-oriented and has offices in Miami, San Francisco and Doha (Qatar). It is ranked 31st among the best universities in the world.

It is a generalist university and they encourage interaction on the Campus as well as interdisciplinarity.



## Information System

The central IT has 285 staff and there are 400 computer specialists in the faculties for local initiatives and outreach support. Financial difficulties led to downsizing 2 years ago with the suppression of 75 posts for the IT department. Their operating budget is \$70m per year. They also benefited from \$280m of investment projects. The natural tendency is not to locally duplicate services in proximity, but to develop collaboration and sharing. They involve deans in the strategic choices, and build on successes in some faculties to try to generalize. They try to accompany the faculties while choosing solutions they can maintain. They provide services with a wide spectrum of users, and retrieve expertise from the faculties (e.g. in Artificial Intelligence)

when necessary, to share it. Their objective is to provide services that are cheap enough to be more interesting than a local version, and also services that comply with regulations (security, etc...).

Their areas of intervention include educational technologies, research informatics, general and management informatics, technological innovation, cyber infrastructure and security. On the latter point, standards are higher on sensitive sites such as the medical school. Concerning the protection of personal data there is no "privacy officer" strictly speaking because of the lack of a global approach.

On the solutions side, they are using Peoplesoft (human resources, education, finance) and are considering replacing it with something more modern (SaaS solution, Oracle Cloud ERP) and maybe the students will not be on the same platform anymore. Also the application for alumni will be replaced.

On the human resources side, they are experiencing recruitment difficulties due to competition from firms.

## Use of technology for education

In the field of education and especially online courses, they are slowly developing hybridization and have a distance Master's degree. They recruit profiles with dual skills in digital and teaching. They use CANVAS (replacing Blackboard since 2015) with a chatbot (based on IBM's Watson) for level 1 support. There are also websites with Drupal and Wordpress. An organization and comitology ("learning spaces" + "digital learning" + "pedagogical platform and applications") that takes into account representatives of the different faculties has recently been set up to define priorities and funding needs. Unfortunately the fund for pedagogical innovation has disappeared following the financial crisis of the institution. The priorities are the development of a process for the implementation of the systems, the encouragement of pedagogical innovations, the improvement of learning spaces, the development of support for teachers, and a shared collaborative learning room.

They have worked on extensions around Canvas with Bluejeans (web conferencing), Turnitin (anti-plagiarism), Respondus (remote exam monitoring), Namecoach (pronunciation), Panopto (video recording of courses), Turningpoint (survey) and Explorance Blue (course evaluation) to name the main ones. Locally they developed Discussion Hero to replace the Canvas forum with something more fun with avatars and points collected for each contribution as well as a graphical representation of the exchanges. The platform receives 10 to 15,000 connections per day.



As far as the distance Master of Laws learning is concerned, they use a live broadcast of the courses and online transpositions of other events, in particular by Zoom (web conference). However, students must come

to the campus for one week for intensive courses, to meet the teachers and other students. This improves their commitment to the course. The degree is accredited by the Bar and the final evaluation is essentially project-based. The evaluation of this approach is based on the employment rate of the students. For the teachers it requires 100 hours of design, as well as animation and online exchanges with the students. This scheme is mainly aimed at professionals who would not be able to come. They expect a return on investment in a few years, the training costs is the same price as residential (54k\$).

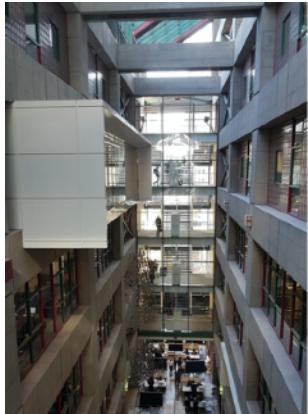
For learning spaces, they define a framework and user guides. Not all faculties have pedagogical innovation rooms, but they would like to have a shared room because demand is increasing. These rooms allow the animation of the class in groups. They have invested \$1M for a 190-seat medical room where they want to shift their teaching to active learning. Microsoft and Steelcase worked with them to design rooms for 28 people (6 groups) based on a standard room. They are based on Surface MS hardware.



Finally, they have created a structure to welcome start-ups in a former car garage, with spaces for creation and also for collaborative work.

# Visit to Concordia University (Montréal)

Frédéric Habert



This university was founded in 1974 by the merger of two institutions. This is a public institution. It has about 46600 students, 37000 in Bachelor's and 9600 in Master's programs. There are 2200 teachers and 4200 administrative staff. 60% of its budget is provided by the Government of Quebec. The registration fee is 4000CA\$.

Concordia University has one Nobel Prize and one Pulitzer Prize. It is ranked 671st among the best universities in the world and 10th for Canada.

It's a general university with no law or medical school.

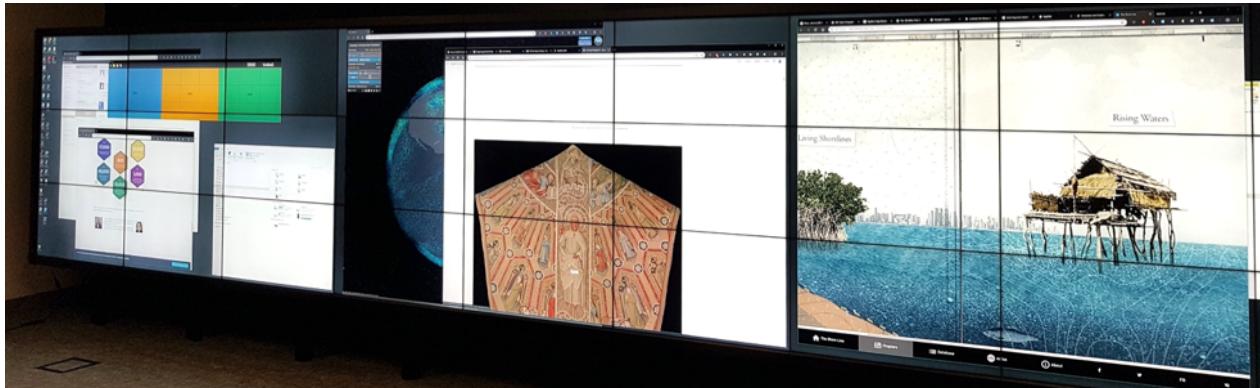
## Information System

The definition of the strategy involves conferences to discuss the digital strategy at lunchtime with renowned speakers in the field of information technology. These are open to everyone in the university. They also conducted a consultation with 125 people representing the community, including 45 individual interviews. As a result, students express a need for more support in developing their digital skills (especially older, international, or technology-specific students). For teachers, the salient point is the lack of time to develop their skills and for administrative staff it is the wide disparity in digital literacy that appears. To communicate, students prefer Facebook and SMS, they don't use email much. Teachers use moodle or social media.



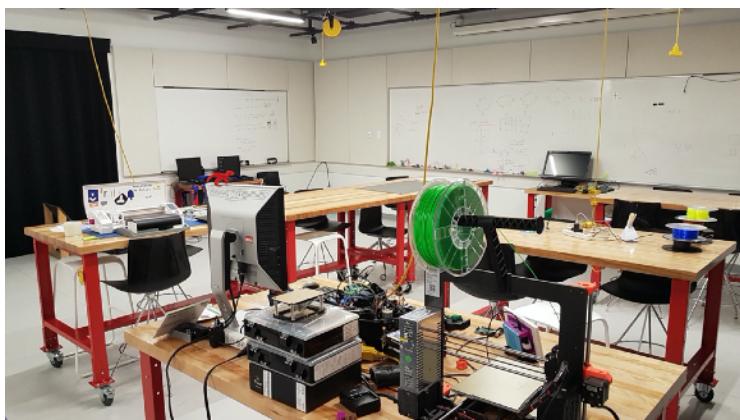
The students would like to have the lessons recorded and teachers to upload more educational content to the Moodle educational platform. Some teachers find Moodle too rigid, and opinions are divided on the value of online training for pedagogy. A survey of students shows that they think digital is important for their careers

but do not feel they are sufficiently prepared. They see digital education as making them more independent and more involved in their lives. Also the 2 elements to be improved in their institution, are the connection to Wifi and more digital pedagogy.



Based on these findings, they identified 8 projects to prepare themselves to be "the university of the new generation". These projects are grouped under 3 axes: improving processes and services, teaching and learning, digital skills. These include a project around the development of the uses of virtual reality and augmented reality, the creation of a central service portal, the recording of courses, a training offer on digital skills.

In addition, the creation of the Laboratory for Innovation in Teaching and Learning will support teachers' initiatives through support and funding. In the field of open educational resources, they have opened a website and are financing creations or adaptations with the aim of creating or using 40 open textbooks by 2022 (a saving of 800kCA\$ for students). Finally, for the development of digital skills they offer a "Sandbox" which is a maker space in the library to encourage non-scientists to use 3D printers, VR and AR.



## Knowledge One (e-concordia)

This structure founded in 2001 is owned by Concordia and is responsible for e-concordia (structure in charge of online courses). They can also provide services to private industry. Their research and development department applied to teaching works on simulation, augmented reality and gamification. Their offer includes 37000 annual registrations for online courses (140000 hours of courses) in 162 countries, which places them in the top 5 for the quality and quantity of online learners (1st in Quebec ex aequo with Laval and twice as many students as Teluq). Services include program design and development and training support.

Their staff (80 people) includes instructional designers, content strategists, project managers, graphic designers, sound and image technicians. Among their partners are Concordia, McGill, U. Montreal, Polytechnique Montreal, but also continuing education for Cirque du Soleil (on security issues), Dyson, IATA (training for all airports where they are present).

They have a specific collaboration with Ubisoft with the "XR workshop". Approached by Ubisoft for their internal training, they created a common entity for X-Reality in games but also for training. They are looking

for institutions that wish to use these courses (license per student, and support supported), a University-Ubisoft diploma, costs 200€ for 90 hours (6 credits).

From a financial point of view, they return their profits to Concordia through its foundation. The margin is reinvested in academic quality. Commercial projects do not involve academics.

# Digital transformations

David Rongeat

Let's try to define digital transformations

## First definition

We will approach here the digital transformations, plural chosen to show their variety.

Basically, we could be satisfied with this generic definition: Digital Transformation (DX) is the use of new, rapid and frequent developments in digital technologies to solve problems.

By adding a little finesse, we can clarify this definition by evoking two notions: the notion of transformation (going from A to B, without knowing B a priori) and that of transition (going from A to B, B being the finality known a priori).

We will consider in the rest of this article an intermediate vision on the a priori knowledge of the target to be reached, allowing us to situate ourselves between transition and transformation with a stronger tendency on transformation that can be named in our French university environment #TransFoNumDuSup (B. Mocquet, 2020), translatable into Higher Education Digital Transformation.

## Definition captured during EDUCAUSE 2019

As early as the introductory session in front of thousands of participants at the show, the subject of digital transformation was identified as an important topic for EDUCAUSE 2019.

It presents (Figure 1) the definition adopted by Educause: "EDUCAUSE defines Digital Transformation (DX) as the process of optimizing and transforming the institution's operations, strategic directions, and value proposition through deep and coordinated shifts in culture, workforce and technology".

**Digital Transformation in Higher Education**

**The process of optimizing and transforming the institution's operations, strategic directions, and value proposition through deep and coordinated shifts in culture, workforce, and technology.**

*Adapted from [Getting Ready for Digital Transformation: Change Your Culture, Workforce, and Technology](#)*

#EDU19

 EDUCAUSE  
ANNUAL CONFERENCE 2019

Figure 1: Definition of digital transformation,  
EDUCAUSE 2019

## Let's talk about innovation

It is difficult to talk about the digital transformation without addressing the subject of innovation. This proposal made by Jamey Hansen to define innovation :

### My definitions

#### Innovation:

Taking ideas (or problems)  
and turning them into...

#### Innovation support:

Things we do **to help**  
faculty, students, and staff  
turn **their** (or **our**) ideas into...

... results and solutions that advance the mission.

Figure 2: Definition of Innovation by Jamey Hansen , Director of LATIS, CIO of College of Liberal Arts University of Minnesota, session « Seeing our work through the Lens of Innovation” EDUCAUSE 2019

We can retain that the notion of transformation is intimately linked to innovation.

## To go further and focus on Higher Education and Research

We recommend to consult the EDUCAUSE 2018 report "Report of the EDUCAUSE 2018 Task Force on Digital Transformation" available here: <https://library.educause.edu/resources/2018/11/report-from-the-2018-educause-task-force-on-digital-transformation>

Other EDUCATIONAL reading on the subject, the pages dedicated to digital transformation: "Digital Transformation of Higher Education". Read here: <https://www.educause.edu/focus-areas-and-initiatives/digital-transformation>

Ready for a 3D trip?

## Digital Transformation in Context: The 3 Ds

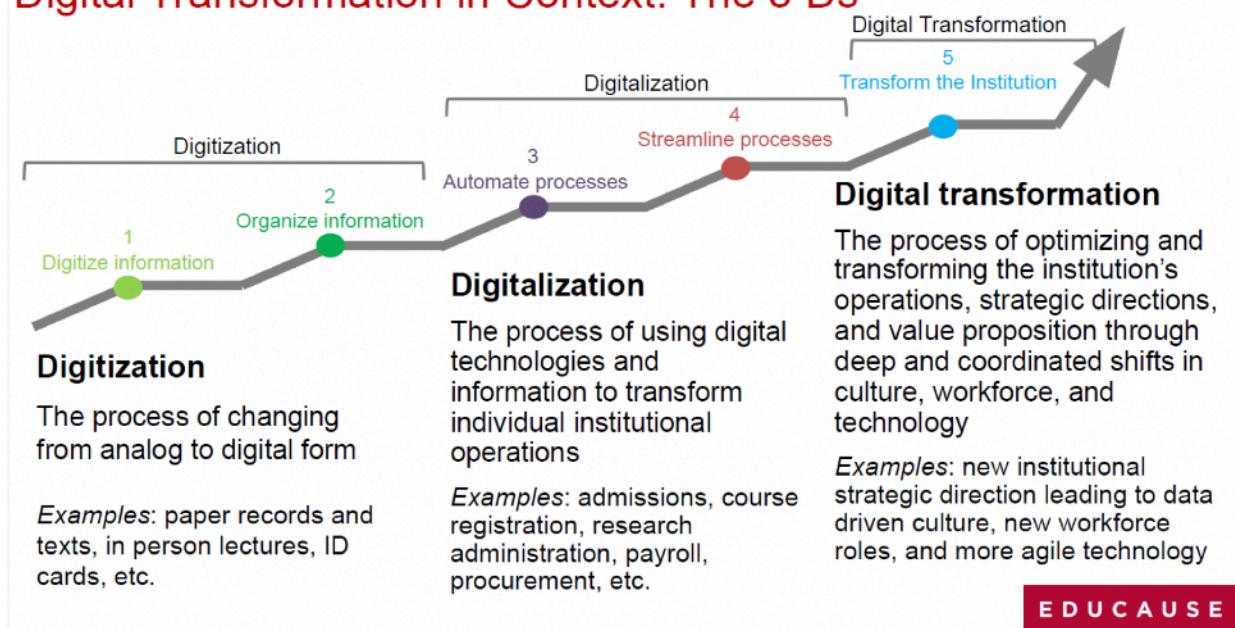
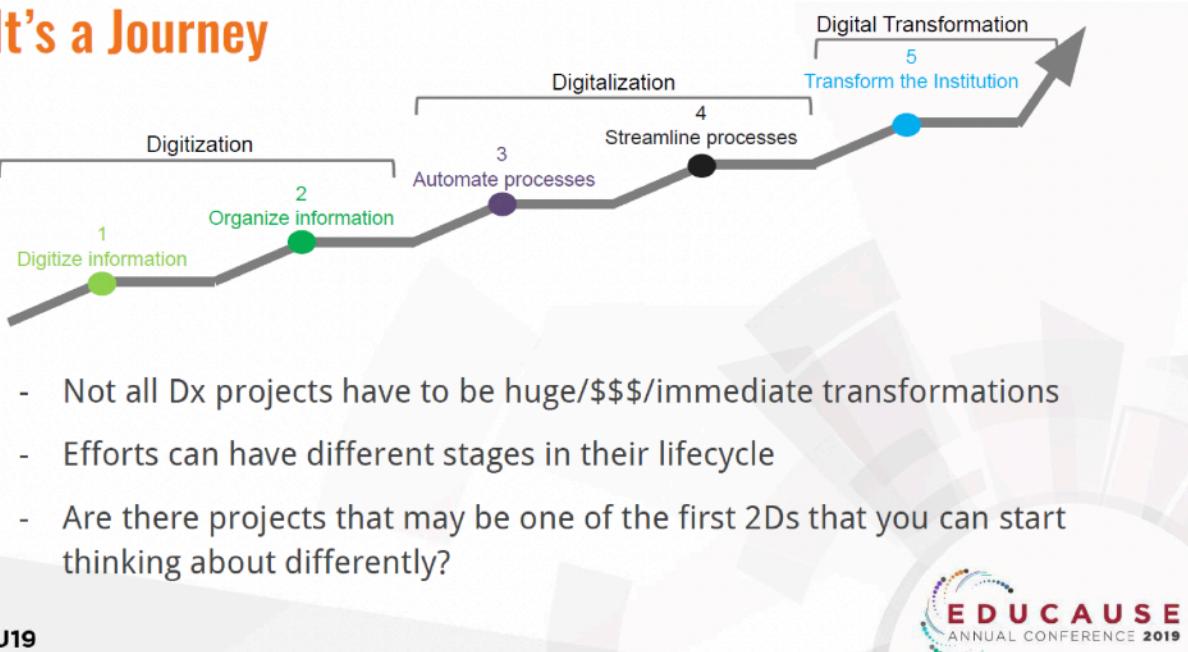


Figure 3: Digital Transformation in Context, The 3 Ds, session “How to Know It When You See It”  
EDUCAUSE 2019

The three D's are :

- « Digitization » is the process of changing from analog to digital.
- « Digitalization » is rather the part that will be called the computerization of business processes,
- into the "Digital Transformation" (DX) is as defined in the above chapters.

## It's a Journey



#EDU19



Figure 4: It's a journey, Session « Digital Transformation : How to Know It When You See It”  
EDUCAUSE 2019

This trip can be done in 5 stages :

1. digitize information
2. organize information
3. automate processes
4. streamline les processes
5. and finally transform the institution

By starting with the digitization of information and leading to the organizational transformation induced or required by the digital transformation.

It is important to remember that not all digital transformation projects have the desire to create significant, costly and immediate transformations.

#### Where is the digital transformation at EDUCAUSE 2019 ?

The vast majority of EDUCAUSE 2019 sessions were associated with a set of themes/think tracks, called tracks, which are listed in Figure 5.

Track	Number of sessions
Creating a culture of data-informed decision-making	59
Evolving infrastructure and enterprise IT	56
Exploring New boundaries in Teaching and Learning	119
Leading and partnering accross the institution	114
<b>Making an impact with innovative ideas</b>	73
Managing and reducing information technology Risq	51
<b>Navigating change</b>	63
<b>supporting the institution</b>	25
<b>Transforming the student experience</b>	97
	<b>657</b>

Figure 5: List of EDUCAUSE 2019 themes

To address the theme "digital transformation" the selection of sessions was mainly based on sessions from the three themes of "making an impact with innovative ideas", "Navigating change" and "Transforming the student experience". These three themes or avenues of reflection account for about a third of the sessions.

#### New for the 2019 edition

The theme "making an impact with innovative ideas", which is closest to the subject of digital transformation, is a new formal theme for 2019, it does not appear in the programmes of previous years (analysis made over the period 2015-2018).

The author of this part of the report attended about a dozen sessions, of which 3 or even 4 were particularly interesting to share on the subject of digital transformation; they were led by participants of Educause working group for the digital transformation, members of the universities of Boston, Minnesota and Ithaca college. Site visits also contributed to this topic.

# What makes up the seven-point digital transformations

These few elements are not intended to be exhaustive, but they synthesize some of the concepts that attracted attention in these presentations.

## 1. Partners in innovation and digital transformation

In the context of the Educause congress, i.e. with a strong majority of Anglo-Saxon institutions and speakers, the notion of partner is very present. These are mainly partnerships between universities and private actors. For the subjects of innovation, according to the feedback heard, it is not uncommon for the beginnings of the solution to be built in partnership with a private player, a solution publisher,....

Sponsors: Another important notion in digital transformation projects is that the project leader, the one who embodies and politically carries the project, its sponsor, has a crucial role.

Finally, one of the themes for many sessions was "Leading and partnering across the institution", demonstrating that digital transformation involves partnerships within the institution's organization or with external partners.

In short, for the digital transformation, let us note the importance of partnerships built around this process.

## 2. Try, attempt, fail to succeed. Knowing to stop.

We can retain through different sessions that the digital transformation goes through attempts, trials and thus failures and successes. Culturally more accepted and valued in the Anglo-Saxon world, the valorization of failure belongs to the process of innovation, inherent to the digital transformation.

The toolbox, presented in the chapter "A toolbox to describe the digital transformation", is a proposal that can help to make decisions to stop a digital transformation process that has already started or is about to start: an insufficiently shared trigger, a goal that is too high, impacts that are too (or not enough) important are all elements that can, in a beneficial way, imply a project stop. Obviously, it is also important to take stock and capitalize on failed projects to feed the organization of this experience.

## 3. Transform to erase an irritant

Although quite obvious, this notion of irritant has been repeatedly recalled as a major component of the digital transformation. When a digital transformation process is initiated to solve a problem, it must be well described, shared with all stakeholders, evaluated and quantified, ...

## 4. Link between innovation and digital transformation

Not all digital transformations are associated with innovations. However, innovations, new practices and technological innovations are often an important vector for digital transformation projects. Innovations, often technological but not only, can be levers, catalysts or accelerators of digital transformations.

Innovation is not identified as a crucial element of the EDUCAUSE definition of digital transformation. Gartner's presentation "kick starting innovation from within IT" brings two elements to this subject. The first is the assertion that the digital transformation is happening because of technology. The second, more related to change management, proposes to teach organizations what innovation is, to acculturate the organization to innovation.

On the other hand, this illustration, an anecdote heard on several occasions, of an establishment manager returning from a visit from colleagues or a congress who, discovering on this occasion an innovative technology (or practice), asks to have the same system in his establishment. The right reflex is to ask: What problem, in the context of your institution, needs to be solved by this innovation? What value should be created ?

## 5. And the user ?

The role and involvement of the user in digital transformation processes is taken up on several occasions in the presentations, particularly those related to innovation processes. Actors for whom it is necessary to solve problems or propose contributions or novelties, it is important to describe the users involved in the digital transformation. To illustrate, a few questions: "Who is he? ", "What is his priority expectation? ", " How to know its needs or expectations? ", " What does his current experience look like?"

In addition, it is interesting, even essential in some cases, to involve users in the ideation process, in design workshops (the "design thinking" website method is highlighted), during the validation of prototypes or solutions and to rely on users as a medium to bring innovations and proposals.

## 6. Role of the IT leader

Let's note the particular role of the "IT Leader" that we can transpose for our French establishments as a digital referent, CIO or digital VP, in the digital transformation. The digital transformation report EDUCAUSE 2018 (see paragraph above "to go further") positions it with a crucial role in the digital transformation.

We can retain this critical role of the "IT Leader" who can :

- Help the institution understand the urgency and potential contributions of the digital transformation,
- Design the architectures and infrastructures that enable this digital transformation,
- Prepare the teams involved to understand the efforts generated by the digital transformation.

## 7. Agility, a fully integrated underlying concept

Many notions involved in digital transformation are assimilated to agility: irritant, prototype, value-based steering, organizational agility, etc, etc. We can be convinced of this by reading the agile manifesto, and more precisely the underlying principles with a digital transformation prism: <https://agilemanifesto.org/iso/fr/principles.html>.

Surprisingly, however, the word agility is hardly ever used in the presentations and session materials related to digital transformation. By analyzing Educause's publications, the number of articles, the frequency of use of the concept of agility in publications, sessions or by exchanging with participants, it appears that the methodology is completely integrated. It is therefore no longer cited as the obvious method.

# A toolbox to describe digital transformation

## What this toolbox is

The device presented here comes mainly from the intervention entitled "Digital Transformation: How to Know It when You See It".

For this presentation it was mainly about :

- To explore the definition of digital transformation, a subject synthesized in the first chapter, and to learn about its characteristics,
- To become familiar with criteria that qualify the digital transformation,
- To develop ideas to spread the digital transformation within the institution's organization.

For the part of the toolbox, it is an adaptation of the work done by Susan Grajek and Betsy Reinitz entitled "Getting Ready for Digital Transformation: Change Your Culture, Workforce, and Technology" available online<sup>27</sup>.

The aim of this methodological proposal is to provide questions and descriptions of the digital transformation of its establishment, and to provide introspection, whether this transformation is underway, past or future. Its use makes it possible to take a step back from the digital transformation, to question it, to measure or encourage changes in the organization of the institution. All this beyond the technological subject alone.

## Why this toolbox

This toolbox has been presented along two axes :

- Intentionnality : it is important to think and care about each component of the method in order to measure the full impact of the transformation effort whether it is past, ongoing or future.
- Holistic : this toolkit provides a means of thinking holistically about what is needed and how it impacts on the institution; an overview.

Anyone can use it to communicate about the transformation, accompany change, to help the institution's organisation evolve, to formalise and measure impacts, quantify contributions, decide whether to continue or stop a project, etc.

## Asking questions to better understand the digital transformation in its entirety

A few statements before asking :

"It's not just an IT effort": The presentation of this toolkit emphasized that it is not just about measuring technological effort, as the digital transformation goes far beyond this single prism. We therefore recommend that these transformative projects should be considered to be about more than just the technical side of things.

The use of this toolbox also allows, on the subject of digital transformation, to :

- Recall that the governance of the institution must understand and defend the changes undertaken,
- Confirm that the changes represent a fundamental evolution,
- Show that changes are holistic in nature.

### First question

What leads to the digital transformation? Here are a few suggestions for this first question:

- Convincing adoption of technology in components and facility,
- Reduced fundings
- New technology-induced expectations for students
- Technological evolutions or revolutions,

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<sup>27</sup> <https://er.educause.edu/articles/2019/7/getting-ready-for-digital-transformation-change-your-culture-workforce-and-technology>

- Data as a new strategic asset,
- And plenty of other triggers.

#### Overview of the toolbox

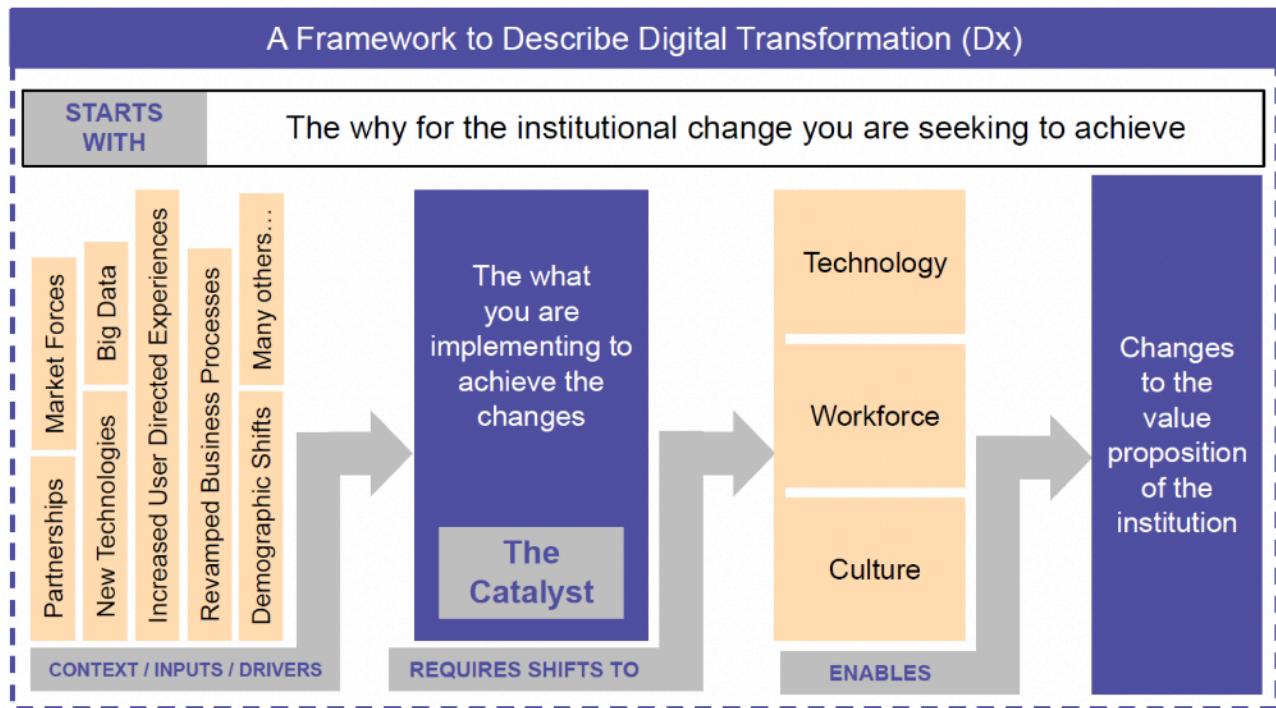


Figure 6: Toolbox to describe digital transformation Session « Digital Transformation : How to Know It When You See It" EDUCAUSE 2019

The proposed path (see Figure 6), to qualify its numerical transformation, is as follows :

- The first phase is to clearly articulate the "why" of the change that the institution is seeking to implement or needs to implement. This description of the origin of the change is completed by the description of the contextual elements, the inputs.
- The second phase involves describing the "what": what is being implemented to achieve change. It is then necessary to describe and measure what this implementation will generate in terms of evolutions/changes in technology, personnel or organization and finally in the culture of the institution. The success of the change depends on these 3 "prerequisites" being taken into account.
- Finally, a third phase concerns the description of developments and value contributions for the institution made possible by the elements previously described

#### The « Why » end its context

Questioning, re-questioning, describing or simply reaffirming the triggers (the "Why") of the transformation project is a crucial part of the description of the digital transformation, the starting point of the journey in short. This short formulation of what drives the digital transformation should allow all the actors involved to share what initiated the process.

Asking questions on this heading alone also makes it possible to find the right sponsors for a digital transformation project. It can also cause this process to come to a halt if the "Why" is deemed insufficient to launch the organization into this transformative project.

This "Why" must be described in a contextualization logic such as: which partners are involved? What technologies are available to begin this transformation process? What user feedback? What changes in the context of the establishment (demographic changes, financial constraints, etc.)?

We can add to this list, presented with the tool, the notion of irritants even if it was not explicitly mentioned during the session.

#### The « What » and the changes induced

In a digital transformation process the "What", what is implemented, often involves technological implementation. However, the innovative part can also be on business practices for example without necessarily requiring technological tools.

Adopting a process of digital transformation involves a series of changes, sometimes profound, of a cultural, workforce and technological nature. Proper consideration of these three types of impact is considered one of the conditions for the success of the digital transformation project.

Perceived in other sessions, digital transformation projects that focus on, or begin, with the "what" increase their risk of failure.

#### Impact at the cultural level

Several impacts of the implementation of solutions that bring about this digital transformation are positioned at the level of the cultural evolution of the institution and its organization or mode of operation.

Transversality: The first element deals with the interaction between the different branches of the institution. Often the digital transformation involves several structures of the establishment (components, business departments, general management...) and the digital transformation pushes for the implementation of transverse steering and joint work. This sharing of a common objective related to the digital transformation brings link in the organization (transversality) and collaboration between different structures of the institution. It is also a process of change management within the institution.

The speed often associated with digital transformation projects encourages the institution to increase its agility and flexibility to align itself with the changes brought about. Let's talk about organizational agility.

#### Impact at Human Resources level

The second kind of consequence of implementing the transformative solution concerns human resources, teams. The digital transformation process inexorably affects the day-to-day work of IT teams, the digital specialists. But it also creates a need for new skills and competences for all those involved in the institution. Identifying and taking into account these needs for all stakeholders (staff, users, ...) is part of the digital transformation process. Ignoring it is a factor in failure.

#### Technological impact

Finally, the third type of impact concerns technology. The high frequency of technological developments, the astonishing speed at which digital technologies and uses evolve makes it difficult to predict their consequences. This section of the toolbox concerns, for example, how technologies are managed in the institution, how they are made available, how they are applied, how they are monitored (technology watch).

## These changes that bring value

In the last step of this toolbox, the objectives to be achieved by the digital transformation are described. What inputs are expected? What changes in practices? What new services? What gains for the institution? What are the benefits for users? What input for partners?

Prior to initiating a transformation, it should be noted that the formulation of these added values makes it possible to share them within the organization and thus collectively take the decision to undertake this digital transformation with regard to these objectives.

This description or formulation of these value inputs can easily be used as a tool to measure the objectives to be achieved for the digital transformation project or to produce indicators to measure change along various axes (technology, users, institutional change, ...). All this to be set against the triggers of the digital transformation (the contextualized "why").

## In summary

We can retain that the digital transformation is a subject as much related to the organization of the institution as it is to technological innovations. The notions of transversality, user involvement, and transformation management are elements to be emphasized, as are the notions of culture and acculturation to digital transformation that are found in the toolbox proposed in this article. We can recommend using the proposal of this toolbox, of introspection, to accompany your digital transformation projects.

Finally, in the article about the visits of the French delegation to the three institutions, you will discover some digital transformations to illustrate this subject.

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# USA Higher Education IT and DEI

Nina Reignier-Tayar

Considered as a key IT issue of the EDUCAUSE 2019 conference by EDUCAUSE President John O'Brien.

Several conferences have been devoted to this theme and that the closing keynote<sup>28</sup>, was entrusted to Reshma Saujani<sup>29</sup>. This conference was entitled « Closing the Gender Gap in Technology ».

All conferences were accessible to the hearing impaired, visually impaired and persons with reduced mobility.

## Introduction, Why DEI for EDUCAUSE?

DEI (Diversity, Equity and Inclusion) is not only about gender equality within the HEI. The aim is to promote and provide opportunities for work in IT (and especially in IT management) for all individuals regardless of their identity, culture or demographics.

Based on the observation that the American HEI, like many private and public organizations, employs few "diversity" people in their IT departments, the EDUCAUSE Board of Directors has established DEI as a critical and major priority for the association.

All studies and surveys show that companies that rely on diversity are more creative and efficient. EDUCAUSE confirms that all companies, universities and organizations will be more attractive to talent and better able to achieve their strategic objectives.

## EDUCAUSE commitments to Diversity

EDUCAUSE understands that the road will be long and that time is needed as an ally. However, EDUCAUSE wishes to measure its progress in this area. This is why EDUCAUSE annually identifies the objectives to reach in the following three areas :

- To help the American academic community better understand the issue of diversity and more globally DEI ;
- To get feedback from EDUCAUSE members on this issue;
- In the light of existing experiences, work on the creation of new initiatives with the professionals of these issues in the American Higher Education.

One of the objectives of the several conferences at EDUCAUSE 2019 in Chicago was to identify working groups and progress often in the form of partnerships between universities on diversity, equity and inclusion.

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<sup>28</sup> This conference is described in this report through Arnaud Frey's article "The gender gap in IT".

<sup>29</sup> Reshma Saujani is an American lawyer and politician. She is the founder of the technology organization "Girls Who Code".

## Commitment of the EDUCAUSE CIO members to DEI

CIOs and digital VPs of the HE can and should play an important role in DEI. In particular when their institution includes this integration in its strategic objectives. This is the case, for example, at North Carolina State University<sup>30</sup>, University of the Pacific<sup>31</sup> and Campbell University<sup>32</sup>.

This is why EDUCAUSE has proposed a charter to work on this objective and to further increase the number of the « under-represented population<sup>33</sup> » in the field of technology. In this charter, CIOs and VPs commit to a series of actions to promote diversity in their leadership:

1. Be aware of the opportunities related to diversity in technology and work to raise awareness at the institutional level.
2. Work to increase opportunities for women, people of color, members of the LGBTQ community and people with disabilities to be information technology professionals and leaders.
3. Work with EDUCAUSE and other professional organizations to publish demographic data on the technology workforce.
4. Become aware of institutional and/or regional demographic trends and work to create an institutional and/or regional technological workforce that keeps pace with demographic trends.
5. Collaborate with institutional colleagues to help students from under-represented populations who are interested in computer science, data science and other technology-related fields to pursue undergraduate and postgraduate degrees.
6. Advocate for and help develop DEI practices, appropriate DEI resources and tools, and encourage and support colleagues who seek to contribute to DEI efforts.

At present, 512 CIOs have signed this charter and have committed themselves to the national approach taken by EDUCAUSE. All signatories' names are on EDUCAUSE web site<sup>34</sup>. This will create links and a kind of "CIO community" that will encourage and work on diversity. This community will be supported by EDUCAUSE and in particular its Diversity, Equity, and Inclusion Task Force.

## The different groups and initiatives on the subject DEI

### DIT: Diversity in IT

The objective of the DIT working group is to foster dialogue and collaboration between the members of the group around diversity in IT. The DIT Group therefore wishes to act as mentors and give advice on issues related to diversity in IT professions.

The co-leaders of this working group, at the conference "Diversity in IT - 2019 EDUCAUSE Annual Meeting" presented the feedback that the DEI group of EDUCAUSE has made regarding the impact measurement of introducing diversity in the university.

### WIT: Women in IT

The objectives of the WIT group are close to the objectives of the DEI group of EDUCAUSE with a focus on women working in IT. The first objective is to create a network of professionals around this subject and to animate it through meetings or webinars. The WIT Group hopes that the network partners will not only commit to recruiting more women in IT but also to improving and accelerating these recruitments.

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<sup>30</sup> <https://www.ncsu.edu>

<sup>31</sup> <https://www.pacific.edu/>

<sup>32</sup> <https://www.campbell.edu/>

<sup>33</sup> including people of color, women, members of the LGBTQ community, and people with disabilities

<sup>34</sup> <https://www.educause.edu/about/cio-commitment>

At the Women in Technology (WIT) Community Group conference, the results of one of the surveys conducted by WIT were presented.

### I am remarkable

#IamRemarkable: is an initiative of google, created as part of Google's offer to its employees to have the freedom to devote 20% of their time to do "other work" different from the one they were recruited for at Google.

Thus, #IamRemarkable was born by a group of Google employees. The objective of this initiative is to encourage women and other under-represented groups around the world to promote themselves and their strengths. This promotion can take many forms, such as speaking publicly about their achievements in the workplace and beyond. The initiative wishes, at the end of its studies and research, to provide a toolbox for this "self-promotion".

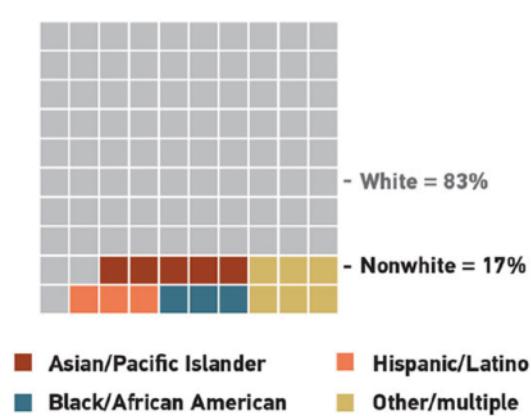
This initiative presented the findings related to "promotion" when it comes to a woman or a man.

### GWC : Girls who code

It is a non-profit international organization working to narrow the gender gap in technology. Its ambition is to take the lead in inspiring and training young girls to gain the skills needed to confront the challenges and seize the opportunities of the 21st century. GWC has taught computer programming to approximately 185,000 girls. Among them, 30,000 girls (16%) are in university. The majority of GWC alumni work in the IT field, which represents 15% more than other alumni.

## State of play of DEI in IT

The conference was based on the EDUCAUSE Workforce 2019 study on DEI.



47% of respondents said that their IT organization reflects the diversity of their academic community and the community at large. The majority of respondents believe that participating in diversity training or working groups will help them improve professionally. However, only 30% of respondents indicated that their managers had encouraged them to participate in a DEI workshop or training program.

The diagram below shows that 83% of the IT professionals working in the HE are white. Diversity represents only 17% of the total

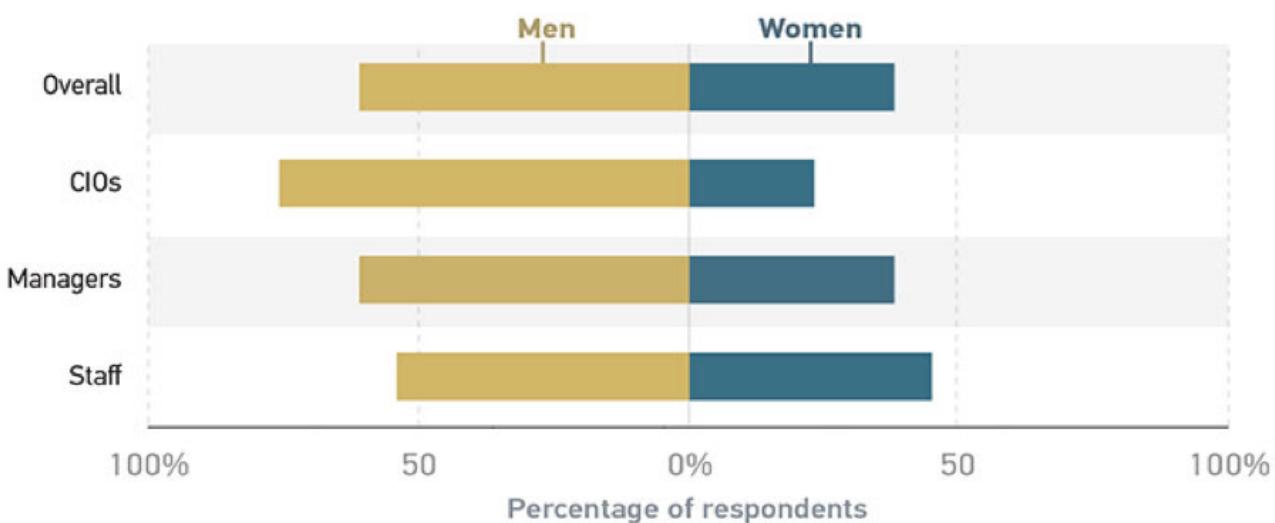
The study also focused on the color discrimination of IT professionals in the American HE.

The following table shows that in 2018, only 16% of CIOs are non-white; the same % represents managers and employees in IT.

**Table 1. Percentages of nonwhite higher education IT professionals, 2010–18**

	2010	2014 <sup>22</sup>	2016 <sup>23</sup>	2018
CIOs	4%	13%	15%	16%
Managers	8%	13%	15%	16%
Staff	10%	12%	15%	18%

If we look at the % of women versus men in IT departments, the survey showed that CIOs, managers and IT employees are predominantly male. The higher we move up in the hierarchy, the less women are present. For example, only 25% of the CIOs in American HE are women.



**Figure 2. Percentage of men and women in each organizational level**

The state of the art shows that IT in Higher Education employs fewer people from diverse backgrounds than other U.S. companies.

Thus, in 2018 and in general 43% of workers are women in the United States. This percentage drops to 38% when it comes to IT departments in US HE.

A paradox concerns the last two years; a 25% increase in the number of female managers in HE IT departments between 2016 and 2018. On the other hand, the % of female CIOs decreased by 4% between 2016 and 2018, from 27% in 2016 to 23% in 2018.

Regarding disability, 8% of IT staff reported having a disability. The conference mentioned a reminder of the obligation to provide them with a suitable working environment and tools.

Finally, in the United States, the study was even extended to gay men working in IT at the HE. They are twice as numerous as in other professional sectors.

## Findings related to self-promotion by gender

The "I am remarkable" conference made the following observations :

- Both men and women don't like women who promote themselves;
- Men apply for promotion more often than women: studies show that men apply for promotion when they believe they fulfil 60% of the targeted function; this percentage must be 100% when a woman applies for promotion;
- The same finding as the previous one when it comes to applying; Women respond to a job offer when they feel they are 100% capable of doing the job. Men apply when they estimate that they answer 60% of the job description;
- Companies with women on their board of directors are 53% more successful than others;

## Reactions to DEI in US Higher Education

The survey launched by the WIT WG consists of answering the question: during your years of professional experience working in the IT department of an American HE institution and as a woman or a minority, what are the reactions you have encountered?

All the results are online<sup>35</sup>. Here are a few testimonials:

- Being interrupted during a meeting: 91% of respondents felt that this was the case;
- Being ignored at a meeting: 81% of respondents are ignored at a meeting;
- Talking behind one's back: 72% of respondents consider themselves victims of this behavior ;
- Recovery of your ideas by someone else who claims to be at the origin: 65% of respondents say that they suffer this recovery;
- Being treated differently than other colleagues: 65% of respondents feel that they are not treated like other colleagues;
- Being paid less than a colleague in the same position: 58% of respondents find themselves in this situation;
- Minimizing a compliment received: 58% of respondents had this reaction ;
- Receiving an inappropriate comment because I am a woman and/or a minority: 51% of respondents agree ;

The results of this survey explicitly demonstrate the differences in treatment and response to women, or a minority person, working in the field of technology.

## Stereotypes related to Women in IT

To illustrate these stereotypes, the speakers showed the images proposed by Google following a search for "IT Girl" or "IT Women".

The stereotypes speak for themselves: women in IT are those with a cool, hip, young-girl look. On the other hand, IT professionals are inevitably men with a "businessman" look.

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<sup>35</sup> [https://wall.sli.do/event/jvy0jcmi?section=efcefb49-717e-4085-baf5-fc8ee07de69e&info\\_modal\\_version=default&open\\_info\\_modal=true](https://wall.sli.do/event/jvy0jcmi?section=efcefb49-717e-4085-baf5-fc8ee07de69e&info_modal_version=default&open_info_modal=true)

## Advices and proposals by role to improve DEI in IT

The EDUCAUSE WF DEI also distributed a document describing the proposals to be made. This document, called the toolbox, represents a first version and the community can enrich it continually. The workforce DEI gave the following proposals by role:

### For CIO

- Study your own IT organization: is it fair and inclusive? Does it represent diversity?
- Collecting data and supporting your analyses;
- Examine whether the pay is fair ;
- Recruit a consultant on diversity issues
- Involve your HR Director on these issues;
- Provide training on DEI issues;
- Set targets and measure progress towards them ;

### For middle management

- Work with your supervisor to engage your organization on these issues and make them a priority;
- Ask for training ;
- Discuss with your own team what DEI means to them and how to promote diversity;
- Ask to add to your organization's evaluation system, the efforts and performance of your employees related to promoting diversity.

### For staff

- Becoming a representative or "ally" of a person from a diverse background;
- Invite other colleagues to attend diversity training;
- Learn to recognize behaviors that hinder exclusivity;
- Develop strategies to stop these behaviors;
- Learn how, when and to whom to report an incident of discrimination;

## Conclusion

Various studies show that companies that employ diversity are more creative and efficient.

US HE institutions employ, on average, fewer people from diverse backgrounds than other US companies.

EDUCAUSE considers DEI to be a major issue. EDUCAUSE relies on the time and work of the various groups and the commitment of the CIOs to improve diversity within American institutions and in the field of technology.

The various conferences presented their work and in particular, the state of play according to the studies carried out. The finding is clear: only 17% of IT professionals working in the HE are from diverse backgrounds. The majority, 83%, of IT professionals in the US HE are white.

All related conferences gave several factors that may "explain" such a gap: women, for example, do not like self-promotion and they do not apply for a position until they have mastered all the skills required...

Based on these studies and analyses, proposals were made by the working groups to improve the DEI in the field of information technology.

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[https://wall.sli.do/event/jvy0jcni?section=efcefb49-717e-4085-baf5-fc8ee07de69e&info\\_modal\\_version=default&open\\_info\\_modal=true](https://wall.sli.do/event/jvy0jcni?section=efcefb49-717e-4085-baf5-fc8ee07de69e&info_modal_version=default&open_info_modal=true)

# The Gender Gap in Computing

Arnaud Frey

Reshma Saujani was the guest of the closing session EDUCAUSE 2019. She introduced her presentation with her professional background. After studying at law school she became a lawyer in New York, a profession she did not practice for long because she did not flourish there. In 2010 she ran for the United States Congress and during the campaign she visited many local schools. She was then surprised by the gender gap in computer classes. This led her to launch the « Girls Who Code »<sup>36</sup> movement, an international non-profit organization working to close the gender gap in technology and to change the image of what a programmer looks like and does.

Moreover the issue of diversity, DEI, was considered as a key IT issue of the EDUCAUSE 2019 conference by EDUCAUSE President John O'Brien. This is why several presentations concerned this subject. Nina Reignier-Tayar's article in this report, entitled "Diversity in Computer Science Professions in American Higher Education," describes the content of several of these presentations.

## The situation in United States

Information Technology is a sector of activity in full development. Yet less than one in five computer science graduates is a woman. As a result, the proportion of female computer scientists in the United States has been steadily declining, as shown in figure 1.

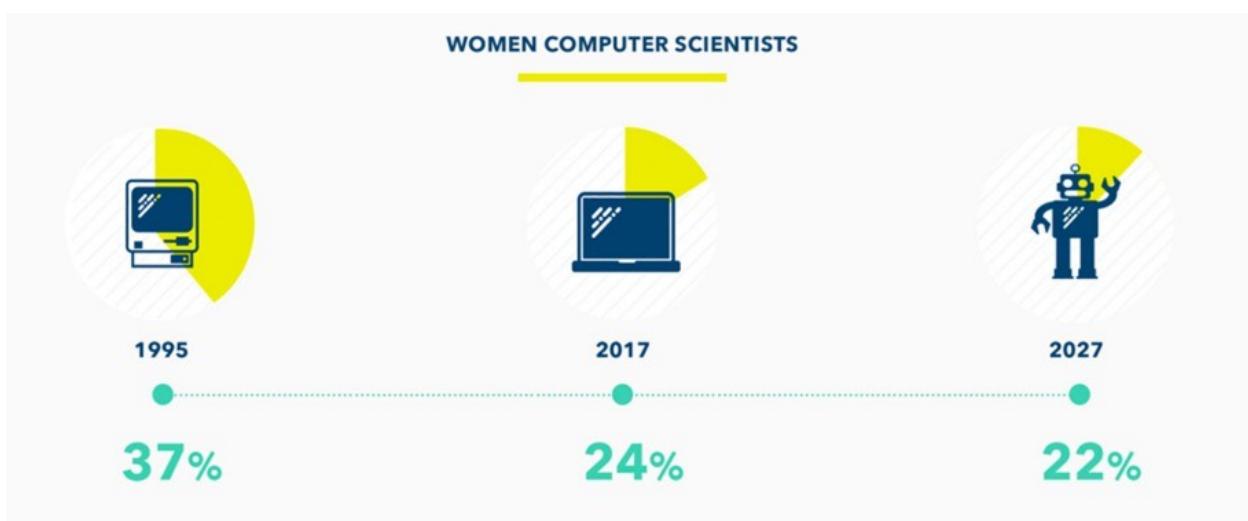


Figure 1: Percentage of female computer scientists (source : <https://www.girlswhocode.com>)

Reshma points out that girls' participation in computer science ebbs over time, but the biggest drop off happens between the ages of 13-17.

<sup>36</sup> <http://www.girlswhocode.com>

In an attempt to explain this phenomenon, she presented us several specific cases that are very revealing of the difference between men and women from an early age. Like for example a video where 5 year old children taste lemonade with salt added<sup>37</sup>. The experience was first addressed to a group of boys, who made it clear that lemonade is not good. The experience was then repeated with a group of girls. They had much more measured comments, probably not to offend the person who prepared the drink: "this drink is very good, but I don't like lemonade", "I liked it, but can I have a glass of water? ». This video shows the difference in empathy that boys and girls can feel and this led us to make the link with perfectionism, because women who have generally had an education that makes them want to be perfect, cannot be perfect if they hurt others.

Reshma also spoke to us about bravery, with the example of her son who is afraid of the dark. And when he goes to bed, his parents put a night-light on to reassure him. But her husband tends to cut it off after an hour, which the boy doesn't like at all. Reshma finally got her husband to admit that he wouldn't do the same thing if it was a girl.

Our current schemas lead us to protect girls more, they are told that they need to take care of them. Then, as they grow up, they should pay attention to their romantic relationships, in order not to get hurt, etc. As for boys, they are often not told anything, or conversely, they are told to dare... The result is that women dare less. This is felt in recruitment as well, as we can see that a man will be able to apply for an offer even if he only meets 60% of the criteria, whereas a woman will generally check each skill required and in the end she will only apply if she has them all.

What needs to be understood here is that education plays an important role in women's self-perception. Being aware of this and adapting what parents say and how they behave towards their children will help to reduce the difference in the future.

But it is not only education that is at the root of women's lack of interest in computers. It must be admitted that the image of the computer scientist has deteriorated and become more masculine. In fact, Reshma asked many girls at the University during her election campaign: "what is your vision of the coder". As evidenced by the testimonies collected, these girls very often replied that it is usually "a boy who drinks Red Bull and hasn't showered". A very negative image that does not favour

the projection of women in this profession. Reshma believes that the media has an important role to play because she found her vocation by watching a series featuring a female lawyer. But there are very few coders in movies and TV series. There was indeed an initiative of Barbie who staged her character as a developer in one of her animated films (see figure 2). But this one was clumsy: in the scene, Barbie's friend asked her to be able to play the game she had developed. And Barbie told her that she only did the design, and that only Rick and one other boy will be able to stage the characters. Reshma cited several examples of the same type where the messages were bad. This gives a negative image of these jobs for women. This part was illustrated by a video "Why can't Girls code" featuring female students. This is a caricature of the worst clichés that can be seen and proves that the image of the developer needs to be improved !

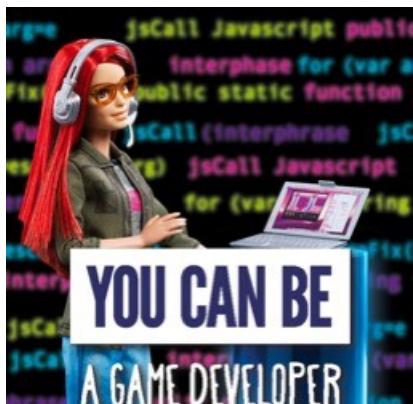


Figure 2: Developer Barbie

All this suggests that changes in behaviour must be made at all levels to encourage the feminisation of technology professions: during children's education, their training, and right up to the professional environment, including the image conveyed by the media. These messages are very important from the point of view of the parent, who wants his or her child, if he or she so wishes, to be able to participate in the development of digital technology of any kind. This is also true from the point of view of the IT manager, who is often confronted during recruitment with the lack of female candidates in the field. We can then question the situation in France to see if we are in the same configuration.

<sup>37</sup> <https://www.youtube.com/watch?v=KD9-jnLD4lY>

## The situation in France

It is clear that we are in the same situation since, according to Hélène Stevens, lecturer in sociology at the University of Poitiers, few women in France are moving into digital professions: in 2012, 9% of students in specialized technical sections, 25% on average among IUTs, 20% among professional bachelor's degrees and 13% among students in engineering schools specializing in computer science. And in spite of numerous voluntary steps taken by various political, economic and associative actors (European and national politics, representatives of IT companies, public or private training establishments, etc.), many of them subsequently leave it for various reasons. The obstacles are now well analysed by social science research, as Isabelle Collet, Associate Professor of Education at the University of Geneva, shows for example: they have difficulty in gaining recognition for their professional legitimacy in a predominantly male environment, they are subject to discriminatory gender stereotypes, they are confronted with opaque rules of progression defined by men and for men, as well as salary inequalities.

The image of the computer scientist has also evolved. According to Isabelle Collet [2017]: "The figure of the hacker (the passionate programmer), or the geek (the technical fan) has supplanted the more mixed image of the IT management technician, working in the tertiary sector. These new images have an attractive effect on men but much less for women.

However, there are many associations that have also been created on the subject in recent years in France, such as Pasc@line or "Elles Bougent". But for the time the actions taken have not led to a reversal of the trend. However, Joël Courtois, Managing Director of EPITA (an engineering school specialised in computer science) and very involved in the question of the place of women in technology repeats : "Making tomorrow's world, which will be digital, without women, is not desirable. Women cannot be excluded from this tremendous employment potential in the years to come! ".

## Conclusion

If we want things to change, it can only happen through a global awareness. So that women can take part in the digital world of tomorrow, and choose the job they want without being influenced by stereotypes that have no reason to be, or even to be the target of discrimination, let us all be aware of this issue and, as parents and/or IT professionals, convey an ungendered image of our profession.

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# Leveraging AI in Academic Activities

Dominique Verez

As early as 2016, Artificial Intelligence (AI) made a remarkable entrance at Educause. After unreasonable hopes and despite some failures, the time has come to settle down and look at the areas where academic success is evident. Because, make no mistake, there is indeed a New World beginning, the contribution of AI is, and will be, unavoidable. A milestone has been reached and there will be no turning back, the corner has been passed. Solution providers and institutions that have not yet taken this turn must do so as soon as possible, at the risk of falling behind.

We live in a world where "international" competition between higher education institutions is only increasing, we must be vigilant, proactive, and certainly also more "open", especially regarding our data. There is no Artificial Intelligence, no Machine Learning, without a critical mass of data.

**« The combined use of massive amounts of information and relatively simple learning algorithms makes it possible to solve problems that were once considered inaccessible. »**

Machine learning and Artificial Intelligence are a vast subject already covered in previous reports. Let us briefly recall what they deal with.

## Artificial Intelligence

Artificial intelligence (AI) is "the set of theories and techniques used to create machines capable of simulating intelligence»<sup>38</sup>. The underlying concept is that "any intellectual activity can be described with sufficient precision to be simulated by a machine" John MacCarthy<sup>39</sup>.

## Machine learning

Machine learning (automatic learning or statistical learning) is a field of study of artificial intelligence. It concerns the design, analysis, development and implementation of methods allowing a machine (in the broadest sense) to evolve through a systematic process, and thus to perform difficult or problematic tasks by more classical algorithmic methods<sup>40</sup>.

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<sup>38</sup> Definition of AI : [www.larousse.fr/encyclopedie](http://www.larousse.fr/encyclopedie)

<sup>39</sup> John MacCarthy the main pioneer of artificial intelligence, along with Marvin Lee Minsky.

<sup>40</sup> Machine Learning : [fr.wikipedia.org/wiki/Apprentissage\\_automatique](https://fr.wikipedia.org/wiki/Apprentissage_automatique)

## The conference

This article is based on the papers presented at the conference: *Leveraging AI to Support Data-Empowered Learning*<sup>41</sup>

It was essentially based on the studies and achievements of the prestigious Pennsylvania State University (which the French delegation to EDUCAUSE visited in 2017 in Philadelphia).

Within the « *Teaching and Learning with Technology* » team, a group of 6 people was formed, the « *Data Empowered Learning Group* ». The work was presented by :

- Bart Pursel<sup>42</sup> - Assistant Director
- Benjamin Hellar<sup>43</sup> - Research and Development Engineer
- Drew Wham<sup>44</sup> - Data Scientist

The team's objective is to explore ways of using data science technologies to bring new insights into the field of higher education.

In particular, they use *machine learning* to assist in course design and production, evaluation of pedagogy, reflection on methods, ideation (the process of forming and sequencing ideas), and the different permutations and forms that student success takes.

All this with one constant, to make the data "talk".

The team has half a dozen projects, which can be divided into two categories :

- Classically and not surprisingly: projects that manipulate institutional data
- Much more surprising and exciting: projects that are based on unstructured data

## AI and ML on unstructured data

Unstructured data includes a variety of sources, such as large amounts of text or audio recordings, data from discussion forums, textual data from exams, essays, or other assignments submitted by students..

Their analysis is done in conjunction with open data sets, such as Wikipedia. One of their first projects used Wikipedia as a dataset to build a content recommendation engine.

From this project was developed a powerful aid in the form of suggestions, an aid that answers one of the many questions that the University asked them: "Can we give the faculty members a list of contents, which they like or dislike, and then try to bring out new interesting contents that they would not have found before and that they can use in different contexts? »

Another project was to get students to contextualize difficult content to help them delve deeper into these topics. With the will to make them discover more than they would find themselves by consulting search engines. It should be noted that the project brings a personalized content to each student, according to his or her own difficulties, in relation to his or her institutional data and Learning Analytics results.

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<sup>41</sup> Leveraging AI to Support Data-Empowered Learning – Wednesday October 16th 2019

<sup>42</sup> Bart Pursel - Assistant Director, Teaching and Learning with Technology Innovation

<sup>43</sup> Benjamin Hellar - Research & Development Engineer

<sup>44</sup> Drew Wham - Data Scientist

### The SPECTRUM project

A curious and original project, with surprising results, which follows a less frequented path of IA, still fallow. He deserves some attention!

The idea came from observing the teaching style of a famous sociology professor, Sam Richards<sup>45</sup>, member of Penn State faculty, which teaches "cultural relations" in front of what is the largest "classroom" in Penn State, with 760 face-to-face students in the same lecture hall.



Apart from the fact that it is certainly very intimidating to stand in front of so many students, how can he do active learning in front of an assembly of this size? The students are engaged and active, Sam does it through discussion, debate, role-playing. He gets people up, he gets them moving around the room.

Penn State's AI team observed him, got to know Sam well, attended many of his classes, filmed and recorded them. With a question: how can we use spaces like this as untapped data sources? How do you use this kind of environment to capture data, understand what's going on in the best training rooms, and then use that data to help feed teachers' thinking, to help them improve their job, to improve themselves?

A first step was to use the DART<sup>46</sup> (Decibel Analysis for Research in Teaching) technology, a project of San Francisco State University<sup>47</sup>.

The question that DART is trying to answer is: "Can audio data from a training room, fed into a machine learning algorithm, identify the pedagogical approaches that teachers adopt in learning spaces? »

The concept is really surprising, and it has been taken up and amplified by Pennsylvania State University in a machine learning project called Spectrum. Project that combines DART, natural language processing, neurolinguistic programming (NLP) and pedagogical data.

The aim: to help teachers and educational engineers/designers (that's how they call them) to engage in reflective practice with the support of machine learning.

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<sup>45</sup> Sam Richards : [sociology.la.psu.edu/people/smr8](http://sociology.la.psu.edu/people/smr8)

<sup>46</sup> DART : [sepaldart.herokuapp.com](http://sepaldart.herokuapp.com)

<sup>47</sup> San Francisco State University : [www.sfsu.edu](http://www.sfsu.edu)



This project begins with audio capture in training rooms. Penn State collects almost all the audio in its classrooms through a variety of methods. The sound is recorded and then processed via the AWS<sup>48</sup> *speech2text* API to convert it from speech to text.

The transcription is accurate, it contains all the words spoken during the course, as well as the timestamps associated with each word.

The transcription is then taken over and executed in one of Google's latest advances, namely BERT<sup>49</sup> (Bidirectional Encoder Representations from Transformers). It is a machine learning model, deep learning, which codes the meaning of sentences.

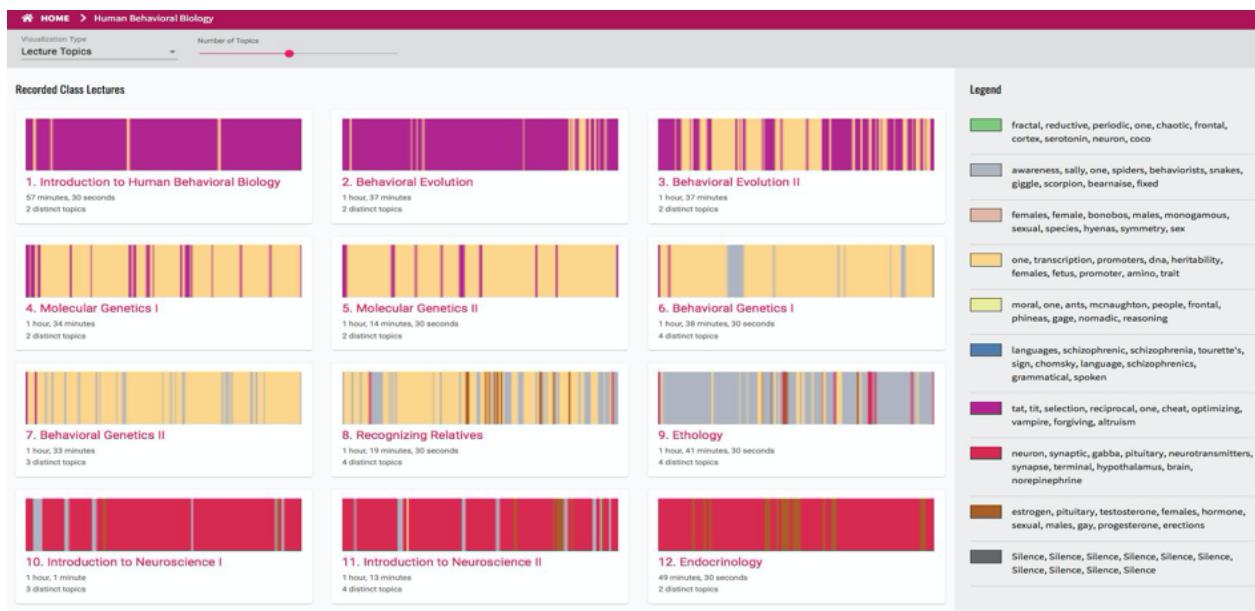
When sentences pass through this model, we get a set of numerical values that represent the idea of what was said at the time. These values are then taken up and processed by several machine learning techniques, developed by Penn State, in order to group, model and summarize these elements over time.

<sup>48</sup> AWS : Amazon Web Services

<sup>49</sup> BERT : [www.blog.google/products/search/search-language-understanding-bert](http://www.blog.google/products/search/search-language-understanding-bert)

## Discovery of the subjects

Spectrum's analysis of a complete curriculum of 12 courses in human behavioral biology reveals the following :



Each block represents a course. The purple block, which is numbered 1, top left, is the first course. Each course in the curriculum has its own block. And each "vertical line" in a block represents 30 seconds of elapsed time.

Each vertical line color represents a major topic discussed in class. These subjects are automatically recognized and labeled by the machine learning algorithm.

One can observe "visually", on a single page, the entire pedagogical progression of the curriculum. The first 2 courses focus on behavior, and then topics related to genetics are covered. If we look at the color yellow, we can see that the words that are most associated have a genetic meaning. Then the course enters the study of ethology. Finally, in red color, it is the beginning of the study of neuroscience.

By comparing the result with the audio recording of a course, we can find these elements very precisely, for example, just at the beginning of the tenth course, there is a grey area. That's when the teacher says, "We're going to start talking about neuroscience. For a week now, we have been talking about ethology". And then he starts his neuroscience class.

Each such sheet, representing a complete curriculum, is then analyzed by an engineer/educational designer, the teacher, and the faculty, in order to reflect on a possible redesign of the course, the way in which the constituent elements of the curriculum are ordered, the time that is devoted to each concept, and whether or not the objectives of the training are achieved.

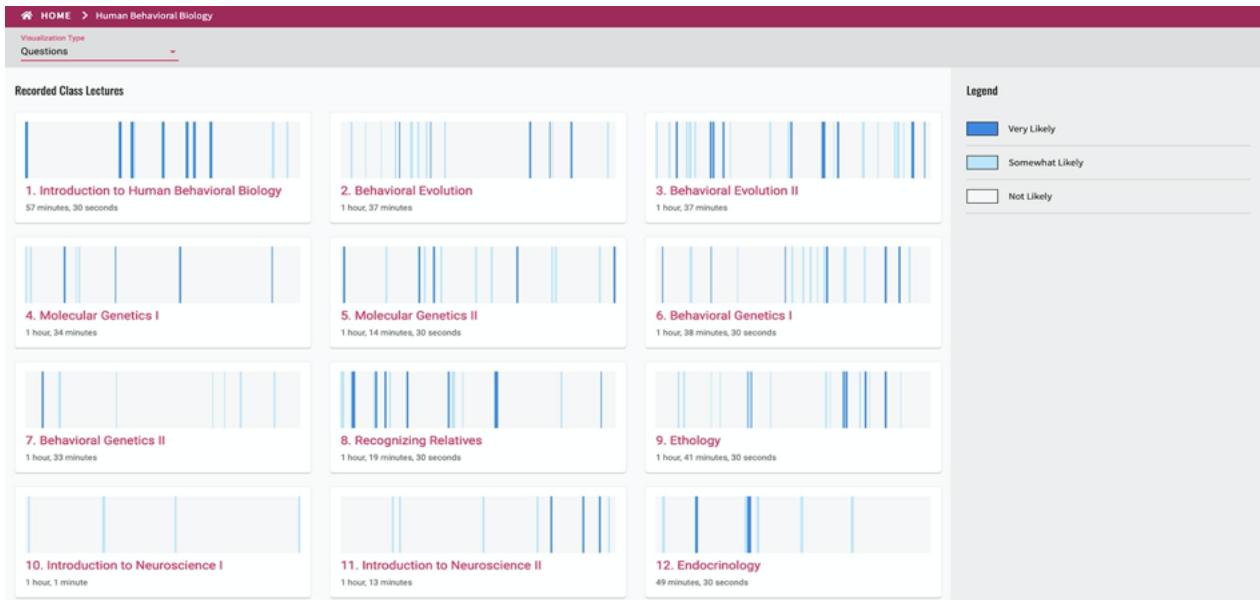
Prior to the introduction of this technology, the work of the instructional engineer was extremely difficult, because without expertise or background in a particular field, he had to come into a training room to understand what is being taught and what the important learning objectives are. But, due to lack of time, he had to do it in a piecemeal way, without being able to attend the whole course, without having a global vision on a particular teaching.

With Spectrum he has a complete roadmap. He can quickly tell a teacher: here is what is being taught, here is roughly what we think are the main groups of topics, and here is how much time is spent on each.

This proves to be a really valuable starting point for an educational engineer/designer and a teacher to start a dialogue together.

### Discovery of interactivity

In Spectrum, all current spoken sentences have been integrated into a deep neural network. Discovering the subjects is not the only thing possible, in fact, there are many other valuable things to discover.



A first example is that apart from simply classifying sentences around a topic, the treatment can also identify when questions have been asked during the course. Questions that are of any type and on any subject.

Here, each blue "bar" shows a question that appears within 30 seconds. The application cannot (yet) determine whether it is the instructor asking this question or a student, but it does highlight the broad lines of interactivity.

Instructional engineers have found this feedback very useful in understanding the moments when there is interactivity between the instructor and the students. For in this scheme, even if it is a teacher who turns to the class and asks a question without the intention of receiving an answer, it is still a model of interaction.

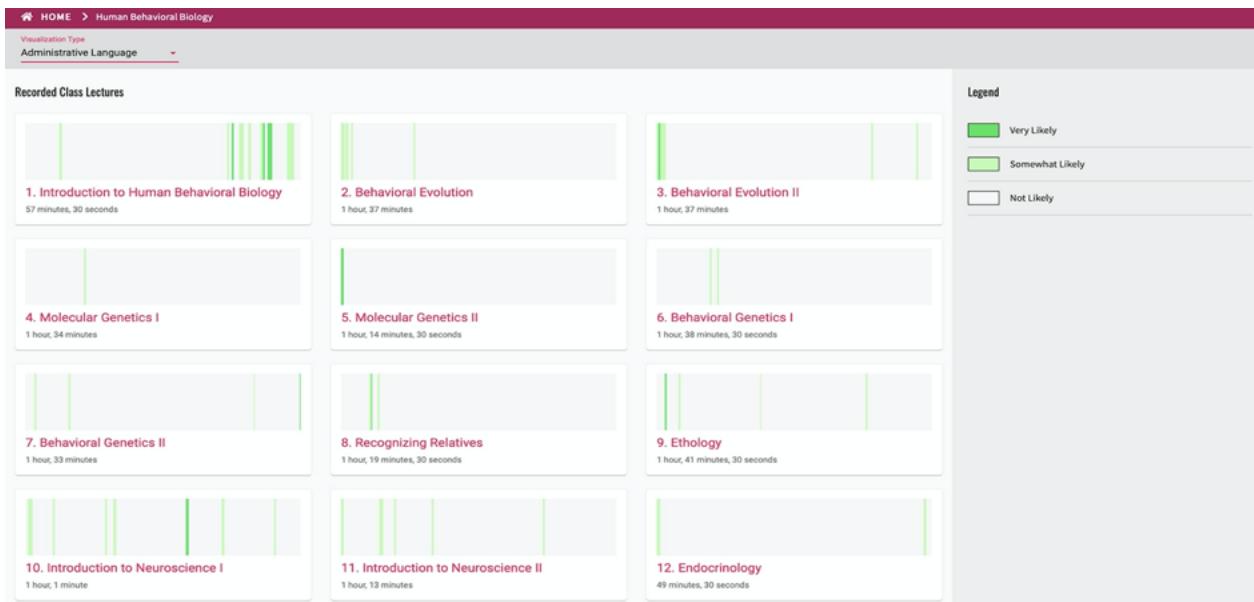
One of the first success stories was the improvement of an anthropology course, where an instructional designer helped a teacher interact better. How? By making him "see" that in the area where he talks about his own research, where he is most passionate, he actually takes fewer questions and interacts the least. This item was reviewed, jointly, to increase and improve interaction with students.

### Administrative discussions

In a second, equally surprising example, the presenters showed us how Spectrum can identify moments when there are particular types of discussions, such as here, "administrative" discussions.

Still in the same course, the teacher, extremely competent and passionate, begins his first class by telling a fascinating story about behavioral biology. But he ends it with a 20-minute discussion about how the course will work, where the student can find the resources for the course, what textbooks he should acquire, that sort of thing. One can "see" in the first block that there is a large space "labeled" as administrative language at the end of this first course. We notice that afterwards, quite regularly, the teacher begins his course with an administrative discussion.

These remarks, discussed with the teacher, helped him to understand that he was spending far too much time on this kind of thing and that he could do without it by using various platforms more efficiently.



Only two examples have been shown, but the Spectrum project has proven its usefulness in a whole host of other equally unexpected subjects, and many are certainly still to be discovered...

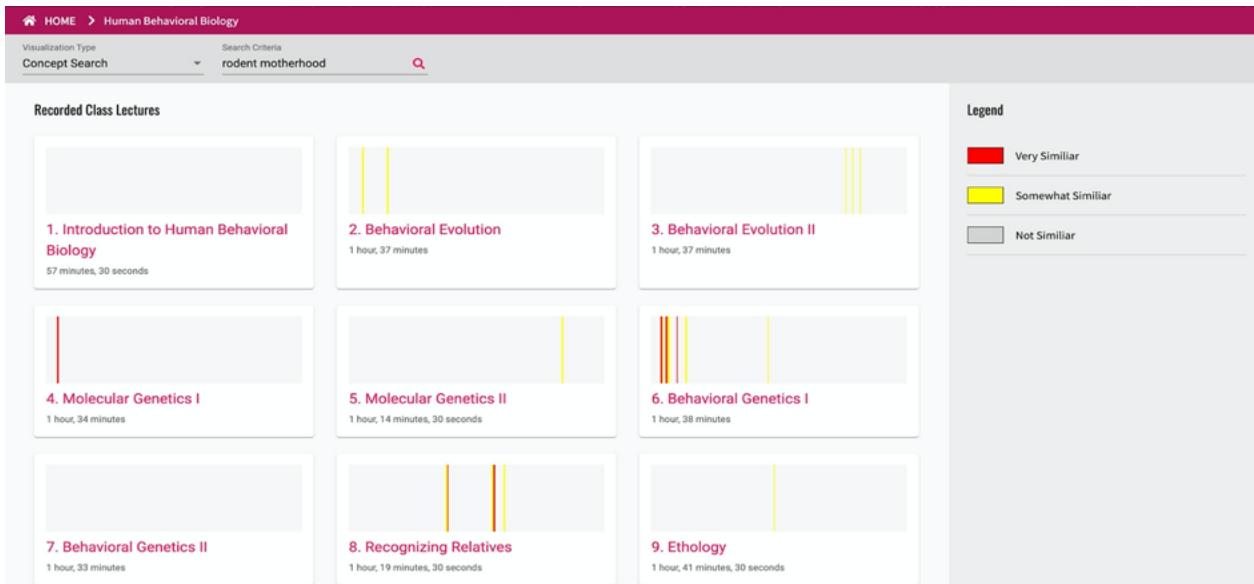
### The future of Spectrum

After initially developing Spectrum for teachers and educational engineers/designers, the Teaching and Learning with Technology team intends to develop Spectrum to help students.

In the future, it would like to provide them with an audio playback “boosted” by Artificial Intelligence. The usage could be very simple, for example, if a student has missed the day's class, or if he or she has been there but cannot remember exactly when the assignments are due, he or she could quickly find out where that information is and listen only then.

In fact, there is a very wide range of possibilities and the development team will work with the students to determine what their needs are.

A very first idea has just been developed, to easily find the elements that need to be reviewed in order to be able to study them. This requires the ability to conduct research based on ideas.



Still in the same curriculum, let's suppose that we are interested in rodent motherhood and parenting behavior. The search "rodent motherhood" in the "Concept Search" tab returns as a result the moments in the curriculum when the subject has been approached in a rather precise (red) or rather similar (yellow) way. In the example, Course 6 seems to be the most suitable module, and indeed, it includes a discussion on the parenting behavior of vampire bats.

The project development team's argument is simple: if you are a student, and you don't have Spectrum, even if you have all the course recordings, you won't be able to easily and quickly find the locations of the exact phrases containing the keyword you are looking for. With Spectrum, you don't even need the keyword, a general idea and a second of processing is enough to explore an entire curriculum.

## AI and ML on institutional data

Projects that manipulate institutional data use different sources:

1. The Institution's Information System ;
2. The Learning Management Systems (LMS) ;
3. More specific data, such as how the student models his or her own learning and data on « engagement » ;
4. The way students browse the web (institutional and pedagogical), and use tools such as Canvas or Blackboard.

The result is that:

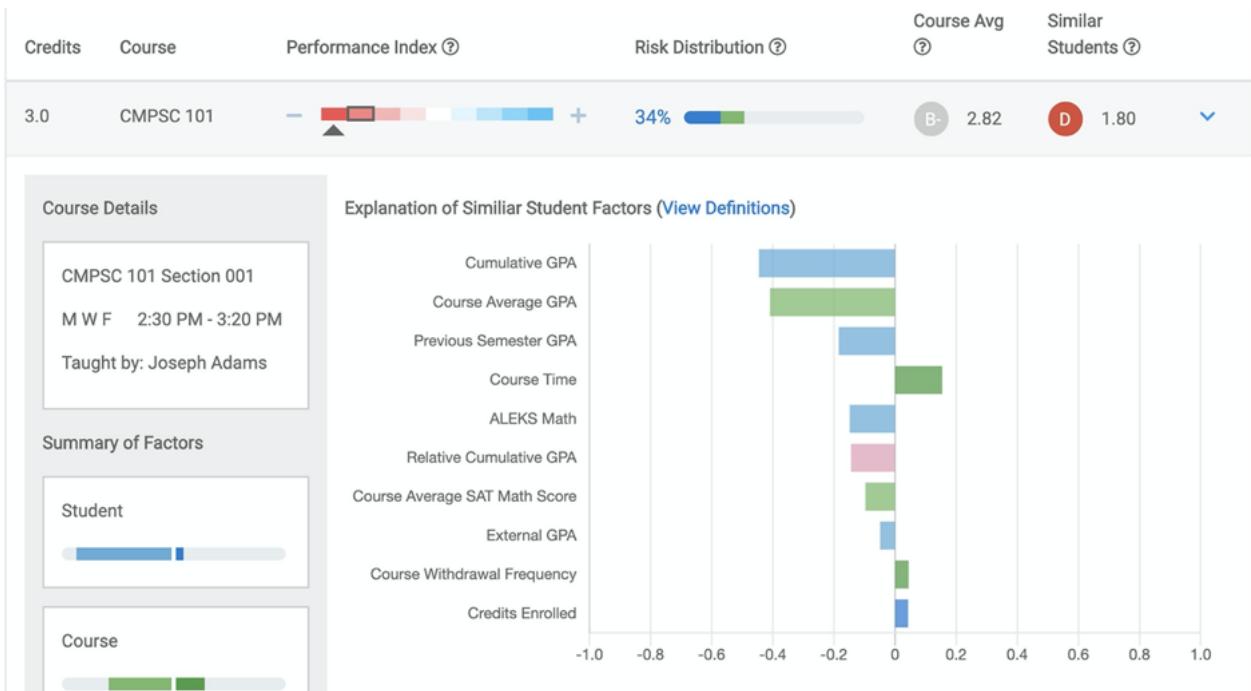
- Modeling "retention" (a very important concept in the United States, where every effort must be made to keep students from leaving elsewhere), i.e., calculating the probability that a student will move from the first semester to the second semester and be retained, and remain, from one year to the next at the institution ;
- More surprisingly, an aid to course development. Reflecting on teacher and student data allows teachers and students to see things from a different perspective, possibly making different kinds of decisions about teaching and learning ;
- Early warning systems to identify students in difficulty.

This use of Artificial Intelligence and Machine Learning has become classic in American universities, as we have already seen several times, and has been declined in different ways in the course of the editions of Educause.

Let us look at a slightly more original achievement, because it incorporates, from the design stage, concern for ethical considerations.

## LIFT

LIFT is a good example of the use of Artificial Intelligence in machine learning, using institutional data. It is intended to be a major tool to assist decision-making in university councils. It can provide indications of how a current student might develop within a course, considering the way previous students have behaved within the same course.



The concept is to look in the past to be able to predict how a student will behave in the present. To do this, Penn State has formed a decision tree model around more than 8.6 million institutional records collected since 2005. It includes transcripts and data from all students.

The LIFT project was developed from all these data in order to make forecasts. In particular, it explores the relationship between course selection and student performance.

LIFT users are the people who supervise students in the Division of Undergraduate Studies, known as DUS at Penn State. First and second year students are assigned a DUS advisor, each advisor manages between 200 and 300 students. It must analyze the success of each student, each semester.

LIFT helps DUS advisors be more proactive in the way they talk to students, rather than just being reactive when a problem arises.

## LIFT at its core.

Using machine learning enables us to personalize insights into how students might perform in specific classes based on how similar students performed in the past.



 **PennState**  
Teaching and Learning  
with Technology

To achieve this, the development team first conducted a pilot study on the ethical use of analytical tools, such as LIFT, in the academic field.

What kind of training is needed before advisors can understand these kinds of tools, which they have never used before? How are they supposed to interpret the results? What are the ethical considerations of such an interpretation? And finally, what is the administrative organization needed to support the project?

The development team uses many new data science models and techniques that are not only at the forefront of academic progress, but are also at the forefront of AI and IT. Using them without regard to ethics is a real danger, both for the institution and for those who use them. A DUS advisor could take an action that could potentially endanger his or her career. A student could challenge a decision concerning him or her.

One of the main criticisms of machine learning is that we cannot understand why the machine learning model makes this or that decision. Fortunately, significant advances have been made in technology and this is now almost totally false. We can know the exact reasons why the machine learning model made such a decision, and in such a way.

The development team insists and is very clear: LIFT is by no means a crystal ball; the human element remains decisive. LIFT will never know if a student has broken up with a loved one, has a family problem at home, or is recovering from an illness. There are several factors that can contribute to a student performing above or below expectations.

And that's exactly where Penn State wants the DUS advisor to fit in. Student data is always a snapshot and a partial view of an individual, it is never an accurate and complete picture. The objective is to trust advisors to rely on their own expertise when making decisions with the help of LIFT.

After a year of implementation, the results of LIFT are very encouraging, with DUS advisors believing that the grades obtained in the LIFT study correspond to their own reflections on a student's "performance" during a given semester. Advisors trust the similarity scores provided by LIFT. They feel that the notes really correspond to what their own intuition dictates. LIFT is particularly appreciated for bringing light in atypical situations.

# Learning Spaces

John Augeri

## Tools

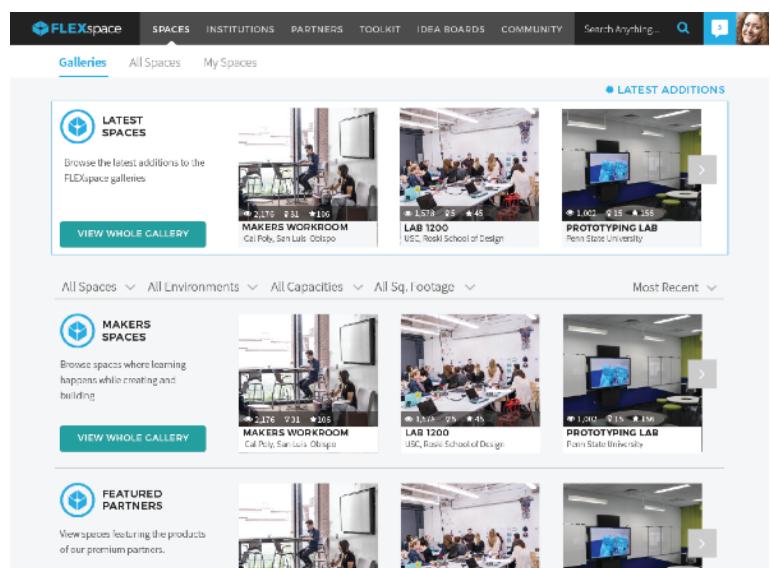
The EDUCAUSE Annual Conference, once again, was an opportunity to review two of the major design and assessment tools related to Learning Spaces. The meeting of the Learning Space Design Community Group presented several remarkable achievements recorded in the FLEXspace online repository and also provided an overview of the Learning Space Rating System.

As we have already indicated in previous French Delegation reports, these two tools are constantly confirming their place in the landscape, and are now a reference in their respective fields. They are also continuing to develop while showing an increasingly marked complementarity.

### FLEXspace<sup>50</sup>

The version 2 of the FLEXspace online repository has been available since 2018, and offers a significantly improved user experience, especially from mobile terminals. Backed by a formalized research activity (the FLEXspace Research and Evaluation Working Group<sup>51</sup>), the contents are currently consulted by nearly 4.500 users from 64 countries. FLEXspace is today a privileged vector to access good practices for the design and implementation, monitoring, forecasting and evaluation of all types of Learning Spaces (Active Learning Classrooms, Learning Centers, Learning Commons, etc.). It is also a privileged platform for valorisation and visibility due to its systematic use as a support for several presentations related to Learning Spaces at the EDUCAUSE and EDUCAUSE Learning Initiative Conferences, but also at other events worldwide.

Following the example of the 2019 edition, a specific pre-conference workshop entitled “Create, Collaborate, and Transform Learning Spaces Hands On with FLEXspace<sup>52</sup>” presented different ways of using FLEXspace in the design or renovation of spaces. The documents and guides used during this day are freely downloadable<sup>53</sup>.



<sup>50</sup> [www.flexspace.org](http://www.flexspace.org)

<sup>51</sup> <http://flexspace.org/frewg/>

<sup>52</sup> <https://events.educause.edu/annual-conference/2019/agenda/create-collaborate-and-transform-learning-spaces-hands-on-with-flexspace-separate-registration-is-re>

<sup>53</sup> <https://flexspace.org/2019/10/educause-2019-flexspace-workshop-oct-14th-handouts/>

## Learning Space Rating System (LSRS)<sup>54</sup>

The LSRS, which has been translated and adapted into French since 2017 by this paper's author<sup>55</sup> will undergo a transition to version 3, the original version of which is scheduled for publication in February 2020, and before the summer for the French version. It should be remembered that this system constitutes an evaluation protocol and a terminology framework, more specifically focused on Active Learning Classrooms.

Addressing a wide range of dimensions relating to the setting up of such a space (governance, operations, technological equipment and furnishing, comfort, etc.), the LSRS makes it possible to draw inspiration from the good practices listed in the booklet accompanying the evaluation grid, and to use the latter to obtain a predictive qualitative score for a room that does not yet exist, and to compare oneself with some others already in place. FLEXspace is increasingly offering LSRS scores for the Learning Spaces listed there.

## Trends and challenges

While Learning Spaces continue to figure prominently in the current and future topics listed by EDUCAUSE, the 2019 edition of the Annual Conference seemed to be a turning point. Beyond considerations of space design, it is indeed the qualification of their uses, not to say their return on investment - not only financial but also ecological - that has been discussed. Realism and rationality seem to have been the key words of this edition.

For the third year in a row, the author of this paper presented at the EDUCAUSE conference an overview of international trends and challenges in Learning Spaces. The latter is based in particular on a comparative study conducted since 2016 on four continents, already involving more than 150 establishments.

This presentation began with a review of Active Learning Classrooms, discussing their design principles from both a furniture and technology perspective. It pointed out that beyond the dogmatism sometimes observed and presenting the flexibility of the furniture and the important amount of technological equipments as an evidence, the reality on the field is much more diverse. The question of spatial flexibility, in particular, seems today to be raised as much by the logic of the versatility of a space aimed at maximizing its potential for use - and therefore profitability - as by a concern to accompany educational activities that are sometimes insufficiently defined. A notable evolution for this category of Learning Spaces is the progressive but very real appearance of specialized Active Learning Classrooms, particularly in scientific disciplines (biology, chemistry, geology), but also in conjunction with innovative visualization devices (AR/VR, panoramic or hemispheric screens). The Active Learning Classrooms, as a whole, and beyond the many legitimate promises they still hold, face a double challenge in relation to the prospect of a generalization that has been announced<sup>56</sup>. On the one hand, their implementation in a sufficient number to offer a cumulated capacity to program tenure classes, but also the support of the faculties in order to draw the quintessence in terms of innovative uses.

Collaborative Lecture Theaters, a counterpart to the Active Learning Classrooms for lecture theatres, are still the least represented category of Learning Spaces, despite the creativity of some of them in their design. This trend seems to validate the questioning - in the medium/long term - of the systematization of face-to-face lectures.

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<sup>54</sup> [www.learningspaceratingsystem.org](http://www.learningspaceratingsystem.org)

<sup>55</sup> <https://www.educause.edu/~/media/files/educause/eli/initiatives/ltrs-v2-french-translation.zip?la=en>

<sup>56</sup> The session of the EDUCAUSE Learning Space Community Group at the 2017 Conference envisioned the beginning of the generalization of Active Learning Classrooms in 2020

As was already pointed out in 2018<sup>57</sup>, there has been a significant shift in the thinking and projects carried out by governances in favour of integrated informal spaces, and in particular Learning Centres and Learning Commons. An Australian study also illustrated this change by referring to the amount of time students spend in

informal spaces as being three times as much as in formal spaces (especially in Active Learning Classrooms). The equipment of these spaces reflects the diversity of the uses they claim to support. Thus a whole range of functional sub-units can coexist in Learning Centers and Learning Commons, through a zoning scheme (physical and functional subdivision of space) which - interestingly - can present similarities between geographically very distant and physically very different spaces. The session also highlighted the emergence of a new category of Learning Spaces, interspersed between formal (Active Learning Classrooms) and informal (Learning Centers and Learning Commons) spaces: transitional spaces. These, which can be seen at the entrance of Learning Centers or at the exit of Active Learning Classrooms, aim to offer users a place to stop for a

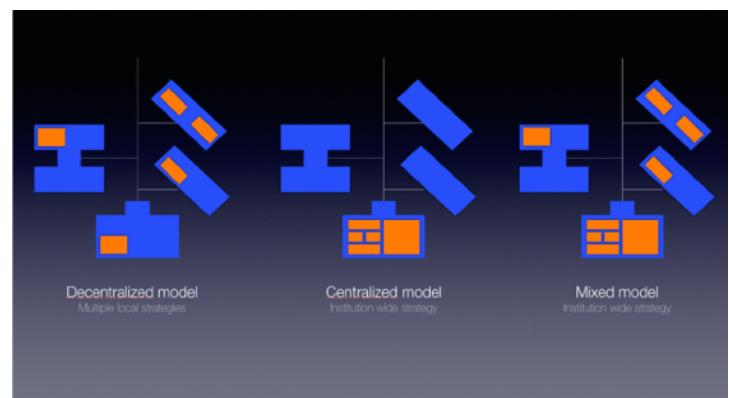
few minutes to relax, charge batteries, or even carry out some short collaborative activities, sometimes through writable surfaces. The installation of such transitional spaces creates spatial, physical and functional continuity within the campuses concerned, and helps to recompose the learning territories. .

The competitive dimensions that Learning Centers and Learning Commons may face were again raised. On the one hand, by underlining that their very nature as third places places them in front of potential actors of the same register, but located outside the campuses, and on the other hand, by reminding that these spaces, certainly more than many others, must be thought of in their ecosystem, taking into account all the daily dynamics of the users.

Finally, emphasis was placed on the phenomenon of centralization increasingly observed on campuses, which consists in concentrating a majority - or even all - of Learning Spaces within a single identified building. This approach is part of an campus-wide strategy, as opposed to decentralized schemes that are generally the legacy of multiple, often uncoordinated, local initiatives. Once again, this trend illustrates the appropriation of the subject of Learning Spaces by stakeholders. A mixed configuration, combining for example the centralization of formal and informal spaces with specialized and decentralized Active Learning Classrooms is also beginning to appear.



Edith Cowan University Central Library  
Perth, Australie



<sup>57</sup> Session « The Rise of Informal Learning Spaces » from the same author at the 2018 Annual Conference: <https://events.educause.edu/annual-conference/2018/agenda/the-rise-of-informal-learning-spaces-design-challenges-assessment>

## Other sessions

Two other sessions, in particular, dealt with the topic of Learning Spaces at the conference.

### Co-construction in design

University of Notre Dame, in partnership with Steelcase Education, presented<sup>58</sup> a process for co-constructing Learning Spaces with students and teachers, using a 5-step methodology and a *Learning Space Report Card*. The corresponding presentation is available online<sup>59</sup>.

### The role of libraries in transforming the uses

Mount Royal University and Ryerson University have addressed<sup>60</sup> the role of libraries in transforming usage, and more broadly the campuses, by positioning them as *Interstitial Spaces*. Two examples of library renovation, with the integration of a large number of new services, illustrate this approach. The corresponding resources are also available online<sup>61</sup>.

## Additional Resources

Readers wishing to delve deeper into the subject can refer to two of the same author's recent publications:

- *Back to Physical*<sup>62</sup> (in French), Bulletin des Bibliothèques de France No.17, June 2019
- *Etat des lieux des Learning Spaces à l'international*<sup>63</sup> (in French), Collection Numérique de l'AMUE No.7, January 2020
- *The Learning Commons phenomenon in Japanese Libraries, an international comparative insight*<sup>64</sup> (in English), Journal of College and University Libraries vo. 113, November 2019

In addition, Île-de-France Digital University, as part of its training program for staff, regularly schedules sessions on the design, implementation and evaluation of Learning Spaces, based on a permanent international survey and participation in the working groups mentioned in this article. The program of these sessions, which aim decision-makers as well as designers and users, is available online<sup>65</sup>.

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<sup>58</sup> <https://events.educause.edu/annual-conference/2019/agenda/steelcase-session-hold>

<sup>59</sup> <https://sites.nd.edu/real/2019/10/11/educause-workshop-building-flexible-learning-spaces-utilizing-faculty-student-driven-design/>

<sup>60</sup> <https://events.educause.edu/annual-conference/2019/agenda/interstitial-spaces-liminal-places-the-academic-library-as-change-agent>

<sup>61</sup> [https://events.educause.edu/HubEventResources/E19/SESS130/SESS130%20-%20Interstitial\\_Spaces\\_Liminal\\_Places\\_slides.pptx](https://events.educause.edu/HubEventResources/E19/SESS130/SESS130%20-%20Interstitial_Spaces_Liminal_Places_slides.pptx)

<sup>62</sup> <http://bbf.enssib.fr/consulter/bbf-2019-17-0106-011>

<sup>63</sup> [http://www.amue.fr/fileadmin/amue/systeme-information/documents-publications/la-collection-numerique/N\\_7\\_-\\_Patrimoine\\_immobilier\\_et\\_numerique\\_-\\_mutations\\_et\\_nouveaux\\_enjeux.pdf](http://www.amue.fr/fileadmin/amue/systeme-information/documents-publications/la-collection-numerique/N_7_-_Patrimoine_immobilier_et_numerique_-_mutations_et_nouveaux_enjeux.pdf)

<sup>64</sup> [https://www.jstage.jst.go.jp/browse/jcul/113/0/\\_contents/-char/en](https://www.jstage.jst.go.jp/browse/jcul/113/0/_contents/-char/en)

<sup>65</sup> <http://formation.unif.eu>

# Privacy vs. Security

Pascal Vuylsteke

In terms of strategy and priority, the 2020 harvest of "Top 10 IT issues" placed Security ("Information Security Strategy") and Privacy, first and second place respectively. The Privacy domain has gained a place over the last year. As for the first place for Security, this is a confirmed trend.

If very often, these two subjects are connected, there is a maturation in the perception of the relationship between the two domains.

Universities such as the University of Chicago have stressed the need for a clear differentiation of roles between the CISO (Chief Information Security Officer) and the CPO (Chief Privacy Officer). For the UoC, the role of CPO is a business one, as opposed to IS. At the time of our visit, it was still a question of opening the position, even though the university was already well advanced on the subject. Our interviewee insisted on the difference between the notions of compliance and regulations, which are complex but only mandatory, versus thinking about what seems ethical to do ("From "Can you" to "Should you").

In the case of Northwestern University, the role of CPO had initially been assigned internally within the IS department. Still, the university quickly recognised the need for some external recruitment, especially at the highest level, in order to assert the independence of this role. However, experts are scarce and Northwestern is looking for the five-legged or rather two-headed sheep: CISO and HIPAA Security Officer. In January this post was still published on LinkedIn. And there is a reason. Around Chicago, the unemployment rate is around 1.2% in IT. Looking for an experience in the USA<sup>66</sup> ?

During the conference, one of the most comprehensive presentations on the subject was made by Baylor University<sup>67</sup> with, once again, this double evidence:

Security and Private Data Protection/Privacy go hand in hand but are not the same concepts.

- Security concerns the protection of all information. Both the ones you choose to share and the ones you don't want to share.
- You can have security without privacy, but you cannot have privacy without security.

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<sup>66</sup> Senior Director, Information Security CISO : <https://www.linkedin.com/jobs/view/1681045779>

<sup>67</sup> Baylor University : One Year In: Establishing a Privacy Program on Your Campus : <https://events.educause.edu/annual-conference/2019/agenda/one-year-in-establishing-a-privacy-program-on-your-campus>



A very beautiful illustration was proposed in this presentation:

*"Security without a privacy policy is like a house made of bullet-proof glass. No one gets inside, but your personal life is fully exposed".*

Overall, security or privacy was addressed in at least 19 sessions of the conference.

## Security, a rather mature subject

The area of IT security has been highlighted in the reports of the EDUCAUSE delegation for more than four years. The field is recognised as a priority, and the EDUCAUSE organisation offers many toolboxes to help institutions to carry out their audits and develop their competence.

One example is the I "Information Security Program Assessment Tool"<sup>68</sup> which allows a self-audit of Security awareness level within one's institution, a tool provided as part of EDUCAUSE's "Cybersecurity Program" offer<sup>69</sup>.

Cybersecurity remains at the forefront for one obvious reason: cost.

The global cost of cybercrime will be \$2 trillion in 2020; global spending on cybersecurity was \$80 billion in 2018<sup>70</sup>.

A 2015 study found that the average cost of a cyber violation was approximately \$225 per compromised record, with an average total cost of \$6.5 million. "Higher Education's Vulnerability to Cyber Attacks", UNIV. BUS. MAG. (September 6, 2016)<sup>71</sup>.

Universities are seen as prime targets because they hold many of the same records as banks but are much easier to access. (Identity Force, J. Leary, Dec. 2016).

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<sup>68</sup> Information Security Program Assessment Tool : <https://library.educause.edu/resources/2015/11/information-security-program-assessment-tool>

<sup>69</sup> Cybersecurity Program" d'EDUCAUSE : <https://www.educause.edu/focus-areas-and-initiatives/policy-and-security/cybersecurity-program>

<sup>70</sup> Legal Update: Data Privacy and Cybersecurity : <https://events.educause.edu/annual-conference/2019/agenda/legal-update-data-privacy-and-cybersecurity>

<sup>71</sup> Higher education's vulnerability to cyber attacks : <https://universitybusiness.com/higher-educations-vulnerability-to-cyber-attacks/>

# Top Cyber Security Threats in 2019

- **Phishing, Spear Phishing, Whale Phishing Schemes Become More Sophisticated**
  - Nearly all successful cyber-attacks begin with a phishing scheme. [Business email compromise \(BEC\)](#), a highly targeted spear phishing technique, is responsible for over \$12 billion in losses globally.
- **Cryptojacking**
  - [Cryptojacking](#) allows hackers to hijack mobile devices, single computers, and enterprise computer equipment for “mining” cryptocurrencies, now [more common than ransomware](#)
- **Ransomware/Malware**
  - Healthcare, government, [education](#) particularly at risk
  - Ransom usually in Bitcoin, traditionally smaller amounts (\$5000 - \$50,000), more recent events indicate increasing ransoms (\$100,000 - \$2,000,000)

## Privacy : a complex, quickly evolving and diverse subject

While the field of security has been in the spotlight for several years, the field of data protection is much less mature but is exploding in all directions.

Two years ago, the schools visited by the delegation saw the GDPR/GDPR as a possible source of inspiration to address the topic, and the first GDPR presentations appeared at the conference<sup>72</sup>.

Today, regulations have multiplied, both internally in the USA and through interaction with different regions of the world (RGPD in Europe, APEC Privacy Framework for the Asia Pacific region or APEC Cross Border Privacy Rules (CBPR)). The result is an impressive list of regulations at different levels, often overlapping and sometimes contradicting each other<sup>73</sup>.

- FERPA -- The Family Educational Rights and Privacy Act of 1974: protects students and their parents
- HIPAA -- The Health Insurance Portability and Accountability Act of 1996: concerns medical data
- The Gramm Leach Bliley Act (GLBA): concerns financial data (tuitions, payments, salaries...)
- “Red Flags Rule” -- The Fair and Accurate Credit Transaction Act of 2003 (FACTA): Identity theft risk in relation to the storage of student financial data
- GDPR – The European Union General Data Protection Regulation of 2018
- CCPA – The California Consumer Privacy Act of 2018 (effective 2020): Duty to Inform about detected attacks and duty to implement a reasonable level of security
- State Laws on PII, PHI, Consumer Data – Each of the 50 US states now has separate, different and sometimes even contradictory data protection laws, creating a complex patchwork of regulations.
- COPPA -- The Children’s Online Privacy Protection Act: concerns data of children under 13 years of age, who may sometimes attend summer camps at some universities, hence the need to take them into account.
- Fair and Accurate Credit Transactions Act of 2003 (FACT Act or FACTA): concerns credit card users.

<sup>72</sup> EU General Data Protection Regulation (GDPR) vu par les américains : EU General Data Protection Regulation (GDPR)

<sup>73</sup> Baylor University : One Year In: Establishing a Privacy Program on Your Campus : <https://events.educause.edu/annual-conference/2019/agenda/one-year-in-establishing-a-privacy-program-on-your-campus> & Legal Update: Data Privacy and Cybersecurity : <https://events.educause.edu/annual-conference/2019/agenda/legal-update-data-privacy-and-cybersecurity>

The most often named law was probably the California CCPA, but this is mainly due to the fact that it is has been effective since January this year.

The general attitude is to delegate the task to a CPO, who is responsible for seeking universal principles to be deployed. They will as well elaborate an all-encompassing strategy to demonstrate the organisation's goodwill in the event of a dispute.

But this stain is sometimes troubling, even for those with legal training, as Elizabeth Lim Brooks from Virginia Commonwealth University, for example, testifies :

## I have a feeling we're not in Kansas anymore...

- State laws **differ** with respect to:
  - Deadline for notifying (14, 30, 45 days; reasonable time)
  - Notification to Attorney General
  - Notification to other State Agencies
  - Substitute notice (email, website, media)
  - Specific facts of incident and type of PI compromised
  - Maintaining records of incident (for 3-5 years)
- Countries also differ with notice requirements
  - GDPR (72 hours)

#EDU19



In brackets, it is interesting to note that universities are not the only ones concerned. Indeed, many platforms updated their Data Privacy Policy in 2019.

Let us look for instance, at Dashlane: "We've updated our Privacy Policy to comply with the California Consumer Privacy Act (CCPA), which takes effect on January 1, 2020". Or again Slack: "In support of upcoming changes to data privacy laws, we're making a few updates to our Privacy Policy, list of Slack Subprocessors, and Data Processing Addendum (DPA)).

The general conclusion of this chapter is that any European university in correct and renewed (up-to-date documentation) compliance with the GDPR is well equipped to deal with the emerging US legislation (the general principles are still the same), but that it would still need the opinion of a lawyer specialised in the subject to state this with certainty.

Universities should definitely include DPOs or even CPOs in their teams.

## Some sources

2020 Top 10 IT Issues : <https://www.educause.edu/research-and-publications/research/top-10-it-issues-technologies-and-trends/2020>

Education before Regulation: Empowering Students to Question Their Data Privacy : <https://er.educause.edu/articles/2019/10/education-before-regulation-empowering-students-to-question-their-data-privacy>

GDPR matchup: The APEC Privacy Framework and Cross-Border Privacy Rules : <https://iapp.org/news/a/gdpr-matchup-the-apec-privacy-framework-and-cross-border-privacy-rules/>

EDUCAUSE Cybersecurity Program : <https://www.educause.edu/focus-areas-and-initiatives/policy-and-security/cybersecurity-program>

# Immersive Learning: massive feedbacks in 2019

Thierry Koscielniak

This article is the fourth in a series that began in 2016 in the delegation's reports<sup>74</sup> :

2016 "Learning with Virtual Reality" - page 44 ;

2017 "Teaching with virtual reality" - page 46 ;

2018 "Immersive Learning: Promises kept?" - page 54.

The 2018 article concluded that results are likely to increase over significant numbers of learners. Indeed, the 2019 conference was an opportunity to present even more experiences than in previous years.

The subject of immersive technologies is becoming increasingly important as indicated by the proposal for two pre-conference seminars that require an additional registration fee.

In the showroom, several manufacturers of VR/AR headsets presented their new products: HP, Lenovo, Microsoft.

Evolution of types of communications:

2016 - A pre-conference seminar / 4 sessions / 1 poster

2017 - One pre-conference seminar / 2 oral sessions / 3 posters

2018 - One pre-conference seminar / one meeting of the XR Working Group / 9 oral sessions / 3 posters

2019 - Two pre-conference seminars / one XR Working Group meeting / 8 oral sessions / one corporate oral presentation / 9 posters

## Abstracts and references for papers in 2019

### Pre-conference seminars (separate registrations)

#### 1. Strategic Insights Into Immersive Learning: How XR Shapes the Future<sup>75</sup>

Ways to help institutions define a strategy on immersive technologies.

#### 2. Down the Rabbit Holes: Teaching and Learning Extended Reality Technologies<sup>76</sup>.

Feedback from the University of Hamilton on creative workshops in Literature using VR. Please note that the slideshow of this paid session is available online<sup>77</sup>.

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<sup>74</sup> <http://tinyurl.com/delegation-Fr-EDUCAUSE>

<sup>75</sup> <https://events.educause.edu/annual-conference/2019/agenda/strategic-insights-into-immersive-learning-how-xr-shapes-the-future-separate-registration-is-require>

<sup>76</sup> <https://events.educause.edu/annual-conference/2019/agenda/down-the-rabbit-holes-teaching-and-learning-extended-reality-technologies-separate-registration-is-r>

<sup>77</sup> [https://events.educause.edu/HubbEventResources/E19/SEM08A/SEM08A%20-Down\\_the\\_Rabbit\\_Holes\\_Teaching\\_Learning\\_Extended\\_Reality\\_Technologies.pdf](https://events.educause.edu/HubbEventResources/E19/SEM08A/SEM08A%20-Down_the_Rabbit_Holes_Teaching_Learning_Extended_Reality_Technologies.pdf)

## Meeting of the XR Working Group<sup>78</sup>

An online survey was used to create sub-working groups on the two themes: Technologies & Tools / Resources.

The group meets regularly in Web conferences.

The slideshow with the agenda of the meeting is available<sup>79</sup>.

## Oral Sessions

### 1. XR on Campus: Vanguard Applications in Teaching and Learning<sup>80</sup>

The flagship XR presentation of the entire conference. A look back at the second year of the HP/EDUCAUSE



"Campus of the Future" partnership that analyzes the use of immersive technologies combined with additive manufacturing (Additive Manufacturing: scanners and 3D printers). 17 universities participating in this program in 2018-2019. The results<sup>81</sup> are grouped into the following themes: Objectives; Uses; Integration; Adoption; Effectiveness.

This presentation has been recorded (video and transcript are subject to a fee<sup>82</sup> except for conference participants).

The slideshow is available online<sup>83</sup>.

The progress report of the "Campus of the Future" project is online<sup>84</sup>.

### 2. Curating a Bilateral Immersive Learning Experience: Our France-Singapore Story<sup>85</sup>

The author of this paper presented the results of work by students in human toxicology (Paris Descartes University) and environmental toxicology (National University of Singapore). The students created 360° resources using Ricoh Theta cameras<sup>86</sup> and the Uptale platform editing studio<sup>87</sup>.

### 3. Scaling XR Teaching and Learning: Development, Delivery, and Assessment Strategies<sup>88</sup>

Roundtable of teachers and ISDs from universities: North Carolina State, Penn State, San Diego State, and Sonoma State. Although standards for the design, evaluation, development and deployment of XR are poorly identified, participants reported progress in the development and refinement of effective practices.

### 4. Virtual Reality: Engaging, Effective, and Affordable Learning<sup>89</sup>

The Civil Engineer School realized virtual tours with a 360° camera.

The term affordable (affordable, economical) is relative to the American market: the cost of the camera is 3400\$.

This presentation has been recorded (video and transcript are subject to a fee<sup>90</sup> except for conference participants).

<sup>78</sup> <https://events.educause.edu/annual-conference/2019/agenda/extended-reality-xr-community-group-session-open-to-all>

<sup>79</sup> [https://events.educause.edu/HubEventResources/E19/DISC35/DISC35%20-%20eXtended\\_Reality\\_XR\\_Community\\_Group\\_Meeting\\_2019-10\\_FINAL.pptx](https://events.educause.edu/HubEventResources/E19/DISC35/DISC35%20-%20eXtended_Reality_XR_Community_Group_Meeting_2019-10_FINAL.pptx)

<sup>80</sup> <https://events.educause.edu/annual-conference/2019/agenda/xr-on-campus-vanguard-applications-in-teaching-and-learning>

<sup>81</sup> <https://library.educause.edu/resources/2019/10/xr-for-teaching-and-learning>

<sup>82</sup> <https://events.educause.edu/webinar/encore/educause-annual-conference-2019-online>

<sup>83</sup> [https://events.educause.edu/HubEventResources/E19/SESS191C/SESS191C%20-%20XRonCampus\\_Pomerantz\\_Slides.pdf](https://events.educause.edu/HubEventResources/E19/SESS191C/SESS191C%20-%20XRonCampus_Pomerantz_Slides.pdf)

<sup>84</sup> <https://library.educause.edu/resources/2019/10/xr-for-teaching-and-learning>

<sup>85</sup> <https://events.educause.edu/annual-conference/2018/agenda/extended-reality-xr-the-new-world-of-humanmachine-interaction>

<sup>86</sup> <https://theta360.com/fr/>

<sup>87</sup> <https://www.uptale.io>

<sup>88</sup> <https://events.educause.edu/annual-conference/2019/agenda/scaling-xr-teaching-and-learning-development-delivery-and-assessment-strategies>

<sup>89</sup> <https://events.educause.edu/annual-conference/2019/agenda/virtual-reality-engaging-effective-and-affordable-learning>

<sup>90</sup> <https://events.educause.edu/webinar/encore/educause-annual-conference-2019-online>

## 5. Harsh Reality to Virtual Reality: Getting Ahead with Immersive Tech<sup>91</sup>

Advice from educational engineers at Pennsylvania State university to explore the use of RV and 360-degree shooting. Slideshow (500 Mo!) and poly are available.

## 6. Going Virtual: VR in Higher Education<sup>92</sup>

University of Louisiana at Monroe has equipped a room with 28 PCs + Oculus Go headsets to view student work in RV application development.

## 7. Anywhere but in the Lab: Exploring Applications for VR<sup>93</sup>

University of Texas at San Antonio: using VR in Learning Lab; the CIO's point of view; the Labster tool for virtual lab work.

The slideshow is available online<sup>94</sup>.

## 8. Inspiring Innovation: The XReality Center at The New School<sup>95</sup>

### Oral presentation Corporate

#### 1. HP, Yale, and UNL Team Up on Blended Reality<sup>96</sup>

Yale and University of Nebraska-Lincoln in partnership with HP on uses of virtual reality in the arts.

### Posters

#### 1. Virtual Reality on the Bayou<sup>97</sup>

The University of Louisiana Monroe has created a virtual reality center, which includes a classroom with 28 VR headsets, a 3D printer and two immersive virtual reality rooms.

#### 2. Enhancing Student Learning with Immersive Technologies<sup>98</sup>

Purdue University: Create virtual labs that will be integrated into training pathways to allow off-campus students to participate. Distance education students will have the same experience in the labs as those on campus.

#### 3. Augmented Reality Chemistry: A Multi-Year Undergraduate Research Experience<sup>99</sup>

Georgia Gwinnett College: poster with an interactive presentation of an interdisciplinary and multi-year undergraduate research experience. To develop applications of visualization of molecules using immersive technologies to improve the teaching and learning of chemistry.

#### 4. Course Engagement with Immersive Visualization<sup>100</sup>

Michigan State University: Integrating immersive technologies into courses to provide students with the opportunity to create visualization experiences.

#### 5. Visualizing Possibilities for Virtual Reality in Education<sup>101</sup>

The poster is available online<sup>102</sup>.

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<sup>91</sup> <https://events.educause.edu/annual-conference/2019/agenda/harsh-reality-to-virtual-reality-getting-ahead-with-immersive-tech>

<sup>92</sup> <https://events.educause.edu/annual-conference/2019/agenda/going-virtual-vr-in-higher-education>

<sup>93</sup> <https://events.educause.edu/annual-conference/2019/agenda/anywhere-but-in-the-lab-exploring-applications-for-vr>

<sup>94</sup> [https://events.educause.edu/HubbEventResources/E19/SESS120/SESS120%20-%20Educause\\_2019\\_10\\_10\\_19.pptx](https://events.educause.edu/HubbEventResources/E19/SESS120/SESS120%20-%20Educause_2019_10_10_19.pptx)

<sup>95</sup> <https://events.educause.edu/annual-conference/2019/agenda/anywhere-but-in-the-lab-exploring-applications-for-vr>

<sup>96</sup> <https://events.educause.edu/annual-conference/2019/agenda/hp-yale-and-unl-team-up-on-blended-reality>

<sup>97</sup> <https://events.educause.edu/annual-conference/2019/agenda/virtual-reality-on-the-bayou>

<sup>98</sup> <https://events.educause.edu/annual-conference/2019/agenda/enhancing-student-learning-with-immersive-technologies>

<sup>99</sup> <https://events.educause.edu/annual-conference/2019/agenda/ar-chemistry-a-multiyear-undergraduate-research-experience>

<sup>100</sup> <https://events.educause.edu/annual-conference/2019/agenda/course-engagement-with-immersive-visualization>

<sup>101</sup> <https://events.educause.edu/annual-conference/2019/agenda/visualizing-possibilities-for-virtual-reality-in-education>

<sup>102</sup> <https://events.educause.edu/HubbEventResources/E19/PS160a/PS160a%20-%20EDUCAUSEdavis.pdf>

6. Utilizing VR for Enrollment without Breaking the Bank<sup>103</sup>

Wayne State University uses 360-degree virtual tours of the campus to generate new enrolments.

7. A Toolkit for an Immersive VR/AR Experience: The Verb Collective<sup>104</sup>

Yale: The Verb Collective is an open set of VR/AR objects designed to help non-programmers (students in the arts and humanities) quickly turn ideas into 3D experiences.

8. Learning with Spatial Computing: Virtual Worlds, Avatars, and 3D Collaborative Workspaces<sup>105</sup>

9. Disrupting Reality: Virtual and Augmented Reality in the Interior Design Curriculum<sup>106</sup>

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<sup>103</sup> <https://events.educause.edu/annual-conference/2019/agenda/utilizing-vr-for-enrollment-without-breaking-the-bank>

<sup>104</sup> <https://events.educause.edu/annual-conference/2019/agenda/a-toolkit-for-an-immersive-vrar-experience--the-verb-collective-1>

<sup>105</sup> <https://events.educause.edu/annual-conference/2019/agenda/learning-with-spatial-computing-virtual-worlds-avatars-and-3d-collaborative-workspaces>

<sup>106</sup> <https://events.educause.edu/annual-conference/2019/agenda/disrupting-reality-how-vr-is-changing-interior-design>

# Exhibit Hall

Dominique Verez & Olivier Afonso

In 2019, 367 companies, 24 more than in 2018 and 44 more than in 2017, were present in the very impressive *Exhibit Hall*. The size of the business fair continues to grow, a sign of the vitality of EDUCAUSE and its strategic role in the global education system.



To simplify the route, the organisers asked each company present to describe itself by 1 to 4 areas of activity, in a total list of 60 themes (6 more than in 2018), as follows :

3D Printing - Academic Information Systems - Accessibility - Analytics - Artificial intelligence (AI) - Artificial intelligence (AI), Chatbot - Assistive Technology (Captioning) - Audio and Video Networking - Blockchain - Business Continuity, Disaster Recovery, Emergency Planning - Business Intelligence (BI) - BYOD - Classroom Control Systems - Cloud Computing and Services - Compliance - Consulting - Content Management Systems - CRM - Data Center - Data Security - Data Warehousing - Digital Courseware - Digital Learning - Digital Publishing - Digital Signage - Document Management - Enterprise Information Systems - Enterprise Resource Planning (ERP) - Extended Reality XR (Augmented, Extended, Virtual Reality) - Furniture - GDPR - Hardware - Help Desk - Identity and Access Management - Intrusion Detection and Prevention - IT Governance - Learning Analytics - Learning Management Systems (LMS) - Learning Space - Lecture Capture - Media Production, Preservation, and Storage - Mobile Apps - Mobile Learning - Network Architecture and Infrastructure - Network Security - Online Learning - Open Source - Portfolio and Project Management - Productivity Applications and Systems (Email) - Risk Management - Security Architecture and Design - Security Management - Social Media - Storage - Student Information Systems - Student Retention - Training - Virtualization - Webcasting - Wireless

Two business areas were renamed: "Audio and Video Conferencing" to "Audio and Video Networking" and "Augmented, Extended, Virtual Reality" to "Extended Reality XR (Augmented, Extended, Virtual Reality)". One is missing: "Captioning".

7 new ones have appeared:

- *3D Printing* – 2 companies
- *Artificial intelligence (AI)* – 19 companies
- *Artificial intelligence (AI), Chatbot* – 7 companies
- *Data Center* – 4 companies
- *Digital Courseware* – 9 companies
- *Digital Learning* – 30 companies
- *Security Architecture and Design* – 4 companies

The following table lists the 30 main themes represented at the 2019 exhibition

<b>Themes 2019</b>	<b>Companies</b>
Cloud Computing and Services	90
Online Learning	60
Analytics	58
Mobile Apps	48
Student Retention	47
Data Security	39
Identity and Access Management	38
Security Management	37
Network Architecture and Infrastructure	32
Network Security	32
BYOD	30
Consulting	30
Digital Learning	30
Enterprise Information Systems	30
Enterprise Resource Planning (ERP)	30
Business Intelligence (BI)	26
Compliance	24
CRM	24
Hardware	24
Learning Analytics	24
Content Management Systems	23
IT Governance	23
Mobile Learning	23
Student Information Systems	23
Audio and Video Networking	20
Learning Management Systems (LMS)	20
Accessibility	19
Artificial intelligence (AI)	19
Lecture Capture	19
Wireless	19

There is no major upheaval in the rankings, as Analytics and Learning Analytics are still at the top of the list and are increasingly meeting the needs of institutions. We particularly appreciated in this area the progress that has been made in terms of "rendering", with impeccable dashboards and an almost limitless possibility of customization.

But once again, the use of so-called Analytics tools requires large amounts of data, and when you look a little more closely at what American universities do, you quickly realize that they are not subject to the same restrictions as we are in Europe regarding personal data!

It is also worth noting that over the years, there has been an increasing number of solutions that address distance learning, Online Learning, Digital Learning, Mobile Learning, a clear sign that face-to-face teaching has a lot of lead in the wing and that at the very least, these solutions complement, if not sometimes replace, some traditional courses.

As regards the Student Retention issue, or how to keep those who enter the first year in their school throughout their studies. The phenomenon had exploded in 2015 and 2016, then subsided, but is back in full force this year, a sign that times are hard and that finances are falling in institutions that are not ranked among the best.

Compared to the previous editions from 2014 to 2018, the 2019 edition marks a clear trend, with the very noticeable appearance of Artificial Intelligence solutions.

Artificial Intelligence	Companies
Artificial Intelligence (AI)	19
Artificial Intelligence (AI), Chabot	7

On this very popular theme (you have to queue to meet them), we will mention some companies, such as :

[OneOrigin LLC<sup>107</sup>](#) - an innovation-driven, enterprise software and technology solutions provider, recognized for designing and developing leading edge products and solutions in the fields of Artificial Intelligence and Cognitive Computing.

Their flagship product is Sia<sup>108</sup>, a unified Artificial Intelligence engine, specifically designed to provide powerful cognitive computing capabilities to higher education institutions and enable an adaptive and personalized learning experience for students.

[ThoughtFocus<sup>109</sup>](#) - a leader in digital transformation in higher education. Their flagship product is the YANA catbot.

[YANA<sup>110</sup>](#) uses a machine learning framework and integrates with existing applications and data warehouses. It is customizable to fit the facility using a template-based approach. YANA works like Siri, using Artificial Intelligence and natural language for conversation between people and its digital interface. When you ask (say, write, text) your question to YANA, you will get an answer in oral or textual form.

[Verbit<sup>111</sup>](#) - harnesses the power of Artificial Intelligence to provide an intelligent transcription and subtitling solution. Built on adaptive algorithms, Verbit transcribes speech files to text with over 99% accuracy. AI technology supports on-demand CART (*Captioning and Real-Time Transcription*) services for real-time results. The solution aims to maximize the potential of an institution's audio and video files by making the information "searchable", accessible and usable.

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<sup>107</sup> OneOrigin LLC : [www.oneorigin.us](http://www.oneorigin.us)

<sup>108</sup> Sia : [www.oneorigin.us/artificial-intelligence](http://www.oneorigin.us/artificial-intelligence)

<sup>109</sup> ThoughtFocus : [www.thoughtfocus.com](http://www.thoughtfocus.com)

<sup>110</sup> YANA : [www.thoughtfocus.com/education/yana](http://www.thoughtfocus.com/education/yana)

<sup>111</sup> Verbit : [verbit.ai](http://verbit.ai)

**Degree Analytics<sup>112</sup>** - based on the observation that students never move around without a smart, connected device - a smartphone, tablet or laptop - and that these devices constantly send signals that are picked up by the campus wireless network and stored (at least in the US). Degree Analytics uses - anonymously - this huge set of data and applies machine learning to automatically analyze hundreds of student behaviors - such as their attendance in class, how they use campus facilities, or whether they take advantage of particular resources, gyms, libraries, cafeterias, etc. - to help them make informed decisions.

Counsellors and administrators can receive daily alerts on actual student behaviour and have reliable and verifiable data on student behaviour to assist them. For example, by optimising their movements, reconfiguring living spaces that are too cramped, changing training locations that are too large or too small, etc.

**Nearpod<sup>113</sup>** - mainly dedicated to university environments where students are highly mobile: internships, part-time, learning... Nearpod provides a complete "student engagement platform" that easily mixes teaching with technology.

The design is student-centred and adapted to mobility to enable faculty to keep learners connected and provide highly interactive experiences to enhance participation and pedagogical effectiveness.

If you would like to know the companies working on this or that theme, do not hesitate to come back to us, because at the National Software Agency of the French Ministry of Higher Education and Research, we have all the contact details and addresses of the 367 companies present at EDUCAUSE 2019 at our disposal.

## Our favorite start-ups

### SpyCloud<sup>114</sup>

Act before criminals! SpyCloud: SpyCloud helps prevent account compromises, it allows you to regularly and automatically check your organization's email addresses with their own repository of compromised accounts and personal information recovered from phishing or theft of accounts from third party providers.

In the event of a proven account compromise detected by SpyCloud, "AD Guardian" even allows you to reset passwords before third parties can use it and access your organization from the compromised account(s).

A regular report can be sent to the head of the organisation who can then know the number of potentially compromised accounts in his organisation (DNS domain).

Several complements to the basic SpyCloud solution exist to complete the offer (AD Guardian for example), Fraud Investigation, etc. An API is available in order to integrate in your own developments the queries to the SpyCloud database of potentially compromised accounts.

The SpyCloud base is impressive: Plus 90 billion referenced compromised account items, 23 billion email addresses, 18 billion unencrypted passwords. This database continues to grow, with an average of 50 new compromised databases being added each week.

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<sup>112</sup> Degree Analytics : [degreeanalytics.com](http://degreeanalytics.com)

<sup>113</sup> Nearpod : [nearpod.com/how-it-works](http://nearpod.com/how-it-works)

<sup>114</sup> SpyCloud: <https://spycloud.com/>

## JIBB<sup>115</sup>

Never lose an idea with JIBB: This application simply turns your smartphone's camera into an artificial eye that captures handwriting and graphics or drawings from a whiteboard, a sheet of paper or any other medium.

Create, share and collaborate: JIBB is an application that allows the "capture of ideas" in real time, from a medium, to share these ideas in collaborative mode, whether at the office or remotely by videoconference.

JIBB uses the AI and computing power of the cloud to vectorize the elements captured by the smartphone and can share them with other devices and applications. Currently, JIBB offers integrations with Zoom, Cisco WebEx and Canvas, but they are already working on other integrations.

The demo video on their site is very impressive and shows the ease of use of this very promising software.

JIBB is still in beta mode, but is expected to be commercially available in early 2020. You can register on their site to test the beta version of the product.

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<sup>115</sup> JIBB: <https://www.jibb.ai/>

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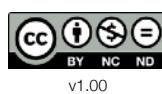
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