Learning Analytics: what does it do, and does it help?

LA Workshop
LDE-CEL Annual Meeting
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Learning analytics is ...

"Data is not information, information is not knowledge, knowledge is not understanding, understanding is not wisdom."

- Clifford Stoll

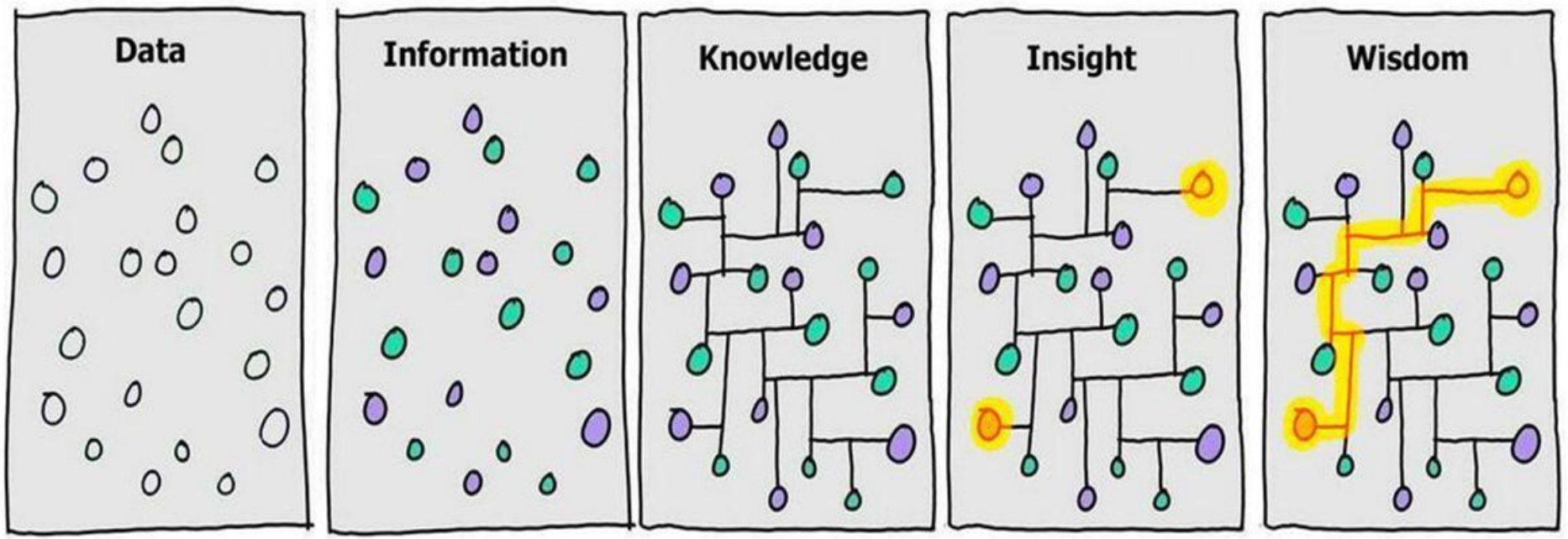


Illustration by David Somerville based on the original by Hugh McLeod
Image from https://random-blather.com/2014/04/28/information-isnt-power/

Learning analytics is...

… the measurement, collection, analysis and reporting of data about learners and their contexts, for purposes of understanding and optimising learning and the environments in which it occurs.

Siemens (2011)

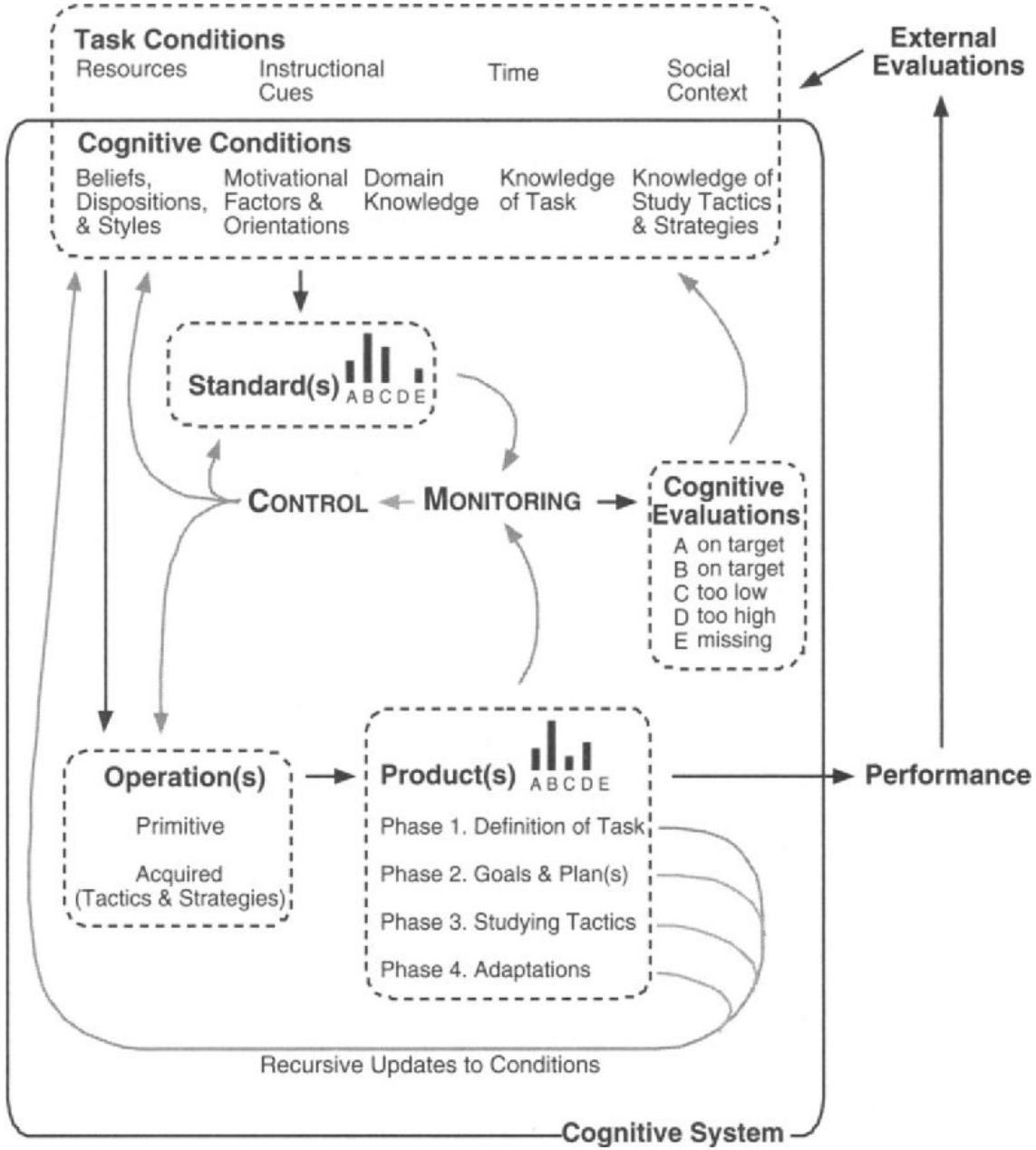
Learning Analytics in Context

- Quantified Self
- Human Goal Setting and Self-Regulation
- Monitoring of Performance

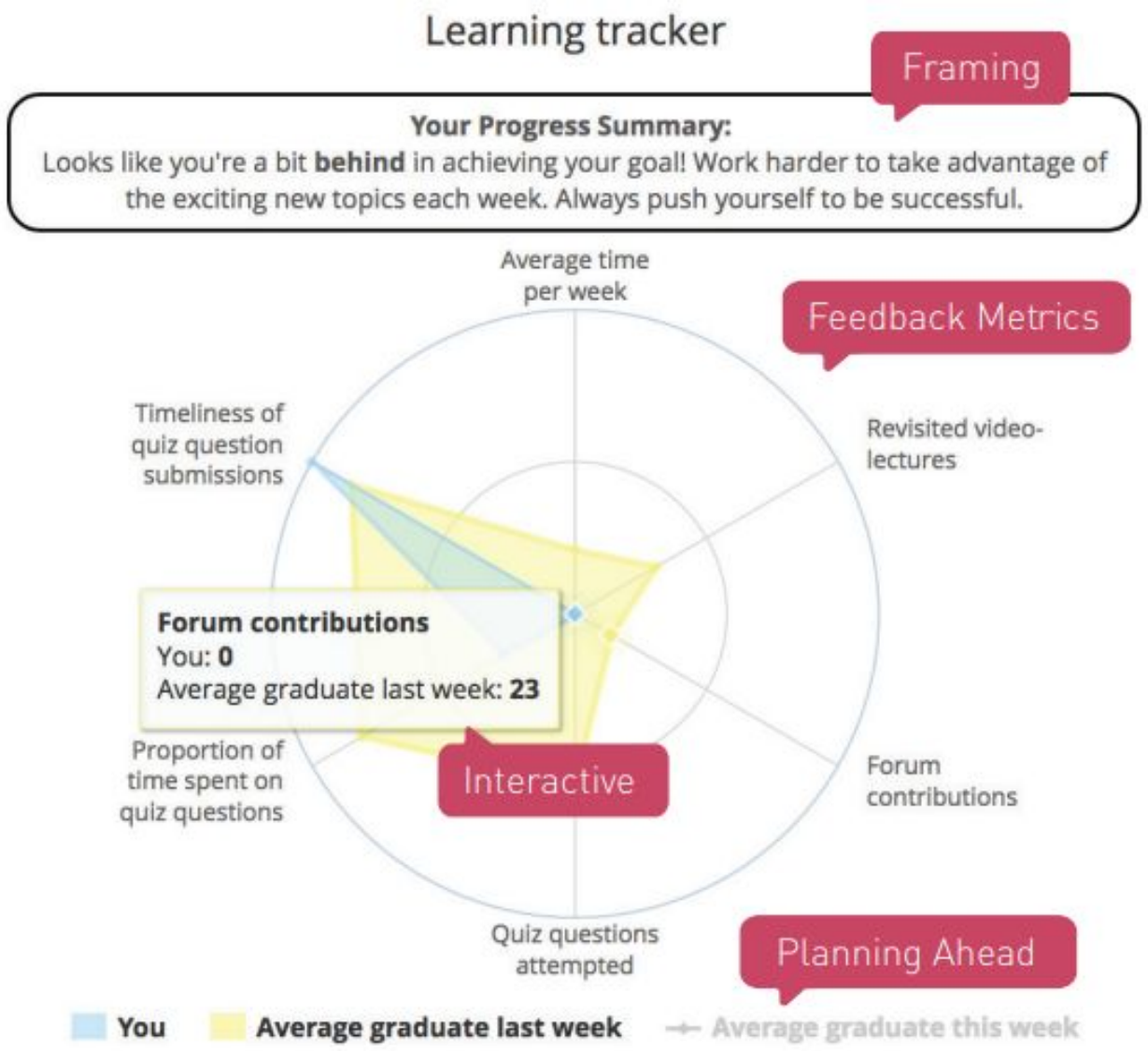
- Framing of Data (Yardsticks)
- Dashboards and Autonomy
- Indicators for individuals and groups
- Multimodal Learning Analytics

COPES

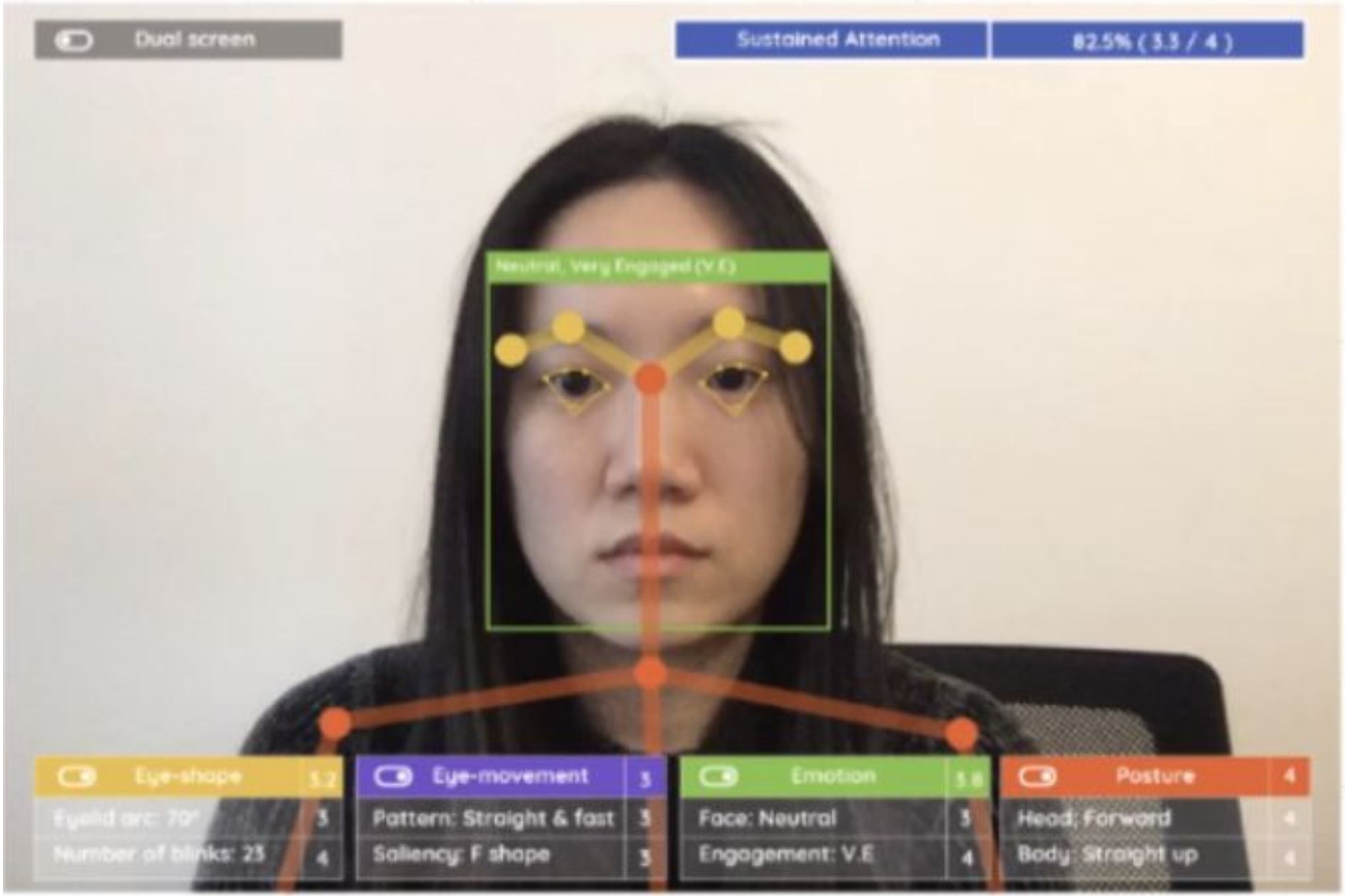
Winne and Hadwin (1998)



Panadero, E. (2017). A review of self-regulated learning: Six models and four directions for research. *Frontiers in Psychology*, *8*(APR), 1–28. https://doi.org/10.3389/fpsyg.2017.00422



- Most indicators correlate positively and significantly with the grades and can be used as predictors
- Responsiveness is the best predictor
- Widget scores from the first half are better grade predictors than those from the second half


Dual screen
Sustained Attention
82.5% (3.3 / 4)
Neutral, Very Engaged (V.E)
Eye-shape
3.2
Eyelid arc: 70°
3
Number of blinks: 23
4
Eye-movement
3
Pattern: Straight & fast
3
Saliency: F shape
3
Emotion
3.8
Face: Neutral
3
Engagement: V.E
4
Posture
4
Head: Forward
4
Body: Straight up
4

LA for You(r institution/class/team): design your own indicators

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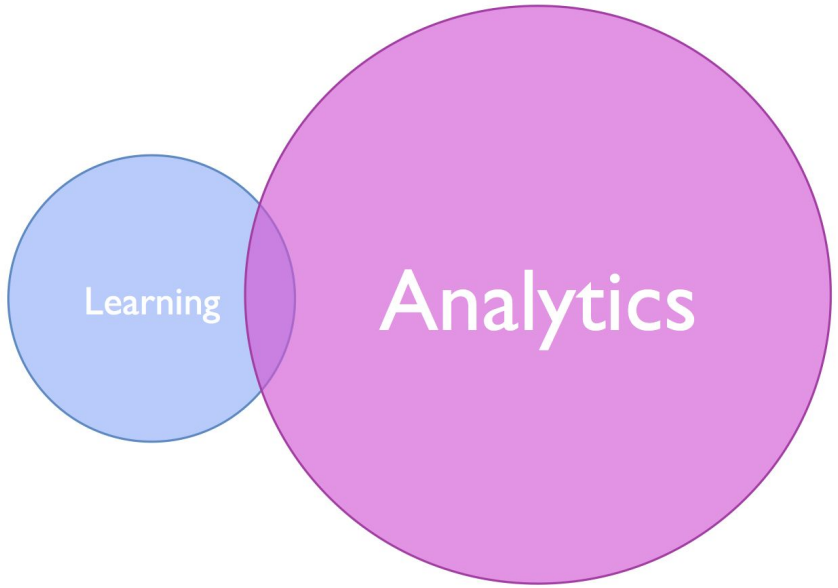


Source: https://www.loginworks.com

Consequences

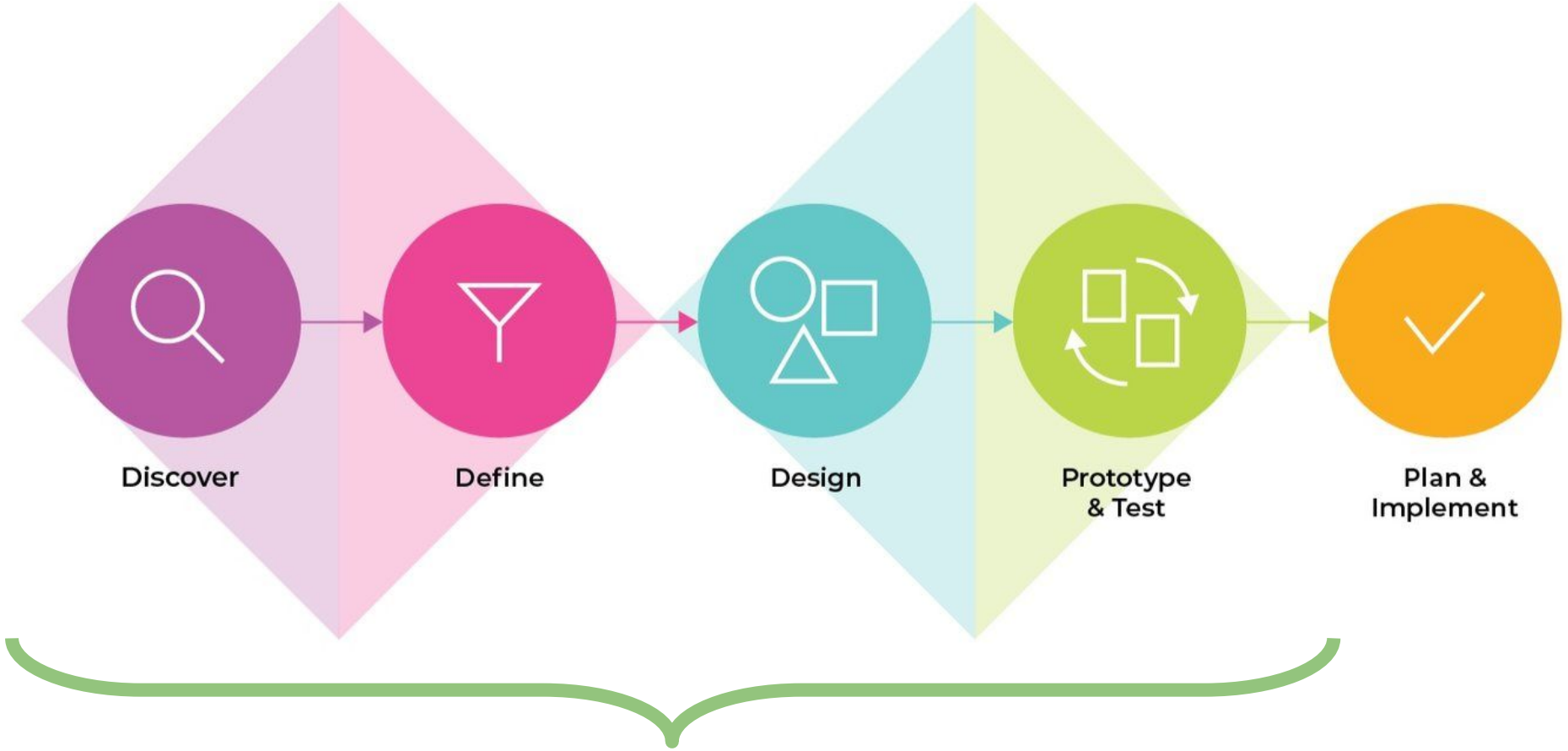
- complicated interfaces and algorithms
- low adoption of learning analytics (Viberg et al., 2018; Dolinger & Lodge, 2018)
- no remodelling of educational approaches (Macfadyen, Dawson, Pardo & Gaševic, 2014)
- lack of trust among stakeholders (Tsai et al., 2019)

Human-Centred Learning Analytics

"… meanings, interaction opportunities, functions, and system attributes should be defined by the people for whom the system is intended, rather than imposed by designers or researchers."

(Buckingham Shum et al., 2019)

Human-Centred Learning Analytics



Source: http://outwitly.com/

Group work activity

https://miro.com/app/board/uXjVObFIKK8=/?invite_link_id=515197280753

Define and describe a problem

- Identify at-risk students
- Increase student retention
- Support students' in choosing effective learning strategies
- Improve student engagement and satisfaction
- Understand instructor effectiveness
- Determine course effectiveness and identify areas for curriculum improvement

Define and describe a problem

Who will use the analytics?
What will they use the analytics for?
When will they use the analytics?
How will they use the analytics?
What meaning will the analytics have for users?

How will you know that you *successfully* solved the problem?

Identify information & data

What information do you need to know in order to work on solving the problem?

What data can give you this information?
Where can you find this data?

Identify information & data

VLE/MOOC logs:

- Assignments
- Calendar
- Content
- Social
- Video
- Assessment
- Sessions

- External content
- Surveys
- Wearables, sensors
- Mobile applications
- Social Networks

Visualize data

How can you visualise this information in an intuitive way fitting your users?

Do you need to customise the visualisation for different sets of users?

Think about the problem, what is the context? and the framing?

Prototype in your system

What features are *currently* available in your learning environment?

How can you use those features to solve your problem?

What is missing between the current state and your visualization?

Plan an evaluation

How do you plan to evaluate the design of your analytics?

How can you measure the success?
Where will you get this data from?

Combining results

Students' Perspective of Learning Analytics

- The learner in the center of Learning Analytics
- Ongoing study
  - Interviews
  - Survey

Students' Perspective of Learning Analytics

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  - Survey
- For example:
  - Information about how well you are progressing in the course
  - Information about how satisfied you are with your progress in the course
  - Information about your class participation
  - Information about how accurate the course estimation is for you (e.g., You spent 20% more time on this topic than estimated by the course instructor.)

Students' Perspective of Learning Analytics

- The learner in the center of Learning Analytics
- Ongoing study
  - Interviews
  - Survey
- For example:
  - Information about how well you are progressing in the course 2.9/5
  - Information about how satisfied you are with your progress in the course 2.1/5
  - Information about your class participation 2.5/5
  - Information about how accurate the course estimation is for you (e.g., You spent 20% more time on this topic than estimated by the course instructor.) 2.1/5

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References

Buckingham Shum, S., Ferguson, R., & Martinez-Maldonado, R. (2019). Human-centred learning analytics. Journal of Learning Analytics, 6(2), 1-9.

Dollinger, M., & Lodge, J. M. (2018, March). Co-creation strategies for learning analytics. In Proceedings of the 8th International Conference on Learning Analytics and Knowledge (pp. 97-101). ACM.

Jivet, I., Scheffel, M., Specht, M., & Drachsler, H. (2018, March). License to evaluate: preparing learning analytics dashboards for educational practice. In Proceedings of the 8th International Conference on Learning Analytics and Knowledge (pp. 31-40). ACM.

Macfadyen, L. P., Dawson, S., Pardo, A., & Gaševic, D. (2014). Embracing big data in complex educational systems: The learning analytics imperative and the policy challenge. Research & Practice in Assessment, 9, 17-28.

Siemens, G., & Long, P. (2011). Penetrating the fog: Analytics in learning and education. EDUCAUSE review, 46(5), 30.

Tsai, Y.-S., Gašević, D., Whitelock-Wainwright, A., Muñoz-Merino, P. J., Moreno-Marcos, P. M., Fernández, A. R., Kloos, C. D., Scheffel, M., Jivet, I., Drachsler, H., Tammets, K., Calleja, A. R., and Kollom, K. (2018) SHEILA: Supporting Higher Education to Intergrade Learning Analytics Research Report.

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.

Follow-up

Implementation and planning
Values - Privacy and Objectives
Cost - Time and Money

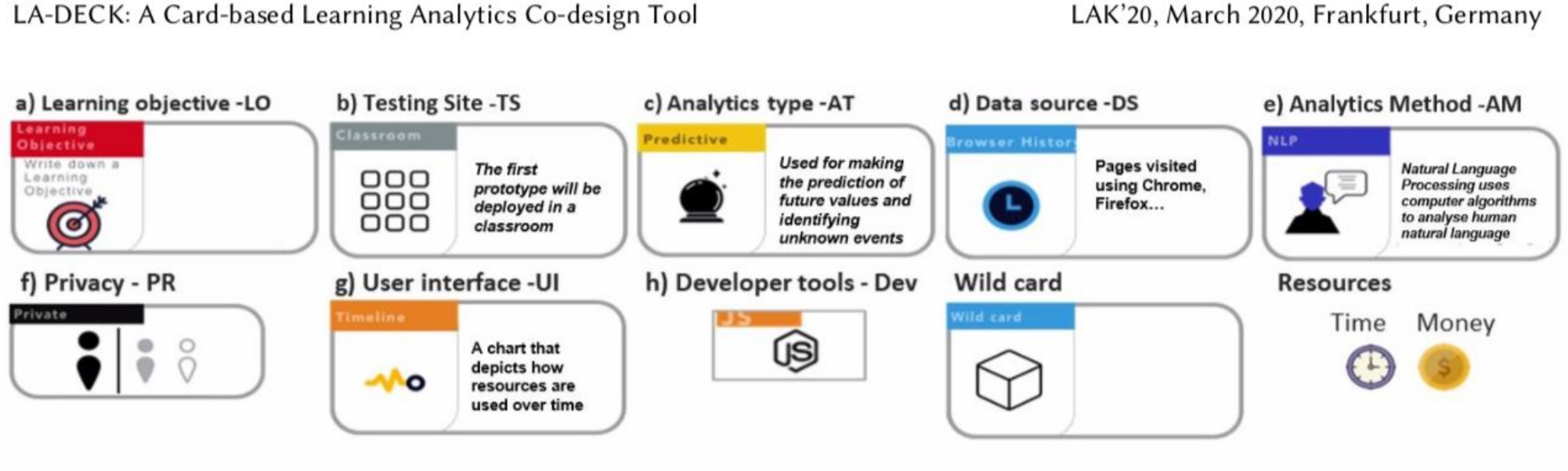

Figure 1: Examples of LA-DECK cards

LA DECK - http://ladeck.utscic.edu.au/