LIÈGE université

ETHICAL FORUM

Learning Analytics at the bedside of a seriously ill patient called 'Assessment'

Matthieu Hausman, Laurent Leduc & Pascal Detroz

19th Ethical Forum of the University Foundation

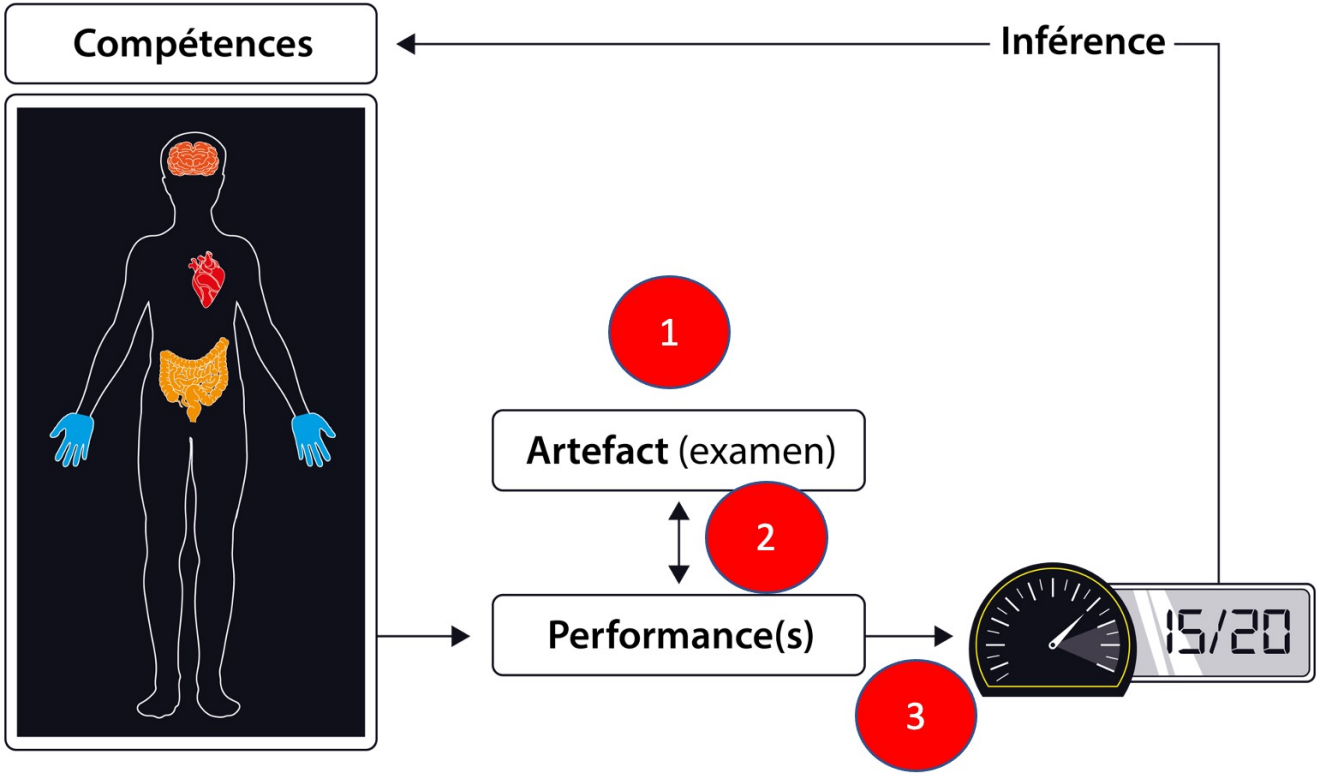
Brussels, 9th December 2021

What about Assessment?

- The primary functions of assessment are to take a **measure** of a given performance, to facilitate **judgment** about that performance, and to make a **decision** about it (Stufflebeam, 1981; Brookhart & Nitko, 2011)

- Measure
- Judgment
- Decision

What’s “wrong” with assessment?



Assessment needs

a) Quality assessment tools (AERA, APA, NCME, 1999)
   - Validity of measure

b) Triangulation of data (Denzin & Lincoln, 2011)
   - Multiple opportunities for assessment, and diversification of assessment modalities (Detroz, Malay & Crahay (2020)

c) A positive impact on learning (Nicol, 2009)
   - Assessment for Learning (Black & Wiliam, 1998; Nicol, 2009) :

A survey on assessment practices in Higher Education on the French-speaking part of Belgium

Comprendre et améliorer les pratiques d'évaluation des acquis des étudiants dans l'enseignement supérieur

Coordinateurs du projet :
Pascal DETROZ et Marc ROMAINVILLE

Équipe de recherche :
Amélie AUQUIÈRE
Marielle DONY
Aurélie PIAZZA
Anne VAUSE

Recherche financée par le ministère de l'enseignement supérieur de la Fédération Wallonie-Bruxelles

UNIVERSITÉ DE NAMUR
FÉDÉRATION WALLONIE-BRUXELLES
Université de Liège

Quantitative side (n=2292) : "What"? "When"?

Qualitative side (n=37) : "How"? "Why"?

What are teachers' assessment practices and what are the reasons for them?

Some interesting results

Tableau 9 : Périodes d'évaluation, selon le type d'établissement.

	Universités N=665		Hautes Écoles N=759		
Uniquement en cours de quadrimestre	43	6,5 %	58	7,6 %	N=738
En cours ET en fin de quadrimestre	286	43,0 %	351	46,3 %	N=1323
Uniquement en fin de quadrimestre	336	50,5 %	350	46,1 %	

Tableau 12 : Types de modalités d'évaluation, selon le type d'établissement.

	Hautes Écoles N=662		Universités N=588	
Examen écrit	457	69,0 %	399	67,9 %
Questions fermées (seules ou non)	***187***	***45,5 %***[6]	***143***	***38,3 %***
Questions ouvertes (seules ou non) *N=411 et 373*	***405***	***98,5 %***	***330***	***88,5 %***
Examen oral	228	34,4 %	232	39,5 %
Travail de fin de quadrimestre (y compris présentation, projet, portfolio…)	188	28,4 %	166	28,2 %

Some interesting results

Tableau 137 : Types de retour fourni aux étudiants lors d'un examen écrit, selon le type d'établissement.

	Hautes Écoles N=897		Universités N=609	
1. Communication à chaque étudiant de sa note (ou sa réussite/échec)	**496**	**55,3 %**	**425**	**69,8 %**
2. Communication d'une note détaillée (par partie, par chapitre, par critère…) à chaque étudiant	**168**	**18,7 %**	**153**	**25,1 %**
3. Organisation d'une consultation des copies	774	86,3 %	509	83,6 %
4. Remise d'un feedback individualisé qui analyse précisément les réponses de l'étudiant	**95**	**10,6 %**	**46**	**7,5 %**
5. Remise d'un feedback individualisé qui analyse précisément les réponses de l'étudiant ET suggestion de pistes concrètes d'amélioration	130	14,5 %	72	11,8 %
6. Réalisation d'une correction collective visant à communiquer les réponses correctes	**73**	**8,1 %**	**73**	**12,0 %**
7. Réalisation d'une correction collective visant à communiquer ET expliquer les réponses correctes[13] (638 et 352)	**93**	**14,6 %**	**55**	**9,0 %**
8. Aucun feedback n'est rendu aux étudiants	25	2,8 %	20	3,3 %

What does the survey reveal about the quality of assessments? (Detroz *et al.*, 2017)

- Data triangulation is not really the norm
  - Most teachers only assess students' achievements in the examination
  - Teachers try to diversify the modalities of questioning, but not in a wide range of possibilities
- Moreover, the quality is not always there
  - Concessions are made with regard to the validity of the measure (e.g., not penalizing errors in the MCQs), particularly when teachers feel that the assessment does not allow for a detailed evaluation of the targeted skills
    - Exposure to assessment bias in both oral and written form
- Most feedback is not supportive of learners' self-regulation
  - Only the grade/score in most cases
  - Specific feedback with suggestions for improvement is very scarce.

Group size and lack of time are the most important factors in teachers' choices

- Standardized testing starting from 125 students

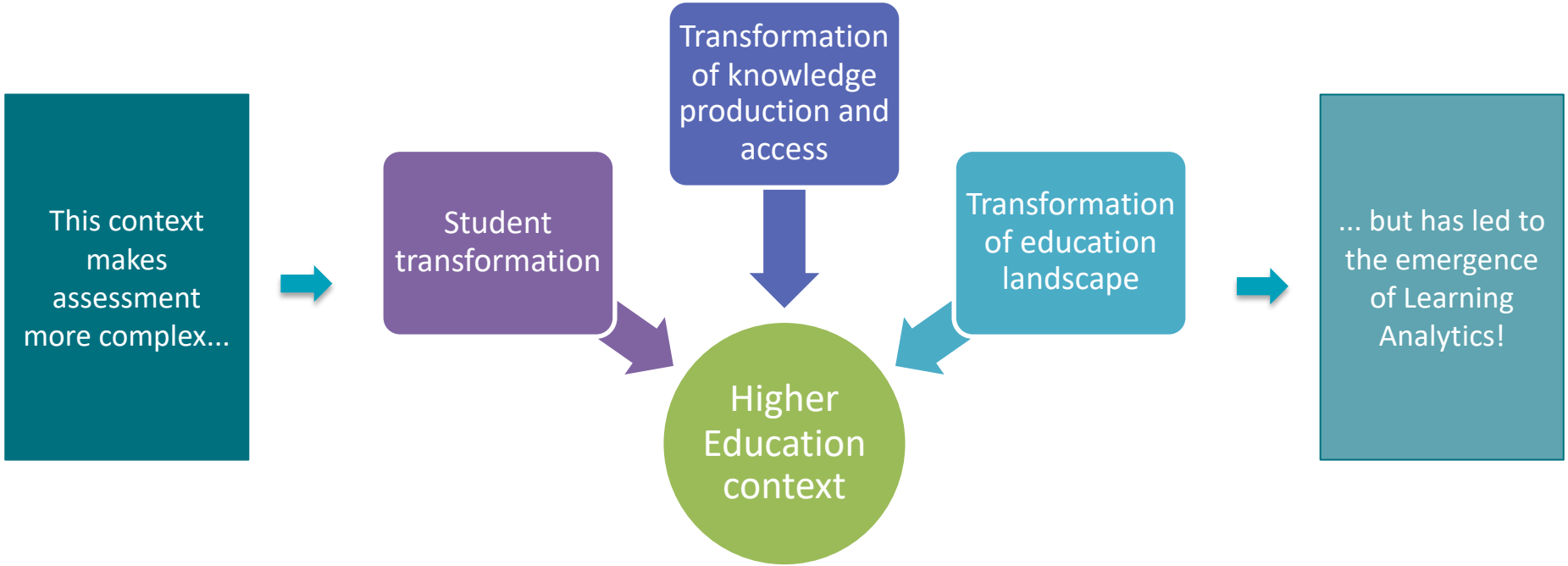
Anyway, teachers want to do well!

- *"[…] teachers are concerned with constructing fair, equitable, valid and reliable assessments…"* (Detroz *et al.*, 2017)

Tableau 199 : Attitudes des enseignants face à l'évaluation : améliorer l'apprentissage à l'Université.

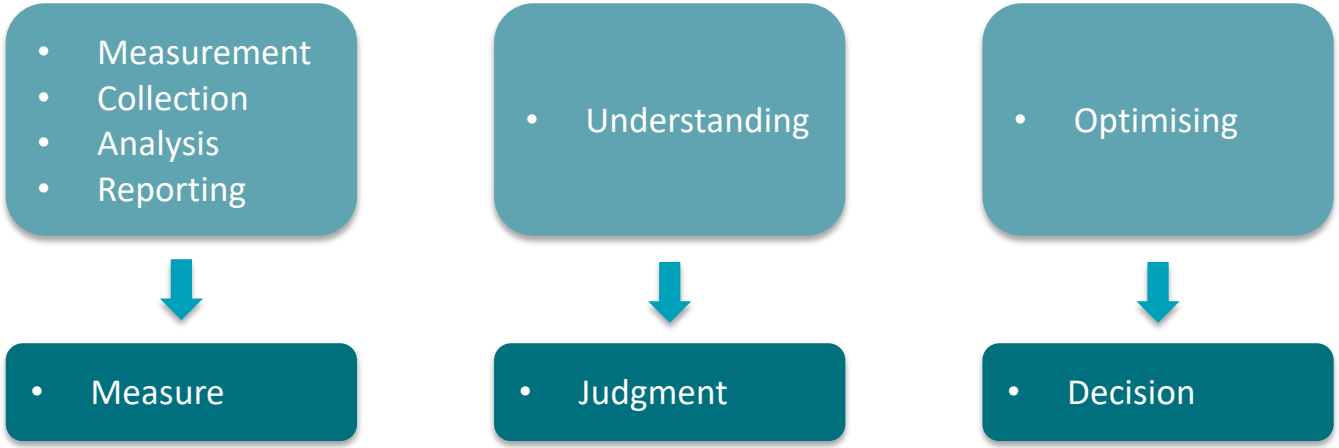
Universités		Pas du tout d'accord		Pas d'accord		Plutôt pas d'accord		Plutôt d'accord		D'accord		Tout à fait d'accord	
Évaluation processus	L'évaluation fait partie intégrante du processus d'enseignement/apprentissage.												
				6	1,1 %	10	1,8 %	89	16,3 %	205	37,5 %	236	43,2 %
	Un des buts de l'évaluation est de faciliter le progrès de l'étudiant en cours d'apprentissage.												
		2	0,4 %	7	1,3 %	31	5,7 %	153	28,3 %	227	42,0 %	120	22,2 %

What if context is both the problem and the solution?



The rise of Learning Analytics

- *« Learning analytics is the measurement, collection, analysis and reporting of data about learners and their contexts, for the purpose of understanding and optimising learning and the environments in which it occurs. »* (Siemens & Long, 2011)



The rise of Learning Analytics

- Functions (Bonnin & Boyer, 2017):

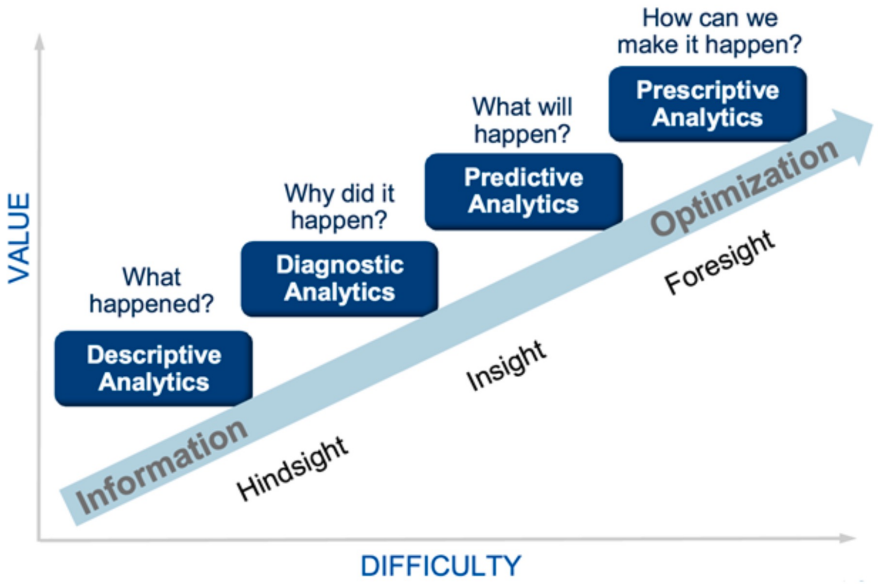


Figure 1 – Analytics (from Gartner) in Bonnin & Boyer (2017)

- Main applications (Sclater, 2017):
  - Visualization of indicators through a dashboard
  - Early alert systems and identification of students « at risk »
  - Provision of recommendations
  - Adaptive learning
  - Inform Learning Design

The cycle of Learning Analytics

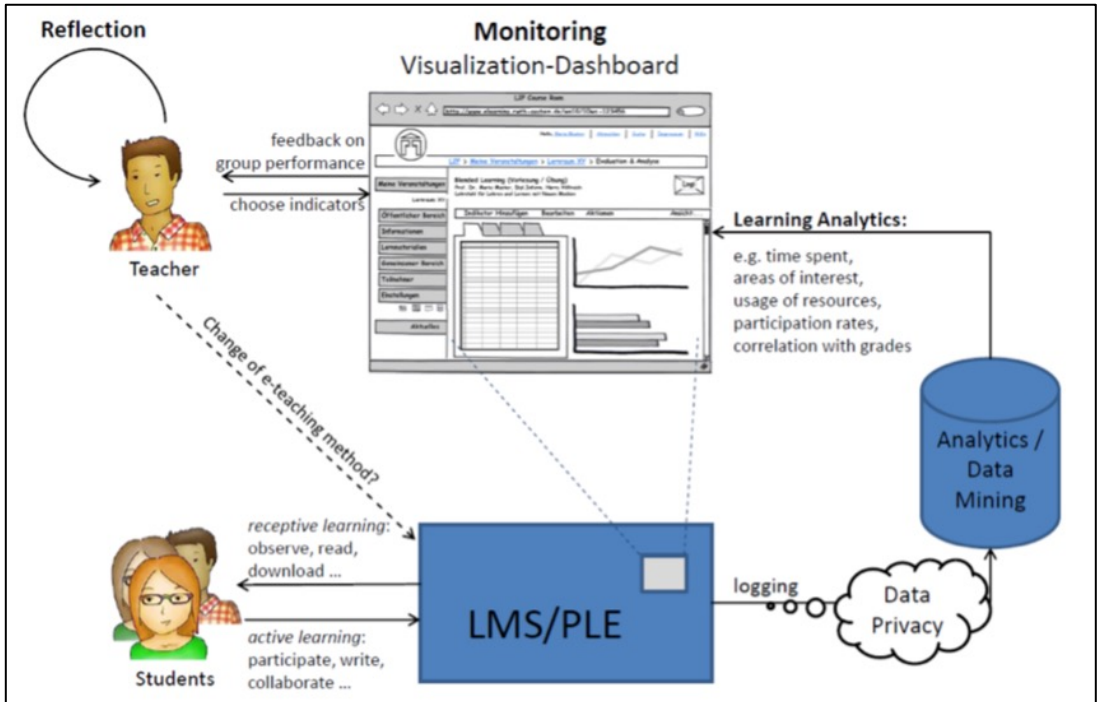


Figure 1. The Learning Analytics Process

Chatti *et al.*, 2012

Expectations

- Added value in assessment:
  - Objectivity of data
    - *« learning analytics, with its ability to track so many more variables than traditional assessment, seems to […] be an exciting opportunity to shift practice and put it on a really firm* ***empirical basis and evidence base****. »* (Buckingham Shum *in* Sclater, 2017)
  - Continuity in the collection of various data
    - Variety of data (performance, use of available resources, predictors of success in higher education, etc.)
  - More effective feedback
    - Learning Analytics **minimizes the delay** between the capture of data and its use (Elias, 2011)
    - *« […] augmenting existing assessment structures through the* ***augmentation of feedback*** *[…] processes for effective assessment. »* (Knight, 2020)

Learning Analytics to support self-regulated learning

For education scientists, it is clear that **Learning Analytics** fits in nicely with the **self-regulated learning** approach (Butler & Winne, 1995; Panadero, 2017)

"Learning analytics process model", Verbert *et al*. (2013)

This approach **actively engages** the learner

*"Use **digital technologies** to support and add value to the implementation of good assessment and feedback practices"* (Nicol, 2009)

Concerns

- Limitations of Learning Analytics in assessment:
  - A wide variety of factors involved in learning and its assessment
  - Limited view on students' activity
    - *« There are not enough data points in the world to **adequately** capture the **complexities** and **nuances** of who a student is… »* (Selwyn, 2018)
  - Ethical dimension to consider
    - *« Concerns about ethical issues have emerged as possibly the **biggest barriers** to the uptake of learning analytics in educational institutions. »* (Sclater, 2017)
  - A need for « data literacy » on teachers' side
    - *« **Ability to navigate** the, often quantitative, information that they are provided with »* (Knight, 2020)
  - Concerns about the amount of information to be processed by students and the effect of the predictive function on student motivation and persistence

To conclude this presentation but to pursue the reflection

- The added value of Learning Analytics for assessment is a **complex but promising** issue (Bonnin & Boyer, 2017)
- However, according to Viberg and colleagues' (2018) findings, **empirical evidence** of effectiveness, moreover, on a **large scale**, is still needed from the field of Learning Analytics
- What is needed for students to **interpret the data effectively**? (Corrin & de Barba, 2015)

References

- A.E.R.A., A.P.A., N.C.M.E. (1999). Standards for educational and psychological testing. *Washington, DC: American Psychological Association*.
- Black, P., & Wiliam, D. (1998). Assessment and classroom learning. *Assessment in Education: principles, policy & practice*, *5*(1), 7-74.
- Bonnin, G., & Boyer, A. (2017). Higher Education and the Revolution of Learning Analytics.
- Brookhart, S. M., & Nitko, A. J. (2011). Strategies for constructing assessments of higher order thinking skills. *Assessment of Higher Order Thinking Skills*, *1*, 327-59.
- Butler, D. L., & Winne, P. H. (1995). Feedback and self-regulated learning: A theoretical synthesis. *Review of educational research*, *65*(3), 245-281.
- Chatti, M. A., Dyckhoff, A. L., Schroeder, U., & Thüs, H. (2012). A reference model for learning analytics. *International Journal of Technology Enhanced Learning*, *4*(5-6), 318-331.
- Corrin, L., & De Barba, P. (2015, March). How do students interpret feedback delivered via dashboards?. In *Proceedings of the fifth international conference on learning analytics and knowledge* (pp. 430-431).
- Denzin, N. K., & Lincoln, Y. S. (Eds.). (2011). *The Sage handbook of qualitative research*. sage.
- Detroz, P., Malay, L., & Crahay, V. (2020). Une démarche structurée pour définir quelques conseils limitant l'impact de la pandémie sur l'évaluation de nos étudiants. *e-JIREF*, (1), 97-110.
- Detroz, P., Romainville, M., Auquière, A., Dony, M., Piazza, A., & Vause, A. (2017). *Comprendre et améliorer les pratiques d'évaluation des acquis des étudiants dans l'enseignement supérieur*. Ministère de l'enseignement supérieur de la Fédération Wallonie-Bruxelles.

References

- Elias, T. (2011). Learning analytics. *Learning*, 1-22.
- Knight, S. (2020). Augmenting assessment with learning analytics. In *Re-imagining University Assessment in a Digital World* (pp. 129-145). Springer, Cham.
- Nicol, D. (2009). Assessment for learner self-regulation: enhancing achievement in the first year using learning technologies. *Assessment & Evaluation in Higher Education*, *34*(3), 335-352.
- Panadero, E. (2017). A review of self-regulated learning: Six models and four directions for research. *Frontiers in psychology*, *8*, 422.
- Sclater, N. (2017). *Learning analytics explained*. Routledge.
- Siemens, G., & Long, P. (2011). Penetrating the fog: Analytics in learning and education. *EDUCAUSE review*, *46*(5), 30.
- Stufflebeam, D. L. (1981). *Standards for evaluations of educational programs, projects, and materials*. McGraw-Hill Book Co., PO Box 400, Hightstown, NJ 08520.
- Verbert, K., Duval, E., Klerkx, J., Govaerts, S., & Santos, J. L. (2013). Learning analytics dashboard applications. *American Behavioral Scientist*, *57*(10), 1500-1509.
- Viberg, O., Hatakka, M., Bälter, O., & Mavroudi, A. (2018). The current landscape of learning analytics in higher education. *Computers in Human Behavior*, *89*, 98-110.

Thank you for your kind attention

m.hausman@uliege.be
Laurent.Leduc@uliege.be
p.detroz@uliege.be