Is it possible to develop a parsimonious approach to Design-aware Learning Analytics?

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Outline

- How do we define a learning design for teachers to use?

    - What does it take to learn?

    - How can technologies help?

    - Is this a parsimonious account?

- What are the key features of a learning design?

- What counts as a good learning design?

- How can AI technologies help with learning analytics?

What does it take to learn?

The Conversational Framework

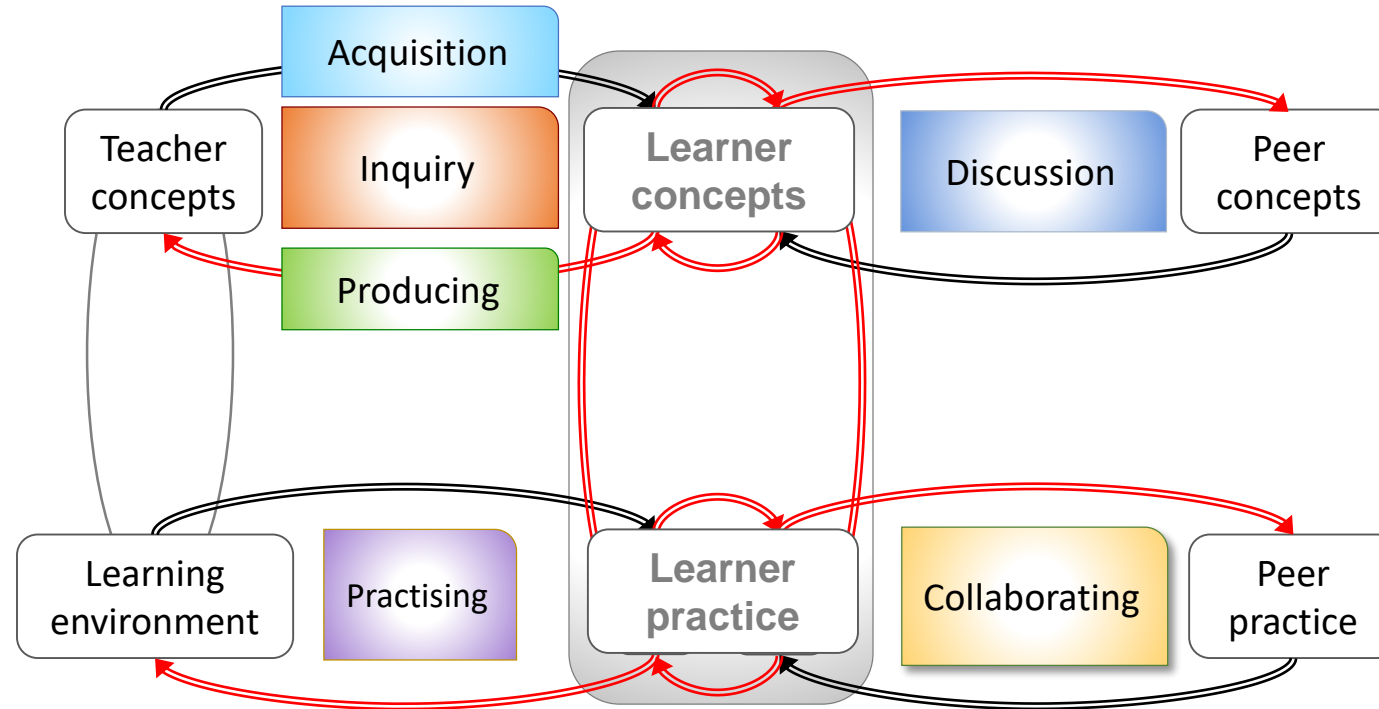Derived from theories and research on learning and teaching

Represents the teaching-learning process as

- a series of iterative exchanges
- between learner and a 'teacher', and
- between a learner and their peers
- at two levels of concepts and practices
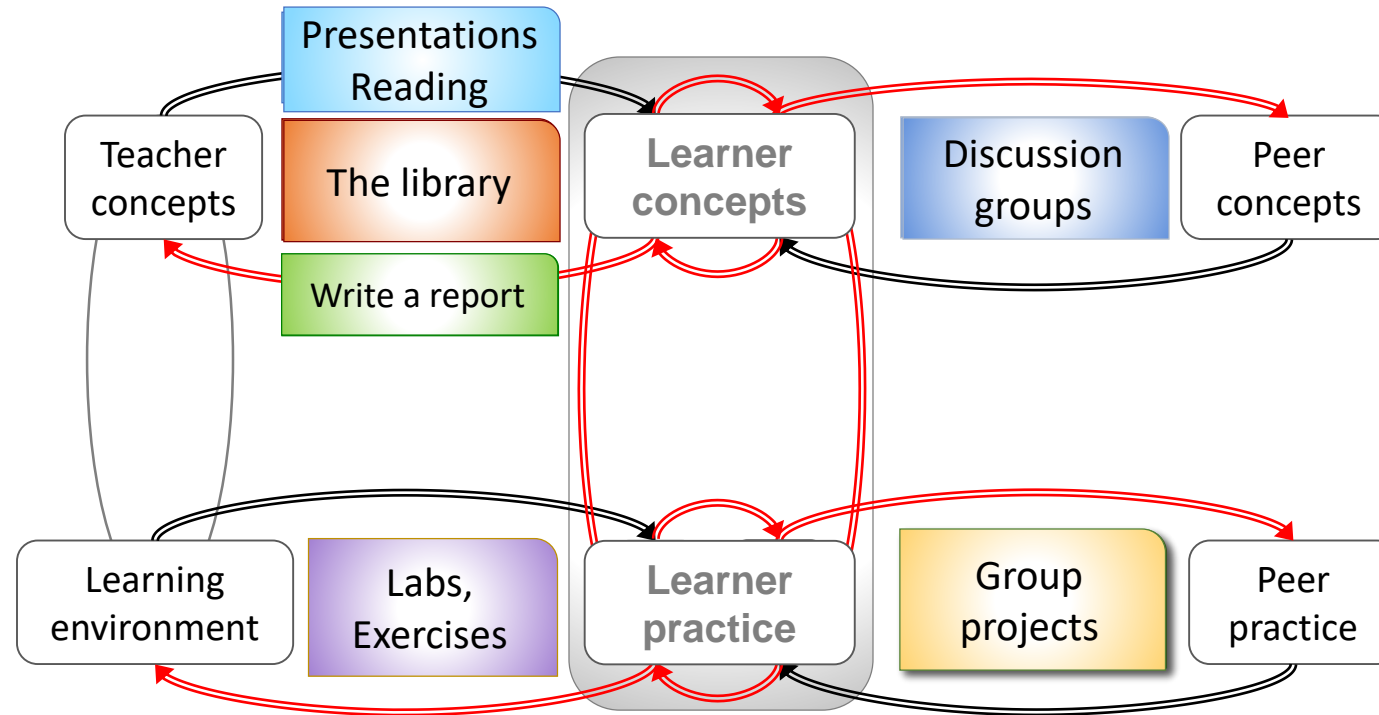
- in any context   (*Laurillard, 2012*)
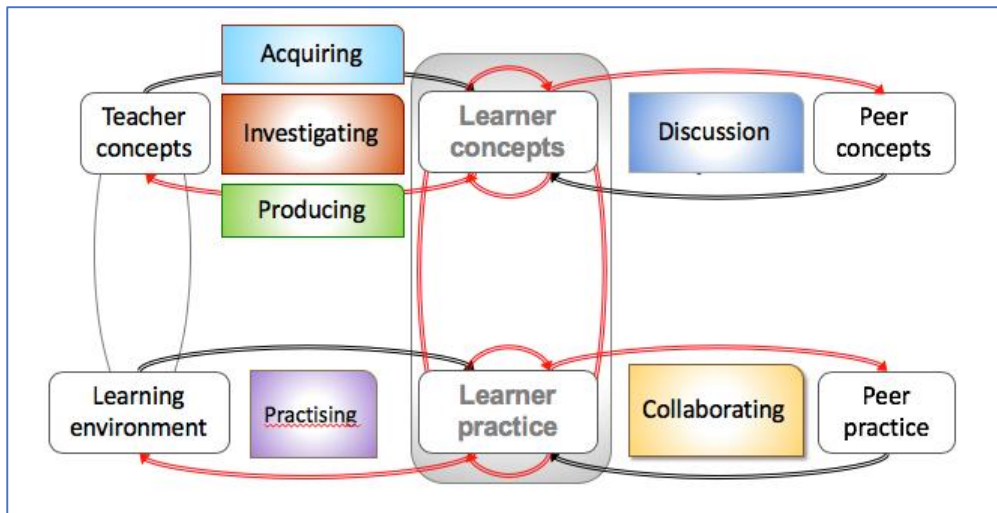
The Conversational Framework: What does it take to learn?
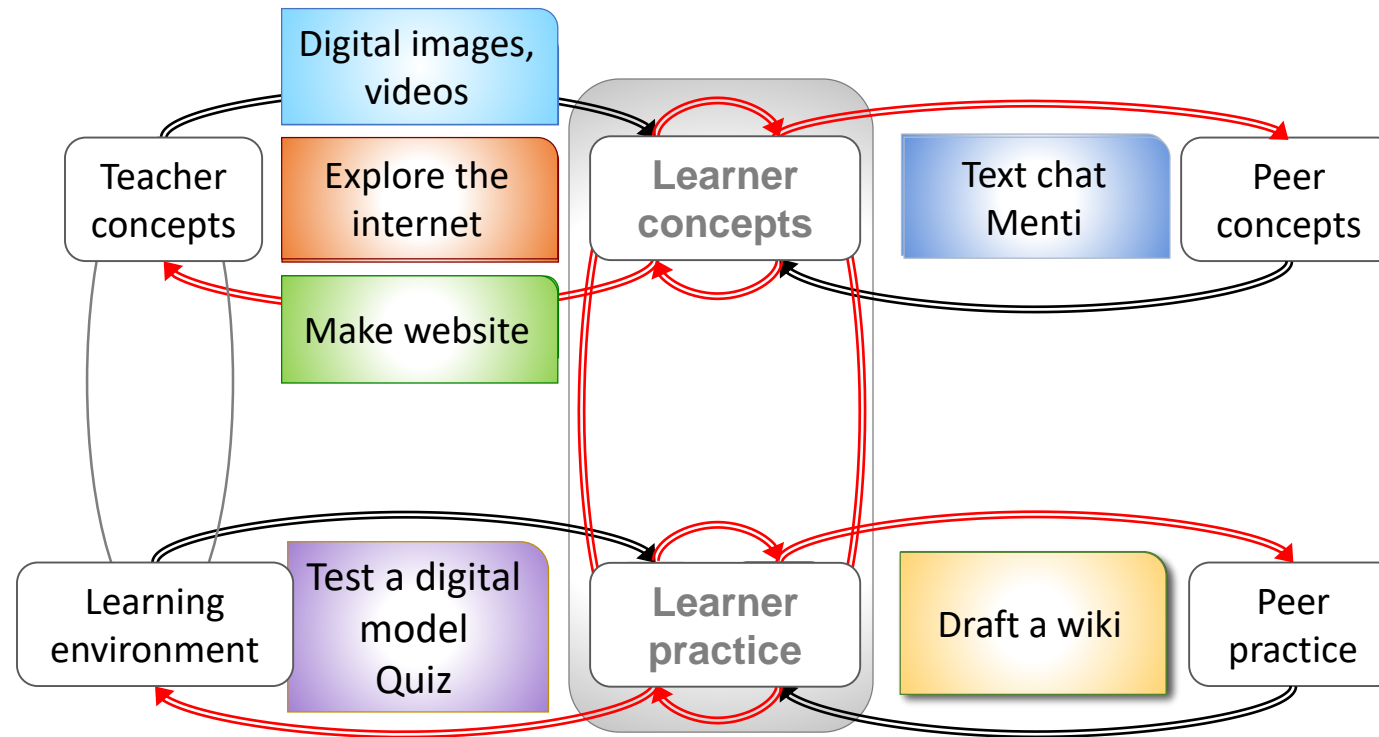

Derived from educational research on how students learn: all these types of learning work together to complement and enhance each other

How do technologies help? Conventional methods

These learning types are encouraged through a variety of conventional methods

How do technologies help? Digital methods

The same learning types are encouraged also through a variety of digital methods

How can digital technologies help to improve learning?

Learning through

- Acquistion
- Inquiry/Investigation
- Discussion
- Practice
- Collaboration
- Production

Learning through acquisition

Digital methods can enhance the teacher's presentation, or the text, images, animation, as ways of improving explanations, situating ideas in context, clarifying relationships…
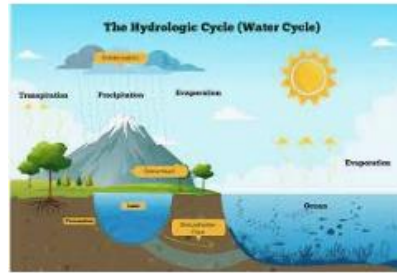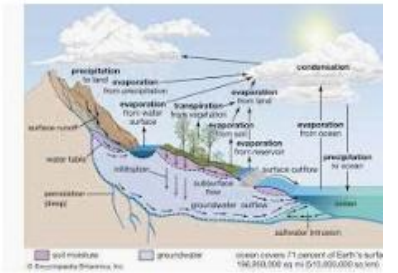

[Source: NASA]

Learning through inquiry

Alternative representations of scientific concepts images and animations assist understanding at any level – giving students agency to discover
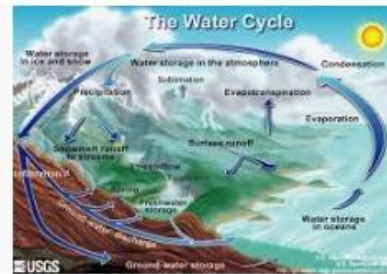
Learning through discussion

Every participant can respond to the question on a Menti site, for the presenter to talk through and give feedback

What are the problems with using learning design to plan your course?

9 responses

I think it is worth if you deliver the same course more than once, and/or more teachers collaborate.

The time for planning and for evaluate the others teachers planning

The possibility of having mixed didactics at the same time

One of the huge problem is the workload for the teachers... learning design requires time, competences and energy

It takes time and motivation to have all involved teachers to learn the model and the tool

Right evaluation of time necessary to do activities of production, discussion, collaboration and investigation (as learning types)

Involve students in asynchronous e-tivities

it is difficult to predict complex events that will take place in the future in such an analytical way. It would

In planning it is important to start thinking so that not only what to do (contents) but also the "mood" that

Learning through practice

Digital models and simulations enable students to explore embodied concepts for 'situated learning'
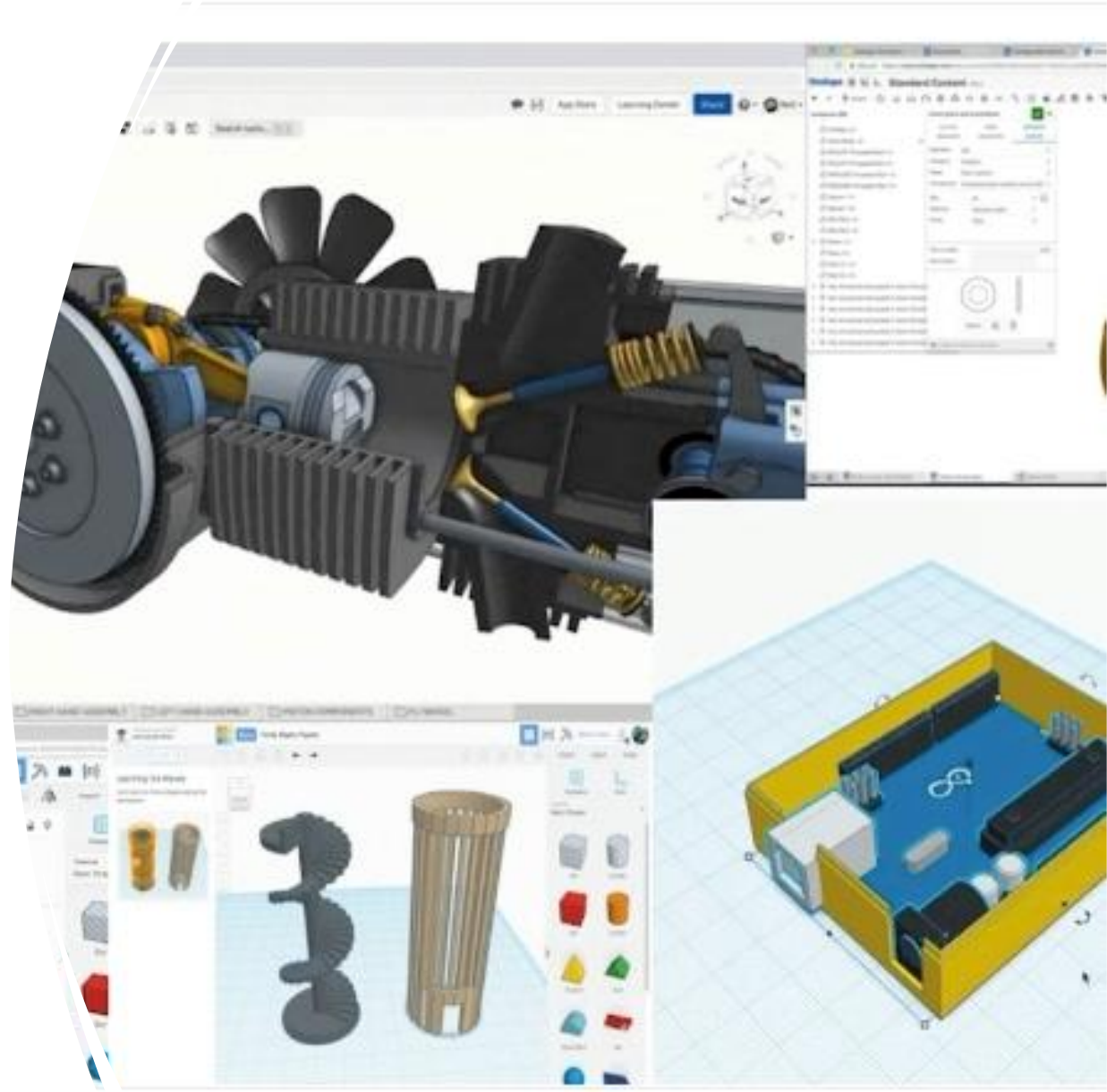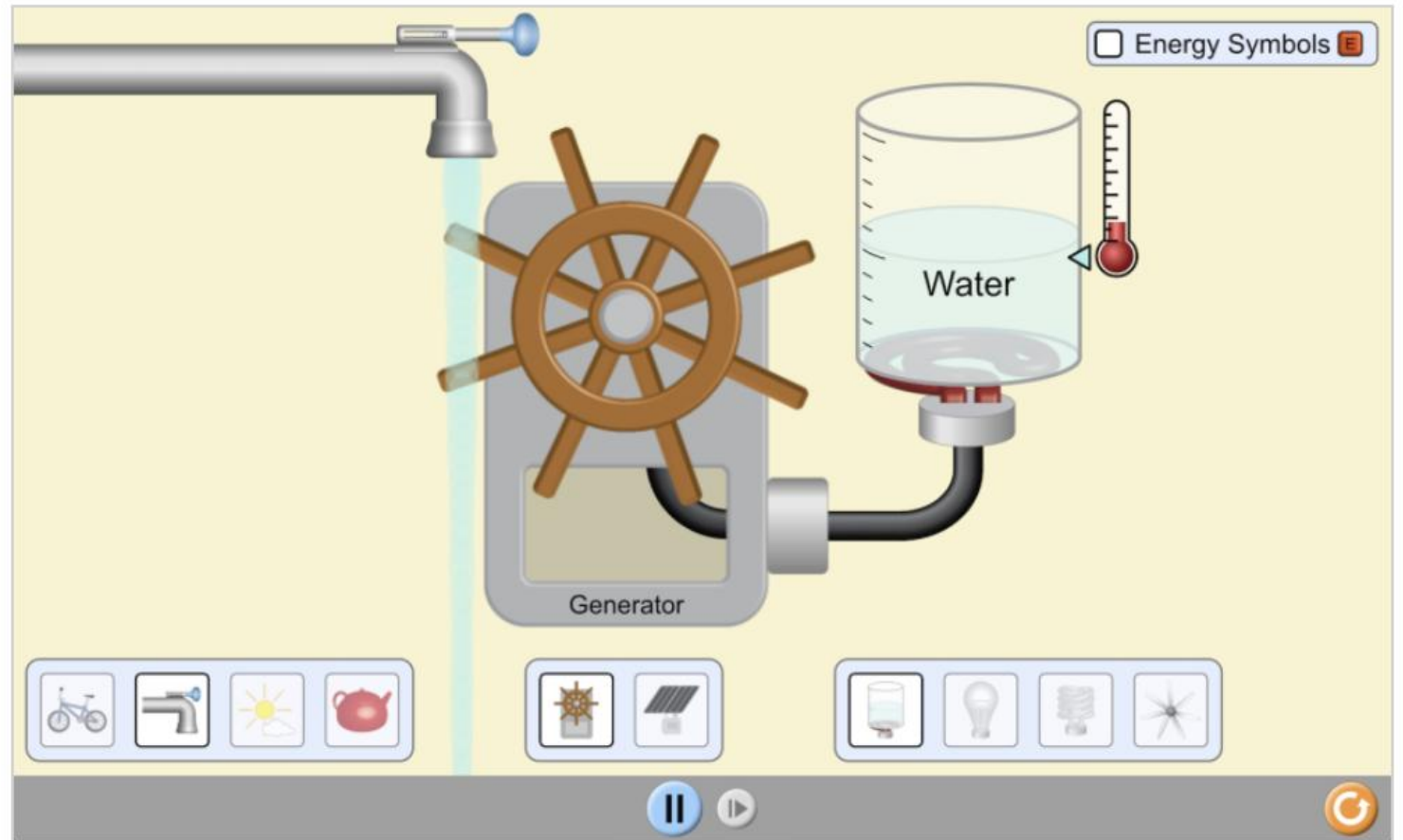
Practice with meaningful feedback

A program is the ultimate digital model

Students interact with a model of a task or process, and see what happens as a result

Source: University of Colorado, Boulder

Learning through collaboration

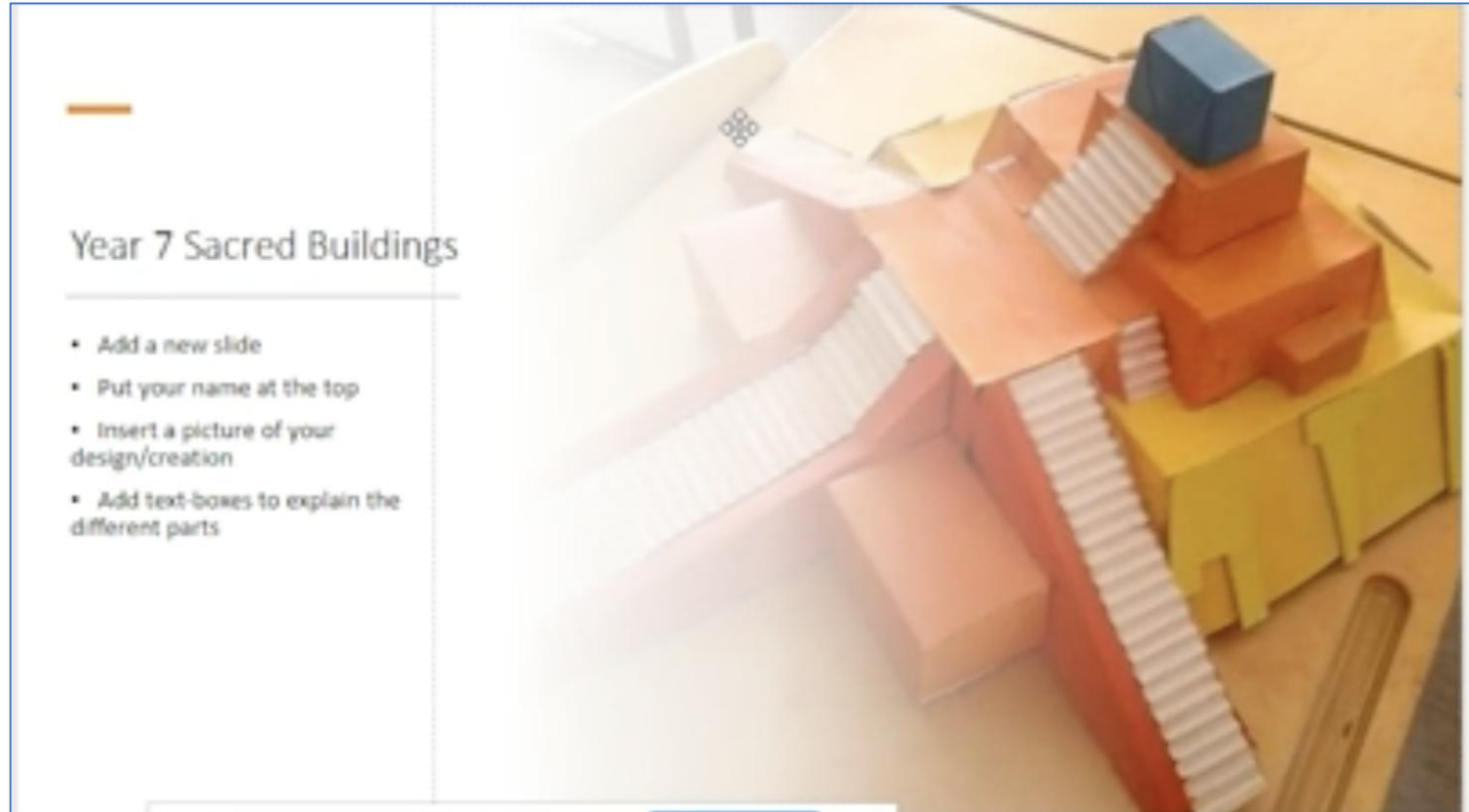Students use a Padlet wall to collaborate by showing and commenting on what they have found on a topic – promoting constructivism
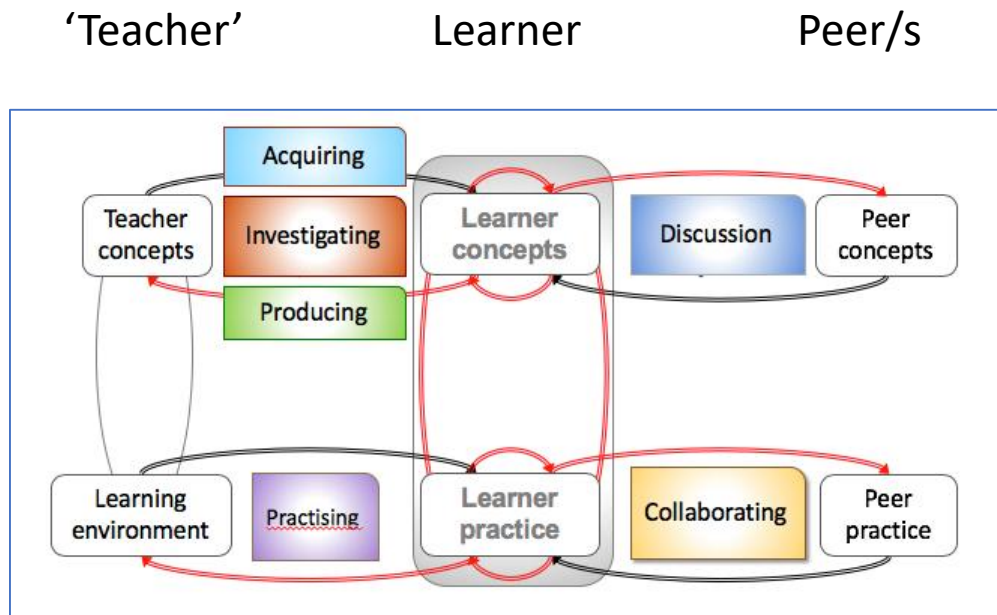
Learning through production

Teachers' presenter tools also enable students to express what they know or have learned.

In this case their understanding of the features of sacred buildings, using ppt.

Year 7 Sacred Buildings

- Add a new slide
- Put your name at the top
- Insert a picture of your design/creation
- Add text-boxes to explain the different parts

Is this a 'parsimonious' account of the teaching-learning process?

'Teacher'   Learner   Peer/s

The **Principle of Parsimony** says

"Entities should not be multiplied beyond necessity" (*Entia non sunt multiplicanda praeter necessitatem*, William of Occam, 14th C)

- Teacher, Learner, and Peers are all necessary
- The two levels of knowledge/action, or ideas/experience, or concepts/practice cannot be reduced
- The 6 types of learning could be reduced to 5 (collaboration is a combination of the other types).

    - Bloom was allowed 6 levels of learning outcome...
    - It is not necessary to increase the learning types

What are the key features of a Learning Design?

The people

- The 'teacher' or source of content
- The learner
- Their peers
- Their concepts and practices

The learning types

- Acquisition
- Inquiry
- Discussion
- Practice
- Collaboration
- Production

Logistics

- Duration
- Blended/Online
- Group sizes
- Teacher present/Not
- Use of internet
- Synch/Asynch
- Digital resources (content)

The pedagogy

- Intended learning outcomes
- Sequence of TLAs (Learning types + Logistics)
- Guidance to learners
- Enabling the cycles of learning

T designs learning types + logistics as the pedagogy.

The pedagogy describes what learners will DO to learn

Actions leave data for LAs

Designing activities for learning

https://www.ucl.ac.uk/learning-designer

The Learning Designer

A free open online design tool to help with planning blended learning.

Based on the six learning types from the Conversational Framework – a model of what it takes to learn.

Supports teachers and educators to
- design a sequence of blended and online teaching and learning activities
- analyse their pedagogic design
- evaluate and reflect on how to optimise it

Building on what you and others know

Articulating your learning design ideas

Thinking about the use of plastics - in class

Read Watch Listen — ⏱ 15 — 👥 25
Watch the teacher's presentation about the use of plastics and make notes on what questions you have.

Discuss — ⏱ 5 — 👥 25
Ask any questions you have about what the teacher presented

Investigate — ⏱ 5 — 👥 1
Now "inspect yourself" - make a list of the different types of plastic you carry with you: clothing, books, mobile devices, utensils used for lunch and their packaging. The teacher will be looking at the lists you are all making.

Read Watch Listen — ⏱ 10 — 👥 25
Watch the teacher's explanation of how we can replace some of the types of plastic the class has listed with alternative materials or practices.

➕ Add Learning Type — ⏱ 35 — Notes ⌃ — 📎 0 ➕

Improving our use of plastics - in class

Collaborate — ⏱ 10 — 👥 2
With your partner look at the list of the items you both identified and discuss which ones could be recycled or replaced or reused. The teacher will be looking at the ideas you are all suggesting

Read Watch Listen — ⏱ 5 — 👥 25
Listen as the teacher comments on some of the ideas that you and the other groups have suggested.

Collaborate — ⏱ 5 — 👥 3
In your group, think about "what can we do better?" Think of three ways that you, your classroom or the school can reduce the use of plastics and increase the practice of recycling. You can include things you use at home. Make notes of your ideas. The teacher will be looking at the notes you are all making.
Discuss in your group any points you want to make in the final discussion. Are there any you would not like to take part in?

Read Watch Listen — ⏱ 5 — 👥 25
Listen to the teacher's summary of what we learned from this session.

➕ Add Learning Type — ⏱ 25 — Notes ⌃ — 📎 0 ➕

Analyzing a learning design/redesign
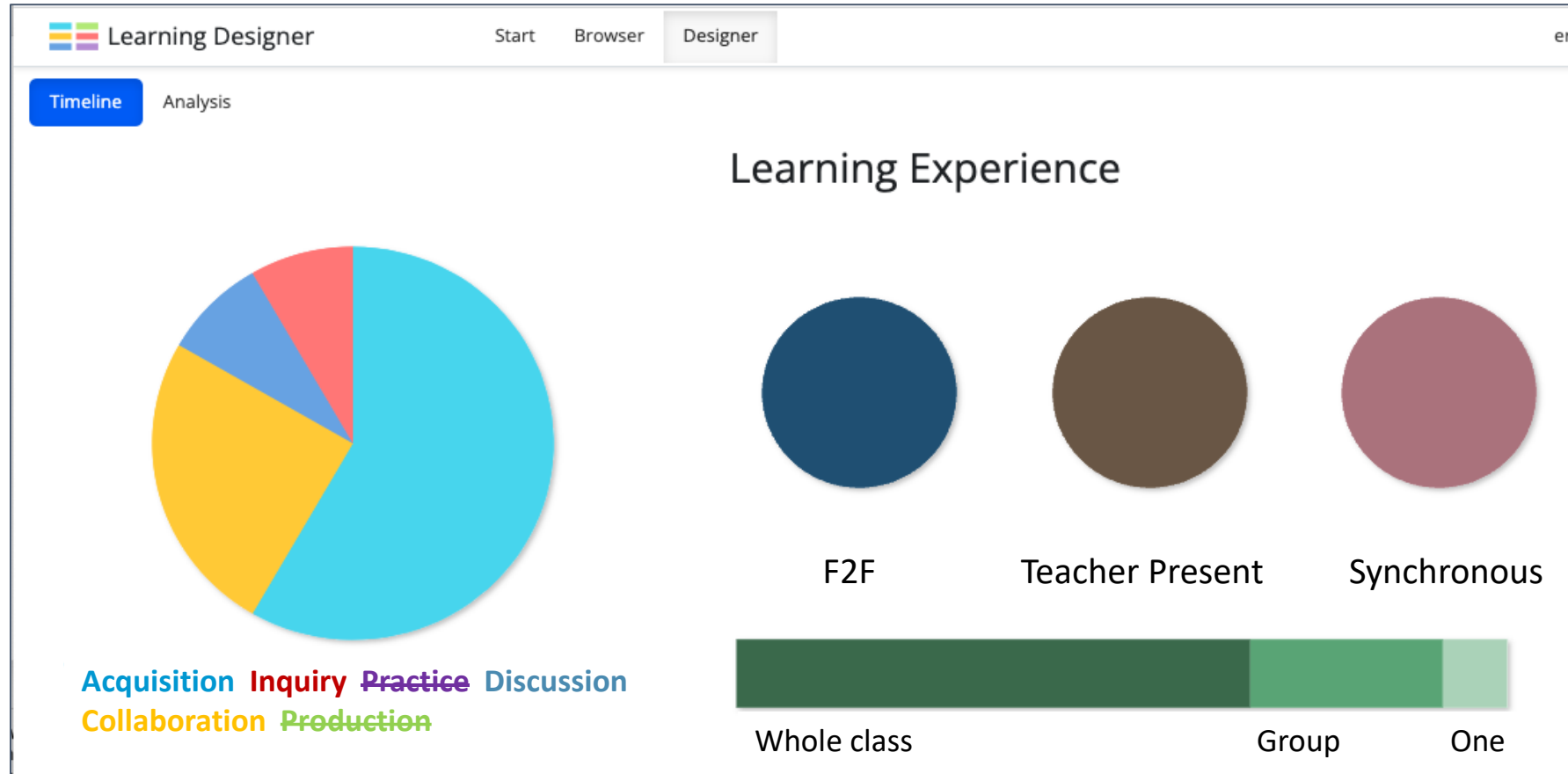
There are no rules about what this analysis should be

Just consider if that looks appropriate for your class

Optimizing digital methods for learning - data for LAs

Digital tools
For a session on 'learning how to design a digital poster' this teacher has used 3 different online tools for Discussion and Collaboration

Data traces
Googledoc – text
Miro Board – text, structures, relations
Forums - text

Learning design: Enabling teachers to innovate together

Designing activities for learning

Building on what you and others know

Articulating what students DO

Analyzing the learning design

Optimizing digital methods for learning

Evaluating the learning design

Sharing learning designs

Evaluating a learning design – by students

Student evaluation

Share your design post hoc with students.

Invite them to comment in the Notes.

Collect their comments in a Googledoc.

For useful Learning Analytics, we need to know:
What makes a good learning design? Our rubric... Do LAs help?
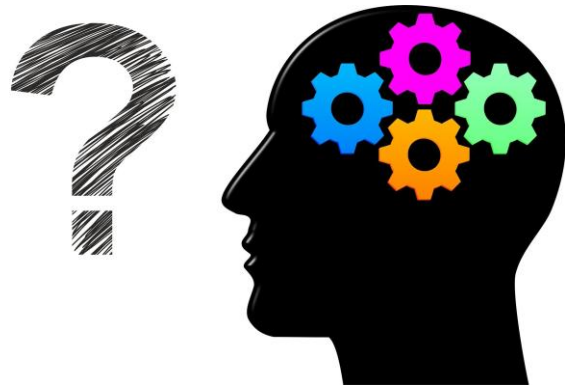
1. Clear learning outcomes

2. Appropriate use of pedagogic choices

3. Sufficient guidance in text for students to follow

4. Use of digital resources — } Resources used
Amount of use
Number of posts

5. Balance of learning types

6. Appropriate time allocation for learning activities

7. Meaningful feedback to students

8. Alignment between intended outcomes, activities, and assessable actions by students

What makes a good Learning Design? Could LAs help?

Rubric for self/peer/expert review

√ 1. Clear learning outcomes

2. Appropriate use of pedagogic choices

3. Sufficient guidance in text for students to follow

√ 4. Use of digital resources

5. Balance of learning types

6. Appropriate time allocation for learning activities

√ 7. Meaningful feedback to students

√ 8. Alignment between intended outcomes, activities, and assessable actions by students

Potential Learning Analytics for auto review

1. Analyse outcomes against Bloom keywords?

2. Too hard?

3. Too hard?

4. Check how they are used; advise on alternatives?

5. Not much to add to pie chart? No rules

6. Too hard? (even for humans)

7. Advice and analysis could be done

8. Could analyse words in text to suggest advice

Forms of feedback to students – How could AI help?

Forms of feedback/assessment	Design-Generated Learning Process Analytics
Self-assessment against a model answer text	AI could compare and advise?
Peer review of text/digital design vs rubric	ChatGPT could offer extra feedback on text in terms of rubric
Teacher feedback on text/digital design	ChatGPT could offer extra feedback on text in terms of rubric
Digital tool/model/environment response	Intrinsic feedback from tool; AI could offer additional interpretation in terms of output?
Automated feedback	AI could analyse student outputs against the set goal to advise on gaps? misconceptions?

A parsimonious approach to Design-aware Learning Analytics?

- We can define a parsimonious approach to learning design in terms of the 6 learning types, and the key pedagogical features of a good design

- The Learning Designer supports the development of good learning designs, based on the Conversational Framework and logistic and pedagogic features

→ AI could develop support for a parsimonious approach as Design-**Generated** Learning **Process** Analytics for some aspects of the teaching-learning process

Coming soon…

https://bit.ly/OnlineLearningFutures