Effective feedback through learning analytics dashboards

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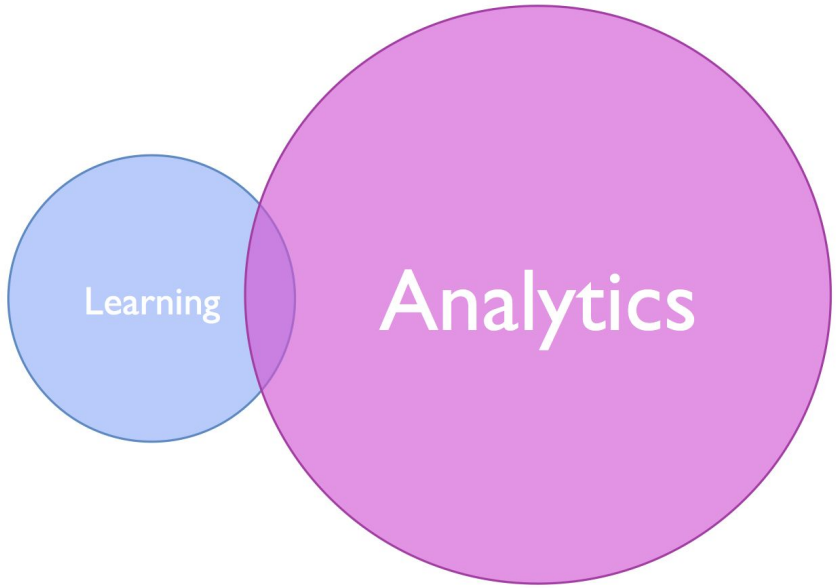
Learning analytics is...

… 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)



Effective feedback through learning analytics dashboards is

grounded: based on research

4 levels of feedback (Hattie & Timperley, 2007)

1. Task and products
2. Process
3. Self-regulation
4. Self

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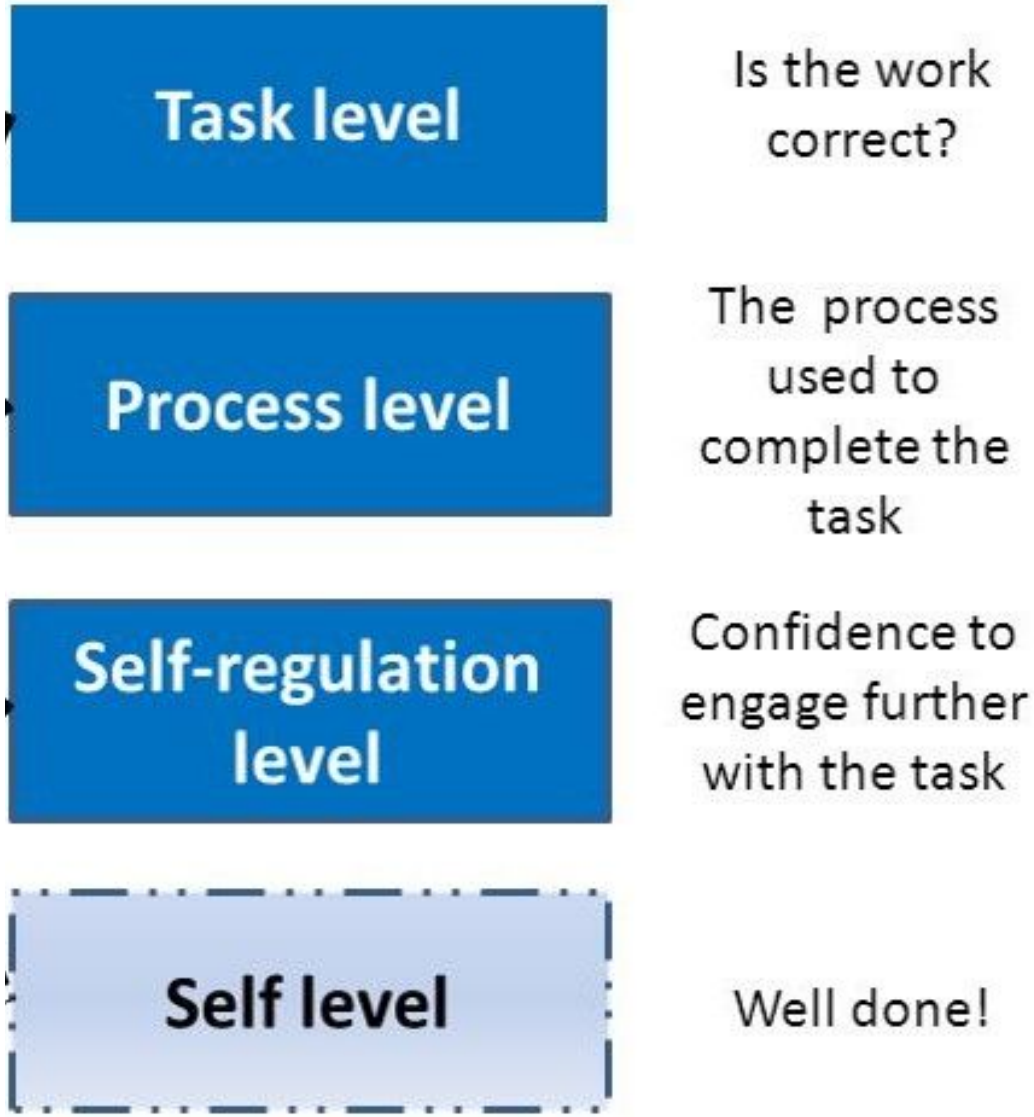

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4 levels of feedback (Hattie & Timperley, 2007)

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Self-regulated learning (Zimmerman, 1990)

- Learners are active participants in their learning.
- Cyclical process: goal setting, performing, self-evaluation.
- Most common theoretical background for dashboards (Jivet et al., 2017).

Effective feedback through learning analytics dashboards is

actionable: guides users to concrete action

Warning!

Male students have 10% less probability to be successful.

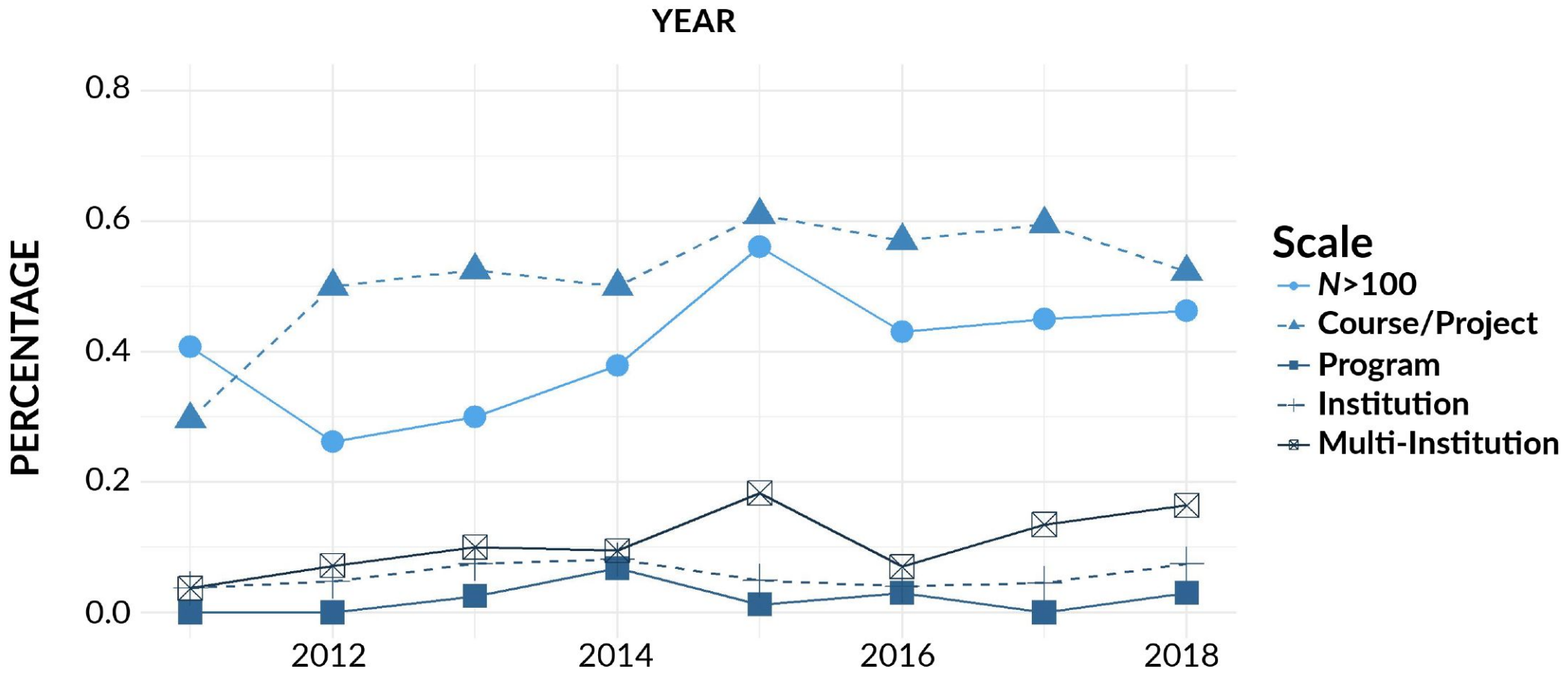
You are male.

Warning!

Your online activity is lagging behind.

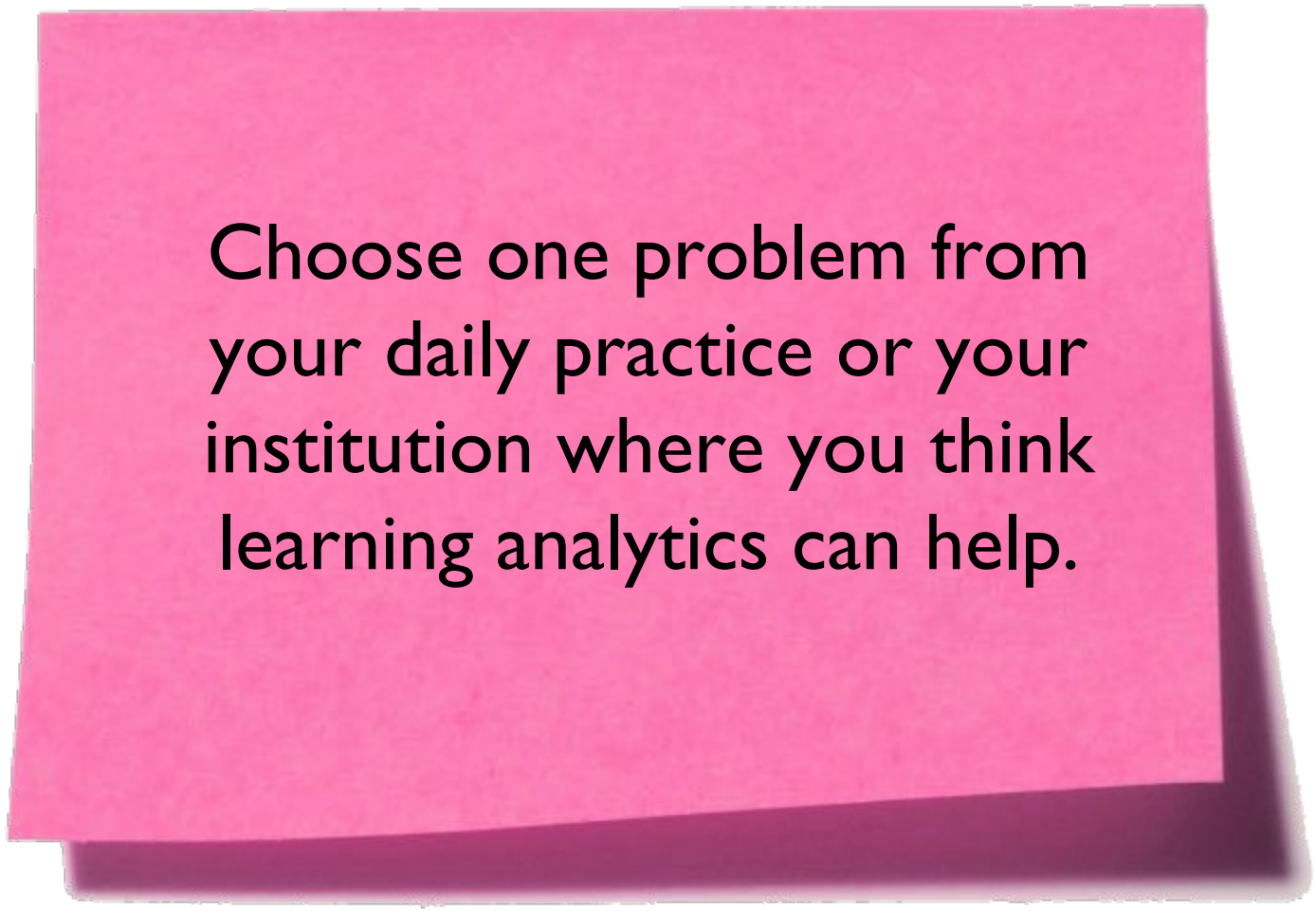
Effective feedback through learning analytics dashboards is

scalable: can be delivered to large cohorts



Dawson, S., Joksimovic, S., Poquet, O., & Siemens, G. (2019, March). Increasing the Impact of Learning Analytics. In *Proceedings of the 9th International Conference on Learning Analytics & Knowledge* (pp. 446-455). ACM.

Define a problem



Identify actions

What actions would solve the problem? What actions do you expect [want] to be taken after consulting the dashboard?

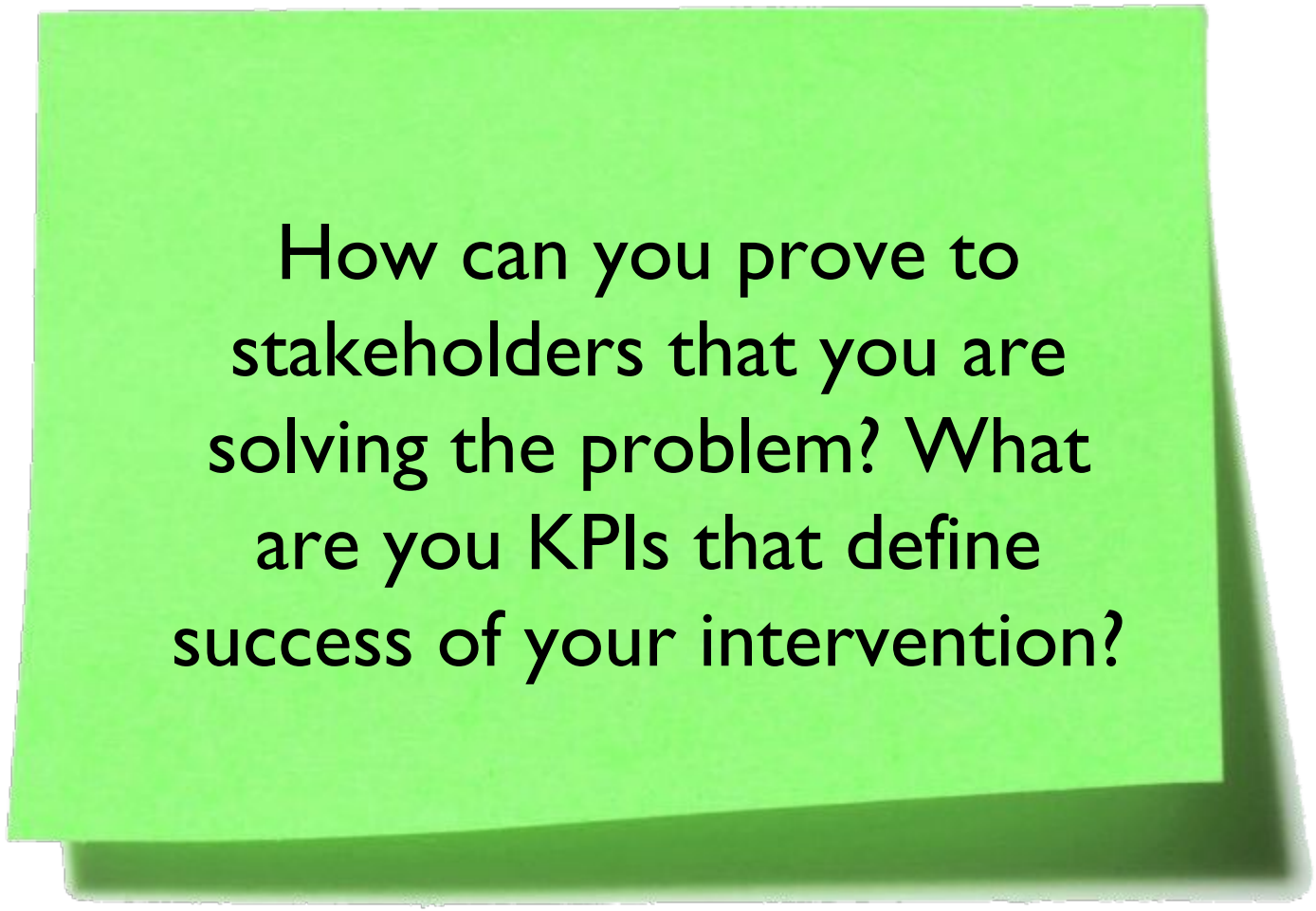
Write down three actions.

Doodle dashboard elements

What information do you need to know in order to take one specific action? Where can you get this information from?

Sketch a visualisation element to show this information.

Plan the evaluation

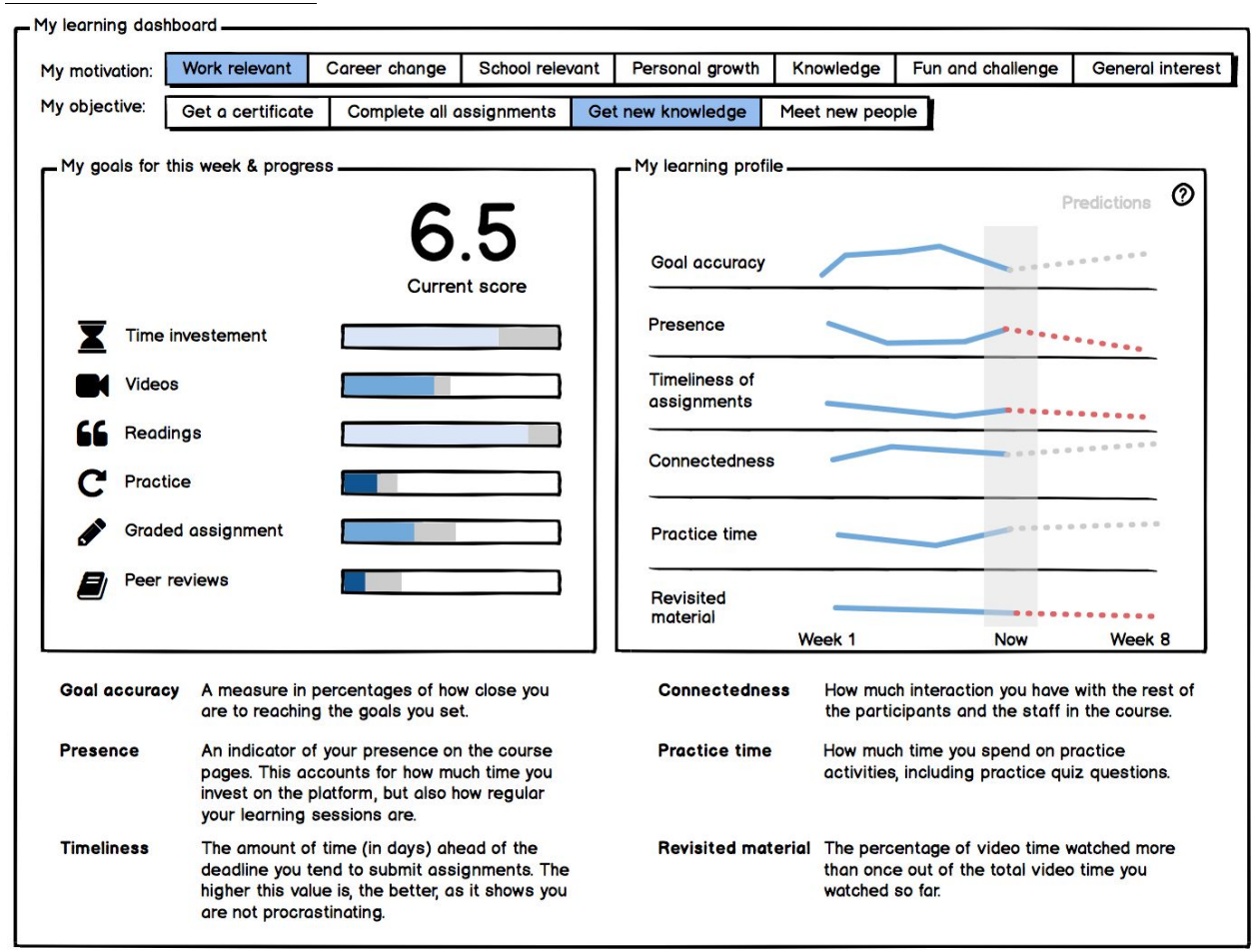


Discuss your group solution

Presentation of the group results

What does research say?

Making sense of dashboards



Jivet, I., Scheffel, M.,Schmitz, M., Robbers, S.,Specht, M., & Drachsler, H. (submitted, under review).

RQ1: What dashboard features support sense-making?

RQ2: Are learner goals related to the perceived relevance of these features?

Mastering the topic of the course vs. *passing the course*

RQ3: Are SRL skills related to the perceived relevance of these features?

SM1	Seeing my overall grade
SM2	Seeing indicators about the course activities that I completed
SM3	Seeing indicators about how I learn
SM4	Seeing requirements for passing the course
SM5	Having my goal at the top of the dashboard as a reminder of my motivation and objectives
SM6	Seeing my performance in comparison to what is maximum activities possible in the course
SM7	Seeing my performance in comparison to the other students
SM8	Seeing my performance in comparison to my past performance
SM9	Seeing my performance in comparison to my goals
SM10	Seeing my areas in need of improvement highlighted on the dashboard
SM11	Seeing the predictions of my learning behaviour by the end of the course
SM12	Having a standard to compare my information to
SM13	Having explanations of how dashboard elements and information relate to each other
SM14	Having explanations of how information is calculated
SM15	Having explanations of how the information is relevant to my goal
SM16	Having explanations of how the information is relevant to my learning
SM17	Having explanations on the scales on which this information is displayed
SM18	Having an overview over my information from the beginning of the course up to the current week.
SM19	Having my information broken down by topics covered by the course.
SM20	Having a consistent use of colours.
SM21	Being able to set goals and edit them
SM22	Being able to access the content of the course where I have difficulties directly from the dashboard
SM23	Receiving information that helps me plan my learning (e.g. estimated time need for each lesson)
SM24	Receiving recommendations on how I could change my learning behaviour to learn more efficiently
SM25	Receiving recommendations on what topics I need to cover next or which topics I should redo
SM26	Being able to contact the teacher through the dashboard

26 elements

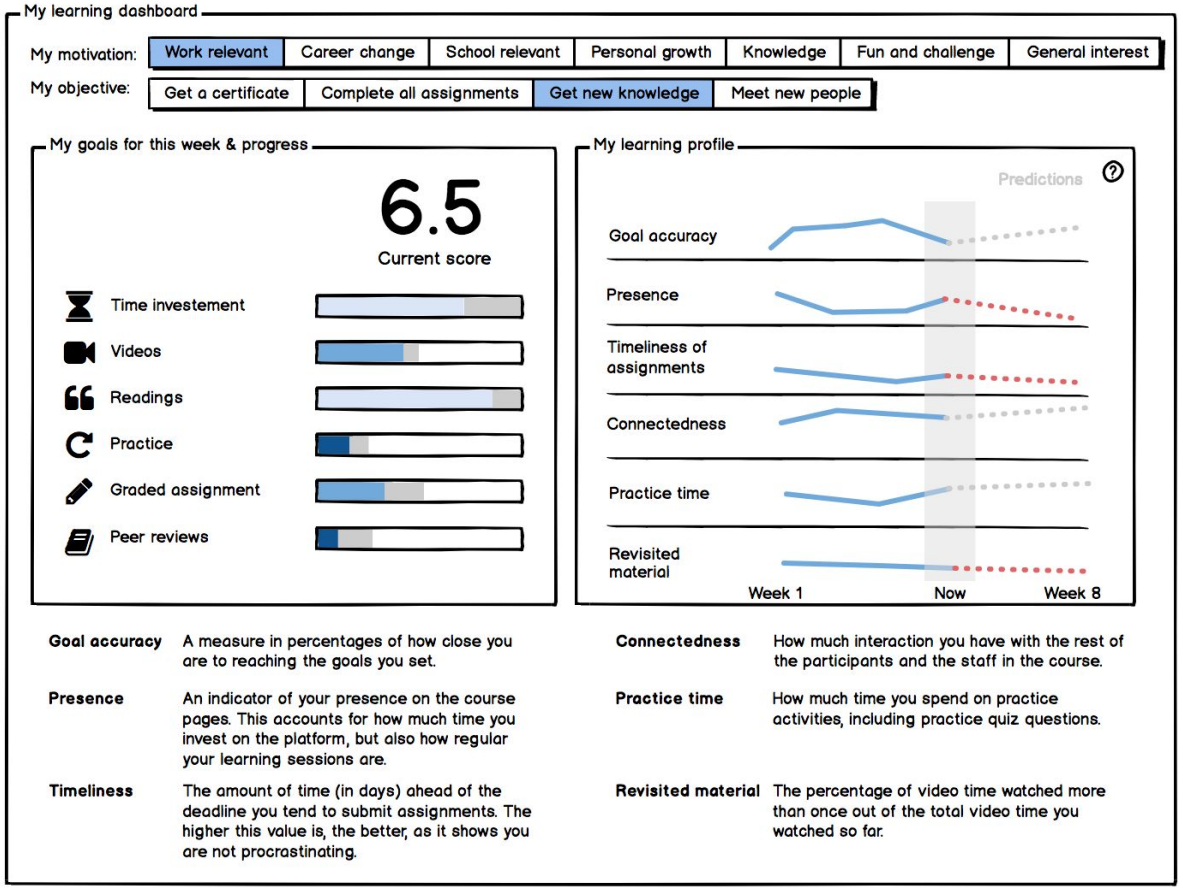
How relevant is this dashboard element for you?

247 students (1st & 2nd year)

26 dashboard
design elements

Learner goals:
A. mastering the topic
B. passing the course

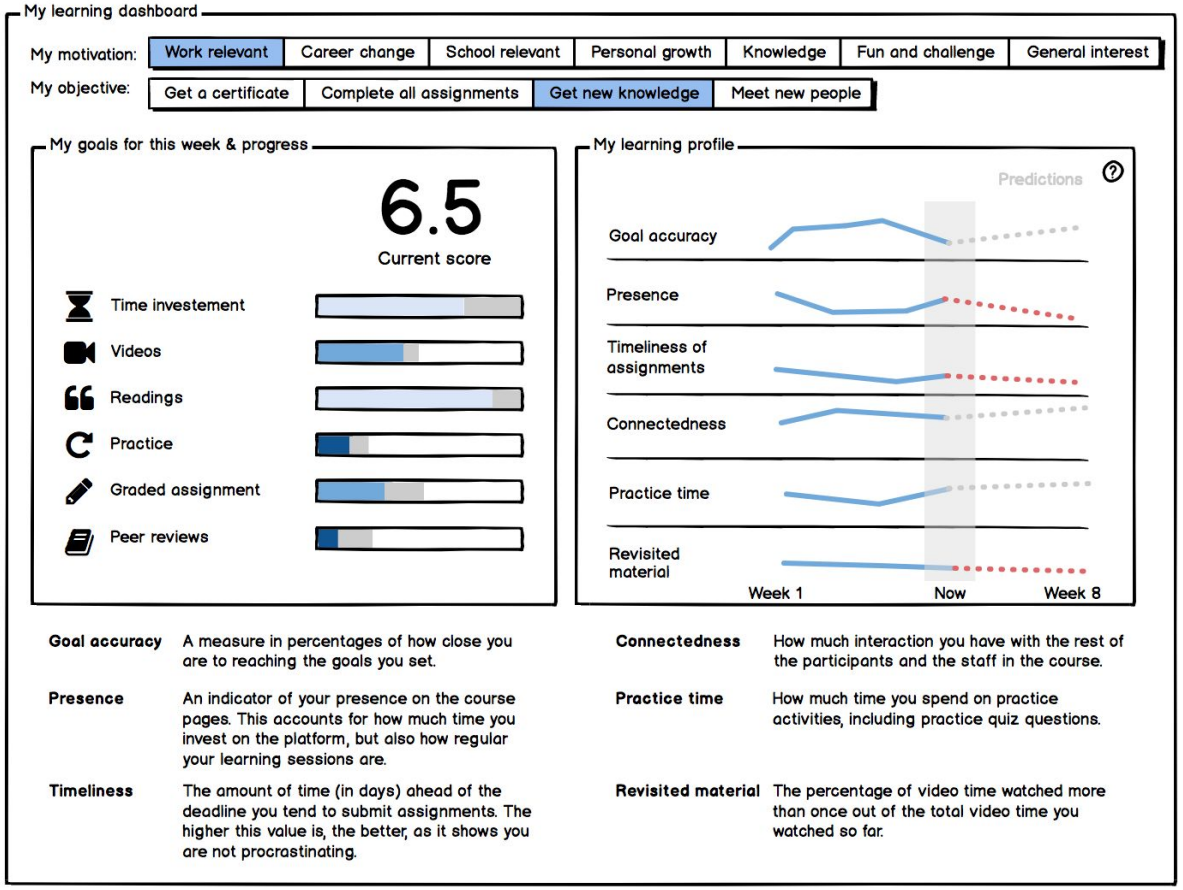
SRL skills (OSLQ)



1. Transparency of design

2. Reference frames

3. Support for action



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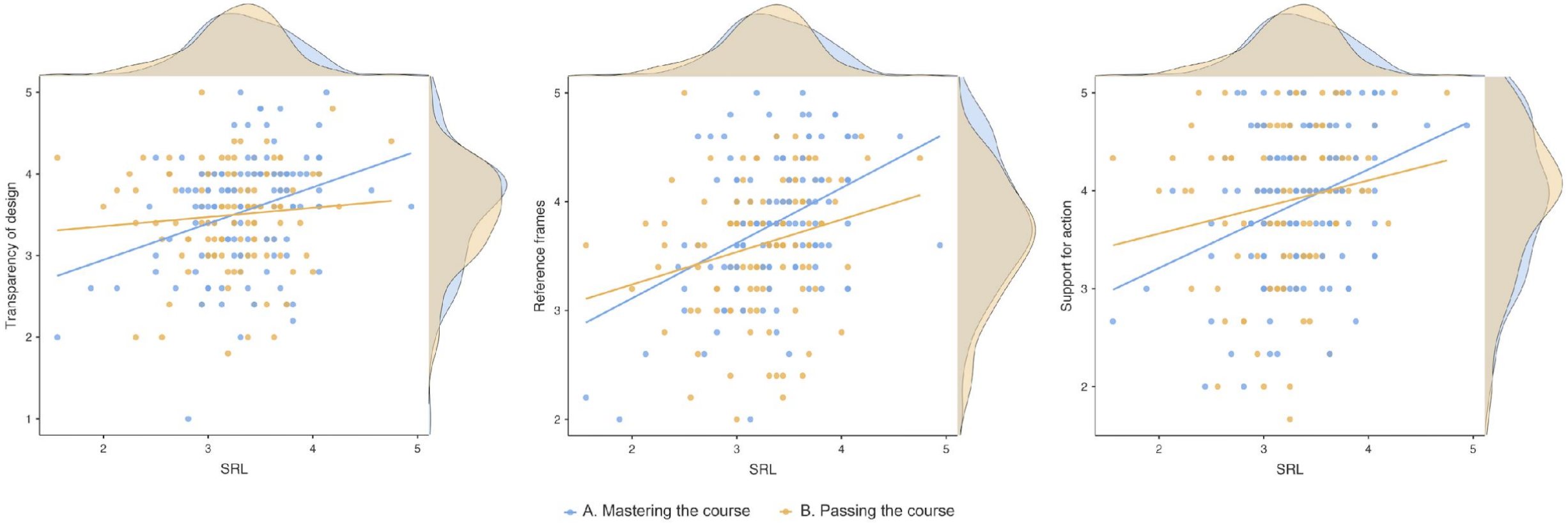
What does research say?

Goals and self-regulated learning



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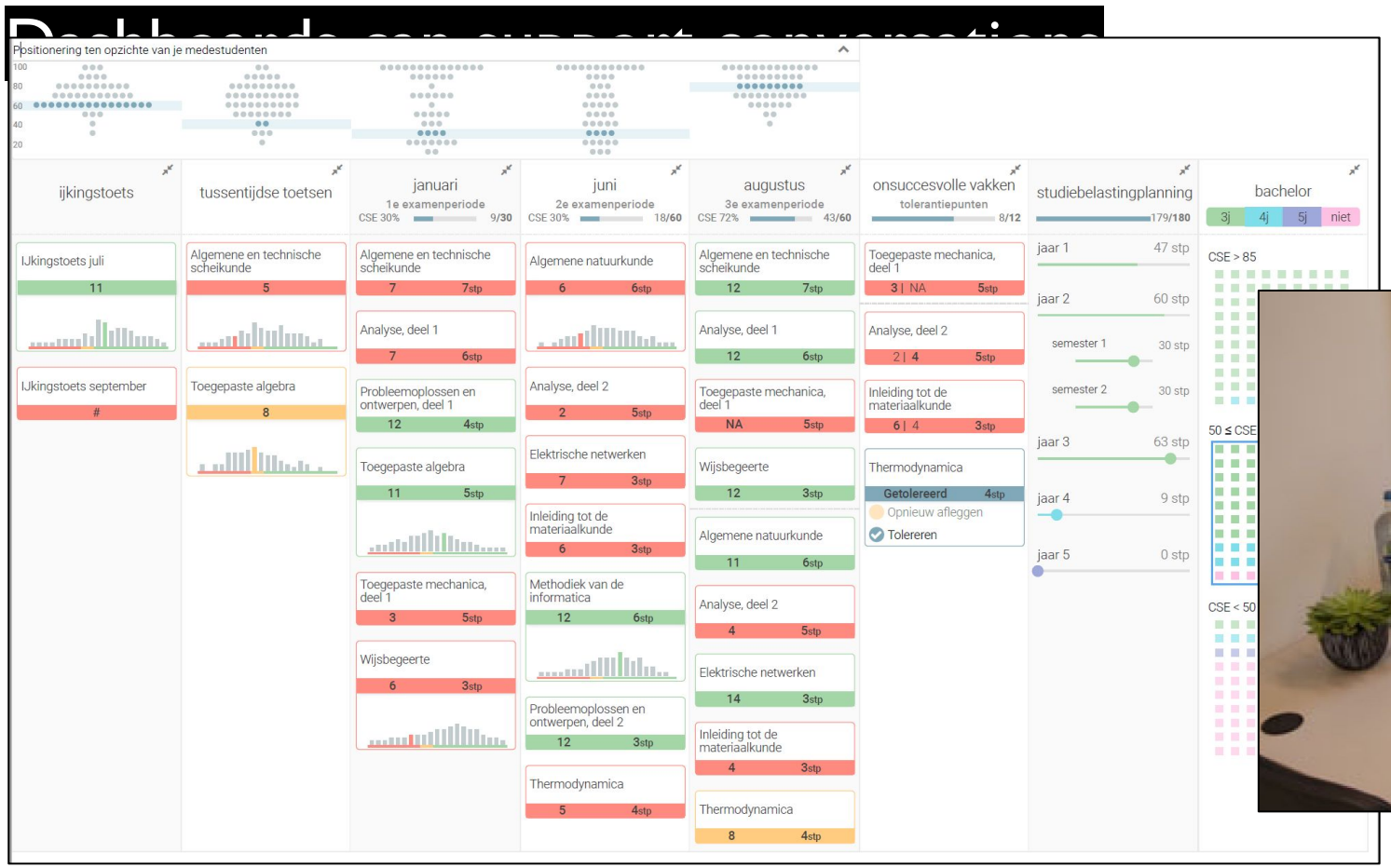

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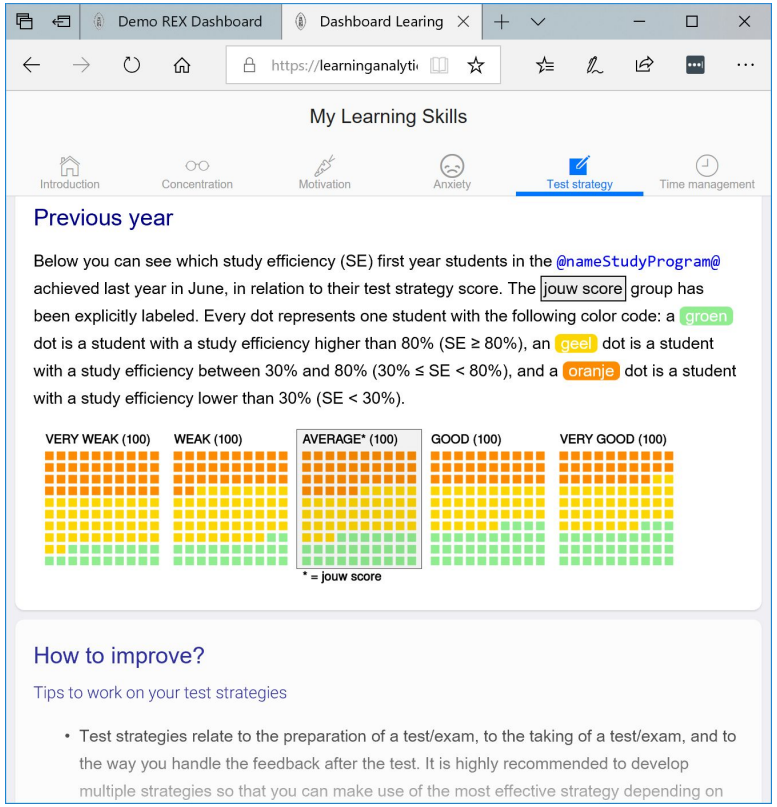
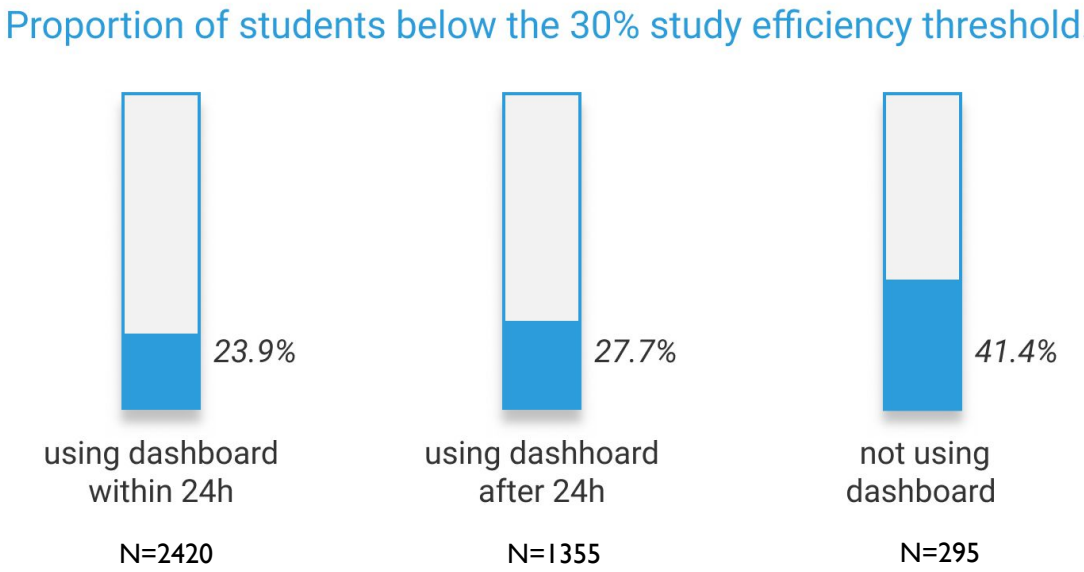
What does research say?

Dashboard usage produces learning traces too.





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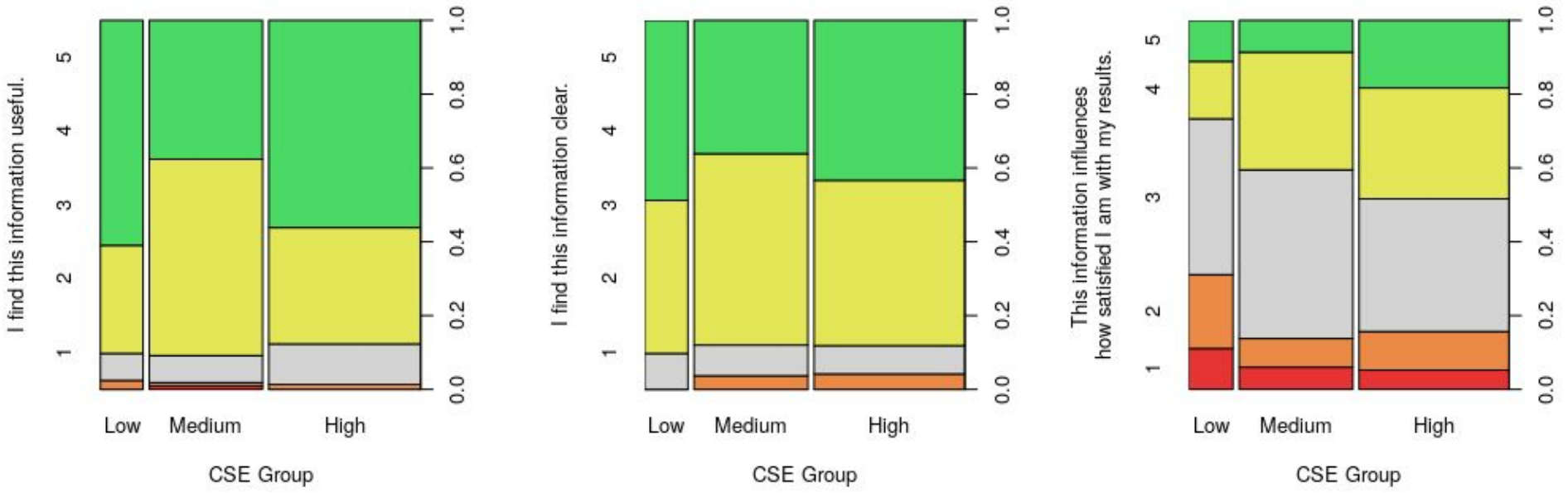
What does research say?

It's difficult to provide good automated feedback to the middle group



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What does research say?

Reference frames (standards for comparison)

1. Social	Class Teammates Previous graduates Top peers Peers with similar goal
2. Achievement	Learning outcomes Learning goals
3. Progress	Self

Jivet, I., Scheffel, M., Drachsler, H., & Specht, M. (2017, September). Awareness is not enough: pitfalls of learning analytics dashboards in the educational practice. In European Conference on Technology Enhanced Learning (pp. 82-96). Springer, Cham.

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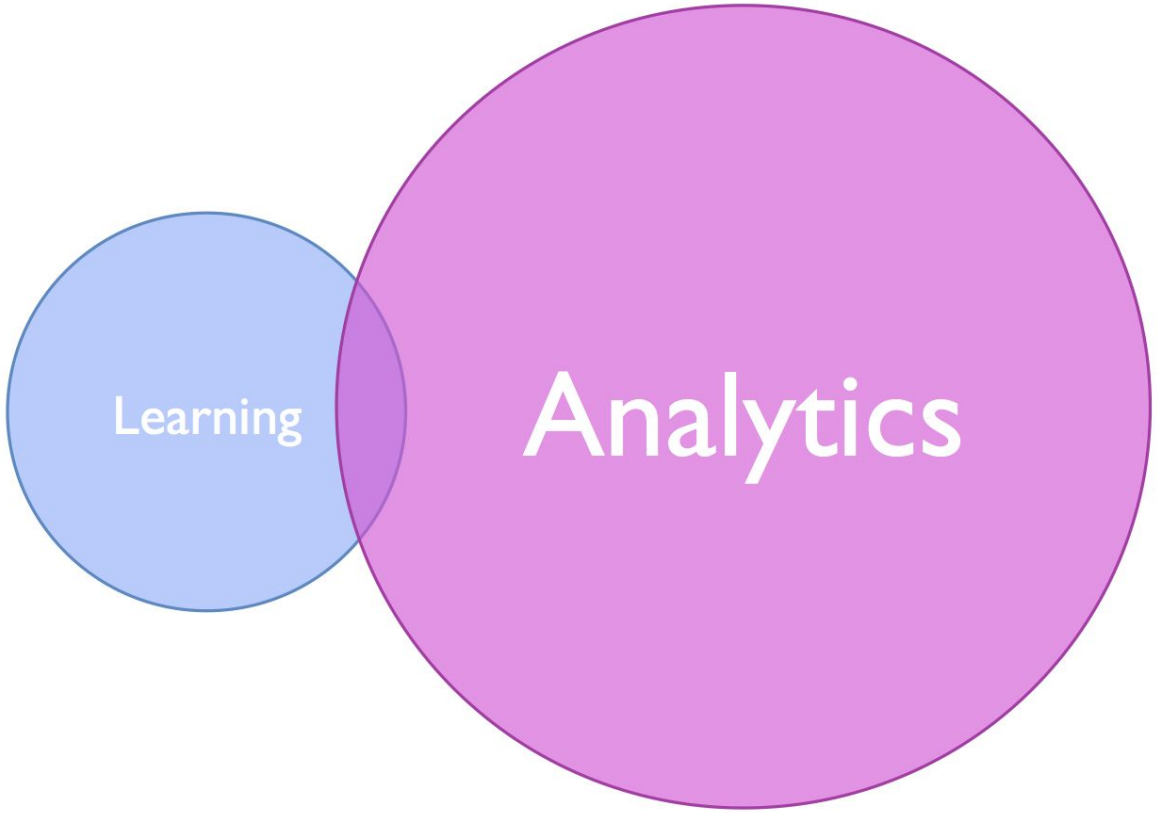

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Zimmerman, B. J. (1990). Self-regulated learning and academic achievement: An overview. Educational psychologist, 25(1), 3-17.