

Learning Analytics

“The **measurement, collection, analysis and reporting** of data about learners and their contexts, for purposes of understanding and optimizing learning and the environments in which it occurs”

(Siemens et al., 2011)



Higher Education and the Revolution of Learning Analytics

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From M. D. Pistilli, EDUCAUSE 2015



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Educational challenges

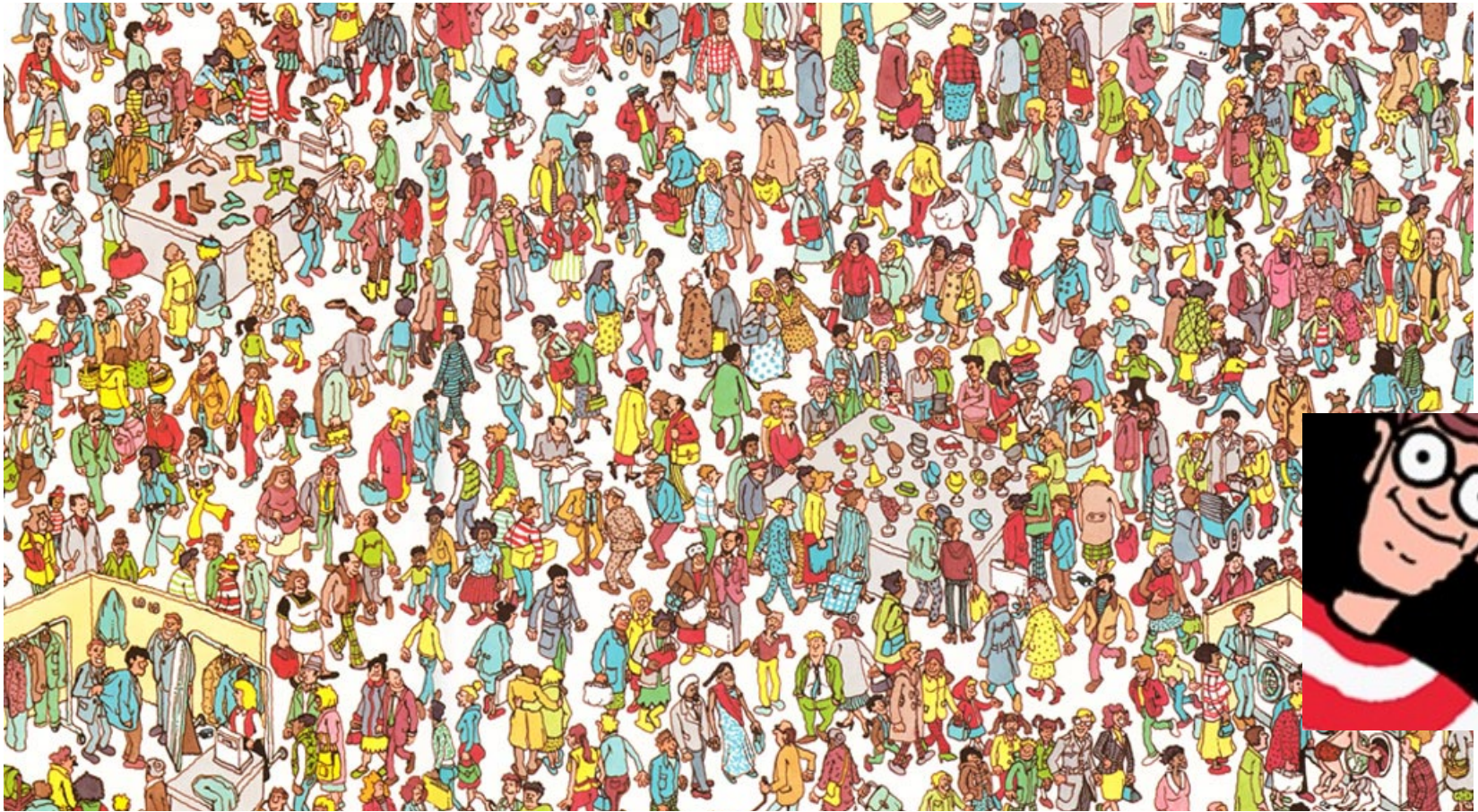
- Growing need for education
 - 100M students more in 2025
 - job market requirements
 - Life Long Learning (5 jobs in your life)
- Active Learning & Adaptive Learning
- Education defunding

Agenda

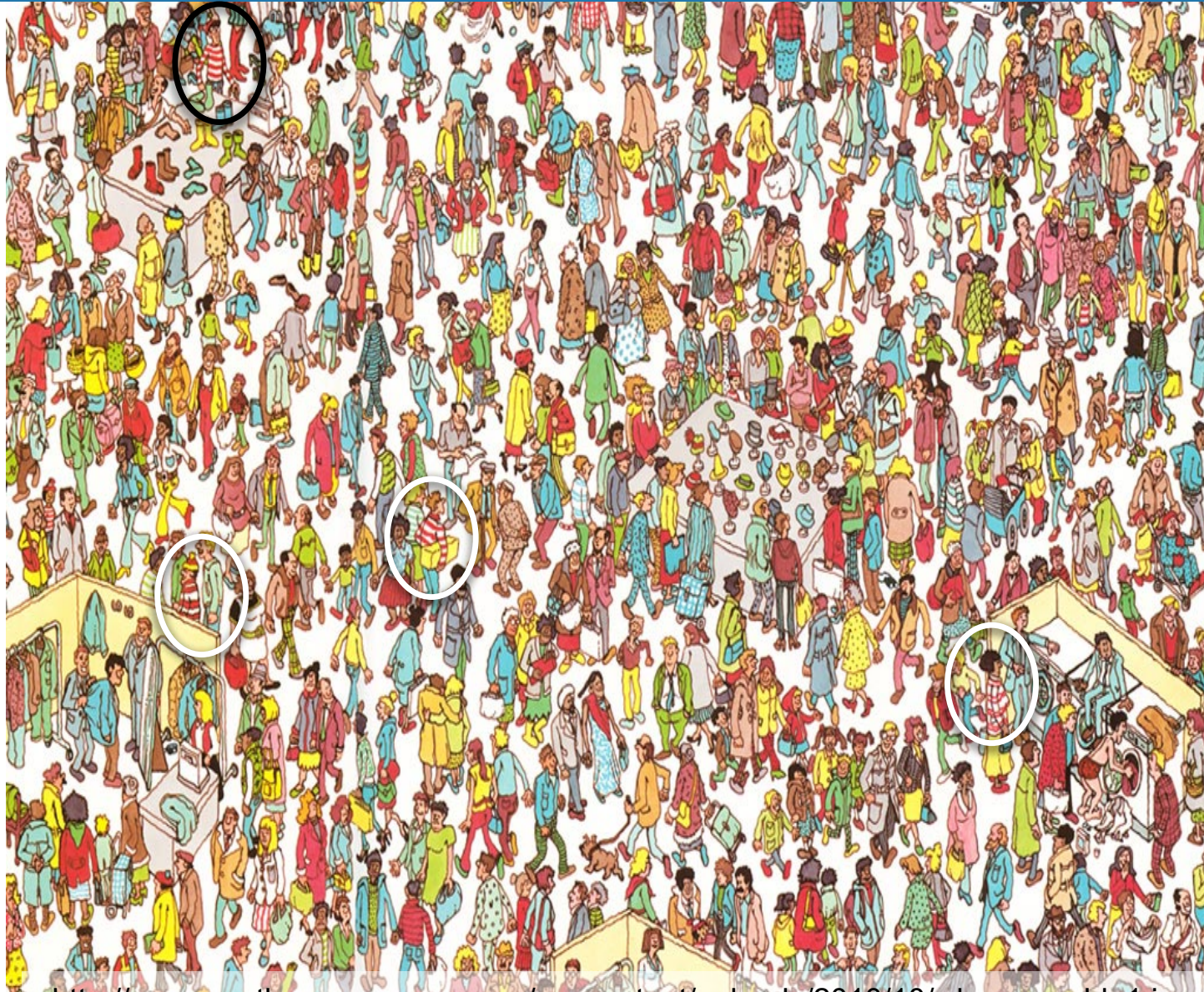
- 1. Why to embed Learning Analytics in your institutional strategy?**
- 2. Is your institution ready for Learning Analytics?**
- 3. What can research in Learning Analytics bring?**

Why to embed Learning Analytics in your institutional strategy?

Where is Waldo?



Challenge 1: how to detect an “at-risk” student?



<http://www.youthareawesome.com/wp-content/uploads/2010/10/wheres-waldo1.jpg>

Challenge 2: how to make him/her successful?



and that for all the students
(at-risk or not)?

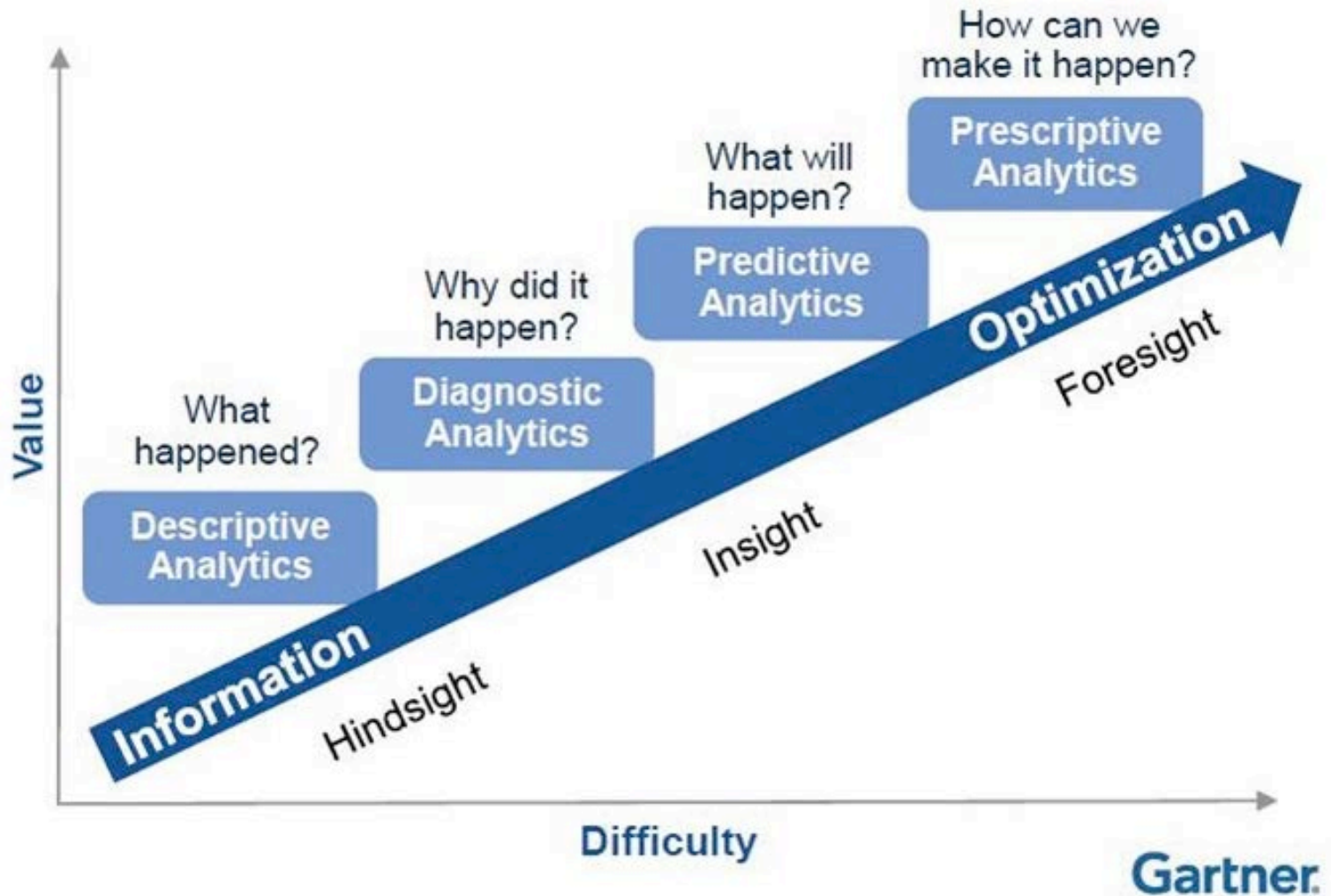


From M. D. Pistilli, EDUCAUSE 2015

Other questions

- How can institutions retain students?
- What can institutions do to improve student success?
- How can institutions help students take advantage of existing campus resources?
- How can students become self-aware of what effort is necessary to be successful in HE?
- How can analytics make a strategic impact at scale?
- ...

Typology of questions



Results in terms of performance

- New York Institute of Technology USA
 - 74% of students who dropped out have been predicted as at-risk students by the data model
- Marist College USA
 - Predictive model provides students with an earlier feedback, allowing them to address any issue before it is too late
 - 6% improvement in final grade by at-risk students who received a learning intervention

Results in terms of personalization

- The Open Universities Australia
 - Drive personalisation and adaptation of content recommended to individual students
 - Provide input and evidence for curriculum redesign
- University of New England, Australia
 - LA is part of a wider ecosystem of engagement with students via social media to foster a sense of community amongst students who may be studying part time or at a distance as well as on campus

Results in terms of budget



- Financial benefit of an institution notifying the risk of failure to students
- Case study: mostly distance university in Australia with about 20 000 students
- On average, lost of about \$4500 each time a student drops out
- With a notification: \$4000 of revenue the first year,

From (Harrison et al. 2016)

To summarize, LA for ...

- Students retention
- Learning personalization
- Quality improvement of education
- Support to the creation of personalized curricula
- Rationalization of cost

Highly promising



**Is your institution ready
for Learning Analytics?**

Preliminary remarks

- “A successful Analytics implementation is a cultural challenge, not a technological one”
Mike Sharkey, VP of Analytics
- Adopting learning analytics requires significant investment of time, resources and money



A reference model (from Chatti 2014)



Focus on data

- Data collection from explicit educational actions
 - homework
 - tests and exams
 - activities on the LMS platform
 - consultation of educational resources
- Data collection from extracurricular activities
 - social interactions
 - messages on blogs or forum
 - and other activities usually not taken into account in learner's assessment

The Data Flow



1 - Data are gathered from a variety of systems

2 - Data are normalized and modeled in a central repository

3 – Success metrics and risk scores are delivered via reports, dashboards and CRM integration

From the UMUC (2015)

- LA can only model what is captured in traces
- Data in many places, “owned” by many people/organizations
- Various processes procedures regulation depending on data owner

Ethical and legal issues

“Who owns the learners’ data?”

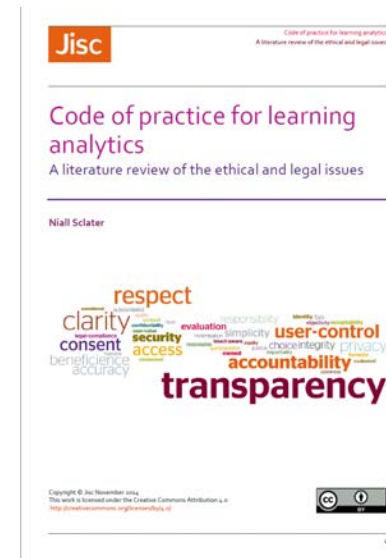
“Is anonymization of data sufficient?”

Work in progress in France at a national level: CNIL

e-FRAN METAL project

- Privacy by design
- Ethical chart, committee and label
- Transparency of algorithms

Sclater, N. (2014). Code of practice for learning analytics: A literature review of the ethical and legal issues. http://repository.jisc.ac.uk/5661/1/Learning_Analytics_A-Literature_Review.pdf



Decisions to take

Why to build an LA software?

- Because no one else is doing what you plan to do it
- Because you need to do it
- Because you can do it
- **Because there is no ethical solution matching your needs**

Why to buy an LA software?

- Because existing tools met existing needs
- Because timing doesn't allow for tool development
- Because on-campus resource doesn't exist
- **Because the tool matches your ethical criteria**

To sum up

Methodology

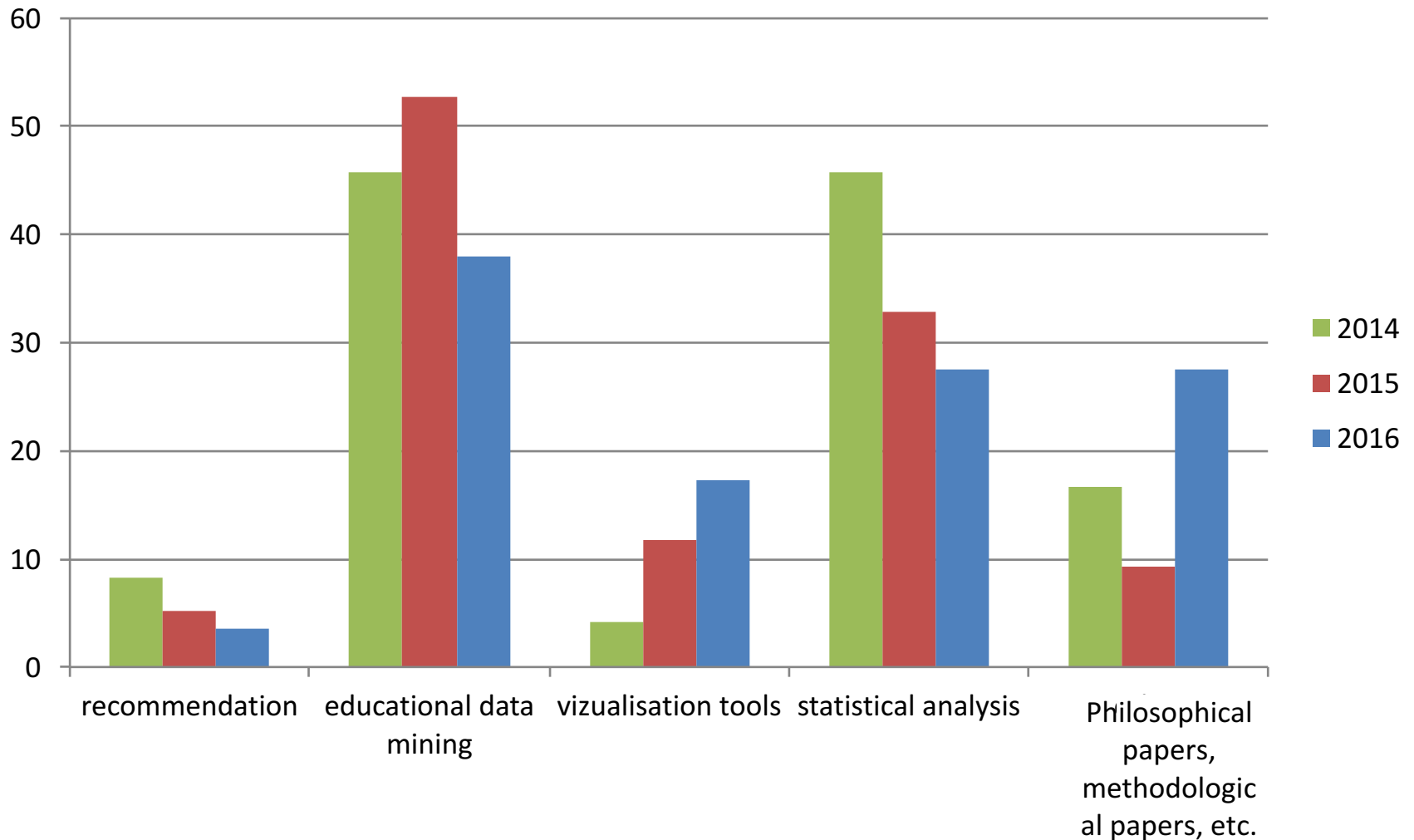
- Have a high level of information about your data and a strong monitoring of the data flow (Educause, 2015)
- Form the right project team by mixing actors, technicians and experts (Educause, 2015)
- Frequently confront hypotheses with reality (Educause, 2015)
- Design collaboratively, build on up-to-date research and organize a clear communication plan

Impact

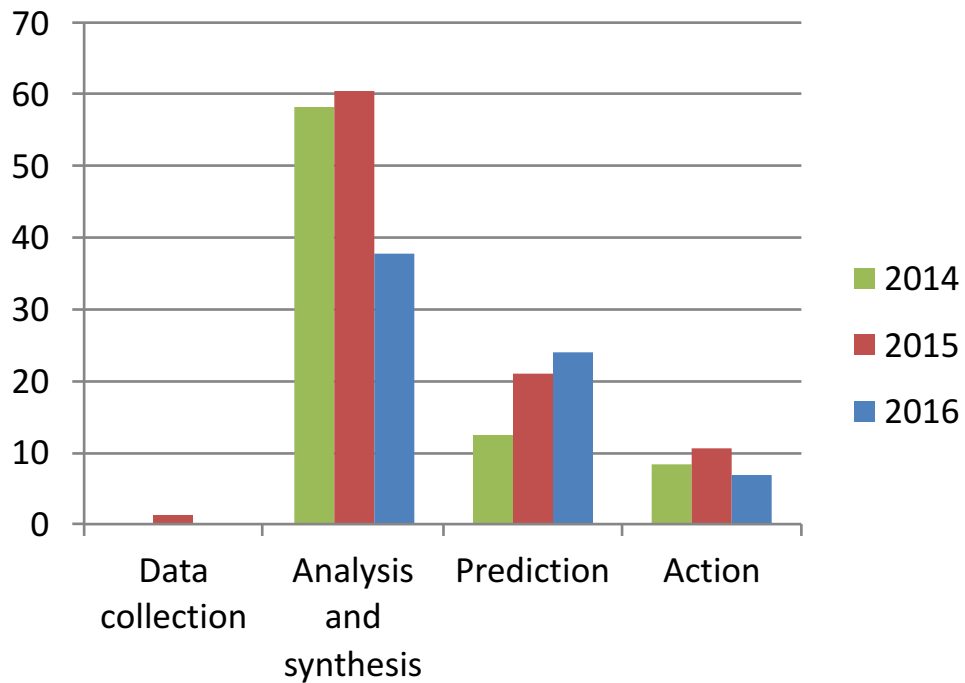
- Behavior of a teacher knowing that a student is “at-risk”
- Behavior of a student knowing he is “at-risk”
- What is an ethical practice, and what is not?
- What does privacy mean nowadays?

What can research in Learning Analytics bring?

Topics of Learning Analytics



Steps of Learning Analytics



Focus on e-PERICLES

Investigation de domaines (Cours : Stockage et traitement des corpus et de l'information avec XML, module 4)

BERGEY Jean-Luc, NGUYEN Van Toan - 2012

Syntaxe SGMML DTD Introduction XML

Document grammaire balisage Phrase

HTML Notice

Accéder à la ressource

DESCRIPTION

Pédagogie Contributions Technique

TYPE DOCUMENTAIRE
Ressource interactive, Son, Texte, Vidéo

STRUCTURE
linéaire

LANGUE
Français

FICHE SUPLOMFR
XML

Voir aussi!
Est une partie de
• Stockage et traitement des corpus et de l'information avec XML : de l'initiation aux pratiques professionnelles

Rebondir avec Rameau
• XML (langage de balisage)
• Linguistique - Informatique

Recommandations

UOH université ouverte des humanités

Connecté sous le nom « Azim Roussanaly » (déconnexion)

ARCHE
Accès aux Ressources et Cours Hébergés sur l'ENT

Accueil Mes cours AI Activer le mode édition

Forum des nouvelles

Section 1

2012-2013
? Qui êtes vous ?

Présentations

- Organisation
- Introduction
- Filtrage bayésien
- Filtrage collaboratif
- Filtrage et classification
- Evaluation
- Confiance
- Sécurité

Recommandations UNT

RÉGLAGES

- Administration du cours
 - Activer le mode édition
 - Paramètres
 - Utilisateurs
 - Filtres
 - Notes
 - Sauvegarde
 - Restauration
 - Importation
 - Préinitialisation

DTUs
34,000 OERs
All labeled and indexed in SupLomFR
Web search engine
No precise usage data about the users
(session data)

LMS in Université de Lorraine
55,000 learners
No indexing of the educational resources

Precise information about the learners
(usage data)

E-PERICLES
recommendation of OERs

Focus on METAL

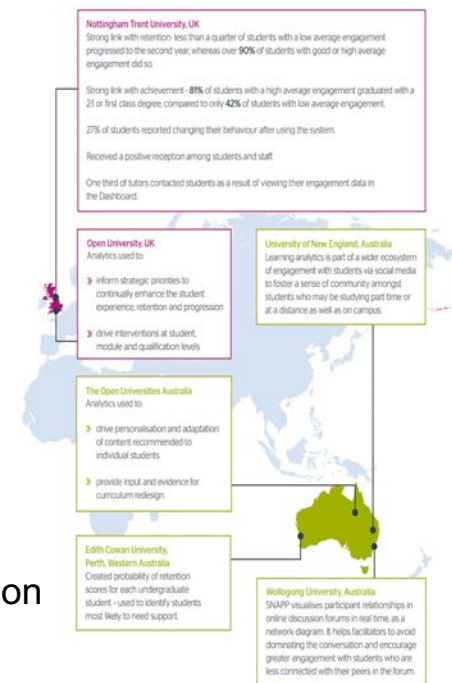
- Design, develop and evaluate a toolbox for
 - personalized monitoring of students to maximize their engagement
 - supporting the new role of teacher as a coach of the learner
 - supporting the new role of learner as an actor of his own progress
- Application
 - Language learning
 - Target: K12
- Research actions
 - Data collection and ethical issues
 - Educational barometer for the learner
 - Educational dashboard for the teacher

Conclusion

Learning Analytics is...

An emergent, interdisciplinary research field

- A powerful tool to enhance quality and personalization in HE
- With successful experimentations



2016 JISC report

<https://www.jisc.ac.uk/reports/learning-Analytics-in-higher-education>

As a conclusion

“The combination of embedded administrative and academic technologies, big data, powerful analytical tools, and sophisticated data-mining techniques are poised to spark a revolution in how education is delivered and how the efficacy of that education is measured”

ECAR, Educause 2015