

ocTEL. Open Course in Technology Enhanced Learning.  
Association for Learning Technology (ALT) | Registered charity no. 1063519

Available online <http://octel.alt.ac.uk/course-materials/>

# ALT: open course on TEL

What are the **BIG QUESTIONS** in TEL?

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# Participants' big questions

## **Pedagogic**

- How to plan flipped classroom class teaching via open distance learning with participants from multiple and widely ranging time zones?
- How can I use TEL to engage and support students across a large, lecture-only course?
- What TEL is appropriate to achieve the desired outcomes in the learning and teaching environment?
- How can TEL support personalised learning in a way that works for both teachers and students?
- Where should the balance lie between learner guidance and learner freedom?
- How do we evaluate the technology-enhanced learning impact on the learning experience and outcomes of individual students?

## **Strategic**

- How do we persuade 'reluctant' members of staff to engage with TEL – especially those with limited skills/confidence/time?

# Candidate big questions

- **Cultural:** How do we create a culture in which TEL can be effectively used by all staff and learners to improve learning?
  - **Management:** Can teachers become a collaborative professional community with responsibility for directing innovation in TEL?
  - **Economic:** Which TEL pedagogies will help solve the 1:25 staff-student ratio problem in educating the world?
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- **Strategic:** How can we get adequate investment in TEL innovation by teachers themselves?
  - **Creative:** Will the new 'computing' curriculum use TEL to build the 'computational thinking' AND the 'digital literacies' all students need?
  - **Technical:** What are the emergent technologies that schools, colleges and HE should be working to introduce over the next few years?

# The global demand for HE

By 2025, the global demand for higher education will double to ~200m per year, mostly from emerging economies (NAFSA 2010)

UK universities offer TNE, including online distance learning for 75/100k students – 5.3% of undergraduate population (BIS 2011, UUK 2012)

The new UNESCO goals for education:

- Every child completes a full 9 years of free basic education ...
  - Post-basic education expanded to meet needs for knowledge and skills ... (Draft for UNESCO post 2015 goals)
- Implying significant teacher training needs for HE



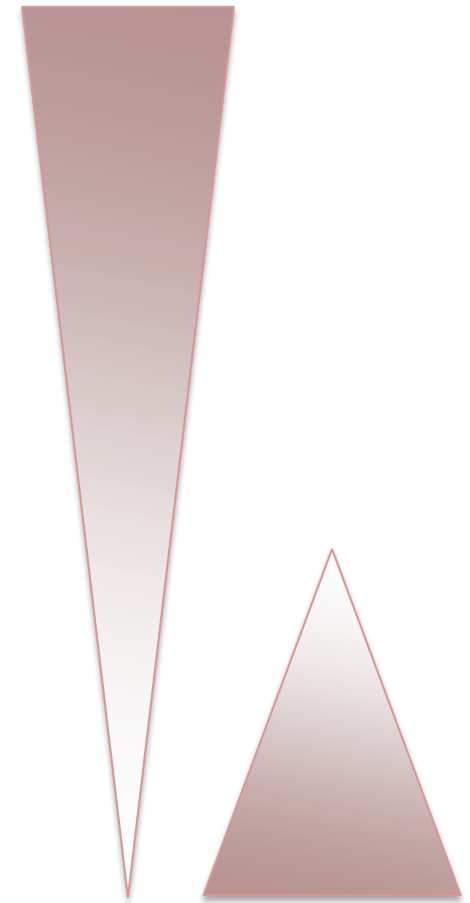
*1:25 staff:students??*

# Forms of TEL/online and teacher time

## MOOC vs standard online course

- Guided TEL resources (model)
- Access to expositions – lectures (videos)
- Automated grading – MCQs, models
- Readings (pdfs)
- Guided collaboration activities (wiki)
- Peer group discussion forums
- Peer grading against criteria
- Tutored discussion forums
- Tutor feedback (e-portfolio)

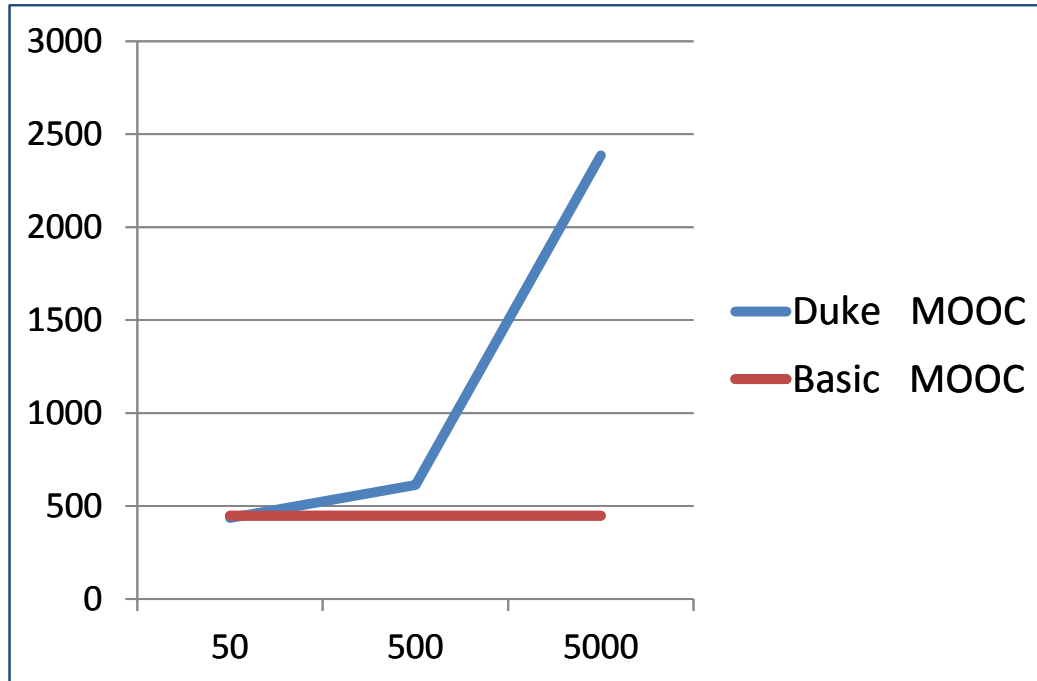
Preparation time (fixed costs)



Support time (variable costs)

# Comparing teacher hours for a basic MOOC and a guided MOOC (48 hour course)

Total teacher time



Teacher support time rises to 2000 hours for 5000 students.

2000 hours  
= 1 year of a tutor for a 5 credit course.

= 24 FT tutors for 120 credit course.

Development time = 420 hrs

Support time	50	500	5000
Duke MOOC	20 hrs	200 hrs	2000 hrs
Basic MOOC	0.00	0.00	0.00

# Modelling the benefits and costs

- We need to understand the pedagogical benefits and teacher time costs of online HE
- What are the new digital pedagogies that will address the 1:25 student support conundrum?
- How do we innovate, test, and build the evidence for what works at scale online?



# Tools for teachers as learning designers

## Pedagogical Pattern Collector



### Welcome

*The Pedagogical Patterns Collector suite of tools enables teachers to share their good teaching ideas. It is intended to help a subject teacher see how a particular pedagogic approach can be migrated successfully across different topics. There are sample patterns to browse and edit, or you can design your own from scratch. This is an output from the TLRP-TEL research project on a learning design support environment for teachers and lecturers, funded by the ESRC-EPSRC .*

### 'PPC Browser'

*offers a collection of generic pedagogical patterns, and their associated instances, which you can redesign for your own teaching practice.*

*click here for*  
**Browser**


### 'PPC Designer'

*presents the pedagogical pattern template to help you describe your own teaching idea for a session (e.g. student preparation, class activities and homework).*

*'PPC Abstractor' is a tool that helps you abstract your teaching ideas, expressed with PPC Designer, into a generic, more reusable form.*

*click here for*  
**Designer**

# Tools for teachers as designers - PPC

**PPC Browser**  PPC navigation [Adapt this pattern >](#)

Learning Outcome - Students will be able to: **Evaluate differing interpretations of an event, artefact or**

Context (e.g. historical monument, building)

Interpretations (e.g. Classical Historian, Archaeologist etc.)

Key aspects (e.g. origin, purpose, meaning etc.)

**TLA 1 - Briefing**

- Read/view the text/presentation illustrating the importance of interpretation (Investigate - 10 minutes)

**TLA 2 - Exploring to compare multiple interpretations of the context**

- On your own explore multiple perspectives from an archaeologist, a classicist, and a modern historian on the origin, purpose, meaning, references of the Altar of Pergamon, and note the differences (Investigate - 25 minutes)
- On your own work through the exercise to test your understanding of the different perspectives on origin, purpose, meaning, references of the Altar of Pergamon, where the feedback will refer you back to the different interpretations (Practice - 10 minutes)
- On your own, produce an outline of the critical differences between the interpretations (Collaborate - 10 minutes)

**TLA 3 - Collaborating to reflect on the comparisons in terms of the key aspects**

- In pairs, discuss your outlines and agree a joint outline of the critical differences between the interpretations (Collaborate - 10 minutes)
- Discuss with the whole group the ways to appreciate multiple interpretations, making use of your notes from previous activity (Discuss - 25 minutes)

**PPC Inbuilt Collection of Patterns:**

- Effects of System Input on Outputs
- Evaluate Multiple Interpretations**
- Predict Observe Explain
- Guess my X - Process-Object relationship
- Teach to Learn

[V More options to narrow your search](#)




**Refine by Learning Outcome categories:**

☐ Knowledge ☐ Comprehension ☐ Application ☐ Analysis ☐ Evaluation [Reset](#)


**Refine by keyword/keyphrase:**

[Show user generated patterns](#)

**Examples of this Pattern (click to view)**

 Altar of Pergamon  Graduate Center  Child Behavior

This instance is described and implemented @ Altar of Pergamon ([click here to open in new window](#))

 Generic

A library of patterns to inspect

# Teacher adopts and adapts a design

**PPC Designer** | PPC navigation | Save and open PPC designs | Export

Abstract into Pattern > | Open... | Save as... | Export for LD...

Learning Outcome - Students will be able to: Explain how to optimise the inputs to a learning design tool to achieve a well-balanced learning design

Total session time: 210 minutes

Total learning time by activity type

> Browse samples of Teaching Learning Activities | Add Blank TLA

**Briefing**

**Read Watch Listen** | Group size: 1 | Duration: 20 min | X

Study the resource attached illustrating the issues you need to consider in deciding on your inputs to the learning design tool to achieve a well-balanced learning design.

**Produce** | Group size: 1 | Duration: 10 min | X

Make notes on they key points to be aware of in assessing the optimal inputs to the learning design tool to achieve a well-balanced learning design

**Read Watch Listen** | Group size: 1 | Duration: 10 min | X

Study the resource attached that describes the current performance of the learning design tool.

**Produce** | Group size: 1 | Duration: 10 min | X

Add to your notes any points that you had not covered, arising from studying the resource.

Time allotted = 50 min | Add Learning Type

Add notes

**Experimenting to achieve a target**

**Practice** | Group size: 1 | Duration: 15 min | X

Select the inputs to the learning design tool and record your results, in terms of which is closer to achieving a well-balanced learning design.

**Produce** | Group size: 1 | Duration: 10 min | X

Make notes on why you think your inputs produced those results, and what you learn from this.

**Practice** | Group size: 1 | Duration: 10 min | X

Time allotted = 35 min | Add Learning Type

Add notes

**Collaborating to improve**

**Collaborate** | Group size: 2 | Duration: 5 min | X

Now work with a partner to see if you can improve your design. Ask another student to work with you and arrange when you will collaborate. Compare your result with your partner - which is closer to achieving a well-balanced learning design?

**Discuss** | Group size: 2 | Duration: 10 min | X

Discuss why you get the results you do - can you explain them in terms of how the learning design tool works?

Time allotted = 25 min | Add Learning Type

Add notes

**Collaborating to improve**

**Collaborate**

Discuss, prepare, a why your optimal is balanced learning c

**Produce**

Vote on which are t

Time allotted = 30

Add notes

With your partner select different inputs to the learning design tool – can you improve on your previous results?

# Teacher adopts and adapts a design

The screenshot shows the PPC Designer interface with several annotations:

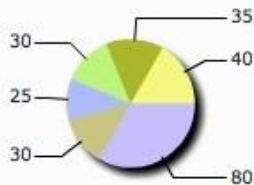
- Share the pattern**: Points to the 'Export for LD...' button in the top navigation bar.
- Export to Word [Moodle]**: Points to the 'Export' button in the top navigation bar.
- Check the feedback on the overall distribution of learning activity**: Points to a pie chart titled 'Total learning time by activity type' in the top right corner. The chart shows a distribution of learning time across different activity types, with values 35, 25, 30, 40, and 80.
- Add link to an OER, e.g. a digital tool for practice**: Points to the 'Read Watch Listen' dropdown menu in the 'Briefing' section.
- Specify the duration of the activity in minutes**: Points to the 'Duration' input field in the 'Briefing' section.
- Adjust the type of learning activity. Edit the instructions.**: Points to the 'Practice' dropdown menu in the 'Experimenting to achieve a target' section.
- Represent the teacher as present or not**: Points to the 'Collaborate' dropdown menu in the 'Collaborating to improve' section.

The interface also includes a 'Learning Outcome - Students will be able to:' section, a 'Total session time' of 210 minutes, and a 'Time allotted' of 30 minutes.

Adopt – Adapt – Import resources - Test and re-design – Share what works



# Export to Moodle for Ed students



Study the resource attached illustrating the issues you need to consider in deciding on your inputs to the learning design tool to achieve a well-balanced learning design.

## Developing a well-balanced learning design

Make notes on they key points to be aware of in assessing the optimal inputs to the learning design tool to achieve a well-balanced design.

Study the resource attached that describes the current performance of the learning design tool.

## Improving a learning design

Add to your notes any points that you had not covered, arising from studying the resource.

Go to the Peadgogical Patterns Collector

<http://tinyurl.com/ppcollector3>

In the Browser, select the 'Understanding Authentic Practice' pattern, choose the Classroom Teaching version, and click on the Adapt button.

Make your edits to the learning design and record your results, in terms of which is closer to achieving a well-balanced design.

Repeat the process until you find what seems to be an optimal design

Now work with a partner to see if you can improve your result.

Ask another student to work with you and arrange when you will collaborate

# Re-design for Med students in PPC

**PPC Designer** | PPC navigation | Save and open PPC designs | Export

Abstract into Pattern > | Open... | Save as... | Export for LD...

**Learning Outcome - Students will be able to:** Explain how to optimise the inputs to a **patient simulator** to achieve **the ideal blood pressure**

Total session time: 210 minutes

Total learning time by activity type

> Browse samples of Teaching Learning Activities | Add Blank TLA

**Briefing**

**Read Watch Listen** | Group size 1 | Duration 20 min | X

Study the resource attached illustrating the issues you need to consider in deciding on your inputs to the patient simulator to achieve the ideal blood pressure.

**Produce** | Group size 1 | Duration 10 min | X

Make notes on the key points to be aware of in assessing the optimal inputs to the patient simulator to achieve the ideal blood pressure.

**Read Watch Listen** | Group size 1 | Duration 10 min | X

Study the resource attached that describes the current performance of the patient simulator.

**Produce** | Group size 1 | Duration 10 min | X

Add to your notes any points that you had not covered, arising from studying the resource.

Time allotted = 50 min | Add Learning Type

Add notes

**Experimenting to achieve a target**

**Practice** | Group size 1 | Duration 15 min | X

Select the inputs to the patient simulator and record your results, in terms of which is closer to achieving the ideal blood pressure.

**Produce** | Group size 1 | Duration 10 min | X

Make notes on why you think your inputs produced those results, and what you learn from this.

**Practice** | Group size 1 | Duration 10 min | X

Repeat the process until you find what seems to be an optimal result.

Time allotted = 35 min | Add Learning Type

Add notes

**Collaborating to improve**

**Collaborate** | Group size 2 | Duration 5 min | X

Now work with a partner to see if you can improve your design. Ask another student to work with you and arrange when you will collaborate. Compare your result with your partner - which is closer to achieving the ideal blood pressure?

**Discuss** | Group size 2 | Duration 10 min | X

Discuss why you get the results you do - can you explain them in terms of how the patient simulator works?

**Practice** | Group size 2 | Duration 5 min | X

Save and upload to the Forum your best inputs that come closest to achieving the ideal blood pressure.

Time allotted = 25 min | Add Learning Type

Add notes

**Collaborating to improve**

**Collaborate**

Discuss, prepare, and why your optimal input blood pressure

**Produce**

Vote on which are the best

Time allotted = 30 min

Add notes

With your partner select different inputs to the **patient simulator** – can you improve on your previous results?

# Export to Moodle for Med students



Study the resource attached illustrating the issues you need to consider in deciding on your inputs to the learning design tool to achieve a well-balanced learning design.



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 Achieving th

 Developing a well-balanced learning design

**The process of professional collaboration:**  
Collecting learning analytics evidence on what works  
Creating a culture for improving TEL  
Teachers responsible for developing TEL pedagogies  
Solving the 1:25 staff-student ratio problem?

Select the blood

Make your edits to the learning design and record your results, in terms of which is closer to achieving a well-balanced design.

Make your inputs

Repeat the process until you find what seems to be an optimal design

Repeat the proces

Now work with a partner to see if you can improve your result.

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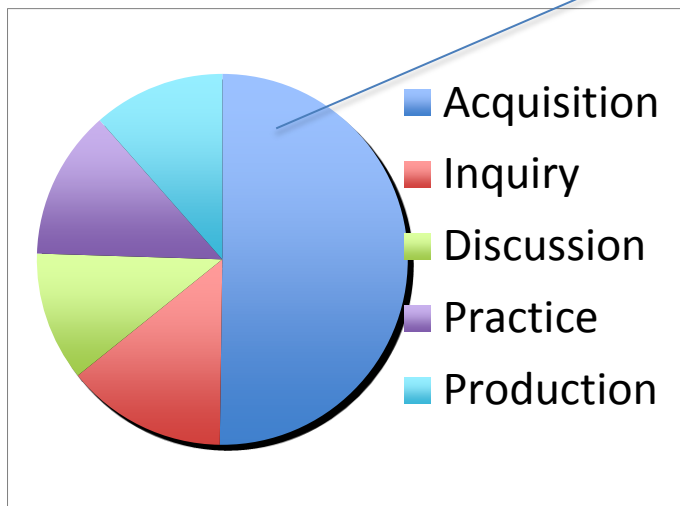
Ask another stude

Compare your result with your partner – which is closer to achieving a well-balanced design?

# Modelling the pedagogic benefits

A computational representation can analyse how much of each activity has been designed in

## Conventional



Categorised learning activities

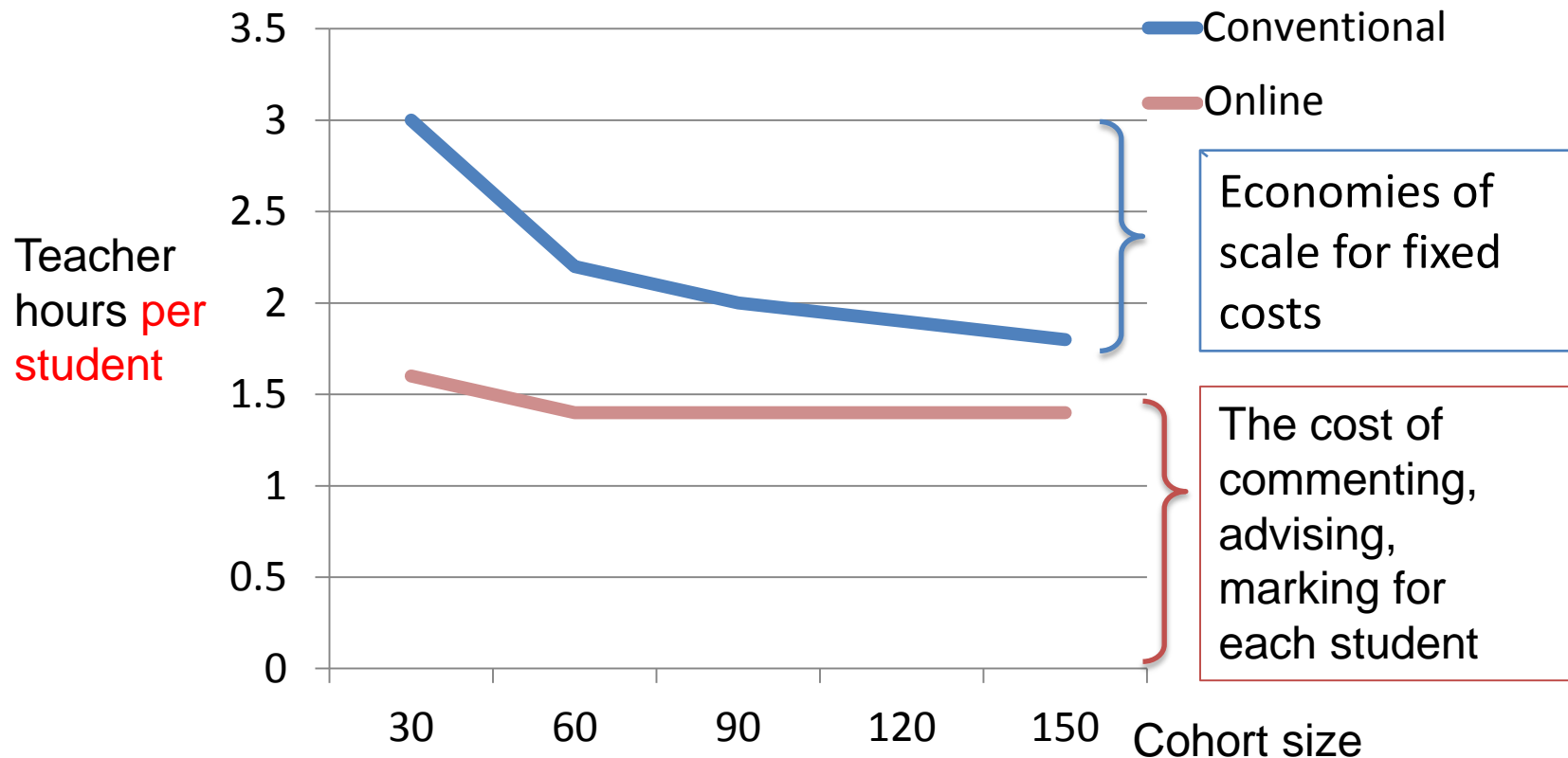
## Blended



Analysis shows more active learning



# Modelling the costs for increasing student cohort size



Scaling up will *never improve*  
the **per-student support** costs...  
unless we invent some new pedagogies

# Teaching as a design science: Tools for professionals teaching MOOCs

The global demand for HE requires investment in pedagogic innovation for MOOCs to deliver

TEL-based pedagogic innovation must support students at a better than 1:25 staff-student ratio

Teachers need the tools to design, test, gather the evidence of what works, model benefits and costs

**Teachers are the engine of innovation** – designing, testing, sharing their best pedagogic ideas

# Candidate big questions

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  - **Economic:** Which TEL pedagogies will help solve the 1:25 staff-student ratio problem in educating the world?
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  - **Technical:** What are the emergent technologies that schools, colleges and HE should be working to introduce over the next few years?

# NMC Horizon Project Short List: 2013 K-12

## **Time-to-Adoption Horizon: One Year or Less**

- Bring Your Own Device
- Cloud Computing
- Mobile Learning
- Online Learning

## **Time-to-Adoption Horizon: Two to Three Years**

- Electronic Publishing
- Learning Analytics
- Open Content
- Personalized Learning

## **Time-to-Adoption Horizon: Four to Five Years**

- 3D Printing
- Augmented Reality
- Virtual and Remote Laboratories
- Wearable Technology

<http://www.nmc.org/horizon-project>

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