

Using Learning Analytics to Personalise Student Support

**AUN-TEPL Workplan
Seminar 2023
25-26 May 2023**



University of
South Australia

Abelardo Pardo



C3L



University of
South Australia

Centre for Change and Complexity in Learning

Exploring human and artificial cognition to understand
knowledge processes and their impact on society

Seeking practical application and impact

“Australia’s Top Research Institution in Educational Technology”

[The Australian, 8/November/2022](#)

Examples

OnTask

Personalised
feedback

LA Model



LA Model



Learning Analytics Model

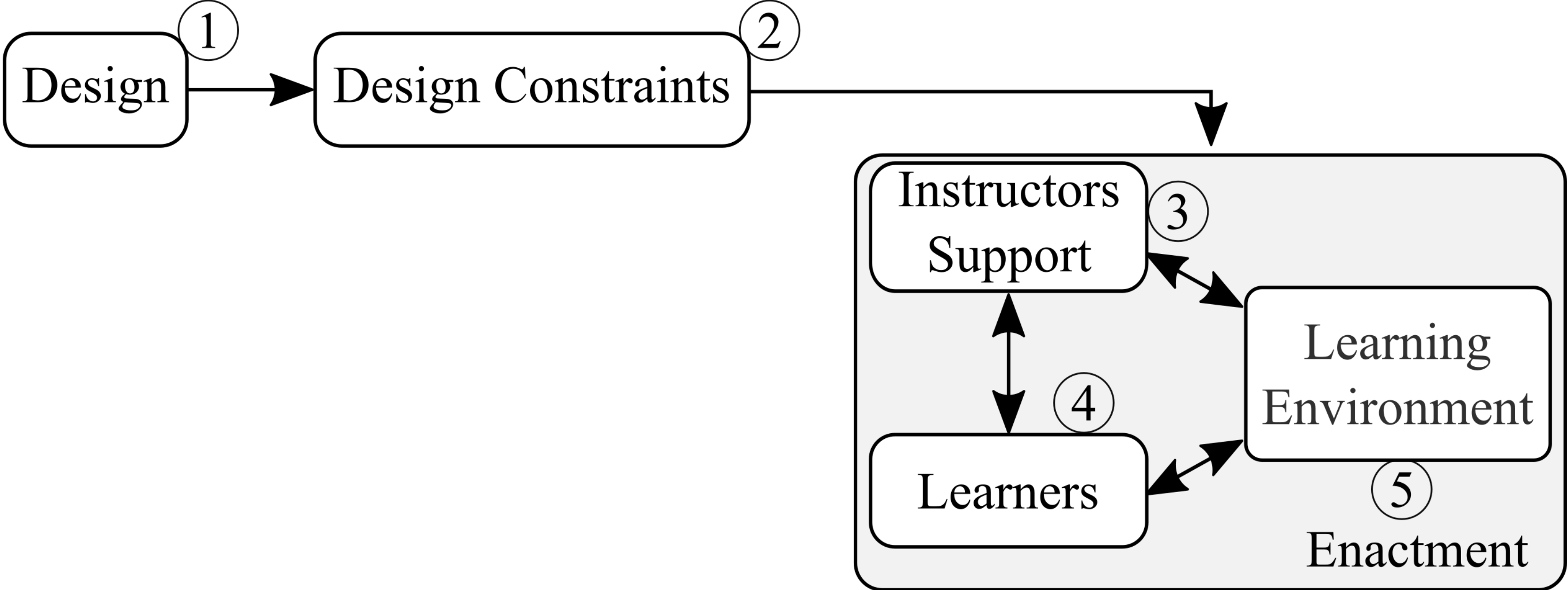
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Learning Analytics Model



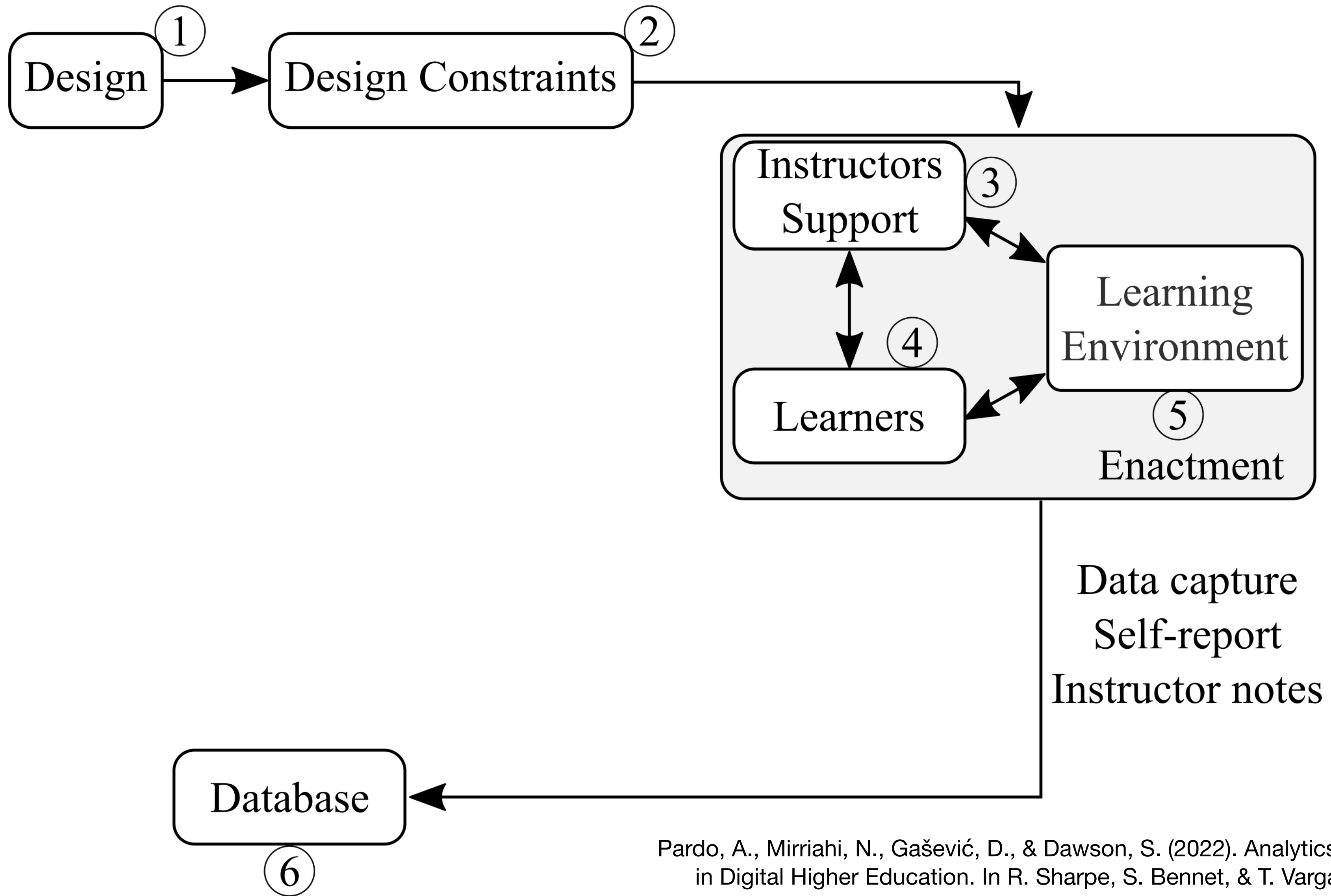
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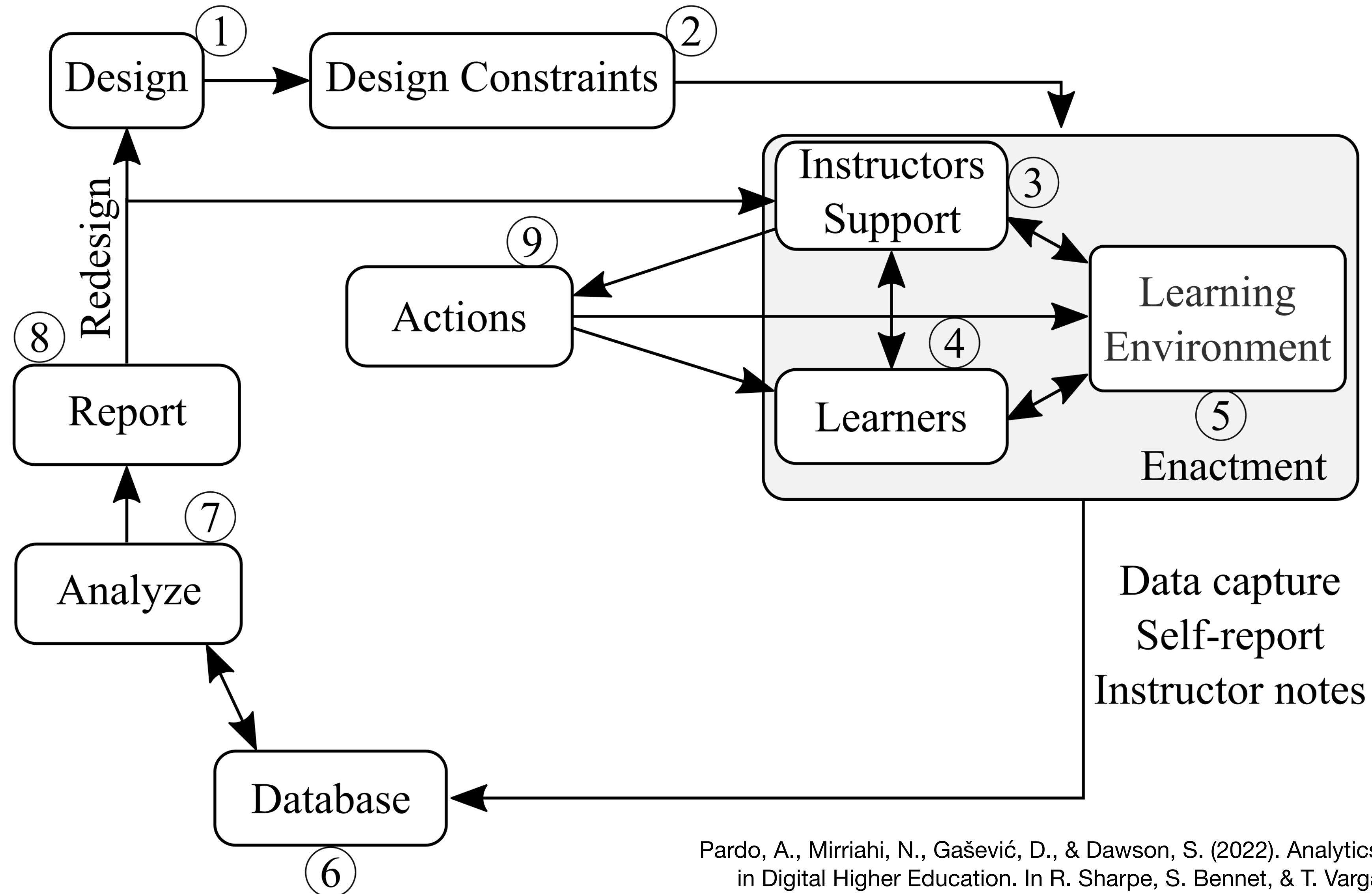
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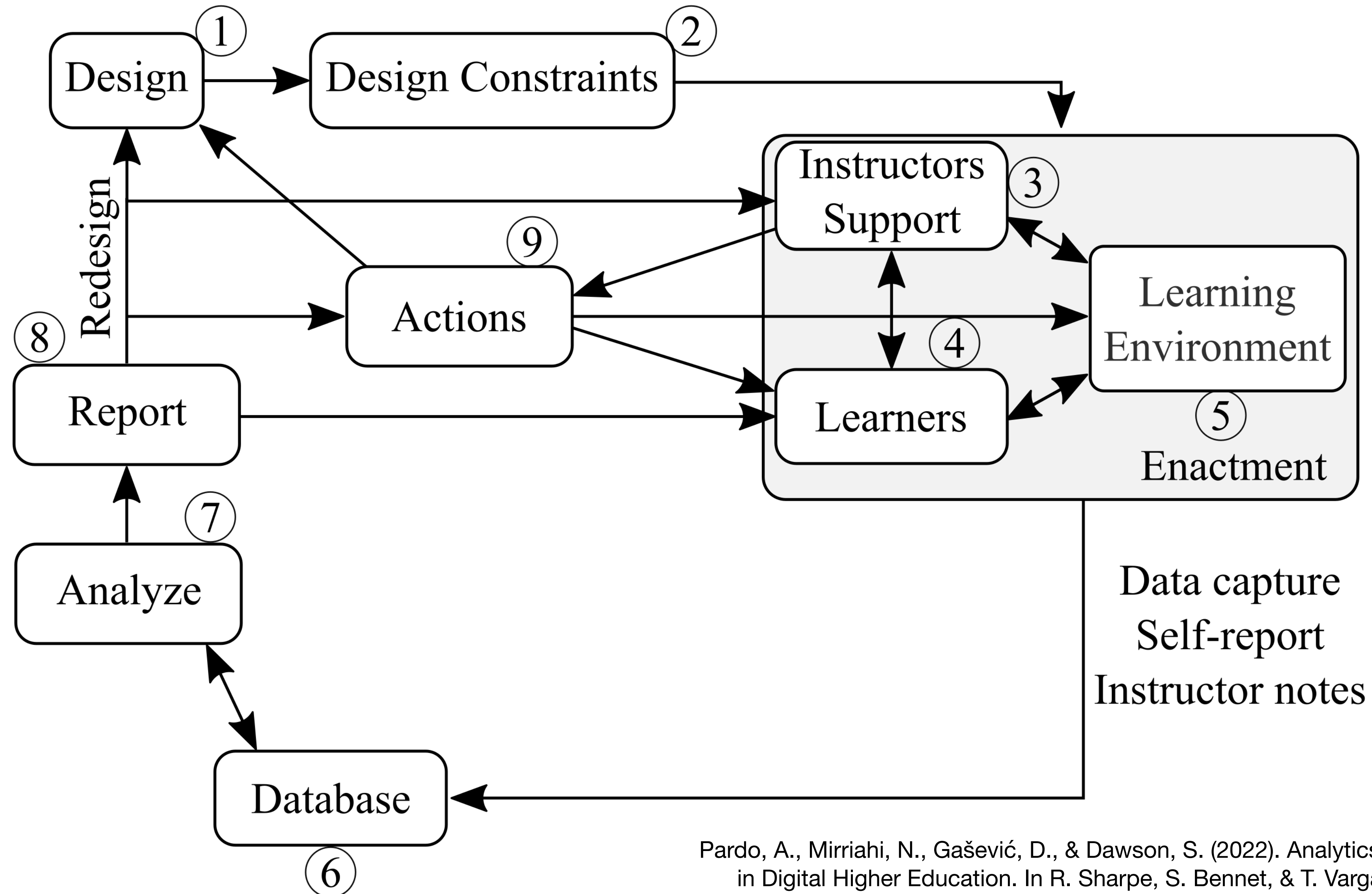
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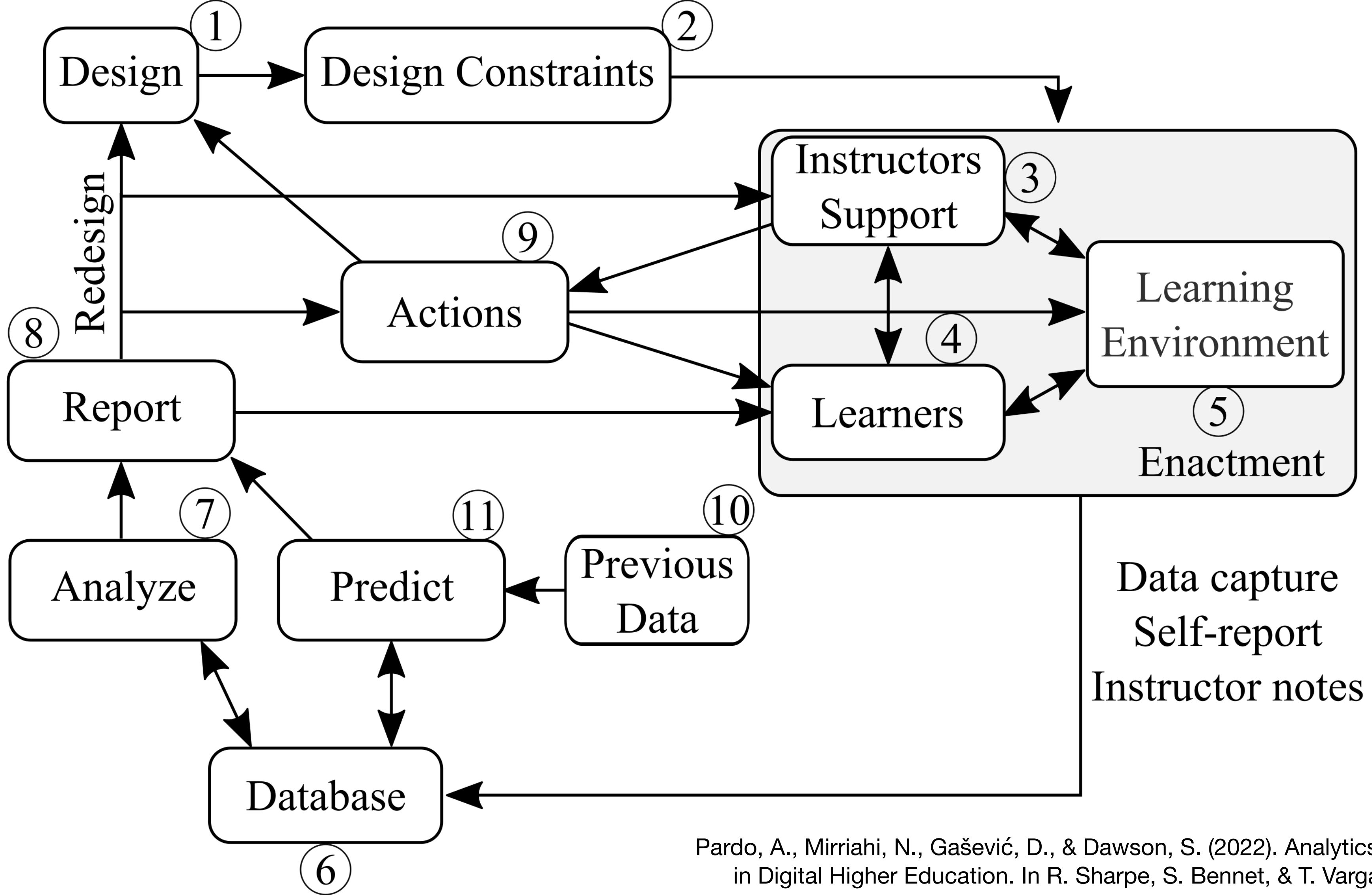
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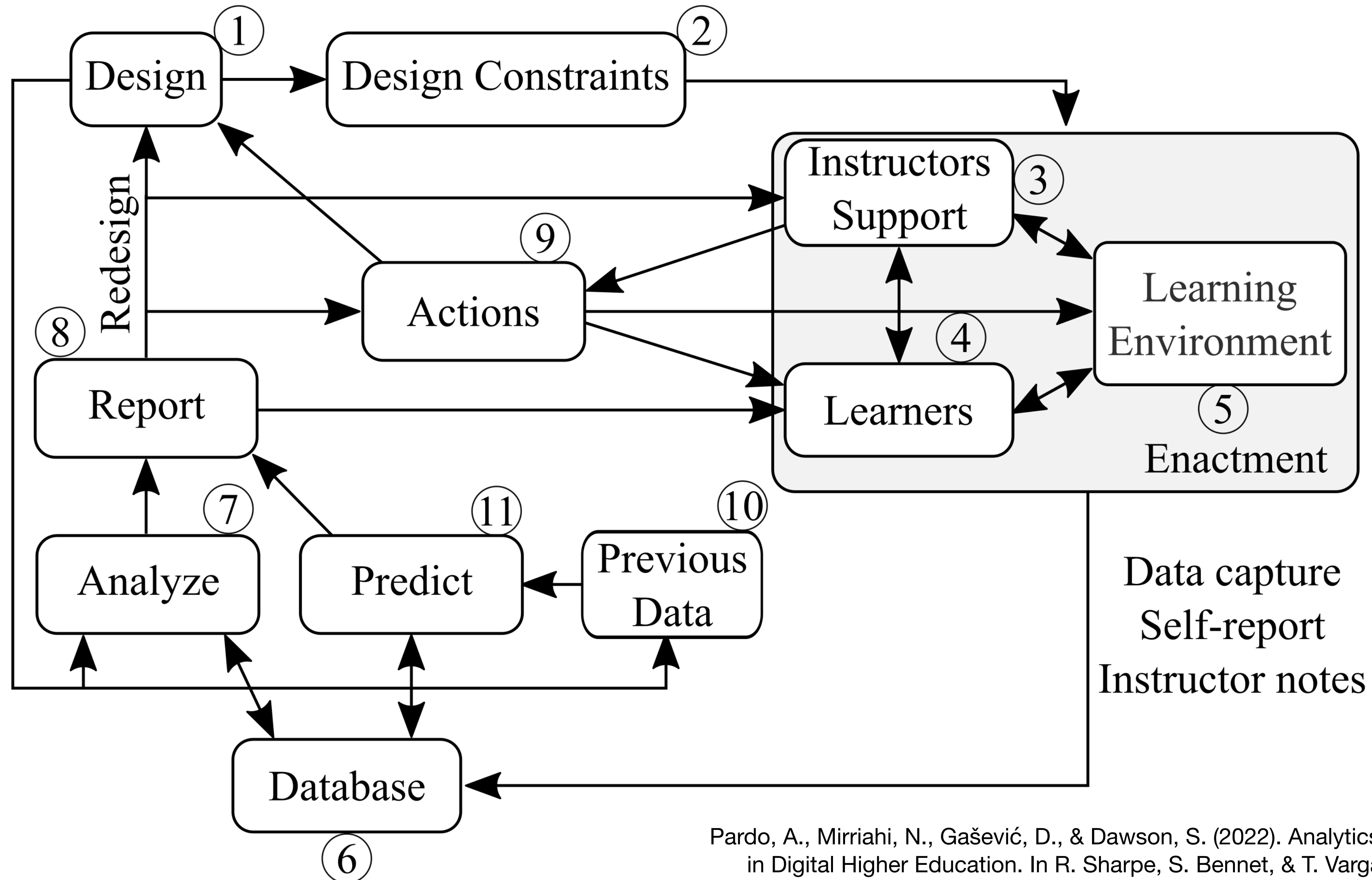
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Gather existing data
(assessment, LMS, etc)

Connect with the design. Make sense of results

Loop 1: What do I know about the design?

Loop 2: Can data provide insight into experience?

Loop 3: Can a predictive model be created?

Loop 4: What affordances should be added?

Sustain loops across course editions

Discuss with all stakeholders



Learning
Designers

ACAD

Statistics
Specialists

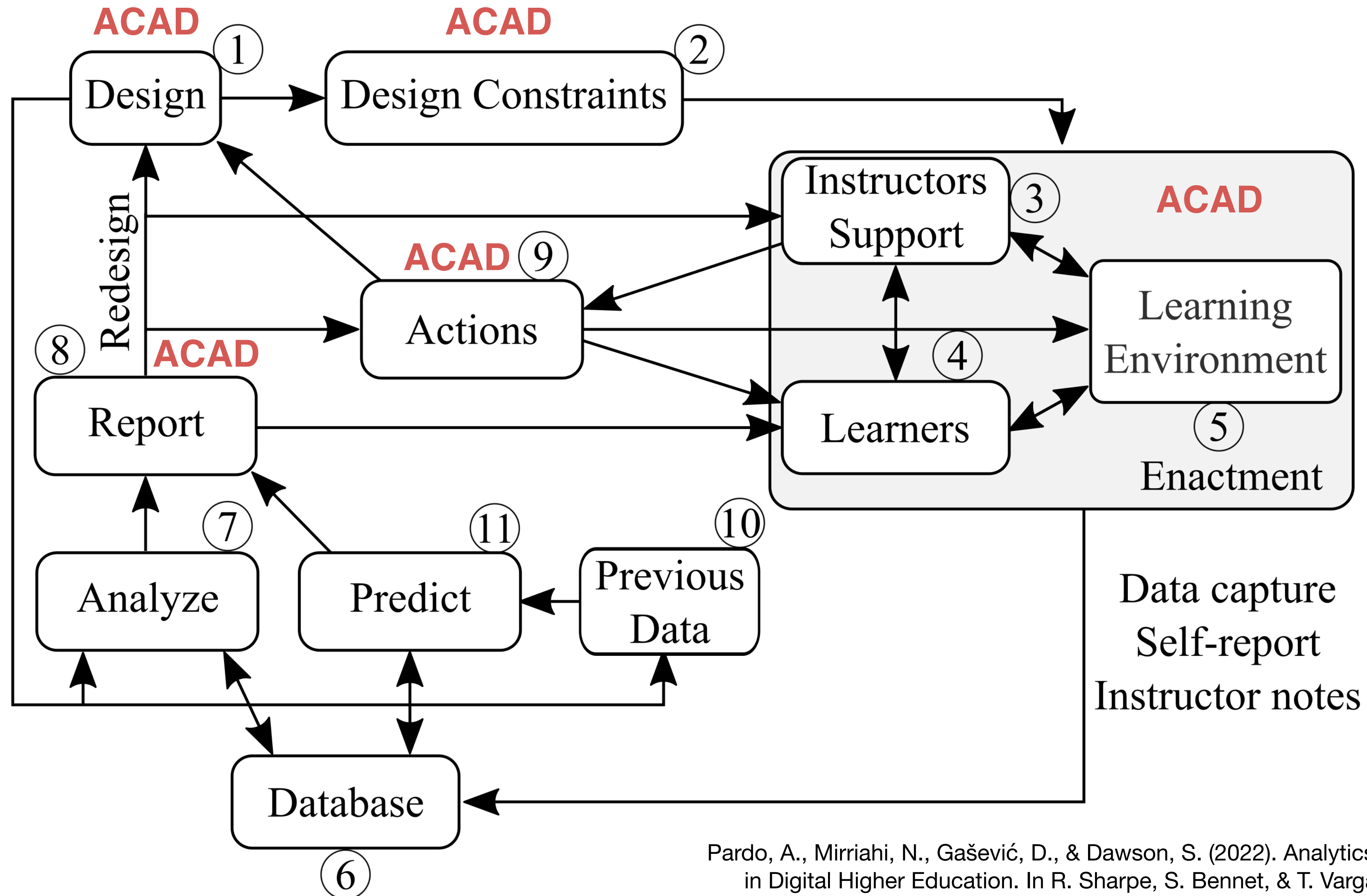
STAT

IT Experts

IT

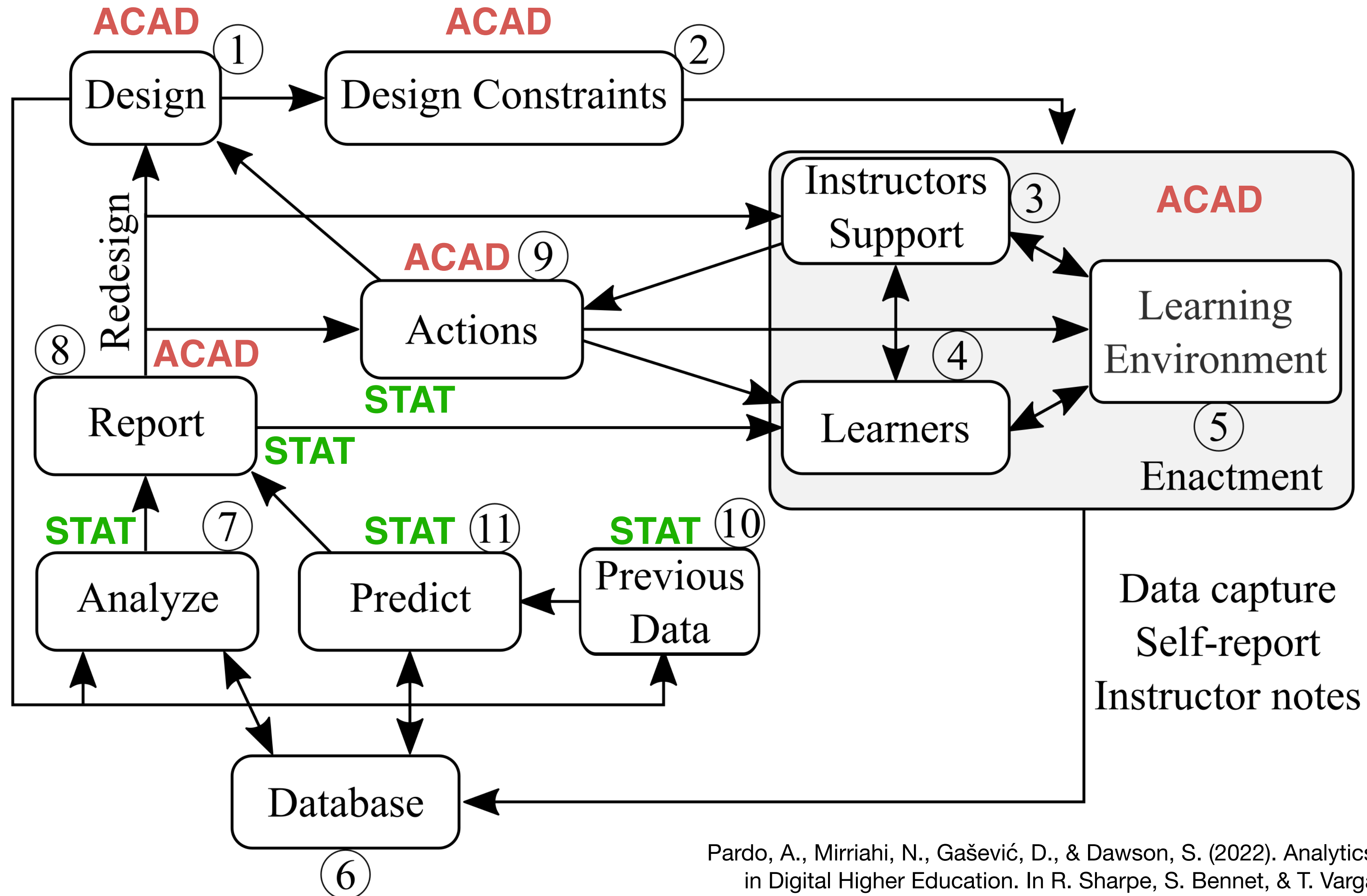


Learning Analytics Model



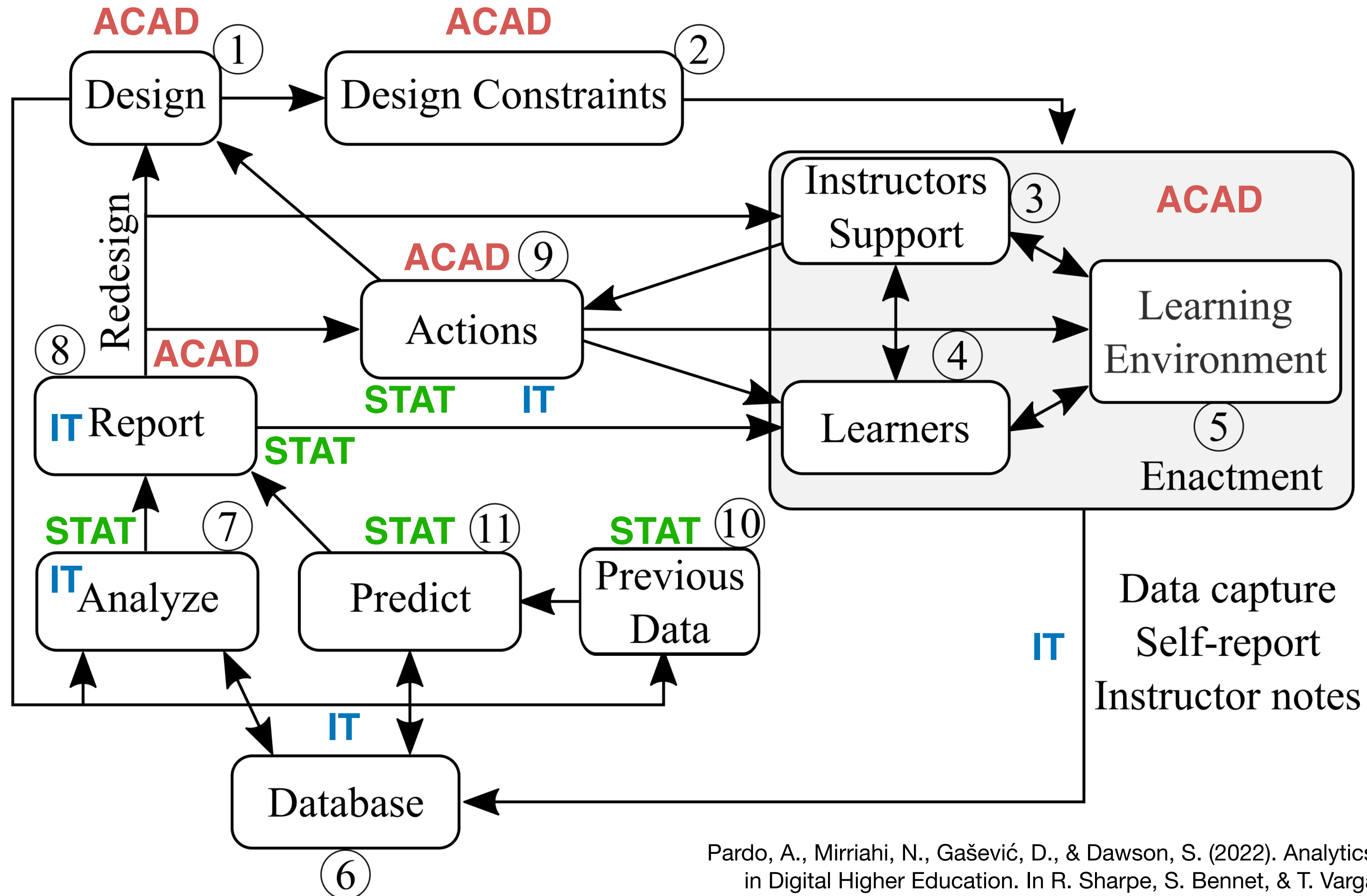
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Personalised feedback

LA Model



The image shows three circular markers lying on a gravel path. Each marker has a teal background with a white arrow pointing to the right. The markers are slightly worn and have a yellowish border. The path is made of small, smooth, brownish-grey stones. There are some dry pine needles and twigs scattered on the left side of the path. A white text box is overlaid on the top left of the image, containing a quote.

“People make good choices in contexts in which they have experience, good information, and **prompt feedback**”

Thaler, R. H., & Sunstein, C. R. (2008). *Nudge*. Great Britain: Yale University Press.

3-STAR LEARNING EXPERIENCES

AN EVIDENCE-INFORMED BLOG FOR LEARNING PROFESSIONALS

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NO FEEDBACK, NO LEARNING

June 5, 2018

Paul A. Kirschner & Mirjam Neelen



Feedback is one of the most, if not the most important tools for supporting learning. Giving effective feedback has also been found to be one of the most powerful educational interventions to improve learning. According to Shank (2017) effective feedback positively affects learning outcomes and motivation to learn, and can help build accurate schema. John Hattie (2011) found that giving feedback has an extremely large effect on learning, with an effect size of 0,79 (2X the average of all other educational effects)...

Search ...

- EXPLORE OUR MOST RECENT BLOGS -

[No Feedback, No Learning](#)

[Chess in Schools: Holy Grail or Snake Oil?](#)

[Logical Fallacies: Don't Let Them Fool You](#)

[Direct Instruction Gets No Respect \(But It Works\)](#)

[A Little Learning in the Workplace is a Dangerous Thing](#)

- TAGS -

[education](#) [effective feedback](#)

Two focal points

- 1) Personalisation
- 2) Coaching





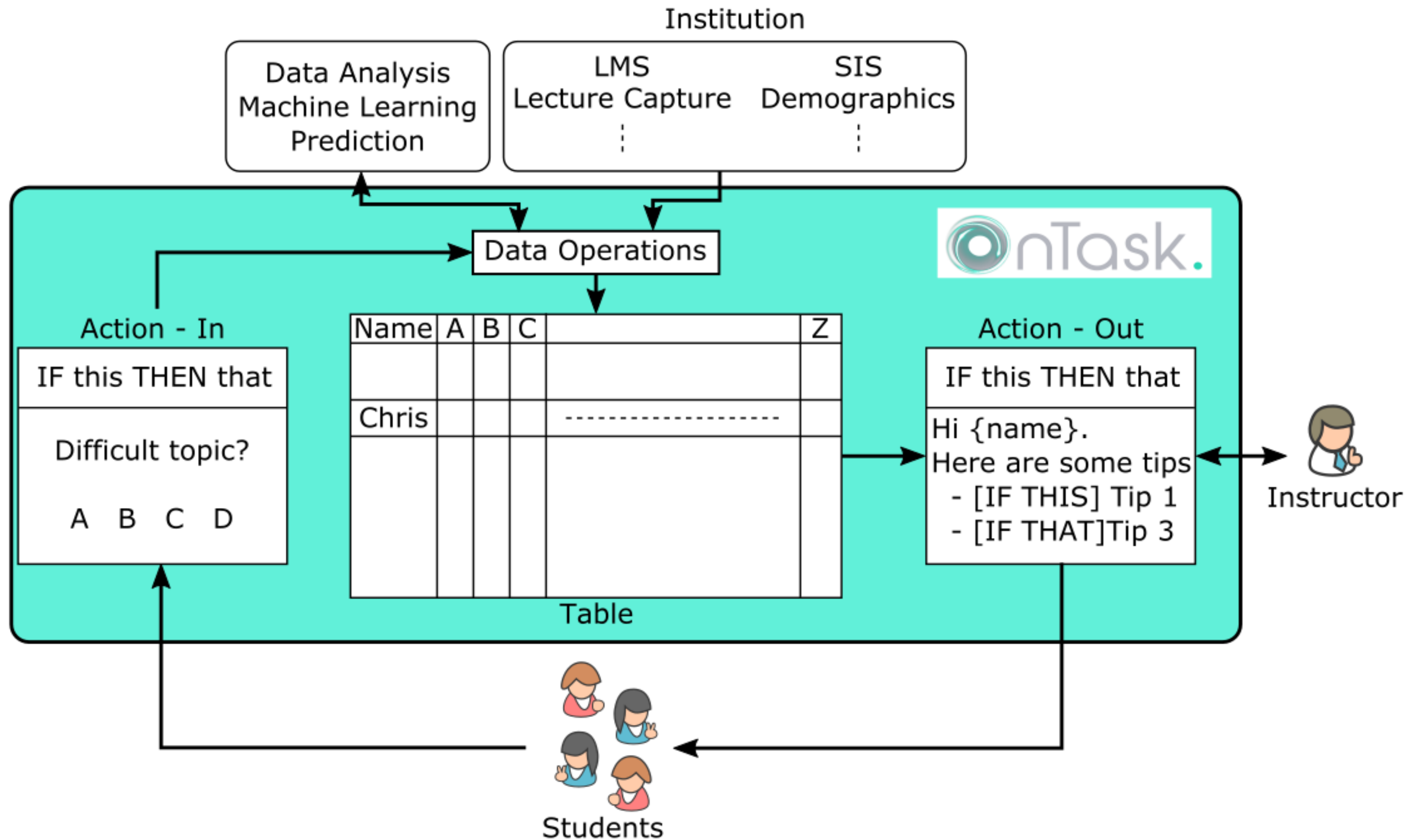
OnTask

Personalised
feedback

LA Model



ontasklearning.org



ontasklearning.org

The screenshot shows the 'Workflows' section of the ontasklearning.org interface. At the top, there is a navigation bar with a 'Workflows' button and user profile icons. Below this, there are three buttons: '+ New workflow', 'Import workflow', and 'Search...'. The main content area displays a workflow card for 'BIOL1011'. The card has a title 'BIOL1011', a subtitle 'Course on Cell Biology', and a description '14 rows, 69 columns, 10 actions.'. At the bottom of the card, there is a toolbar with icons for 'Open', edit, copy, delete, and star.

Course/Workflow →

A workflow contains a table with data about a set of learners and a collection of actions. The table is organised by columns and the information in each row corresponds to one learner. The actions will behave differently depending on the values stored for every learner and a set of conditions. These conditions can be written based on the values of the columns for each student. Typically, you create a workflow for a cohort of learners for which you have data available. Then you write the actions depending on a) when you want students to introduce data or b) when you want students to receive personalised data. The personalisation is done writing conditions to enable/disable text or other elements in a page. The page can either be sent to the learner through email, shown through a HTML address, or sent to another machine.

+ Row + Column Views Dashboard Column statistics CSV Download

Show 10 entries

Search:































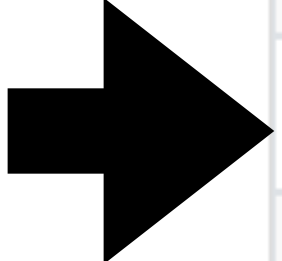
	SID	email	Surname	GivenName	MiddleInitial	Gender	UOS Code	P
  	300773633	euhz6532@bogus.com	Jen	Jie	M	male	ELON3509	
  	315500979	zqdk2609@bogus.com	Iredale	Flynn	M	male	ELON3509	
  	317547296	ckrn7263@bogus.com	Prenzel	Blake	I	male	ELON3509	
  	319549896	ttqp9766@bogus.com	Chien	Jin	Y	male	ELON3509	
  	320250819	tjxk6150@bogus.com	Tuan	Donglu	D	female	ELON3509	
  	326285587	isim6886@bogus.com	Pan	Li Na	Y	female	ELON3509	
  	330794979	olie8242@bogus.com	Chang	Lian	M	female	ELON3509	
  	352120481	ucdx8510@bogus.com	Shao	Tain	L	male	ELON3509	
  	360594548	euho9752@bogus.com	Vida	Bailey	C	male	ELON3509	
  	363393232	tdrv2640@bogus.com	Hague	Joel	K	male	ELON3509	

Table 

Showing 1 to 10 of 14 entries

Previous 1 2 Next

String | Number | Boolean | Datetime

You may drag and drop a column header to change its position in the table

+ Action Import actions Export actions Timeline Show All actions

<p>Send Email with report</p> <p>Send email with column values as a report</p> <p>Last Executed --</p>	<p>Send JSON report</p> <p>Send the list of inactive students in week 2 to another platform</p> <p>Last Executed --</p>	<p>Initial motivation</p> <p>Motivating message depending on the program enrolled. This action sends email using the CANVAS platform</p> <p>Last Executed --</p>	<p>Send JSON to remote server</p> <p>Send a JSON object to a remote server (outside this platform)</p> <p>Last Executed --</p>
<p>Badges</p> <p>A badge reflecting the activity with respect to the videos</p> <p>Last Executed --</p>	<p>Comments about how to prepare the lecture (Week 4)</p> <p>A message commenting on the videos they watched for Week 4</p> <p>Last Executed --</p>	<p>Midterm comments</p> <p>Comment the midterm scores divided by topic</p> <p>Last Executed --</p>	<p>Suggestions about the forum</p> <p>Message to remind those students that haven't visited the forum to do so.</p> <p>Last Executed --</p>
<p>Project feedback</p> <p>Provide feedback about the project using the results from the rubric</p> <p>Last Executed --</p>		<p>Student comments Week 1</p> <p>Feedback about the material in Week 2</p> <p>Last Executed --</p>	

Actions →



Workflows

Actions

Table

More



BIOL1011

Comments about how to prepare the lecture (Week 4)

Column statistics

Preview

Save

Close

Text

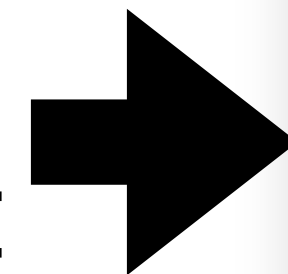
Select Learners (3 learners of 14)

Text Conditions (2)

Add Filter

Set view as filter

Select Subset



Filter

Either Video 1 or Video 2 in Week 4
have zero engagement

Formula

(Video_1_W4 = 0.0 and not empty) OR
(Video_2_W4 = 0.0 and not empty)





Workflows

Actions

Table

More



BIOL1011

Comments about how to prepare the lecture (Week 4)

Column statistics

Preview

Save

Close

Text

Select Learners (3 learners of 14)

Text Conditions (2)

+ Condition

Clone other conditions

No Video 1

(1 learner)

Didn't watch Video 1 Week 4

Formula

Correct_1_W4 = 0.0 and not empty



No Video 2

(3 learners)

Didn't watch Video 2 Week 4

Formula

Video_2_W4 = 0.0 and not empty



Text
Conditions →



Comments about how to prepare the lecture (Week 4)

Column statistics

Preview

Save

Close

Text

Select Learners (3 learners of 14)

Text Conditions (2)

Insert Column Value

Use condition in highlighted text

Insert Attribute

File Edit View Insert Format Tools Table Help

System Font 14px Paragraph B I

Dear {{ GivenName }}

Here are some comments about the preparation videos for this week.

{% if No Video 1 %}

Genes and Proteins Activity

This video explains the role of the genes to synthesise proteins in the cell. It is very important to see the connection between the proteins and the rest of processes occurring in the cell.

{% endif %}

{% if No Video 2 %}

STEM Cells

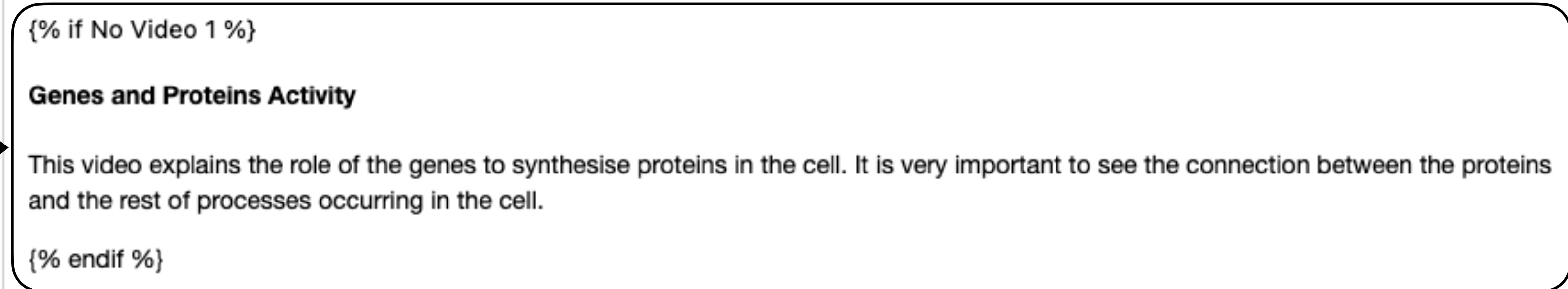
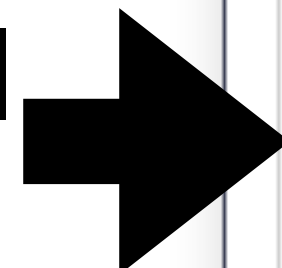
This video show how stem cells are a fundamental building block of how cellular organisms evolve. There are very valuable descriptions in this video about the mechanisms that are involved in this specialisation.

{% endif %}

P

101 WORDS POWERED BY TINY

Conditional Text



Examples

OnTask

Personalised
feedback

LA Model



Personalised feedback

1. Identify a potential aspect of the course to communicate with the students
2. Think about how to differentiate the students based on the available data
3. Identify different message types
4. Provide contextualised support tips

Example: Annotate videos

- a) Learner plays video and creates annotations in Week 2
- b) Learner plays video and does not create annotations in Week 2
- c) Learner plays video, first time, no annotations, during Week 5
- d) Learner plays video, fifth time, added several annotations

If THIS then THAT

Learner did not play video nor create annotations

IF: Video Play W2 = 0 AND Annotations W2 = 0

THEN: *“It would be good for you to check the video as it relates to [TOPIC] and we need this to then tackle [OTHER TOPIC].”*

Example: Biology course

Indicator: Level of persistency (**given!**)

VLP: very low persistency

LP: low persistency

MP: Medium persistency

VHP: Very high persistency

Biology course — Very low persistency

“You may want to try to make some headway in this unit. The concepts of specialisation and evolution are very important for the course. Charles Darwin’s famous voyage in the HMS Beagle involved a visit to the now famous Galapagos Islands. See if you can piece together some of the clues that inspired Charles Darwin. It’s important for you to get some understanding of these ideas as they are essential concepts in biology. Where do species come from?”

Biology course — Very low persistency

“You **may want to try** to make some headway in this unit. The concepts of **specialization and evolution** are very important for the course. Charles Darwin’s famous voyage in the HMS Beagle involved a visit to the now famous Galapagos Islands. See **if you can piece together** some of the clues that inspired Charles Darwin. **It’s important** for you to get some understanding of these ideas as **they are essential concepts in biology. Where do species come from?**”

Biology course — Low persistency

“Good initial work with this module. You should probably take another look at the units such as ‘The Galapagos Exploration’ and ‘The Birds and the moths’. This unit will help you develop some understanding of evolution through natural selection –which is one of the most important processes (perhaps the most important) in the natural world.”

Biology course — Low persistency

“**Good initial work** with this module. You should probably **take another look** at the units such as ‘The Galapagos Exploration’ and ‘The Birds and the moths’. This unit **will help you develop some understanding** of evolution through natural selection –which is **one of the most important processes** (perhaps the most important) in the natural world.”

Biology course — Medium Persistency

“Good work with this module. Would you be able to anticipate the influence of air pollution on Kettlewell’s moths? How important are relationships (such as symbiosis) in the natural world? Lessons such as ‘Peer pressure in nature’ will help us understand how energy flows in food webs and the different types of relationships that provide a cornerstone of the natural world.”

Biology course — Medium Persistency

“Good work with this module. Would you be able to **anticipate the influence of air pollution on Kettlewell’s moths? How important are relationships (such as symbiosis) in the natural world?** Lessons such as ‘Peer pressure in nature’ **will help us understand** how energy flows in food webs and the different types of relationships that provide a cornerstone of the natural world.”

Biology course — Very High Persistency

“Thorough work with the unit! Would you be able to describe the relationship between clownfish and their sea anemone host as a commensalism or a mutualism? Could you explain why hemophilia seems only to afflict males (such as in the British royal family of the 19 th century)?
Great work!”

Biology course — Very High Persistency

“Thorough work with the unit! **Would you be able** to describe the relationship between clownfish and their sea anemone host as a commensalism or a mutualism? **Could you explain** why haemophilia seems only to afflict males (**such as in the British royal family of the 19th century**)? **Great work!**”

Biology course — Week 5 announcement

“The concepts of specialization and evolution are very important for the course. Charles Darwin’s famous voyage in the HMS Beagle involved a visit to the now famous Galapagos Islands. See if you can piece together some of the clues that inspired Charles Darwin. It’s important for you to get some understanding of these ideas as they are essential concepts in biology. Where do species come from?”

You should probably take another look at the units such as ‘The Galapagos Exploration’ and ‘The Birds and the moths’. This unit will help you develop some understanding of evolution through natural selection –which is one of the most important processes (perhaps the most important) in the natural world.

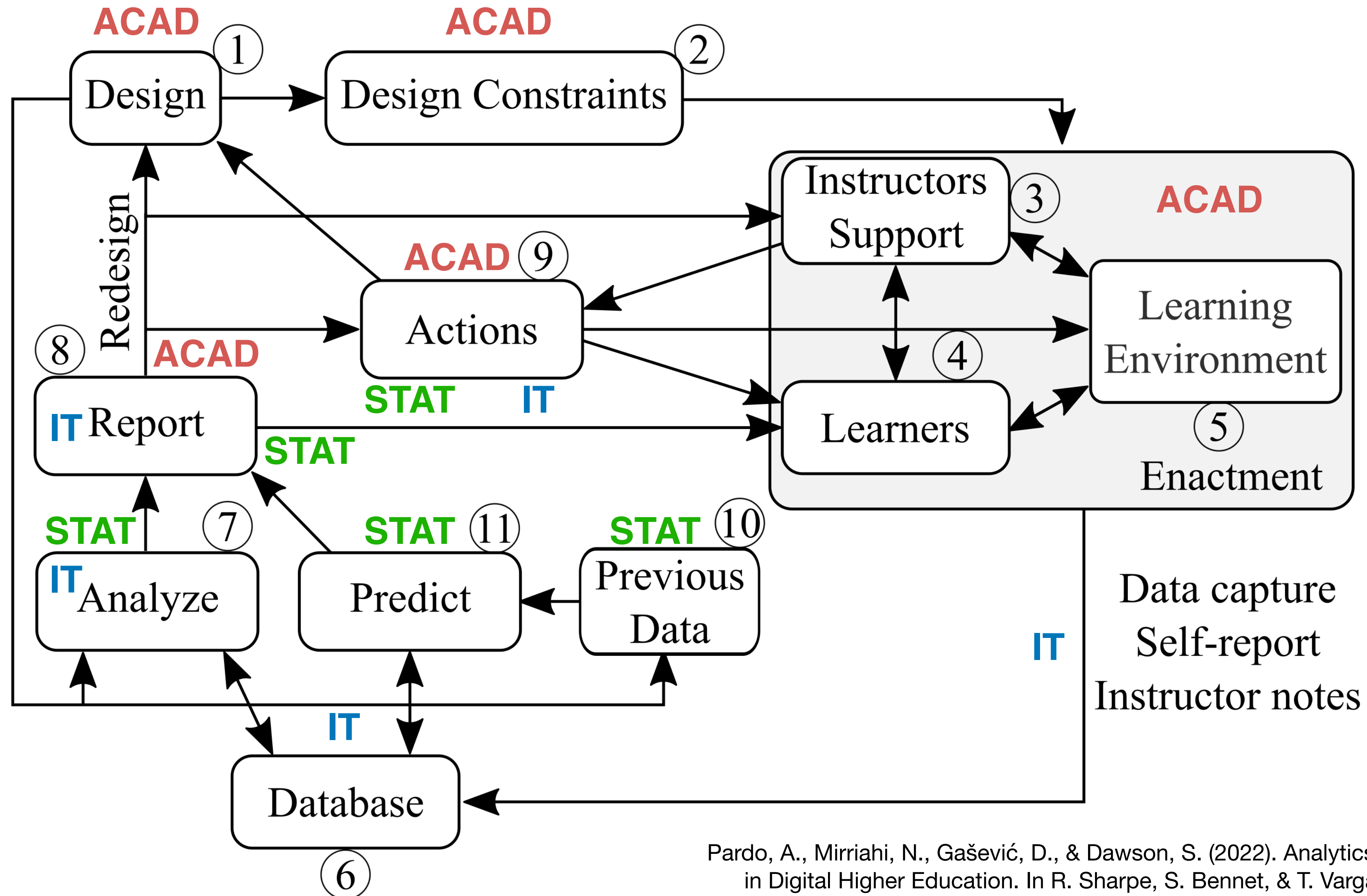
Would you be able to anticipate the influence of air pollution on Kettlewell’s moths? How important are relationships (such as symbiosis) in the natural world? Lessons such as ‘Peer pressure in nature’ will help us understand how energy flows in food webs and the different types of relationships that provide a cornerstone of the natural world.

Would you be able to describe the relationship between clownfish and their sea anemone host as a commensalism or a mutualism? Could you explain why haemophilia seems only to afflict males (such as in the British royal family of the 19th century)?”

Example: Identifying effective study techniques

- a) Create activities that provide indicators of strategy
- b) Collect indicators and perform sensemaking
- c) Identify groups of students with similar strategies
- d) Personalise messages

Learning Analytics Model



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Conclusions

- Learning Analytics deployment requires multidisciplinary groups collaborating within an institution
- Feedback is one element suitable for personalisation at scale
- OnTask is a platform to deploy personalised messages based on collected data
- Personalisation relies on effective contextualisation

Using Learning Analytics to Personalise Student Support

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