Educause annual conference 2015
Visits to Purdue University & University of Washington

French delegation report

Foreword

For the third year running, a French delegation was officially formed to participate in the annual EDUCAUSE conference. Like the previous two years, it was decided to take advantage of the trip to the United States to visit two universities, Purdue University in West Lafayette (IN, 100km from Indianapolis), and the University of Washington in Seattle (WA). This report follows the feedback meeting held in Paris on February 12, 2016 and covers the two day-long university visits and the various workshops attended at the EDUCAUSE conference itself.

French delegation 2015

Olivier Afonso
software group member
National Software Unit
olivier.afonso@cnlesr.fr

John Augeri
program director
Paris Ile-de-France Digital University
john.augeri@unpidf.fr

Brigitte Contois
digital strategic plan coordinator
Paris 8 University
brigitte.contois@univ-paris8.fr

Khadija Dib
digital university project manager
Higher Education & Research Ministry
khadija.dib@enseignementsup.gouv.fr

Yves Epelboin
professor emeritus
Pierre et Marie Curie University
yves.epelboin@impmc.upmc.fr

Laurent Flory
vice-president
CSIESR
laurent.flory@csiesr.eu

Thierry Koscielniak
ICT for education director
Paris Descartes University
thierry.koscielniak@parisdescartes.fr

Christine Marle
software group member
National Software Unit
christine.marle@cnlesr.fr

Jean-Marc Meunier
IT/ICT vice-president
Paris 8 University
jean-marc.meunier@univ-paris8.fr

Dominique Verez
director
National Software Unit
dominique.verez@recherche.gouv.fr

Visit to Purdue University

John Augeri - john.augeri@unpidf.fr

Purdue University (IN) is located about 100km northwest of Indianapolis. Purdue has a student body of almost 40,000 and is best known for its aeronautical and astronautical engineering programs – alumni include Neil Armstrong and several other astronauts.

The IT challenge

We were welcomed by Gerry McCartney (professor, Vice President for IT and System CIO) and his team, and met with staff of the university library. Gerry reminded us that making IT relevant within the university is a constant challenge, as all that arises from the two key missions of teaching and research has a cost. IT is also

perceived as a risk factor. In 2014, this perception prompted Purdue to organize an original annual event: "Dawn or Doom: the risks and rewards of emerging technologies."[1] It is a day of presentations and panel discussions on key IT topics and issues, open to all comers (including from outside the university community) and facilitated by journalists. The event has proved a great success in terms of audience with nearly 2,000 attendees in September 2015. Purdue is also experimenting the use of MOOCs through a two-year contract with edX.

A comprehensive student experience

Our colleagues stressed the university's desire to offer students a comprehensive experience that includes much more than their studies in the strict sense. Perhaps to compensate for the campus's isolation – it is located on the outskirts of a small city – the university has undertaken various initiatives to promote socialization and collaboration between students. These are both physical, including setting up learning communities and social events between student residences and providing spaces that catalyze group work (photo below), and virtual, through apps specially developed by the university (right)[2]. At the pedagogical level, the university aims to ensure that students can learn as much as possible from their peers. Peer teaching is promoted, as is a system for guided peer review based on an application[3].

We also had the opportunity to visit several of the university's libraries, some of which have been recently renovated and reorganized to integrate active learning classrooms and video production studios. Faculty incentives have been put in place to promote educational innovation through the use of these facilities ($5 million over three years).

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[1] http://www.purdue.edu/dawnordoom/

[2] http://www.itap.purdue.edu/studio/#section1

[3] http://itap.purdue.edu/studiohq/guide/gradient.html

Visit to University of Washington

Thierry Koscielniak - thierry.koscielniak@parisdescartes.fr

The University of Washington is considered one of the best in the world and sits at 10th place overall in the Shanghai rankings. In 2015, the student body numbered 54,000. The University of Washington has a full-time staff of 27,264 and a faculty of 4,561. Its budget of June 30, 2015 showed total revenues of nearly $5 billion (of which over a quarter comes from grants and contracts, and another quarter from its two medical centers), $4.67 billion in expenses, and $10.5 billion in assets. The UW foundation has raised $82 million in donations. The table below gives a breakdown of UW's fund sources and operating expenses[4].
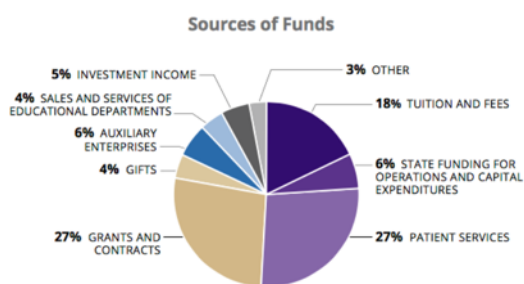
OPERATING EXPENSES (Dollars in thousands)	2015
INSTRUCTION	$ 1,113,959
RESEARCH	729,608
PUBLIC SERVICE	35,428
ACADEMIC SUPPORT	336,747
STUDENT SERVICES	43,101
INSTITUTIONAL SUPPORT	215,105
OPERATION & MAINTENANCE OF PLANT	241,719
SCHOLARSHIPS & FELLOWSHIPS	146,570
AUXILIARY ENTERPRISES	291,628
MEDICAL-RELATED	1,203,140
DEPRECIATION/AMORTIZATION	310,960
TOTAL OPERATING EXPENSES	**$ 4,667,965**

The UW visit consisted of presentations and discussions with our hosts followed by a tour of the Odegaard Library and its active learning classrooms (see photos below), and of the supercomputing center.

Presentations of Tom Lewis, Director of Academic & Collaboratives Applications

A data-driven university. A notifications tool has been designed, *Notify.UW*, which let students know when a course they are interested in becomes available. Using business intelligence tools, a dashboard has been created that draws on the data warehouse to analyze student performance and determine their risk of dropping out. As this type of analysis is gradually expanded into all areas of the university, the need for analysts has become pressing.

The mobile portal : work is underway to streamline the various mobile apps into a single mobile web app (as opposed to native apps). This app concentrates information about a wide range of campus resources, from courses and schedules to libraries, places to study, and social events. In parallel, the web portal has been completely revamped following the principles of responsive web design.

Presentation by Chance Reschke, Director of Research Computing

UW's cyber infrastructure includes the latest software, on-site large-scale storage, and Hyak, a shared, high-performance computer cluster dedicated to research computing, providing researchers with supercomputing on demand[5].

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[4] http://f2.washington.edu/fm/uwar/annualreport2015.pdf

[5] https://itconnect.uw.edu/service/shared-scalable-compute-cluster-for-research-hyak/

Ressources

The campus software license program: http://www.washington.edu/itconnect/wares/uware/
Odegaard Undergraduate Library Active Learning Classrooms - Active learning classrooms research year 1 report:
https://www.lib.washington.edu/ougl/learning-spaces/active-learning-classrooms/FinalALCReportYear1.pdf
Overview of teaching and learning tools : https://itconnect.uw.edu/learn/tools/

Our hosts gave our colleagues from the software group invaluable recommendations for campus software to use as an alternative to expensive solutions.

The Higher Education context in the US

Laurent Flory - laurent.flory@csiesr.eu & Yves Epelboin - yves.epelboin@impmc.upmc.fr

« Higher education is an integral part of the American Dream. But today more and more young people increasingly have to finance their education through student loans.
In the past three decades, the cost of attaining a college degree has increased more than 1,000 percent. Two-thirds of students who earn four-year bachelor's degrees are graduating with an average student loan debt of more than $25,000, and 1 in 10 borrowers now owe more than $54,000 in loans »[6]

The US will elect a new president in 2016 and the primaries are in full swing. For many, this is an occasion to question the role and importance of higher education in the economy and society. In this section we will try to understand the environmental factors of higher education in the US and their consequences after eight years of the Obama administration. This will help shed some light on the developments forecast at EDUCAUSE 2015 in Indianapolis.

Note that this debate has received plenty of attention during the primaries. It is obviously important to candidates from both sides, though unsurprisingly Republicans and Democrats propose different solutions.

Developments in the higher education environment since 2009

Students' increasing average age

The increase in the number of students over 25 is the same as for students under 25, but is expected to exceed the latter by 2023 (with an increase of 20 percent for over-25s compared to 12 percent for under-25s). Apart from an older student population, this entails different needs, later (re-)entry into the workforce, and therefore a shorter time to pay off student loans[7].

A change in demand for labor

Increasing automation results in a sharp reduction of demand for low-skilled labor, unlike in previous waves of industrial growth. The rise of small businesses including startups and unicorns (with very small staff numbers) is challenging the business models of classic industrial corporations. There is a growing number of new professions that require a university education but pay relatively low salaries. A demand for new skills is emerging (robotics, industrial IT, etc.)

The scissors crisis of student debt

The rising cost of education has far outpaced the cost of living (with an average annual increase over 6 percent higher than for the cost of living). As an illustration, in 1971 a year's tuition at Harvard amounted to about 13 weeks' worth of the median household's annual income, compared to more than 11 months' worth in 2015[8].

This is due to the significant decline in foundations' revenue from investments (an 85 percent drop between 2006 and 2012) and a reduction of state funding for many institutions on the one hand, combined with an increase in student numbers and in their expectations about study conditions on the other. The result has been rising tuition (to balance budgets) while at the same time students remain in education for longer and salaries continue to fall.

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[6] Rapport du congrès américain de 2012 : https://www.americanprogress.org/issues/higher-education/report/2012/10/25/42905/the-student-debt-crisis/

[7] http://nces.ed.gov/fastfacts/display.asp?id=98

[8] http://www.cnbc.com/2015/06/16/why-college-costs-are-so-high-and-rising.html

**CPI: College Tuition vs.
U.S. Home Prices vs.
CPI: All Items, 1978 to 2010**
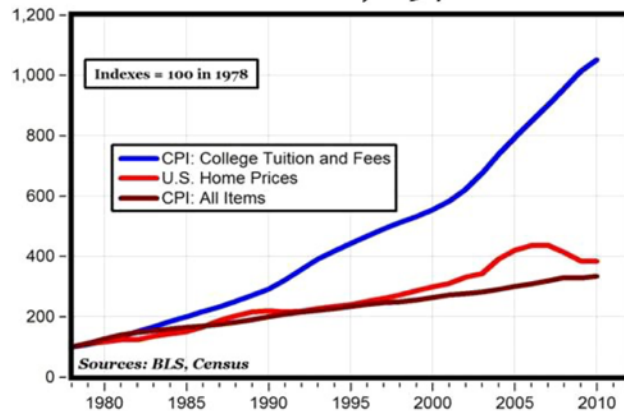
Average tuition is rising much faster than inflation[9].

In parallel, entry-level wages of college graduates have been falling since the early 2000s.[10]

Entry-level wages of male and female college graduates, 1973–2011

Source: Forthcoming Mishel, Bivens, Gould, and Shierholz, *State of Working America 2012–2013*; Economic Policy Institute
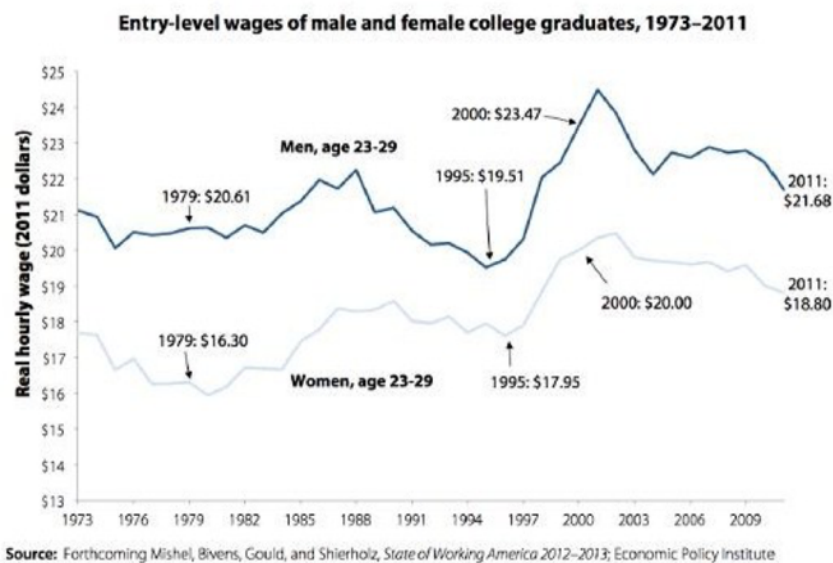
Furthermore, state funding for scholarships has shrunk. In 2012, the biggest state scholarship covered only 27 percent of tuition compared to 67 percent in 1975, further increasing students' personal debt[11].
Graduates (regardless of age) are therefore finding themselves with more and more debt and less income to repay it.
These contextual factors have a number of effects on American higher education.

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[9] Wikipedia https://en.wikipedia.org/wiki/Education_in_the_United_States

[10] http://www.metiseurope.eu/les-salaires-des-jeunes-americains-baissent-depuis-10-ans_fr_70_art_29366.html

[11] http://etudiant.lefigaro.fr/international/actu/detail/article/etats-unis-hausse-des-inegalites-entre-etudiants-11219/

Problem number 1 : student debt

A major social issue

Student debt is an increasingly significant social problem, requiring a strong political response. In eight years, total new student loans in the United States have risen from $75 million per year to over $100 million per year (up 33 percent). Average student debt has gone from US$17,233 in 2005 to US$27,253 today. While young people's debt has tripled since 2004, that of the older age brackets has skyrocketed – from $6 billion to $58 billion between 2004 and 2014 for the over-40s and from $2.8 billion to $18.2 billion for the over-60s![12][13] The inability to repay student debt now affects 3 percent of US households with one member aged over 65, and entails a withholding tax (up to 10 percent).

Increase in Student Debt Balances Since 2004
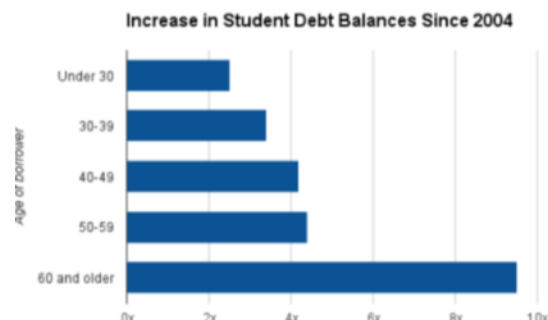
Even if this has resulted in increased state funding for loans, to reduce tuition and to help with loan repayments, 7 million former students are in default (all age groups, 2014), or 2.17 percent of the total US population.

The Obama administration proposed and introduced a system (which is expanding) to nationalize potential losses. The federal government now directly manages a large share of new loans, in order in part to reduce the cost of credit (with lower rates) but mainly to limit the exposure of banks. Today 85 percent of student loans are directly managed or indirectly guaranteed by the state.

A financial risk for the government

At this point it is important to highlight two figures: as of 2014, total student debt amounted to US $1,200,000,000,000 (one thousand two hundred billion US dollars)[14][15]. When the bubble burst in 2007, the subprime mortgage crisis represented $1,300,000,000,000 (one thousand three hundred billion US dollars).

For the record, that crisis resulted in $500 billion in pure losses and $300 billion in recapitalization. A very small proportion of student debt is securitized due to federal coverage, with market exposure of only $225 billion (compared to 100 percent of subprime debt). Many economists are concerned about the probable collapse of this bubble in coming years.

A significant budgetary impact

Under the Obama administration, the increase in annual federal subsidies for student debt has gone from $15 billion to $30 billion, $15 million of which is dedicated to helping retirees who can no longer pay their debt. Meanwhile, funding for universities (commercial or private) has declined sharply.

Note that the US federal budget for higher education is $150 billion for 6,500 universities.

One of the issues of the campaign will be to determine if this budget and these subsidies should go to students or to institutions.

The question of return on investment in education

The starting salaries of college graduates in the US are higher than for non-graduates. However, faced with the risk that debt represents, students act increasingly like consumers looking to maximize their investment. The main question before enrolling in a university (and therefore taking out a loan) is now: how much will I earn when I leave and will I be able to pay off my loan? So much so that there is debate in serious publications about whether it's worthwhile embarking on advanced university studies.

An official public website, https://collegescorecard.ed.gov/ has been set up to compare student success rates, graduate salaries and tuition costs between universities.

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[12] time Inc part of fortune.com sites http://time.com/money/3913676/student-debt-into-retirement/
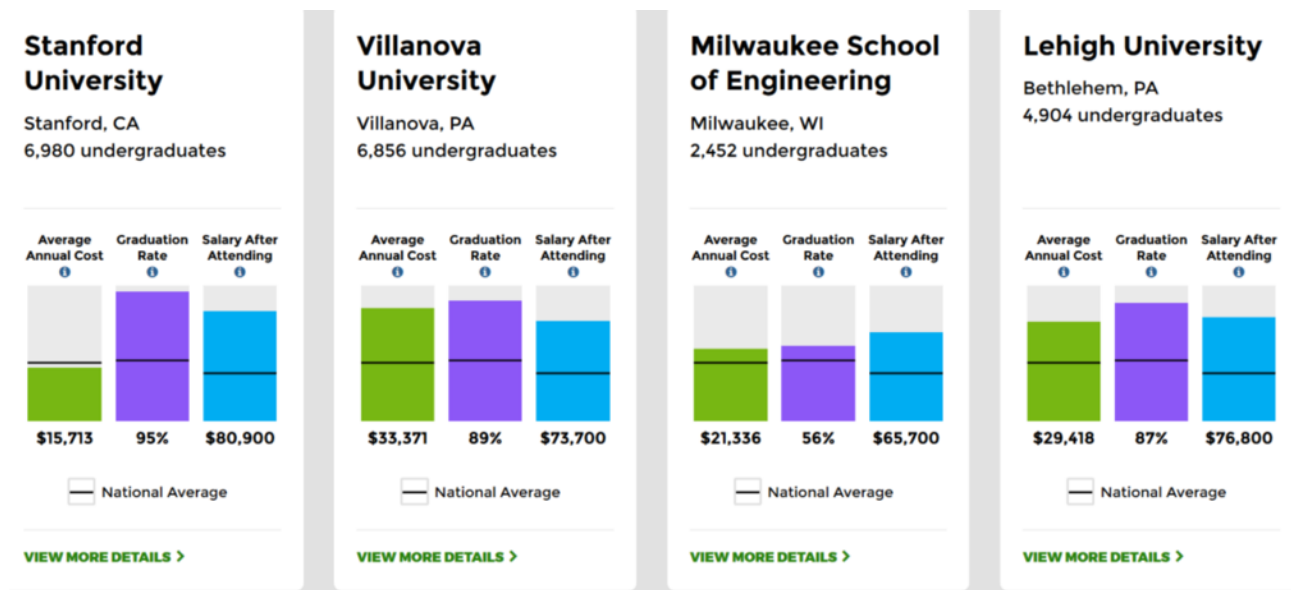
[13] The Guardian http://www.theguardian.com/money/us-money-blog/2015/jul/05/student-debt-retirement-funds

[14] Céline Mistretta-Belna, "L'accroissement de la dette étudiante aux États-Unis, source de fragilité économique ?", Bulletin de la Banque de France N° 197, 3rd trimester 2014.

[15] https://en.wikipedia.org/wiki/Student_debt

This powerful tool enables a simple comparison of institutions from a financial point of view and in terms of academic success. It does not include the selectivity of institutions.

Stanford University

Stanford, CA
6,980 undergraduates

Average Annual Cost	Graduation Rate	Salary After Attending
$15,713	95%	$80,900

— National Average

VIEW MORE DETAILS >

Villanova University

Villanova, PA
6,856 undergraduates

Average Annual Cost	Graduation Rate	Salary After Attending
$33,371	89%	$73,700

— National Average

VIEW MORE DETAILS >

Milwaukee School of Engineering

Milwaukee, WI
2,452 undergraduates

Average Annual Cost	Graduation Rate	Salary After Attending
$21,336	56%	$65,700

— National Average

VIEW MORE DETAILS >

Lehigh University

Bethlehem, PA
4,904 undergraduates

Average Annual Cost	Graduation Rate	Salary After Attending
$29,418	87%	$76,800

— National Average

VIEW MORE DETAILS >

A problem receiving increasing media attention: campus violence

Violence and particularly sexual violence on campus is also a major current issue. Recent reports[16] show that 20 percent of college students have been faced with violence during their studies, 16 percent through technological means, particularly social networks. For female undergraduate students, the rate of sexual violence on campus rises to 23 percent[17]! This problem (of violence in general and sexual violence in particular) is increasingly making headlines, with growing pressure around these issues for university leaders.

Only about 10 percent of incidents are reported. As pressure to attract (paying) students is strong, the federal administration has decided to support institutions in the process of reporting and managing these behaviors, in a context of widespread denial.

In parallel, the government has published on the Internet a list of higher education institutions suspected of not handling these problems properly[18]. Among the 55 institutions appearing on this sorry list are Berkeley, Harvard, Princeton, and the University of Pennsylvania.

NB: these rates of campus violence are higher than those of the general US population.

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[16] https://www.notalone.gov/assets/report.pdf

[17] https://www.aau.edu/Climate-Survey.aspx?id=16525

[18] http://www.ed.gov/news/press-releases/us-department-education-releases-list-higher-education-institutions-open-title-ix-sexual-violence-investigations

Increasing inequality

Despite the American dream and the role of higher education in this dream, access to university degrees in the United States is increasingly unequal with regard to family income. At present, the success rate for students from the top income quartile is 75 percent, compared to 9 percent for students from disadvantaged economic backgrounds. In the 1970s, according to a study conducted by the University of Pennsylvania and the Pell Institute in Washington, these rates were 40 percent and 6 percent[19].

Possible developments

Faced with these challenges, experts and forecasters suggest several possibilities.

Policy developments
Policies for free access to higher education in free community and technical colleges – on the initiative of either the federal administration or individual states such as Michigan, Oregon, and Tennessee – have been implemented for undergraduate programs. It is surprising to see that while the question of charging tuition for university study regularly resurfaces in France, that of free higher education (for a limited range of programs) is emerging in the United States. Nonetheless, the gap between the two worlds remains significant.

In parallel, an accreditation scheme is being discussed with the aim of "guaranteeing" the quality of programs and student success. Student failure is a very important point. Only 16 percent of students enrolled in the first two years of college earn their diploma or degree within the allotted time. As longer studies and student failure are factors that increase the cost of education, and therefore indebtedness or inability to repay student loans, this is a major issue, in which digital technology seems to have an important role to play.

Organizational and technological developments
Some of the points listed below are covered in more detail in this report from the French delegation to EDUCAUSE 2015.

- An education based more on skills than on theoretical knowledge. American higher education has always been envisaged more as training for the professions required by industry than as acquisition of knowledge, but this tendency has become more pronounced in recent years.
- Teaching at the students' own pace with a lot of case studies and tutored projects;
- An increase in blended learning with more distance learning and a sharp drop in face-to-face time;
- Systematic use of big data with the spread of learning analytics, not only to promote student success but more generally for fund raising and management of higher education institutions;
- The growing role and importance of the digital humanities;
- The changing role of campus libraries.

Eventually (in 2026), the vision put forward is of students in their forties coming to study on site for a few hours a week at universities that are (nearly) all privatized. Courses will be based on rich multimedia with a high degree of gamification.
While the growth of MOOCs is expected to continue in Europe, they are dropping back in the US, with their role limited to that of a loss leader to attract student customers looking for the best possible ROI.
Obviously, these are all just the predictions of futurologists. Yet one thing is certain: whatever scenario plays out in the end, the digital component in its broad sense will be central to these (r)evolutions.

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[19] http://www.pellinstitute.org/downloads/publications-Indicators_of_Higher_Education_Equity_in_the_US_45_Year_Trend_Report.pdf

Top 10 IT issues & trends 2016

Brigitte Contois - brigitte.contois@univ-paris8.fr & Khadija Dib - khadija.dib@enseignementsup.gouv.fr

Top 10 IT issues 2016

Every year, the EDUCAUSE conference draws up the top 10 IT issues and priorities for the current year and the next. For 2015-2016 the 10 issues selected are as follows:

1. Information Security: Developing a holistic, agile approach to information security to create a secure network, develop security policies, and reduce institutional exposure to information security threats

2. Optimizing Educational Technology: Collaborating with faculty and academic leadership to understand and support innovations and changes in education and to optimize the use of technology in teaching and learning, including understanding the appropriate level of technology to use

3. Student Success Technologies: Improving student outcomes through an institutional approach that strategically leverages technology

4. IT Workforce Hiring and Retention: Ensuring adequate staffing capacity and staff retention as budgets shrink or remain flat and as external competition grows

5. Institutional Data Management: Improving the management of institutional data through data standards, integration, protection, and governance

6. IT Funding Models: Developing IT funding models that sustain core services, support innovation, and facilitate growth

7. Business Intelligence and Analytics: Developing effective methods for business intelligence, reporting, and analytics to ensure they are relevant to institutional priorities and decision making and can be easily accessed and used by administrators, faculty, and students

8. Enterprise Application Integrations: Integrating enterprise applications and services to deliver systems, services, processes, and analytics that are scalable and constituent centered

9. IT Organizational Development: Creating IT organizational structures, staff roles, and staff development strategies that are flexible enough to support innovation and accommodate ongoing changes in higher education, IT service delivery, technology, and analytics

10. E-Learning and Online Education: Providing scalable and well-resourced e-learning services, facilities, and staff to support increased access to and expansion of online education

These ten points are grouped into three themes:

differentiate	2.Optimizing educational technologies
	3.Students success stats
	7.BI and analytics
	10.e-Learning and online education
reinvest	1.Information security
	4.IT workforce hiring and retention
	6.IT funding models
	9.IT organizational development
divest	5.Institutional data management
	8.Enterprise applications integration

Trends

Rising cost of education and student debt

American student debt is taking on considerable proportions. This year the EDUCAUSE conference chose to stress this worrying situation. Statistics published in February 2015 by the Federal Reserve Bank of New York show that outstanding US student loan balances amounted to $1.16 trillion as of 31 December 2014.

Note that until the 2008 financial crisis, college graduates could find a job suited to their qualifications without much trouble. They therefore had access to other credit, including mortgages. With the 2008 crisis, the labor market changed. It is now more difficult for recent graduates to find a job, particularly one with a salary commensurate to their qualifications. This situation makes it hard for graduates to pay off their debt.

Competency-based education for employability and focus on mid-level jobs

The 2015 conference highlighted the importance of new competency-based programs to meet the specific needs of startups. These programs are based on digital badges, with which learners can prove to employers that they will meet their expectations.

The goal is to improve students' employment rate.

Similarly, the 2015 conference underlined the importance of mid-level programs (bachelor's degrees) that can lead to immediate employment. This in turn questions the advantages of doctoral programs and the professions for which it prepares (research, senior executives, etc.).

Better services for students: Education IT and student life (comfort on campus, etc.)

The goal is to improve student success by providing 24/7 mobile access to the information students need, when they need it.

The example presented at the EDUCAUSE conference was a solution offering students a wide range of services and events (CampusQuad). This solution fosters students' attendance, involvement, and participation in various campus activities (culture, health, jobs, housing, etc.).

Indicators make it possible to evaluate in real time the use and quality of campus resources.

Greater transparency for student results

Traditionally, universities prefer to communicate on the student success rate. The trend at EDUCAUSE 2015 was to focus as well on students who had not completed their programs. The goal for institutions is to analyze the causes of these failures in order to better adapt their teaching for future students. This situation further strengthens the development of learning analytics within institutions.

Focus seriously on continuing education

Lifelong learning (LLL) was only partially addressed at the 2015 conference. This year, major players like Udacity were not present. However, LLL is obviously a factor in the dramatic rise in online and distance learning offered by universities.

Ubiquitous connectivity: BYOA (Bring Your Own Anything)

Today, students want to have access to all the services and resources required for their studies any time, any where, on any device, and in keeping with a social lifestyle which is steeped in the sound, image and networking culture. Several sessions at the 2015 EDUCAUSE conference indicated that upgrading networks has become strategic for most universities. In addition to the upgrade of networks, EDUCAUSE 2015 also stressed access on students' own devices, from laptops to tablets and smartphones – BYOA Bring Your Own Anything. This is a very hot topic (massive number of specialized companies in the exhibit hall). The goal is to offer students ubiquitous connectivity.

In this context, it is important to have an overall vision for redesigning learning spaces and implementing a BYOA strategy across campus in order to retain the students already enrolled and to attract new ones. However, note that it is currently too soon to measure the impact on uses and the benefits derived from this ubiquitous connectivity.

It is of course clear that connectivity must be built on a security policy that protects the institution's entire IT landscape (infrastructure, SI, applications, services, resources, etc.).

Support for the production and dissemination of resources by libraries: the changing role of librarians.

The role of librarians is being completely reinvented. It is no longer limited to the traditional functions (book reservations, loans, etc.), but is developing an additional focus on the creation and diffusion of all types of content, including video. This content not only covers all disciplines but is also made available to all users, especially students.

Furthermore, librarians are also responsible for the set up and management of learning spaces. The profession retains its important traditional role while at the same time gaining a real responsibility for content and facilities management (Purdue University).

Cybersecurity

The Snowden affair has had an impact on university data management. Before this affair, American universities were willing to entrust their data hosting and processing to external operators. Today, the strategy is to outsource so-called non-sensitive data, such as email and students' data storage, to external cloud providers. However, researchers' data is hosted and processed in private clouds within the university. For example, the University of California, San Diego (UCSD) and the University of Washington in Seattle host and process their data internally.

Note also that public universities in the same state tend to pool their data hosting into one cloud within their state.

Developments 2015 - 2016

The perspectives for 2016 bring new priorities such as data security. In 2014, data security was addressed as part of risk management. Along with this emphasis, EDUCAUSE 2015 highlighted the protection of individual rights and ethics, which was practically absent last year. Many speakers emphasized an ethical approach to the use of data and a real awareness of standards that establish limits for their use. However, measures concerning confidential data in the US remain to be assessed, as they are less drastic and controlled than in France and Europe.

Similarly, the key points focus on IT organizations and their operation. Organizations must be reviewed and structured, the recruitment and retention of existing staff is clearly mentioned, and business applications are identified as a priority with the strengthening of business models. Cost reduction has become a systemic approach in funding models related to IT organizations and the objectives pursued. 2015 seems to have brought in-depth reflection on costs and return on investment, focused on avoiding losses and hidden costs associated with various factors (turnover, issue of recognized investment models being unsuited to the university's structure or situation, trend towards applications suited to the university and its needs instead of diversified but ill-adapted tools). Funding models must be based on a robust strategy and sustained reflection on the calculation of costs, their relevance and efficiency. IT organizations must meet the challenges of well-defined security policy and processes, and maintain significant attractiveness to attract new staff.

However, the use of analytics was more accentuated in 2015 than the year before, with two themes regarding BI strategy, analytics and data governance. Moreover, student success is emphasized both in terms of the technologies used (platforms) and of learning analytics and other assessment tools.

In 2014, MOOCS had disappeared in favor of support for faculty on digital learning tools and practices. In 2015, the focus is on all types of teaching and learning tools in view of their optimization. We have moved from the introduction phase to the improvement phase. The teaching model is established but needs to be perfected.

2014	2015
4. Improving student outcomes through an institutional approach that strategically leverages technology	3. Student success technologies maintained but through a statistical approach
5. Partnership between leadership and CIO	9. IT organizational development
2. Support for teachers in technology use	2. Optimizing educational technologies
6. Using analytics	5. Institutional data management 7. BI and analytics
3. Developing IT funding models, Cost reduction 1. Retaining qualified staff	6. IT funding models 4. Workforce hiring and retention
7. WiFi access and BYOD	8. Enterprise applications integration
8. Role et strategy of online education (and 7. on the mobile aspect)	10. e-Learning and online education
10. Risk management	1. Information security

Consideration of pedagogical support for faculty has given way to the mobilization of technical skills in the IT organization. The 10 points do not literally mention cloud computing but many of the sessions echoed this environment, which affects data security and information systems. IT organizations are gaining in importance and now fall under the scope of institutional strategy.

Questions in many of the sessions kept coming back to the use of data to meet student success objectives, particularly with regard to data transparency which may be at odds with security issues.

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Collaborative Decision-Making Models for Developing Online/ Hybrid Course Offerings

Brigitte Contois - brigitte.contois@univ-paris8.fr

The Business Model Canvas for collaborative, cross-cutting development of online or hybrid programs

As evidenced by the EDUCAUSE top 10 IT issues for 2016, online and distance learning remains a priority for higher education institutions. Beyond the issues this obviously raises for teaching and learning, the need to optimize human and financial resources is prompting decision-makers to think before deciding. In order to establish an actionable strategy, the lead organization must build a coherent case and gain the approval of various different departments. That is why, in several presentations at EDUCAUSE, recurrent references were made to the use of the Business Model Canvas to determine a project's strategic priorities and directions on several subjects related to data governance and organizational projects, and also as a link between central administration and faculty.

The Business Model Canvas is a strategic financial and organizational management template that assists organizations in aligning their activities by illustrating potential trade-offs. The Business Model Canvas was initially proposed by Alexander Osterwalder in 2008 (source: Wikipedia). It has become the benchmark project management tool and template for bringing together various stakeholders.

The model has much in common with the problem solving methods applied in organizational management and with the feasibility study and specification-drafting tools used in project management.

The Canvas is also relevant as it can be used in conjunction with gamestorming, a method of facilitating innovation through games. The example presented at EDUCAUSE involved using the Canvas and gamestorming methods in workshops for designing online courses. The workshops are open to each of the departments involved in the project and encourage participants to propose and compare ideas.

The structure of the business model Canvas

The template takes the form of a table with nine building blocks.

The Business Model Canvas

Key partners	Key Activities	Value propositions	Customer partnerships	Customer segmentation
	Key Resources		Channels	
Cost Structure		Revenus Streams		
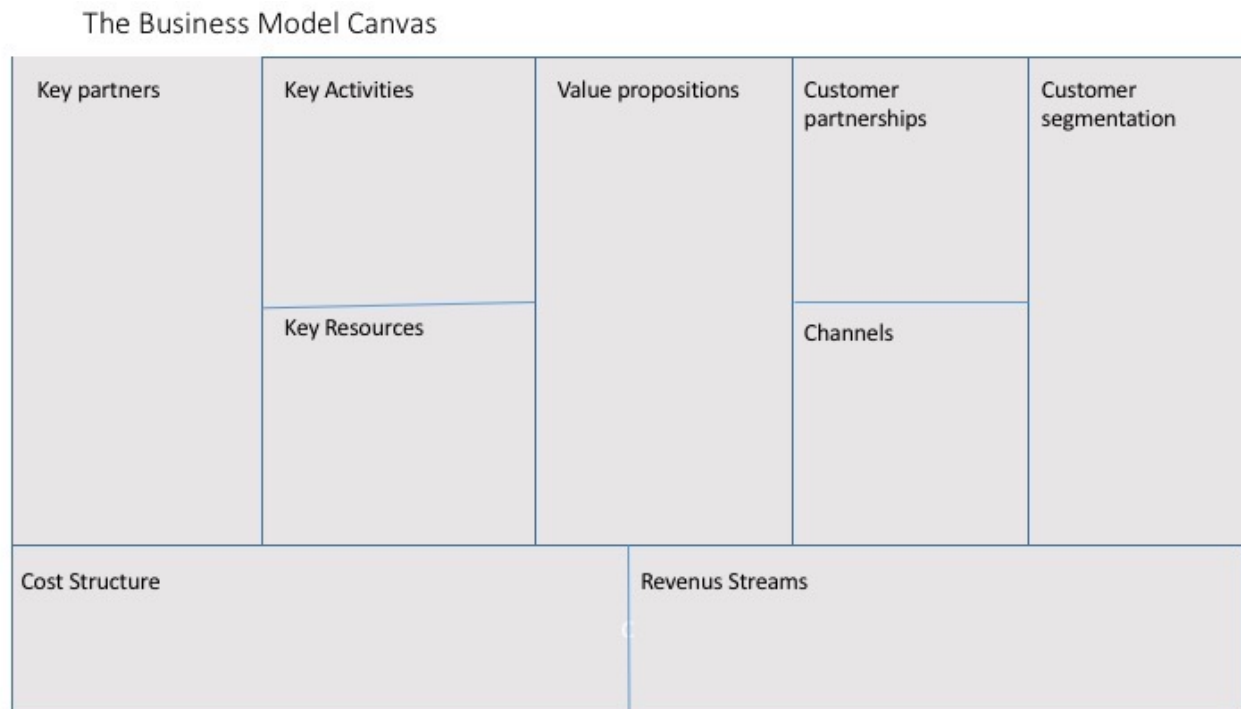
The nine categories are:

Key partners: does the project need external partners to be developed, maintained, or promoted?

Key activities: what needs to be put in place to execute the model? For example, software development, a reception desk, an alumni network, etc.

Key resources: what are the financial, technical, and human resources required for the project, product, or service?

Value propositions: Main category that lists the project's benefits and expected results. The propositions answer questions such as: what will the results be for the institution? What needs or problems does it answer? What is the added value? What aspects differ from the competition? What are the quantitative or qualitative factors? What are the financial gains and other aspects?

Customer relationships: how do we communicate with the target? With which tools? Internet, blog, magazine, forum? Automatic or personalized messages? How often? Is there a method of customer retention or acquisition? Is there any compensation or reward, a certificate?

Channels: how is the product or service distributed or provided? On the Internet? Within the institution? On what medium?

Customers: for each product or service, who is the target or recipient? For example, for an online course, is it young adults, students or senior citizens? Which country or native language? Are they employed or not?

Costs: what types of costs are there? Fixed costs, variable costs, one shot, etc.?

Revenue: does the product or service generate revenue (subscriptions, licenses, enrollments, etc.)? Are there other possible funding sources?

The method begins with the value propositions category. Once participants or users of the model have made their value propositions, the other categories can be addressed.

Application in online or hybrid course design with gamestorming

The University of Kentucky (UK) presented their collaborative workshops based on serious game techniques for online course and program design. The expert proposed using "gamestorming" (concept by Dave Gray), which leverages the boundless creativity of brainstorming but with games, in conjunction with the Business Model Canvas.

Depending on the participants, the Canvas and gamestorming tools help to overcome cultural and political barriers between departments within an institution. They facilitate collaboration between representatives of the university community (students, administrators, and faculty) and IT to identify, create and deliver online learning programs, models, and courses.

Here are a few recommendations for setting up a workshop:

- Plan a FULL DAY for the primary workshop

- The Business Model Canvas must be assimilated and understood by decision-makers beforehand: Dean, Chair, senior faculty, instructional support staff, etc.

- Allow plenty of time for preparation to decide on the tools to be used (business model canvas and game-based approaches)

- Appoint an "impartial facilitator" to run the workshop who has no overt leaning toward a technical or financial or educational approach

- Use original means when setting up the workshop: for example, send participants an invitation as if to participate in a puzzle. The approach must be attractive; the organizer needs to motivate participants

For the workshop, the tools function as a visual heuristic to stimulate imagination and creativity. One of the tools presented was the "Heart, Hand, Mind" game, where an issue is approached successively from the emotional, practical and logical sides. Participants are encouraged to reflect on these three aspects of a proposition, and add their input to a wall chart with space for each category.

Each game has its own rules, for example:

- Participants have three decks with set colors: the cards for added value, key activities and resources, and channels

- The cards are identified by their color and a label on the back, some are already filled out and others are blank

- The participants' mission is to review and distribute the cards to identify the missing elements

- Participants must accept the rules of the game and the scenario until its time to review

- The games have funny names, such as "HOW- NOW-WOW!" for developing a useful ideas matrix

Each game has a duration and a procedure. The facilitator needs to supervise. Matrices are drawn based on the elements identified, and graduated according to the impact on the institution or targets and the resources required.

Obtaining an algorithmic diagram of the course

The evaluation and ratification stage is important. Each element identified is listed under one of the criteria. The elements can then be studied in detail and, through a cascade effect, this leads to a chart, storyboard or template for an online course. The workshops are iterative and diverse, so teams can reflect on the various projects or phases of a given service or product.

The example below shows a summary table resulting from the workshop. Using the summary, participants can keep working and build a suitable course

Results of game Mind-Heart-Hand : *architecture history literature course*

Mind	Scholarly and critical engagement with architecture history literature Familiarity with works of architecture built (and not built) after ca. 1865	Consideration of relation architecture and identity Exploration of architecture built in cities ca. 1865 and other buildings *Secretary of interior standards for documentation*
Heart	Topical rather than temporal approach to subject Alternating lecture and discussion Peer-to-peer interaction in discussion Critical/scholarly analysis of arguments of literature Development of scholarly arguments	
Hand	Research Writing Dicussion (both leadership and participation) *Notes: 50/50 lecture/discussion, 22 lecture hours*	*Gaining greater familiarity with national register of historic places + complex Properties and Laws +contexts othen than Architecture* *Ability to work from 3D sources of info/ Render 2 dimensionally*

This example is a simplified extract of a single exercise adapted to our university context.

In this way, the gamestorming approach can build on the Business Model Canvas. The illustration is based on the design of a course template. However, the feedback did not detail the time and expense of a single project in terms of the resources assigned to it. Considerable work must be done before and after the workshop, but the advantage of this method is that it mobilizes stakeholders across the board and provides a summary that everyone can understand.

Finally, the Business Model Canvas was mentioned for contextualizing learning analytics to meet specific needs.

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Learning analytics

Brigitte Contois - brigitte.contois@univ-paris8.fr & Yves Epelboin - yves.epelboin@impmc.upmc.fr

The issue

Learning analytics is a very hot topic. The term covers all imaginable indicators (finances, student enrollment and success, learning platforms, etc.) that can be used for university management and student monitoring. Listening to the speakers at EDUCAUSE, it is clear that learning analytics goes far beyond a simple tool for tracking student success.

The issue of learning analytics can be divided into several points:

Gathering all data from the various departments (financial, students, human resources, libraries, real estate, etc.). This goes much further than data mining, which is limited to aggregating databases, whereas learning analytics aims to capitalize on all the relevant information that users leave in logs when they use services as diverse as learning platforms, registry systems, authentication systems, etc.
Extraction and organization of this data derived from systems that are often fairly incompatible with each other.
Analysis of the data to build relevant indicators.
Presentation of these indicators to the various stakeholders (students, faculty, staff, and possibly parents) while respecting confidentiality and ethical standards.

Finally, let's not forget the assessment of whether these indicators are used effectively. But few are at that stage yet, except perhaps if we consider only the indicators taken from learning platforms and used to build adaptive learning paths. We cover this point in the section on adaptive learning.

Educause

32 sessions addressed this topic at EDUCAUSE 2015. Some also talked about adaptive learning.

The most interesting project was Openup Learning Analytics by Josh Baron, who presented the results of a study conducted by ECAR (EDUCAUSE Center for Analysis and Research) and the Apereo foundation, resulting in an initiative to build a comprehensive service for the collection and analysis of data from different systems. At the same session, two universities presented their initial results, although as yet no conclusions can be drawn as the presentation focused on the implementation phase. This collaborative initiative has crossed the Atlantic with Britain's JISC (Joint Information Systems Committee) now participating. It was also presented in Paris at the "Learning Analytics" seminar held at the Ministry on December 10, 2015. As a member of Apereo through ESUP, France has good access to the initiative.

Another presentation from IMS Global Consortium discussed the use of a standardized API, Caliper, to aggregate data. The issue of data aggregation appeared in several other presentations, as it is a serious obstacle in the attempt to build holistic or cross-cutting indicators.

An ECAR study, "Moving the Red Queen Forward" by E. Dahlstrom et al., approached the issue of learning analytics from the institutional perspective and analyzed its positioning. Learning analytics is not only a technical issue, as it raises many ethical and organizational questions regarding the use that is made of the data. The study shows that in fact, learning analytics are not yet a priority for most institutions in the United States. Only 47 percent focus on analytics and their first priority is not student success but rather the optimization of means and resources for teaching. The study took a highly administrative perspective.

Another ECAR study, "Predictive Analytics", led by J. Baron in collaboration with Blackboard and BrightSpace, focused on the use of learning analytics for teaching. It aimed first of all to advocate for investment in the field. Practical examples were presented but these are still at the experimental stage. They were based only on data from the learning platforms of the two providers with no other sources, as the aggregation of other data is not yet envisaged.

Many universities have set up indicators to monitor student success. The most noteworthy presentation was by the University of Central Oklahoma (UCO) about their project to aggregate data from several sources. It is still experimental and little was said about how the indicators are developed. The results are promising.

UC Berkeley presented a very interesting poster session on student support, where they explained their strategy that draws on increasingly sophisticated metrics. This work is linked to learning analytics in the sense that year after year, they collect and analyze increasing amounts of data so as to develop effective monitoring indicators. The important point to note is that they do not claim to be doing predictive analytics, but rather to be developing indicators which try to link past years' data with the story and background of each student. This is summarized in slide 2 of the document referenced below. This document seemed to us the most relevant we came across on the issue of analytics.

University visits

The universities we visited, Purdue and University of Washington, have set up student monitoring indicators based on learning analytics. Our hosts did not go into the construction of these indicators in detail, but stressed the issues of personal data confidentiality and ethics. Students register in the analytics system on a voluntary basis. They must read and accept an acceptable use policy. They are encouraged to register but it is by no means mandatory. Faculty and staff can only participate in the project after having taken a training course on these issues.

UW's approach is noteworthy. Rather than leveraging learning analytics for selection purposes prior to admission as most reputed universities do, assessing students' profiles and ability to succeed, UW uses them to support students in difficulty. UW has several campuses, including Takoma, south of Seattle. This branch campus has over 20,000 students, many of whom are from reservation or immigrant communities, and many of whom struggle with poor performance in education. The results are not as good as in Seattle, but to try and prevent these minorities from dropping out, measures are in place to help students throughout their program of study and to guide them in their choice of program and modules. The representatives from the University of Washington said they were keen to maintain this approach even though the results may impact their national and global rankings.

Recommendations for a learning analytics project

Setting up advanced analytics technology in a higher education institution is complicated. It demands an investment over several years, with a significant initial investment to launch the initiative with a shared, optimistic vision and political backing. This will also avoid the project being managed at the level of a single department when it must be deployed across the institution.

A rigorous methodology is also recommended for the management of learning content. To avoid disparity in the formats, materials and tools used, or analytics being distorted by data repetition, the choice of a single directory for learning materials is strongly recommended:

• Choosing an interface that is easy to use, even for users who are not particularly computer literate, will mean it is used more. Otherwise, users will be discouraged and could become highly reticent about the project.

- On the other hand, the tool and project may be such a success with students and faculty that adequate infrastructure must be in place to support heavy traffic.
- Monitoring statistics (courses, flows, programs, etc.) must function continuously despite any bugs in the system. This database must be maintained and stabilized to ensure the statistics are reliable.
- Information on security or the standards of confidentiality and ethics must always be available and visible.

A few best practices were mentioned for running a learning analytics project:

- Talk about the project should not focus on "doing statistics," but should discuss from the outset the appropriate data exploitation models for optimizing the data collected.
- Data must be contextualized (one step further than simply collecting or reporting)
- The target recipients of these analytics (students, academic departments, administration, services, etc.) must be identified, along with the objectives the analytics are supposed to meet.
- The initial question or objective must be maintained to avoid displacing the context according to the data collected.

Students' perception of learning analytics

Students are generally satisfied (8 out of 10 students) and curious about this type of statistics even if they are the ones being quantified. A survey conducted by institutions in partnership with the Gartner Group gives the following figures:

- 92% of students want to monitor their performance with personalized support
- 89% want a personalized dashboard with real-time monitoring
- 88% want to be given advice to improve their performance
- 88% want personalized quizzes or practice questions to work on

However, some students find that statistics too focused on their habits, activities and behavior outside their studies can be intrusive (a feeling of "big brother" surveillance).

This table compares the different perceptions of learning analytics:

Positive perception	Negative perception
Monitoring progress in their education, degree and credits (equivalent to validating stages) Progress in their course or degree program History of progress in previous courses Comparison of their level with other students Tracking their specific activity in the discipline or at the university	Tracking their activity on the university website Tracking of activities performed using their usernames on the system Tracking of activities performed on a smartphone Tracking in the area surrounding the university Geolocalization on the campus

Finally, learning analytics were clearly named one of the key points of this year's conference and are one of the main uses of analytics in universities alongside business performance analytics and advanced analytics for information security and methodologies for data collection.
As such, learning analytics represent 20 percent of all the analytics covered by data governance. Institutional analytics represent 35 percent.

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Analytics, Business Intelligence, and Data Governance

Brigitte Contois - brigitte.contois@univ-paris8.fr

Business analytics and data governance remained a key topic at EDUCAUSE 2015. Last year, the analytics theme was dominated by learning analytics, as the recent widespread deployment of MOOCs and learning platforms had introduced new means of tracking student performance. Business analytics appeared in the form of ambitious management models; the initiatives presented were supported by large organization and management firms using flagship ERP or business software. The projects we heard about last year based on organizational IS models complemented by the mapping of functional units or decision centers seemed to be working. This year, few models were presented and there was little feedback on projects in this area supported by private firms or organizations. However, it appears that this type of project is being seriously called into question, due in large part to the following pitfalls:

- An overly large or poorly estimated investment at the outset

- A lack of human resources and skills

- Models which are unsuited to the organization, structure or operations of the institution

- Data which is too disparate or unsuited to the objectives set or vice versa

- The issue of security and ethics in relation to personal data

Some went as far as to conclude that it is more appropriate to use manual methods requiring human intervention than to remain within the scope of machines (tools, software, computers, etc.).

What are business analytics and what is their objective?

The use of data, statistical analysis and models to gain actionable insight into complex areas and thereby improve the institution's services and activities. The clearly stated objective is to develop an understandable (governance) data architecture, to facilitate the comparison of this data with the goals and needs of the institution, and to respect data quality standards with security, confidentiality and integrity requirements. This diagram represents data management in higher education based on the development of statistical models.

What are the benefits ?

How data governance benefits institutional organization and strategy:

In terms of analysis and flexibility:

- The decision support system is at the heart of the IS
- Ad-hoc reporting of data and statistics is organized into models

In terms of the operational system:

- reducing demand on the system improves its performance

In terms of reporting for end users:

- Reporting is focused on attainment of capacities and objectives
- Saving time, or other side effects on time management and repetition, promotes the use of data

In terms of the knowledge database:

- The structure of the database remains simple
- Data integrity is a major focus

In terms of performance:

- A full analytical report is obtained
- Rapid production; actions are made easier

In a survey of institutions, 47% of weighted responses mention the following priorities for a data governance project:

- Optimizing resources
- Identifying areas of improvement for higher education and research
- Improving IT staff retention
- Stabilizing or reducing costs
- Providing greater transparency
- Better understanding of students' specificities
- Improving the quality of administrative services
- Reviewing business processes
- Optimizing the institution's attractiveness (attracting more students)

What are the main types of data concerned?

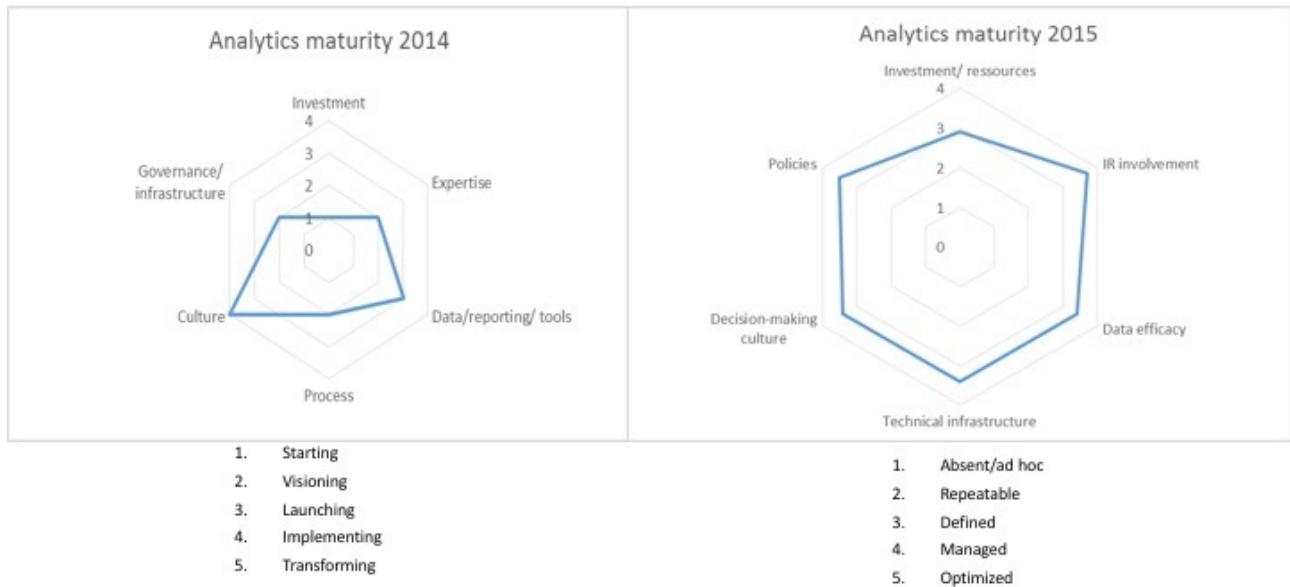Learning analytics is still the primary use of data, ahead of financial uses:

- Information about students
- Admissions, grants and financial management
- Focus on modes of recruitment (admissions, monitoring; operations)
- Human resources, management IT
- Class organization and course scheduling
- Learning management
- Alumni management

- Room scheduling, facilities management, maintenance

How is data governance developing?

The diagram below illustrates the growing maturity of data governance projects:

Focus on analytics maturity between 2014 and 2015

Analytics maturity 2014	Analytics maturity 2015
1. Starting	1. Absent/ad hoc
2. Visioning	2. Repeatable
3. Launching	3. Defined
4. Implementing	4. Managed
5. Transforming	5. Optimized

Although the scale is slightly different and the comparison criteria vary, the trend shows that projects are up and running in 2015, but are not sufficiently advanced to have optimized processes or perfected the tools in place.

What are the trends ?

A large share of the discussion and thinking is focused on developing predictive models. Failing an appropriate block diagram, the main points are:

- Predictive models are more portable than expected

- Standard models can be used if they fit a specific purpose within the institution

- An open library of predictive models can be shared (same principle as open source programs)

What are the experts' recommendations?

Participants at EDUCAUSE offered some recommendations on setting up a data governance project:

- Plan for a major investment in technical staff to avoid a disparity between the technologies used and the skills available; this also includes appointing a project manager.

- Set objectives and stick to them: obtaining certain data and results can shift the level of interpretation and distance the results from the objectives originally sought.

- Present the project to the institution's leadership to have it integrated into the institutional strategy and obtain political backing.

- Create a multi-annual data governance program, a schedule, and workflow models.

Other advice was useful for the overall vision and monitoring of the project:

- Build reliable, well managed data governance to serve the needs of all stakeholders/end users while maintaining data security and compliance

- Integrate, implement, and develop a data infrastructure that allows continuous access across the board

- Provide, develop, and coordinate the training and skills of key stakeholders to ensure that data is understood and interpreted in terms of the relevant business priorities

- Eliminate barriers: user diversity, data vulnerability, the proliferation of tools, insufficient expertise available on data governance, duplication of data and tools, redundancy of effort, etc.

- Identify risks: obsolete statistics or data, IT security, long term costs, failure to provide the elements requested

2015 seems to have highlighted the complexity of a multi-dimensional project for institutions, with a focus on investment and security. It remains to be seen if in 2016, data governance projects will have reached maturity or at least be in an improvement phase with the new IT challenges facing American universities.

Learning Spaces

John Augeri - john.augeri@unpidf.fr

First applications of the Learning Spaces Rating System (LSRS)

section 1 5 credits integration with campus context	section 2 7 credits planning & process	section 3 8 credits support & operations
section 4 8 credits environmental quality	section 5 14 credits layout & furnishings	section 6 8 credits technology & tools

The Learning Spaces Rating System[20] is a set of measurable criteria to assess the quality of innovative classrooms, established by EDUCAUSE's Learning Spaces working group. It is organized into six theme-based sections, each of which has from 5 to 15 credits. The sections cover not only features specific to this type of project (IT equipment and furnishings), but also governance and operational management criteria. A year after the release of version 1, a range of feedback has been obtained on the concrete application of the LSRS to renovation projects.

For instance, De Anza College (CA) used the LSRS when creating a presentation space in its Media & Learning Center. The LSRS was judged:

- Easy to use
- Capable of standardizing a qualitative measure that spans different types of space, different uses, and different organizations
- Suitable for a national benchmark

Areas for improvement were also identified:

- The terminology and concepts of the LSRS are very university-focused
- The terminology includes terms that are too vague and would benefit from clear definitions or more precise references (e.g., "innovation")
- It can be difficult to give a binary answer (yes/no) to subjective questions, potentially leading to the over- or underevaluation of the space being rated
- The documentation required by the LSRS can be hard to find

Indiana University (IN) also presented the various ways it has applied the LSRS[21]

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[20] http://www.educause.edu/eli/initiatives/learning-space-rating-system

[21] https://uits.iu.edu/learning-spaces

Learning space design: principles, lessons and prospects

Beyond the use of tools such as the LSRS mentioned above, several workshops addressed the actual design of learning spaces. There is a clear consensus as to the fundamentally multidisciplinary nature of such projects. Their success requires the involvement of different but complementary offices and staff such as IT, property, libraries, faculty, and governance more generally. This aspect was well illustrated by a project to renovate two 512-seat lecture halls in a historic building at Pittsburgh University.

On a material level, the diversity of spaces and the uses that may be made of them raise important issues at the design stage. For example, a flexible space (mobile tables, repositionable on demand) may not be appropriate when establishing collaborative spaces with specific furniture that requires fixed wiring. Lecture hall design also remains an important issue, and the potential for innovation during renovation seems less important than the constraints of this type of facility.

Rather than seeking a versatility which could be restrictive on many levels, the examples presented this year instead relied on mixing different spaces – and thus establishing functional zoning – with complementary uses: versatile rooms (repositionable furniture), collaborative rooms, interactive cafés, modernized lecture halls, rest areas, etc.

There were also significant variations in how the technological aspect is handled; several "low-tech" but well-designed spaces have ended up getting more use than certain richly (and unnecessarily?) equipped rooms.

On the organizational level, it again appears essential to take into account the multidisciplinary nature of a learning space project. Once the space has been completed, change management and user support (mainly for faculty) are key dimensions for the project's success. Of the examples that back up this point, the adaptive classroom at the University of Washington (WA, see chapter on the visit) is particularly interesting. Training courses were organized when it was launched to help faculty get to grips with it.

Overall, learning space projects have now reached a certain maturity in their design. They appear to be more dependent on organizational aspects than developments in technology or furnishings, as their main purpose is much more the development of teaching practices than the physical facility itself.

BYOD, Tablets & Mobile Learning

John Augeri - john.augeri@unpidf.fr

Setting up an institution's BYOD strategy: feedback

Three universities in Florida (University of Central Florida, University of South Florida et University of Florida) presented their feedback following the establishment of a joint BYOD strategy, based on virtual application delivery. This strategy is part of a comprehensive initiative to promote mobility on campus.

The choice of virtualization was motivated by several factors:

- Students must be able to access and use software owned by the university

- They potentially work anywhere, 24/7

- Reducing the number of self-service computers on campus generates savings

- Students use a variety of devices

The solution chosen was Citrix XenApp, which virtualizes multiple OSs. Several issues had to be taken into account at the time of deployment, including:

- Communication with users, particularly by involving faculty

- Producing documentation

- The lack of control over users' OS and browsers

- Integration of the LMS

Overall, the result of these operations is positive, particularly on the following points:

Any device, anytime, anywhere. Students who are located far from campus have been able to use highly specific analysis software without having to buy it or install it on their computers.

The impact on computer rooms. Former computer rooms are gradually being converted for new uses, such as BYOD spaces. Compared to the previous situation, the spread of BYOD has provided better visibility of uses, enabled the centralization of support for and acquisition of software licenses, and generally afforded a simpler view of IT infrastructure.

Synergy between services. Existing services – distance education, physical spaces, thin client services, license management, storage of educational content – have benefited from the arrival of BYOD. New services have also emerged with BYOD: for research; a storage system for student data.

iPad deployment: types of uses, advantages and lessons learned

Several presentations addressed the deployment of university-owned tablets. California State University Northridge, Jackson State University, and Lynn University in particular presented their experiences, not only in terms of deployment – of iPads in these three examples – but also of the impact on organization and teaching practices, with a focus on mobile learning. This correlation was indeed clearly underlined, with Lynn University for instance evoking a comprehensive ecosystem around the iPad.

In these examples, objectives were clearly defined prior to deployment:

- Increasing student engagement

- Improving the quality of teaching materials

- Decreasing the cost of these materials for students (up to 90 percent in the case of Jackson State University)
- Creating a community of 21st century learners

Typical uses were defined for the iPads:

- Reading eTexts
- Access to the LMS
- Internet access
- Learning with apps
- Viewing recorded lectures and classes
- Answering polls
- Using ePortfolios

All three universities stressed the need to involve faculty, with the (re)design of teaching materials being a clear success factor for this type of project. This redesign work was presented as an opportunity rather than a simple necessity. Note that while setting up their iPad program, Lynn University also abandoned their previous LMS in favor of iTunes U and resources in iBook format, the production of which was promoted through various incentives.

Several lessons were presented that had been derived jointly from these experiences:

Technology is a tool, not an end in itself. The involvement of faculty in a technology-based approach is essential. Instructors need time to (re)design appropriate materials that take advantage of the tablets, motivated where necessary with incentives.

Support for faculty is crucial. Apart from the incentives mentioned above, California State University Northridge set up a comprehensive faculty support scheme, organizing a "tablet academy," making advisors available to instructors, and setting up user communities. The university also makes use of active learning classrooms with a system for identifying students in difficulty.

The quality of materials and content is paramount. eTexts, the most obvious source of savings for students, take time to be designed and must correspond to a need. The development of learning apps is also a plus.

The technological component must be taken into account. This concerns apps, WiFi (which should be available not only in the classroom but across the whole campus) and the tablet deployment system (MDM/Mobile Device Management and over-the-air configuration, based on the cloud).

These projects represent a change in institutional culture, which requires guidance.

Faculty perception of Mobile Learning

A case study on the establishment of a mobile learning strategy was presented by Zayed University (Dubai & Abu Dhabi). This initiative was prompted by a nationwide equipment procurement plan launched by the United Arab Emirates in 2012. In order to involve faculty, the university's Center for Educational Innovation launched a major online survey between January and February 2015. 236 of the 720 faculty members replied to the 21 questions. A summary of the responses was presented:

Perception of mobile devices: what do mobile technologies evoke for you?

- Security problems
- Students look at Facebook in class
- A disconnect between decision-makers and real classroom conditions
- A distraction for students, slower learning
- An interference
- A financial expense
- A flashy effect with limited use
- An appealing term, but it does not represent any real learning benefits apart from the production of digital books
- The difficulty of controlling a class; time wasted explaining how the app works, rather than focusing on the subject of the course.

Major obstacles: a negative perception overall

- Being obliged to use devices that are not very effective, and ultimately a distraction for students
- Technology is a waste of time. Deriving any real benefit from it requires too much effort
- The use of mobile technology in class is counter-productive
- Students' use of smartphones is personal, not educational
- Too many applications available, and yet none of them seem to make a difference to learning
- We are still waiting for evidence of the transformative potential of iPad and smartphone use
- Courses are not designed for exploring the opportunities offered by mobile technology
- A lack of apps relevant to the course
- A lack of resources and content designed for mobile technologies
- Tablets are simply not suited to certain disciplines, such as mathematics, for which the use of a whiteboard remains more effective
- Cannot be adapted to the learning objectives of the course
- There are no clear objectives in terms of educational benefits

Major obstacles: a lack of support

- Lack of practical demonstrations (not just talk) concerning learning improvements
- Not enough practice
- Not enough time to create learning activities using mobile technology
- No knowledge of the most useful apps
- Apps require payment to access additional functions
- Lack of a model for integrating mobile technology into a course. Need to visit and observe real classes
- Support is needed for faculty

Major obstacles: technical problems

- Problems with students' devices, waste of time resolving them
- The internet connection is unreliable
- Some tools are not accessible in the classroom (example: Youtube blocked)
- Lack of a real keyboard for typing
- Poor help and support service
- Blackboard does not work on mobile devices
- Need more support for Apple TV

Major obstacles: a lack of skills and confidence

- Need for more confidence; instructors avoid using some things that may not work and/or that they are not sure how to operate
- No knowledge of specific apps that can be used in the classroom in my discipline. No generic apps
- Need specific training to use a few apps and devices
- Students do not have the learning skills to be independent and autonomous
- Understanding the link with learning
- Need to know what is possible
- Trainers lack expertise in mobile learning

To deal with the various obstacles mentioned above, Zayed University's Center for Educational Innovation examined the type of help and support that faculty should be given as part of this kind of project. This resulted in a very learning-focused approach involving incentives and based on one-on-one support, practical workshops, and the establishment of certificates.

Mobile Learning: best practices according to ECAR

The ECAR[22] (EDUCAUSE Center for Analysis & Research) Mobile Learning working group has also looked into the barriers and best practices to implement as part of a mobile learning strategy. This research was based on the following trends and needs:

* Over 50 percent of Internet usage happens on a mobile device

* Over 60 percent of future students will have their first contact with their university on their mobile device

Mobile strategies must therefore accommodate the uses of different audiences and comply with institutions' privacy, security, and communication policies.

The following issues, challenges and opportunities were discussed:

* What is an institutional app?

* What are the needs in terms of branding?

* Are there processes to ensure that the app is tested for quality, and respects the institution's security policy and the protection of student data?

* Is intellectual property respected when an app is developed by students or a university department?

* Are there financial considerations to take into account?

According to ECAR, governance of a mobile learning project must identify and meet the needs of the various stakeholders and users concerned. It must involve the IT, communication, and legal departments as well as faculty and students, and must be based on an action plan covering the short- and long-terms and incorporating a real strategic vision. Finally, it must be backed by a unifying leadership.

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[22] http://www.educause.edu/ecar/ecar-working-groups/mobile

Serious Games

Jean-Marc Meunier— jean-marc.meunier@univ-paris8.fr

What are they ?

Today the concept of serious games is often equated with using video games in a learning context, but in fact IT is not an essential component (e.g., role-playing or strategy games). With IT and particularly the web, computer games now dominate the serious games landscape. The different types of games can be categorized according to whether the learning objective is explicit or not, and to whether the entertainment value is intrinsic or not (Marne-Kim Huynh Bang & Labat, 2011; Sauvé & Kaufman, 2010). Serious games are games used for learning purposes. They facilitate knowledge and skill acquisition through game-based interaction, which favors the construction of resolution patterns or automatic reflexes and motivates learners thanks to the entertainment factor.

The heading of serious games actually covers a large variety of activities, ranging from the use of software originally unrelated to education for learning purposes to more or less complex and realistic IT simulations for teaching medicine or piloting, to name only the best known. There are three main categories:

Fun educational games: learning situations where the educational content and objectives are "disguised" in a playful context such as trivial pursuit, a board game or a quest through a series of pictures.
Training games aim to develop learners' cognitive or motor performance. These might be competitions between learners or to clear levels by responding faster and better to a series of questions or challenges
Simulation games where an environment is modeled so the learner can face a situation virtually in near-real conditions. Examples include business management simulations, simulation of medical situations for learning diagnostics, and flight simulators for pilot training.

These games offer several advantages for effective learning. The first is that the entertaining nature of the activity helps motivate and engage the learner. The second is that the game situations promote the development of skills that lectures on their own cannot, particularly skills for problem solving and managing dynamic situations. Finally, particularly in simulations, games allow learners to build knowledge and expertise in near-real conditions.

New developments at EDUCAUSE

Contributions to the issue of serious games were limited this year, with only one conference session and one discussion session on the topic. One startup (Moblab) was also present. The conference concerned a generic platform for serious game development and some feedback.

NC State gamification module
North Carolina State University has developed a gamification module for the Moodle platform. This module leverages existing Moodle functionality to create gamification elements. For example, access restrictions and activity completion are used to create levels, the database to define roles in the game, the page and book modules to organize the narrative structure, groups to add a social dimension (e.g., team competition), and quizzes and badges to create challenges. Feedback on two modules was presented, one in botany and the other in sports science. A serious game in medical microbiology is under development. A demonstration site is available[23].

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[23] https://gamification.delta.ncsu.edu/

MobLab

MobLab[24] is a startup offering a generic platform for serious game development with several projects in economics and game theory. The platform is geared towards mobile solutions. It proposes to produce serious games from different configuration menus and customizable canvases. The platform supports several thousand students and provides learning analytics in real time.

Games and learning, discussion session

The discussion session was moderated by Victoria Mondelli (executive director for teaching and learning, Mercy College). It was the opportunity for the thirty or so participants to share experiences and views. These discussions highlighted the heterogeneity of approaches and, paradoxically, a tendency to look for a framework with which to conceive of generic development systems such as those mentioned above. This trend mirrors the development in France of the GenericSG platform, which has a similar philosophy[25].

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Sauvé L. et Kaufman D. (2010), Jeux et simulations éducatifs, Presses de l'Université du Québec, p.19

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[24] https://www.moblab.com/

[25] https://sites.google.com/site/genericsg2012/

Video Platforms

Thierry Koscielniak - thierry.koscielniak@parisdescartes.fr

This chapter provides an overview of the various video platform solutions presented at EDUCAUSE 2015. The solutions could be seen at booths in the exhibit hall.

Definition

In what follows, the term video platform is used to refer to a suite of tools for recording, editing, and distributing videos online. Video conferencing, virtual classrooms or public video broadcasting platforms are not included in the survey.

Solutions in the exhibit hall

http://flipgrid.com
This is not a classic platform but a cloud-based niche tool for posting video questions and answers; more for personal than institutional use.
Products/services: audio and video conferencing, mobile apps, mobile learning

http://www.ensemblevideo.com
A platform that includes many plugins to integrate into online course platforms or LMSs. Several hundred academic customers.
Products/services: cloud computing and services, lecture capture, media production, preservation and storage, online learning

http://zaption.com
A newcomer on the market with a Freemium offer. Focused on active learning and flipped classrooms.
The Higher Ed Plus rate only offers 50 hours of video in the cloud.
Products/services: BYOD, learning analytics, media production, preservation and storage, online learning

http://www.sharestream.com
A product derived from a project at Georgetown University.
The proposed interfaces are perfectible.
Products/services: content management systems, media production, preservation and storage, online learning, webcasting

http://barco.com/fr/
https://www.ubicast.eu
Ubicast was present on the Barco booth. French solution for integrated recording and distributing equipment.
Products/services (Barco): BYOD, cloud computing and services, learning spaces, online learning

http://www.polycom.com/education
The videoconferencing giant is diversifying into higher education.
Products/services: audio and video conferencing, cloud computing and services, lecture capture, online learning

http://www.techsmith.com
Camtasia is the flagship screen recording and video editing product.
There is also a useful transcription feature.
The video creation and hosting solution is called Relay.
Products/services: lecture capture, mobile learning, online learning, training

http://www.panopto.com

With over 500 customers, Panopto is positioned as the campus Youtube.

A major player in the academic market with prestigious customers.

Founded in 2007 by members of Carnegie Mellon University's School of Computer Science.

Products/services: Lecture capture, media production, preservation and storage, online learning, webcasting

Epiphan is a partner of Panopto at EDUCAUSE 2015.

http://www.epiphan.com/blog/panopto-epiphan-partnering-educause-2015/

http://www.kaltura.com EDUCAUSE Gold partner

Open source platform with a community on www.kaltura.org and www.html5video.org.

More than 300,000 company and website customers.

Strengths: mobile version and HTML5 player.

Cooperation with 3PlayMedia, the market leader for transcription www.3playmedia.com

Kaltura is the most comprehensive solution.

This is evidenced by the steady increase in the size of Kaltura's booth in the exhibit hall at successive EDUCAUSE conferences.

Products/services: BYOD, lecture capture, online learning, open source

http://www.sonicfoundry.com EDUCAUSE platinum partner

Mediasite platform with over 3,000 customers in 60 countries.

One of the top three providers of higher education platforms.

Products/services: Audio and video conferencing, content management systems, lecture capture, webcasting

Presentations at the conference

As chance would have it, the only noncommercial presentation was given by Purdue University, which the French delegation to the conference had visited. It concerned the Panopto solution and was entitled "*Simple, Sustainable Video Production through Collaboration*."

http://www.educause.edu/annual-conference/2015/simple-sustainable-video-production-through-collaboration

Seven poster sessions presented video uses.

One presented Avalon[26], an open source system for managing and providing access to the video collections of libraries and archives, developed at Indiana University:

The Avalon Video and Audio Repository for Libraries and Beyond

http://www.educause.edu/annual-conference/2015/avalon-video-and-audio-repository-libraries-and-beyond

One poster session was dedicated to One Button Studio, a project from Penn State.

How to run a recording studio with the press of a button[27]!

Scaling Content Creation: The One Button Approach[28]

A few players from the French market

The open source project Pod, started at Université de Lille 1, has been scaled up by integrating the ESUP community. Several French universities are in the process of installing Pod.

It is a comprehensive distribution platform with an EDM (electronic document management) interface and full HTML5.

https://github.com/EsupPortail/pod

ANSTIA, an association of French higher education IT and audiovisual departments, has set up its own pod[29].

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[26] http://www.avalonmediasystem.org/project

[27] http://onebutton.psu.edu

[28] http://www.educause.edu/annual-conference/2015/scaling-content-creation-one-button-approach

[29] http://pod.anstia.fr

The SAM project from Sciences Po is a video delivery platform, where videos can be edited online without changing the source.
Originally designed as a solution for exploiting an institution's video archives, SAM is now being tested in a classroom context, where students edit and comment on videos they make themselves.
http://www.sam-network.org

Medias.D from Université Paris Descartes is used to capture, broadcast and archive events such as ESUP-Days. A simplified capture solution, GEEM, is deployed in lecture halls and classrooms and was developed by the Descartes Faculty of Medicine.
https://mediasd.parisdescartes.fr

Conclusion

One thing is clear: Kaltura is the market leader for online video platforms in US higher education, with heavyweight clients including Yale, Stanford, NYU, Michigan, and Pearson Education.

The Gartner analysis consulted after the EDUCAUSE conference confirms this status quo, positioning Kaltura as a leader in the Magic Quadrant for Enterprise Video Content Management. This study only includes companies with a turnover for 2014 of over $6 million and offices in both Europe and the US, among other criteria. Qumu, which was not present at EDUCAUSE, mentions no university clients.

The full report at: http://www.agilecontent.com/documents/en/Gartner-MQ-for-EVCM-2015.pdf

Figure 1. Magic Quadrant for Enterprise Video Content Management

Machine learning

Dominique Verez - dominique.verez@recherche.gouv.fr

"The joint use of massive quantities of information and of relatively simple learning algorithms makes it possible to solve problems which, until a short time ago, were considered unsolvable."

We were captivated by the scope of possibilities! We attended the presentation "Robot Writers and the Future of Open Learning Materials" by speakers from Pennsylvania State University: Kyle Bowen, Director of Education Technology Services; C. Lee Giles, Professor; and Barton K. Pursel, Faculty Programs Coordinator.

Wikipedia: Machine learning is a subfield of computer science that evolved from the study of pattern recognition and computational learning theory in artificial intelligence... Machine learning explores the study and construction of algorithms that can learn from and make predictions on data. Such algorithms operate by building a model from example inputs in order to make data-driven predictions or decisions, rather than following strictly static program instructions.

Robot reporters are already used to develop original narratives that cover news, sports, and economic markets. Combining the same algorithmic approaches to sources of open content, textbooks can now be outlined by authors and written by robots.

"Learning content outlined by authors and written by robots"

The objective of the session was to explore how machine "learning" can greatly aid the creation of course content and will perhaps one day be used to write courses from start to finish.

The presenters demonstrated how machine-learning concepts can be applied to the generation of learning content. The hardest part is then to critically evaluate machine-generated content and identify typical pitfalls. They then focused on identifying opportunities for using machine-learning technology to enable and expand the use of Open Educational Resources (OER).

Wikipedia: Open Educational Resources (OER) are freely accessible, openly licensed documents and media that are useful for teaching, learning, and assessing as well as for research purposes.

There are many other examples of machine learning that demonstrate fairly well how the principle works. Perhaps the easiest to understand, yet one of the most amazing, is the machine learning system that enables a robot with the ability to move its limbs – but that knows nothing to start with about coordinating its movements for walking – to learn to walk. The robot begins by making random movements. Then, by selecting and favoring movements that allow it to move forward, gradually puts in place an increasingly effective walk.

Journal du Net, March 28, 2014. In a few months, the Memorial Sloan Kettering Cancer Center in New York will recruit a young oncologist of a somewhat peculiar kind: not a brilliant doctor of genetics, but an artificial intelligence (AI) developed by IBM and answering to the name of Watson. During his "studies" Watson devoured 2 million pages of specialist journals and almost as many clinical reports. This voracity for knowledge and unmatched analytical skills already put Watson in a position to surpass his human colleagues.

But the examples are legion:

- A self-driving car... by Google.

- Handwriting recognition. This is a complex task because two similar letters are never exactly equal. The machine learning system learns to recognize letters by observing "examples", i.e., letters it knows. It is the same for face recognition, recognition of natural language and machine translation.

- Predictive analytics of a consumer's shopping cart is probably the most common use.

- Detection of fraud in banking transactions

- Estimating the default risk of a loan based on the applicant's financial history

- Feelings analysis in the social sciences seeks to classify documents according to their dominant emotional tone.

References

For those who want to know more about Machine Learning, we recommend a MOOC from the University of Washington that we checked out after EDUCAUSE, which offers twenty videos that give a good overview of the subject[30].

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[30] https://class.coursera.org/datasci-001/lecture/preview

Adaptive Learning

Yves Epelboin - yves.epelboin@impmc.upmc.fr & Jean-Marc Meunier— jean-marc.meunier@univ-paris8.fr

Definition

The emergence of MOOCs has brought to light a significant yet poorly understood feature of learning platforms, so far only used by faculty with the strongest grasp of learning technology: the possibility of guiding students through course documents to build learning paths. This goes far beyond a simple table of contents. Learning platforms are most often limited to storing course materials with, at best, instructors adding a table of contents with links to each document so that students can locate what they're after.

However, it is possible to take things further by controlling how students progress through these documents rather than letting them dip in at random. This is obviously more effective from a pedagogical perspective in which you want students to cover the fundamentals before continuing their discovery and understanding of a subject. LMSs like Moodle enable this progression to be controlled to some degree by establishing conditions that must be met before the next material can be accessed. Prerequisites might include having opened previous documents, getting a certain quiz score, actively participating in forums, writing blog posts, etc.

Though more intelligent that the usual linear progression, this approach has its own limits. The possible paths must be devised in advance, which entails a rigid categorization of how students can progress. An answer to this challenge is emerging: adaptive learning, i.e., platforms able to offer students individualized paths that adapt in real time to their knowledge and understanding of the course. This individualization is based either on modeling a field of knowledge, or on a hierarchical sequence of concepts or skills to be learned. In both cases, the possible paths are described in graph form. A branch of the possible paths is dynamically opened to a student, according to much more numerous and sophisticated criteria than those mentioned above. These criteria are based on the knowledge acquired over the course and take into account a set of parameters based on the use of the platform by the students and the individual dynamic profile of each user. Each branch of the graph is analyzed and the least used are discarded. This approach recalls the programmed learning project of the 1950s, but with infinitely more powerful technology. We are moving towards a predictive, adaptive model that employs artificial intelligence methods. Instructors can adjust the possible paths, at each node in the graph, by manipulating these parameters using variables that play on the knowledge that the platform claims to have acquired about the students.

State of play at Educause

There were a dozen presentations on adaptive learning. The subject is still fairly new and can be considered as a specific use of learning analytics. Several companies are getting into this field, offering a new generation of learning platforms. A few universities, among the most advanced in innovative online education such as UCF (University of Central Florida, which we visited last year), presented their feedback. This is a fast-growing sector and there should be more presentations next year.

Knewton, Realize IT and Desire2Learn, providers of adaptive learning platforms, had booths in the exhibit hall. When asked about how they analyze the mass of student data gathered by the platform, and how they construct the variables that allow instructors to adjust the learning paths, their answers were too vague for any conclusions to be drawn. They all claim that their product helps quickly detect students who are losing their footing.

The experiences covered in the presentations show that we're still in the early stages.

UCF (University of Central Florida) did not observe a systematic improvement in results. It depends on how the students worked and varies from one course to another. However, course construction was more complicated. Faculty had to be trained and supported by instructional designers. These courses also demanded a lot more preparation. The students liked it but, interestingly, the instructors had to justify to some students why the system offered them a different, longer path. With analytics, instructors were quickly able to identify any students in difficulty.

ALMAP (Adaptive Learning Market Acceleration), a fairly large-scale study on adaptive learning platforms (700 instructors, 21500 students) funded by the Bill & Melinda Gates Foundation, confirms these results. It adds that the gain in efficiency is not clear compared to other blended learning methods (use of a platform + face-to-face).

A lot of research is still needed to determine which data to consider and how it should be analyzed it in order to offer students personalized learning paths. Nonetheless, this approach holds great promise because unlike a lot of learning analytics projects, it does not try to use all the data from all the university information systems – data that is often difficult to gather from a set of fairly incompatible systems – as the platform is self-sufficient. The next step will be to determine the right indicators and how to use them. This reflects the broader challenge of the use of learning analytics and the development of indicators.

Bibliography

UCF's experience : http://www.educause.edu/annual-conference/2015/adaptive-learning-online-learning-results-ongoing-evaluation & http://www.educause.edu/annual-conference/2015/challenges-adaptive-content-perspective-two-universities
The ALMAP study : http://www.educause.edu/annual-conference/2015/progress-using-adaptive-learning-technology-student-college-success

Exhibit Hall, the Other Side of the Conference

Dominique Verez - dominique.verez@recherche.gouv.fr & Christine Marle - christine.marle@cnlesr.fr

The Cellule Nationale Logicielle or CNL (National Software Unit) is an office within the French Ministry of Education, Higher Education and Research (MENESR) responsible for pooling software resources and solutions for all higher education and research institutions in France. We award government contracts for the recurrent needs of institutions: Microsoft, Adobe, VMware, RedHat, etc. We have also signed protocols with around a hundred publishers. We represent over 350 higher education institutions (universities, research organizations, schools) in all ministries. We group together the software requirements for around 700,000 PCs and 70,000 servers.

Organization of the conference and the exhibit hall

This is the second year that the CNL has been part of the French delegation at EDUCAUSE. We knew what to expect in terms of the volume of companies (332 this year) and the massive scale of the event. Yet we were still surprised to see that our smartphone pedometers had clocked more than 10 kilometers by the end of the day! It might be dedicated to higher education, but this conference is organized with just as many resources and as much professionalism as any conference in the commercial sector: a VIP lounge, the "First-Timer Pit Stop" for those new to EDUCAUSE, lounges, and a real effort in terms of accessibility (cued speech interpreters, for example). Perhaps because in the US, education is seen as a business like any other? Or perhaps because education will become the major issue for the society borne of the digital revolution, as Andrew McAfee predicted at one of the plenary sessions? In a world where technology is eliminating many repetitive jobs, school and education have to lead their own revolution. There is no longer a need to format humans to complete mechanical tasks (there are already robots for that), but to educate people who are able to create and innovate.

With regard to innovation, one of the sectors of the exhibit hall that is particularly worth looking at is Startup Alley, and we will come back to that in detail later.

Navigating the maze of companies

Almost instinctively, we found ourselves searching for names and logos we knew in the huge space dedicated to product and service providers. We certainly found some. Most of the international giants in infrastructure, software, and cloud were present: Amazon, Citrix, Dell, Dropbox, Epson, Fujitsu, Google, IBM, Lenovo, Microsoft obviously, Oracle, Palo Alto, Panasonic, RedHat, SAP, SAS, Symantec, Unit4, and VMware, just to name a few. We also noticed slightly smaller companies whose name was familiar: Fortinet, Minitab, NetApp, Nuance, TechSmith, etc. We had agreed to meet at the modest-sized booth held by Adobe, slightly smaller than the Corel booth, but with products that are widely used by the US higher education community. However, nearly half of the companies were new to us.

Many of the companies that we had not previously come across address issues specific to American higher education, which is at a real turning point. The major universities, as prestigious as they are expensive, no longer meet the diverse needs of today's population. Furthermore, there is now some doubt as to the return on investment of very expensive studies. Community Colleges, comparable to polytechnics and offering shorter courses of study, are enjoying a strong rise in popularity. They meet the current demand: they are accessible to everyone and to all ages, and are much less selective than major universities. This situation

specific to the United States is generating new needs, which many of the companies present at EDUCAUSE are attempting to meet, as shown by the inventory of companies by sector below.

Startup Alley, a mirror of current issues

The student population is much more diverse than it was. Today, students are often employed and many are parents. In 2020, 42 percent of them – almost half – will be over 25. At present almost two-thirds of students fall into the "non-traditional students" category. These students are mobile and well-equipped with smartphones and tablets. A number of companies, particularly in Startup Alley, offer applications for simplifying student life: calendars, room schedules, menus, available equipment, contact with other students in the same discipline, etc. One company has developed a special application for families, to keep parents informed about campus life (ESP Campus).

Teaching and learning practices have changed. The traditional model of lectures on campus and exercises at home is undergoing a reversal with flipped classrooms (students learning their theory lessons at home, with classroom time dedicated to exercises). As the slogan of one of the startups indicates, "Time for class is show time." For these new models, faculty need ready-to-use content. Some publishers specialize in ready-made content and also offer ready-made assessments in multi-choice or quiz form (FlipGrid, Junction Education, MobLab, PearDeck, ForClass, etc.).

To put a course online or simply to make it attractive, faculty have to be able to create videos easily without any need for a cameraman or editor. This is what DYCAP offers, for example.

Finding a program that promises an attractive future and a job is the main concern for today's students. Certain applications are designed to promote mentoring and develop students' network (GetSet Learning, Career Pillar), or to help choose a study path (Learning GamePlan).

A walk through Startup Alley provides a sketch of the American student of today: a child of BYOD, the cloud and mobility, with many faces, above all in search of efficiency, contacts, and a network, and concerned about his or her professional future.

Our top picks

Zeticon[31] (MediaHaven solution)
A young Belgian company founded in 2011 and based in Gand.
It offers two solutions:
MediaHaven Asset Management: Video and photo management
MediaHaven Analytics: automatic extraction of metadata from French text

Junction Education[32] [33]
Start-up from New Jersey that offers online courses in US history, psychology, macro- and micro-economics and sociology.
The courses are designed for smartphones and tablets, are customizable, and integrate with Moodle.
Quizzes and videos enliven the course, and it is possible to chat with an instructor or another student.

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[31] www.zeticon.com

[32] www.junctioneducation.com

[33] www.facebook.com/junctioneducation

Dropbox

Dropbox is obviously not new, but at the conference we learned that the company is about to open a data center in Europe, and is currently developing a solution for education.

Companies present at EDUCAUSE 2015, by sector

In 2015, 332 companies were present in the very impressive exhibit hall. Compared to the 2014 conference, 2015 marked several clear trends, all in connection with current issues and often specifically American. The exhibit hall was replete with solutions attempting to respond very quickly to the immediate concerns of universities and colleges.

This was true of Student Retention, i.e., how an institution can keep the students who enroll in first year throughout their study program (with 43 companies on this theme compared to two last year). This issue has really taken off in the last two years, to the point where loyalty programs are now being created.

Analytics in general and learning analytics in particular are on the rise. Big Data and its statistical and analytical processing, or – and this is new – its use in machine learning, will likely be the stars of EDUCAUSE in coming years.

Note also, although this had already appeared in 2014, the growing awareness of the importance of data and security. The time when security was the last link in the chain ended with the coming of Mr Assange and Mr Snowden...

The Top 4 most heavily represented sectors haven't changed, except that Online Learning has inched ahead of BYOD. Cloud Computing and Services remains the uncontested leader of the sectors represented at EDUCAUSE, recalling a shock phrase heard at MIT last year: "Any request for development must be able to be executed in the cloud or it will not be addressed."

Top 12 sectors:

1. Cloud Computing and Services – 115 companies
2. Online Learning – 55 companies
3. BYOD – 50 companies
4. Analytics – 47 companies
5. Mobile Apps – 46 companies
6. Student Retention – 43 companies
7. Enterprise Resource Planning (ERP) – 38 companies
8. Student Information Systems – 35 companies
9. Hardware – 32 companies
10. Content Management Systems – 32 companies
11. Security Management – 30 companies
12. Data Security – 29 companies

Top 5 fastest growing sectors:

1. Mobile Apps – 46 companies in 2015 / 23 companies in 2014
2. Student Retention – 43 companies in 2015 / 2 companies in 2014
3. Enterprise Resource Planning (ERP) – 38 companies in 2015 / 15 companies in 2014

4. Business Intelligence (BI) – 23 companies in 2015 / 13 companies in 2014
5. Clickers – 8 companies in 2015 / 4 companies in 2014

In 2015, for the 332 companies in the Exhibit Hall, we identified 57 major sectors. We indicate below how many companies were present for each sector and the variation compared to 2014.

1. Academic Information Systems – 24 companies (+20%)
2. Analytics – 47 companies (+27%)
3. Assistive Technology – 5 companies (new theme in 2015)
4. Audio and Video Conferencing – 28 companies (+33%)
5. Business Continuity, Disaster Recovery, Emergency Planning – 12 companies (-8%)
6. Business Intelligence (BI) – 23 companies (+77%)
7. BYOD – 50 companies (-7%)
8. Captioning – 1 company (-50%)
9. Classroom Control Systems – 11 companies (+0%)
10. Clickers – 8 companies (+100%)
11. Cloud Computing and Services – 115 companies (+28%)
12. Compliance – 18 companies (-28%)
13. Consulting – 27 companies (new theme in 2015)
14. Content Management Systems – 32 companies (+33%)
15. CRM – 20 companies (+67%)
16. Data Security – 29 companies (+45%)
17. Data Warehousing – 4 companies (new theme in 2015)
18. Digital Publishing – 16 companies (-11%)
19. Digital Signage – 10 companies (+43%)
20. Document Management – 20 companies (new theme in 2015)
21. E-Commerce – 11 companies (+57%)
22. E-Mail Management – 4 companies (new theme in 2015)
23. Enterprise Information Systems – 29 companies (-6%)
24. Enterprise Resource Planning (ERP) – 38 companies (+153%)
25. E-Portfolios – 4 companies (-33%)
26. Financing – 3 companies (+0%)
27. Furniture – 6 companies (-45%)
28. Hardware – 32 companies (+88%)
29. Help Desk – 9 companies (-31%)
30. Identity and Access Management – 15 companies (-6%)
31. Internet2 NET+ – 16 companies (new theme in 2015)
32. Intrusion Detection and Prevention – 5 companies (+150%)
33. IT Governance – 13 companies (new theme in 2015)
34. Learning Analytics – 21 companies (+0%)
35. Learning Management Systems (LMS) – 22 companies (-4%)

36. Learning Space – 13 companies (new theme in 2015)

37. Lecture Capture – 16 companies (new theme in 2015)

38. Media Production, Preservation, and Storage – 11 companies (+22%)

39. Mobile Apps – 46 companies (+100%)

40. Mobile Learning – 28 companies (-13%)

41. Network Architecture and Infrastructure – 20 companies (+5%)

42. Network Security – 19 companies (-5%)

43. Online Learning – 55 companies (+22%)

44. Open Source – 12 companies (+20%)

45. Portfolio and Project Management – 8 companies (+14%)

46. Privacy – 4 companies (+300%)

47. Productivity Applications and Systems – 26 companies (new theme in 2015)

48. Risk Management – 8 companies (+0%)

49. Security Management – 30 companies (+15%)

50. Social Media – 9 companies (+29%)

51. Storage – 14 companies (+100%)

52. Student Information Systems – 35 companies (+52%)

53. Student Retention – 43 companies (+2050%)

54. Training – 21 companies (+75%)

55. Virtualization – 17 companies (+6%)

56. Webcasting – 5 companies (+25%)

57. Wireless – 14 companies (-18%)

Compared to 2014, the following 10 themes have emerged:

Assistive Technology / Consulting / Data Warehousing / Document Management / E-Mail Management / Internet2 NET+ / IT Governance / Learning Space / Lecture Capture / Productivity Applications and Systems

Compared to 2014, the following 8 themes have disappeared or have been redistributed differently:

Adaptive Technologies / Content Capture / Content Management Services / Data Administration and Warehousing / Document Imaging and Management / E-mail and Productivity Systems / Governance and Compliance / Learning Space Design and Outfitting

You should have no trouble finding these companies' contact details using a good search engine. If you do have problems, don't hesitate to contact us, we have nearly all the contact details.

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Credits

Contributors: Olivier Afonso, John Augeri, Brigitte Contois, Khadija Dib, Yves Epelboin, Laurent Flory, Thierry Koscielniak, Christine Marle, Jean-Marc Meunier, and Dominique Verez.
Editor in chief, editorial coordination and layout: John Augeri - john.augeri@unpidf.fr
Translation: Jessica Edwards – edwards.translation@gmail.com
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The 2015 French delegation with John O'Brien, President & CEO of Educause

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