



FernUniversität in Hagen



Leading education
and social research
Institute of Education
University of London

Mobile and distance learning: Finding the optimal learning designs

08 November 2012

Diana Laurillard
London Knowledge Lab
Institute of Education

www.ioe.ac.uk

The changing teaching context

- Innovative teaching and learning methods are needed as education attempts to respond to economic, social, cultural, and technological changes
- Teachers have to explore every new opportunity - webinars, social media, mobiles, augmented reality, MOOCs... and the list will keep changing.

Findings on mobile learning

In the future, a transformational model is not located in one place... It will involve fluctuating cohorts of participants ... in different patterns of partnerships based on expert-learner, learner-learner, learner-‘new’ expert, etc. It will have multiple locations – online learning environments *which can be accessed, increasingly, by mobile devices.*

(Pachler et al, 2010: 91, *my italics*)

Typically, personal inquiry learning involves active exploration of an open question, with the student taking ownership of the inquiry process. *Mobile phones can become inquiry toolkits.*

(Sharples et al, 2012: 5, *my italics*)

Teaching must develop an innovative professional learning community

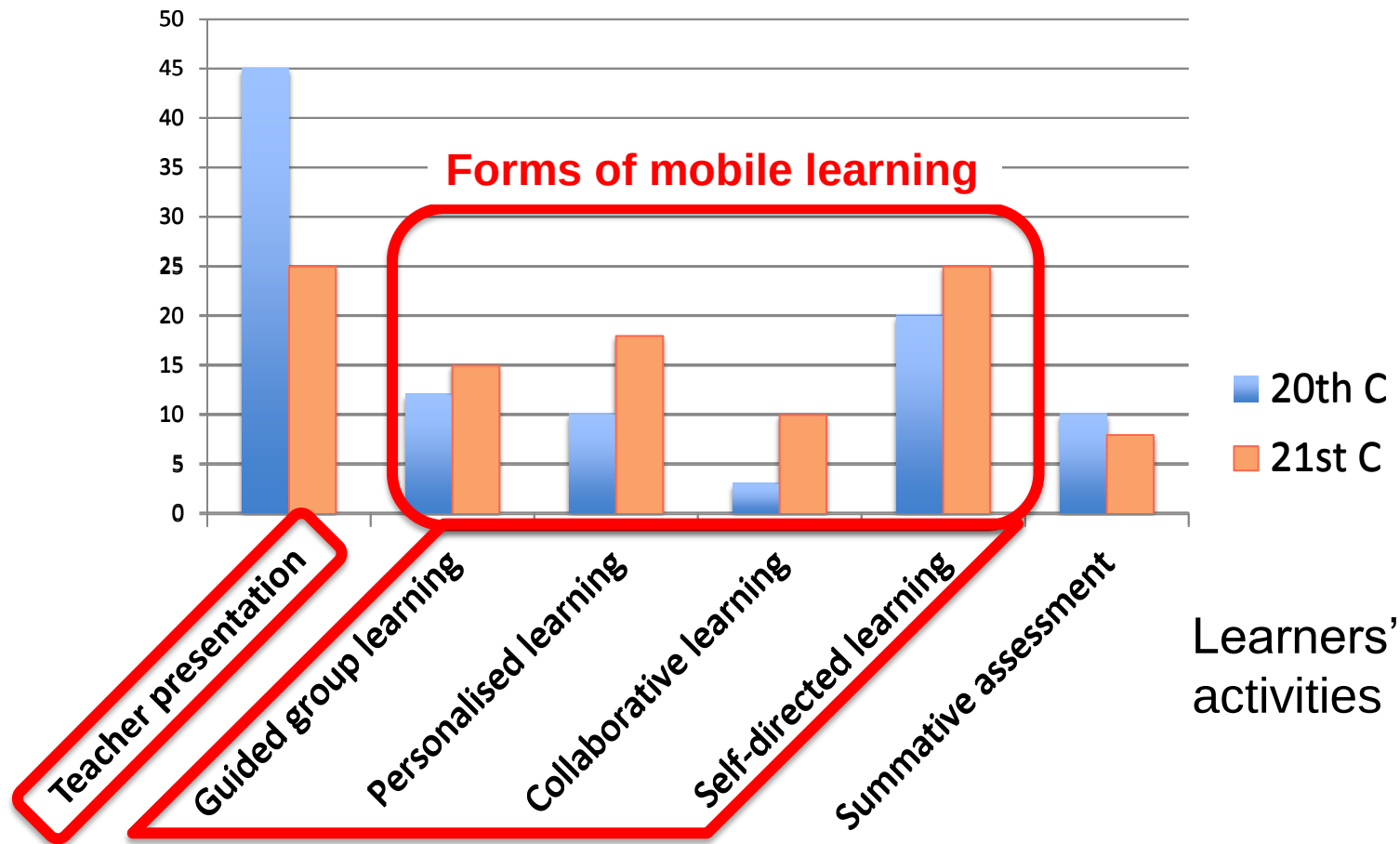
- Rewards to academics and departments are greater for research than for teaching
- Time needed for teaching and innovation in teaching is not understood, not properly costed
- To move from conventional to digital learning we must understand the changes in **time costs** and **learning benefits**
- → Need to professionalise and reward teaching

Changing the nature of teaching and learning

- Increasing the digital activities that improve the learning experience
- Moving from class contact to more mobile, online, personalised, collaborative learning
- Changing the way learners spend their time
- Changing the way teachers spend their time in preparation, presentation, and support

New expectations of learning

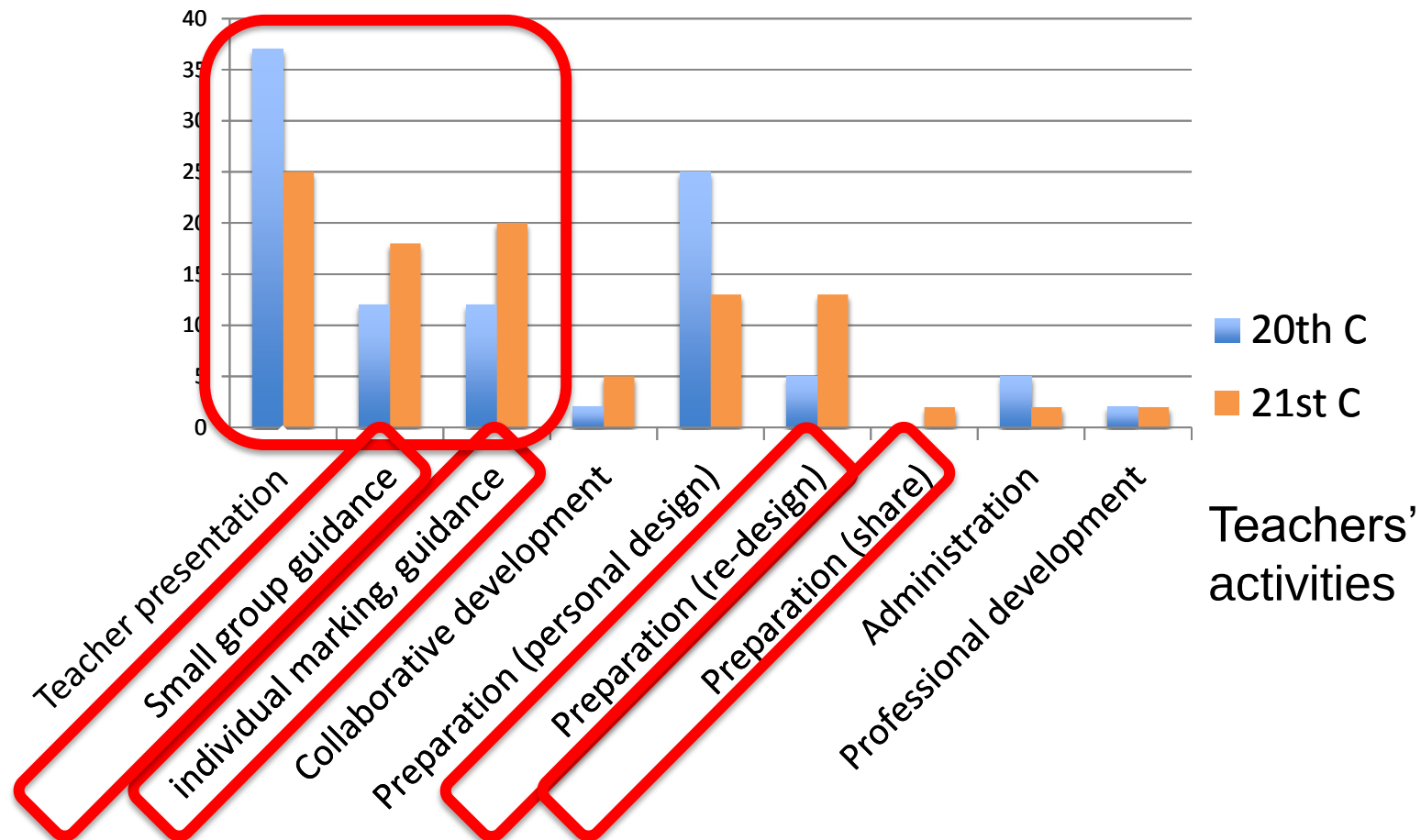
From 20thC to 21stC learner?



...increase in personalised, collaborative, and self-directed

New expectations of teaching

From 20thC to 21stC teacher?



...shift from personal design to co-design of learning

Can learning design be supported computationally?

It's difficult, but it's worth a try, because...

Teachers need much more support than they get to make the most of learning technologies

If they can learn together, collaborate, *build on the work of others*, they can build this knowledge

Not just in staff development courses, not just books and journals, but in the same way as other designers learn...

That's why we built →



The Learning
Designer

The Learning Designer

- Teachers express their effective teaching ideas as a formal 'pedagogical pattern'
- Teachers share their patterns with others to adopt and adapt, using formal descriptions
- Teachers can adopt other's pedagogical patterns of good teaching with open educational resources (OERs)
- The program analyses pedagogy and teacher workload costs

tinyurl.com/ppcollector3

A computational representation

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

tinyurl.com/ppcollector3

The Pedagogical Patterns Collector

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

Learning Outcome - Students will be able to: **Relate theoretical knowledge to practice**

Authentic practice (e.g. classroom teaching, dental surgery etc.)

Data collection method (e.g. photographs, audio recording etc.)

Aspects to focus on (e.g. pupils engagement, patient's comfort etc.)

TLA 1 - Briefing

- Teacher introduces the importance of focusing on **smiling** appropriately for students to focus on in their data collection task (Read/View)

TLA 2 - Planning Data Collection

- Students are grouped into small teams and plan data collection (10 minutes)

TLA 3 - Collecting data

- The data collection is conducted with one or more members of the team (15 minutes) to collect data about **smiling** appropriately in the context of the **customer service**

TLA 4 - Analysing

- The teams select and share their recorded data and share their findings (15 minutes)
- All class members facilitate a discussion and share their findings (15 minutes)

TLA 5 - Reflecting

- The teacher uses the data to facilitate a discussion and share their findings (15 minutes)

A library of patterns to browse, both generic and specific versions

Each activity has been categorised by type of learning, and duration in minutes

Colour-coded text identifies content variables. Black text captures pedagogy design.

PPC In

Effects
Evaluation
Predict
Guess
Teach t

V More c

Refine

☐ Know
☐ Appli

Refine

Show

Example

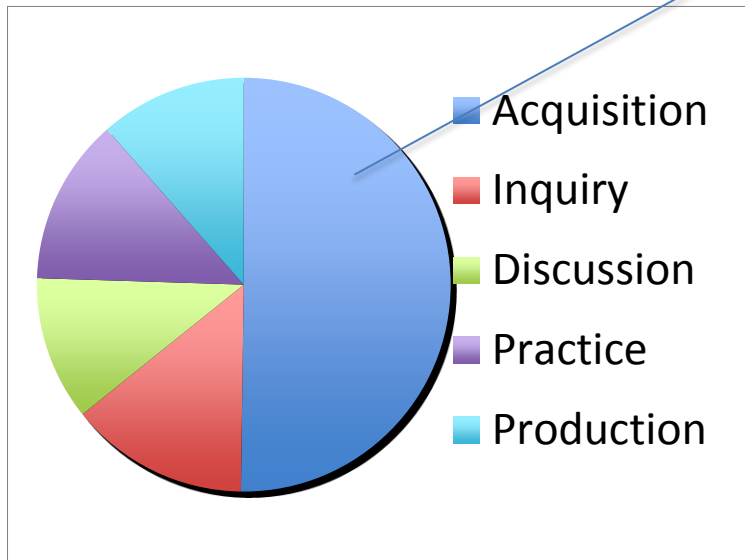
Classroom

This insta
project

Comparison of pedagogical benefits

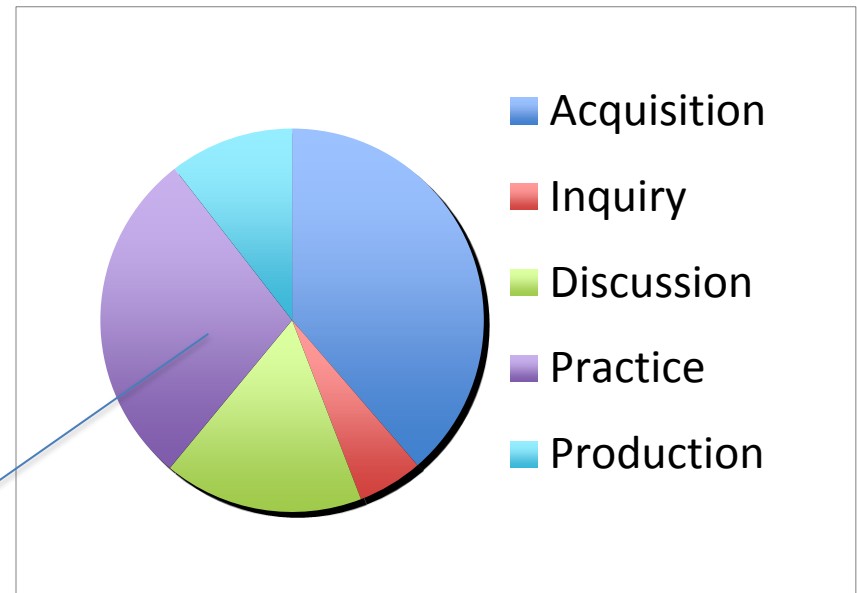
Program analyses how much of each activity has been designed in

Conventional



Categorised
learning activities

Blended



Analysis shows more
active learning

Adopt/Adapt a teaching pattern

PPC Designer | PPC navigation | Save and open PPC designs | Export | Total session time 225 minutes | Total learning time by activity type

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

Learning Outcome - Students will be able to: Relate theoretical knowledge to practice

> Browse samples of Teaching Learning Activities | Add Blank TLA

Briefing

Read Watch Listen

Teacher introduces the importance of focusing on participants' engagement, as one of the general principles of classroom teaching for students to focus on in their data collection task

Duration 10 min Group size 1

Planning Data Collection

Collaborate

Students are grouped into small teams and plan data collection on classroom teaching

Duration 20 min Group size 2

Investigate

Read, Watch, Listen
Investigate
Discuss
Practice
Share
Produce

Collecting data

Practice

The data collection is conducted with one or more members of the team photographing key situations to collect data about participants' engagement in classroom teaching

Duration 15 min Group size 2

Analysing data

Collaborate

The teams select the recorded data and s... providing an explanation evidence

Duration 15 min

Collaborate

members e... m...

Time allotted = 10 min | Add Learning Type

Time allotted = 45 min | Add Learning Type

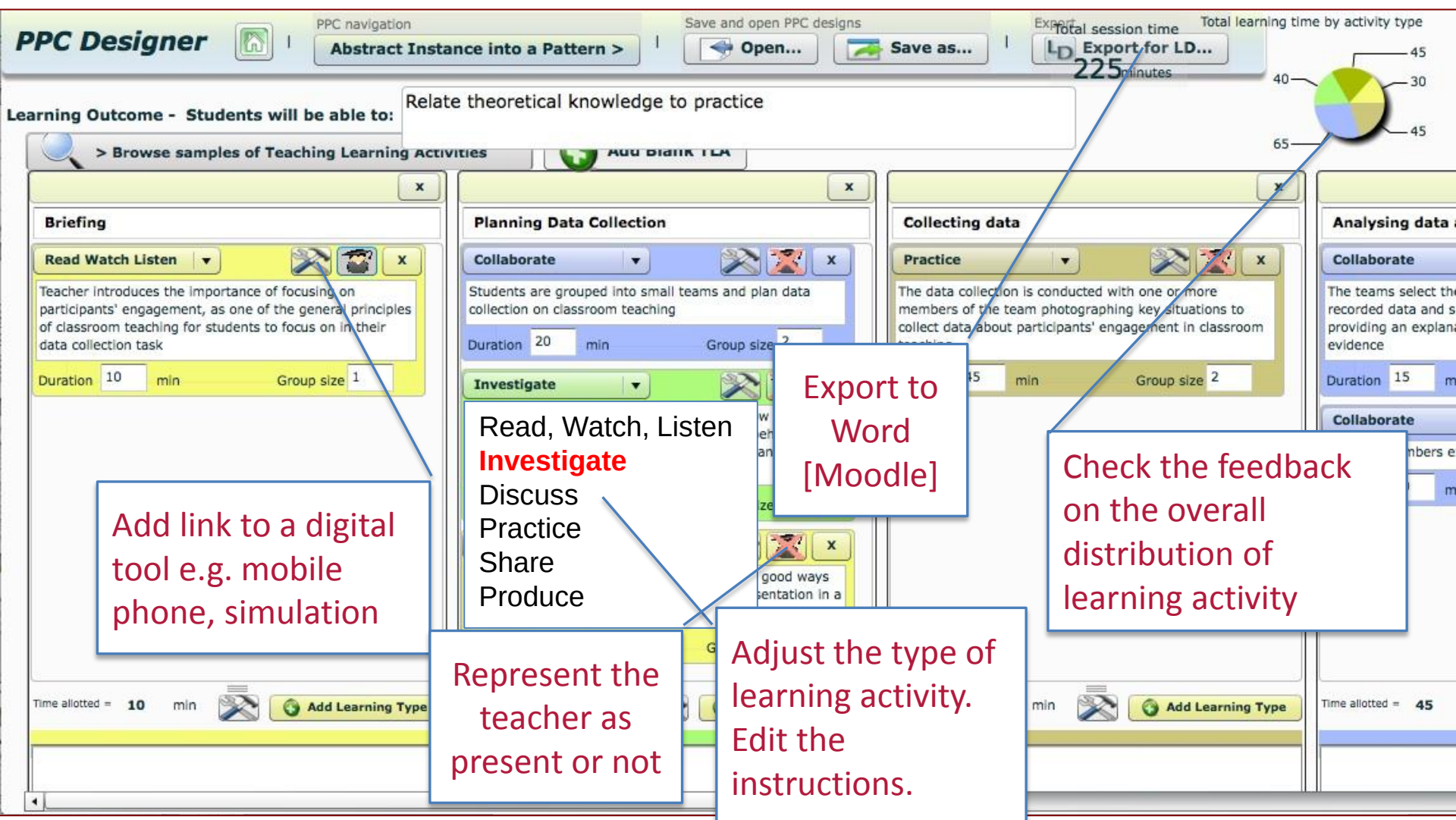
Export to Word [Moodle]

Check the feedback on the overall distribution of learning activity

Adjust the type of learning activity. Edit the instructions.

Represent the teacher as present or not

Add link to a digital tool e.g. mobile phone, simulation



The screenshot shows the PPC Designer software interface. At the top, there's a navigation bar with buttons like 'Abstract Instance into a Pattern', 'Open...', 'Save as...', and 'Export for LD...'. Below this, a 'Learning Outcome' field contains the text 'Relate theoretical knowledge to practice'. The main workspace is divided into several panels: 'Briefing', 'Planning Data Collection', 'Collecting data', and 'Analysing data'. Each panel contains specific activity details, including duration and group size. Callouts are overlaid on the interface, providing instructions on how to use various features, such as adding links to digital tools, representing the teacher, adjusting learning activities, and checking feedback. A pie chart in the top right corner shows the 'Total learning time by activity type'.

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

Comments on the PPC

- *[The pie-chart] is one of the most useful features ... it gives a good overview of the balance between different learning experiences*
- *I rarely consider how the [trainees'] time is apportioned ... it's good to be made to think about this.*
- *Seeing how the sessions are shaping up in such a visual medium would probably make me think more carefully about providing a mix of activities*

on

Save and open PPC designs

Export

Total learning time by activity type

Abstract into Pattern >

Open...

Save as...

Export

LD

knowledge about road safety management

pedestrians in practice

theoretical knowledge about analysing paintings to focusing on

tional style in practice

g Activities

Add Blank TLA

g Learning Activities

Add Blank TLA

Planning Data Collection

Investigate

Group size

Duration 10 min

In groups of 3, students investigate o

websites to decide on what is important

Principles of

In their data

Produce

Group size

Duration 8 min

Students note the main points to look

Collaborate

Group size

Duration 10 min

Students plan their data collection on

management, and decide on who will

who will direct the data collection.

In class about

Planning Data Collection

Investigate

Group size 3

Duration 10 min

In groups of 3, students investigate data on recommended

websites to decide on what is important to look for.

Produce

Group size 3

Duration 5 min

Students note the main points to look for.

Collaborate

Group size 3

Duration 20 min

Students plan their data collection on analysing paintings,

and decide on who will photograph key compositions and

who will direct the data collection.

Using Mobile phone

to film traffic

behaviour

Using Mobile phone

to photograph

paintings

Learning Type

Time allotted = 35 min

Add

Add Learning Type

Independent learning design for Ed students

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

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

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

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

Produce | Group size: 1 | Duration: 10 min

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

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

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

Practice | Group size: 1 | Duration: 10 min

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

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

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

Practice | Group size: 2 | Duration: 5 min

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

Collaborate | Group size: 2 | Duration: 5 min

Save and upload to the Forum your best inputs that comes closest to achieving a well-balanced learning design.

Time allotted = **25 min**

Add Learning Type

Add notes

Collaborating to improve

Collaborate

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

Produce

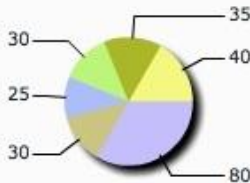
Vote on which are t

Time allotted = **30 min**

Add Learning Type

Add notes

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

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

Total session time

Total learning time by activity type

35 25 40

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

35 25 40 30 80

> 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 they 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 comes closest to achieving the ideal blood pressure.

Time allotted = 25 min | Add Learning Type

Add notes

Collaborating to improve

Collaborate | Group size 2 | Duration 5 min | X

Discuss, prepare, and why your optimal in blood pressure

Produce | Group size 2 | Duration 5 min | X

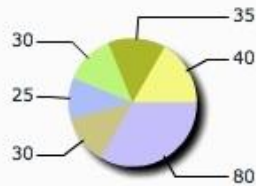
Vote on which are t

Time allotted = 30 min | Add Learning Type

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.



Achieving the ideal blood pressure

Make notes on the 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.



Determine the current performance of the learning design tool

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

Go to the Patient Patterns Collector

<http://medpatientpatterns.com/ppcollector3>

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

Ask another student to compare your result with your partner – which is closer to achieving a well-balanced design?

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 the 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 Pedagogical 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

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

From design idea to adoption to implementation

Design for trainee teachers, in PPC

PPC Designer

Save and open PPC designs

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

Total session time 210 minutes

Learning Outcome - Explain how to optimise the inputs to a learning design tool to achieve a well-balanced design

Students will be able to: learning design

Browse samples of Teaching Learning Activities

Add Blank TLA

Briefing

Read Watch Listen

Produce

Experimenting to achieve a target

Practice

Produce

Collaborating to improve

Collaborate

Collaborate

Produce

Design exported to Moodle for teachers

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 Pedagogical Patterns Collector

<http://tinyurl.com/ppcollector3>

Use the PPC Guide in the resource attached to guide you if you need help.

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

☐ PPC Guide

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

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

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

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

Save and upload to the Forum your best design that comes closest to achieving a well-balanced design.

Design adapted for trainee medics

PPC Designer

Save and open PPC designs

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

Total session time 210 minutes

Learning Outcome - Explain how to optimise the inputs to a patient simulator to achieve the ideal blood pressure

Students will be able to: how

Browse samples of Teaching Learning Activities

Add Blank TLA

Briefing

Read Watch Listen

Produce

Experimenting to achieve a target

Practice

Produce

Collaborating to improve

Collaborate

Collaborate

Produce

Design exported to Moodle for medics

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.

☐ Achieving the ideal blood pressure

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

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

☐ Determine the optimal drug dose and patient management

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

Go to the Patient Simulation resource

<http://medpatientsim.ac.uk>

Select the 'Blood pressure' activity.

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

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

☐ Patient Simulation resource

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.

Compare your result with your partner - which is closer to achieving the ideal blood pressure?

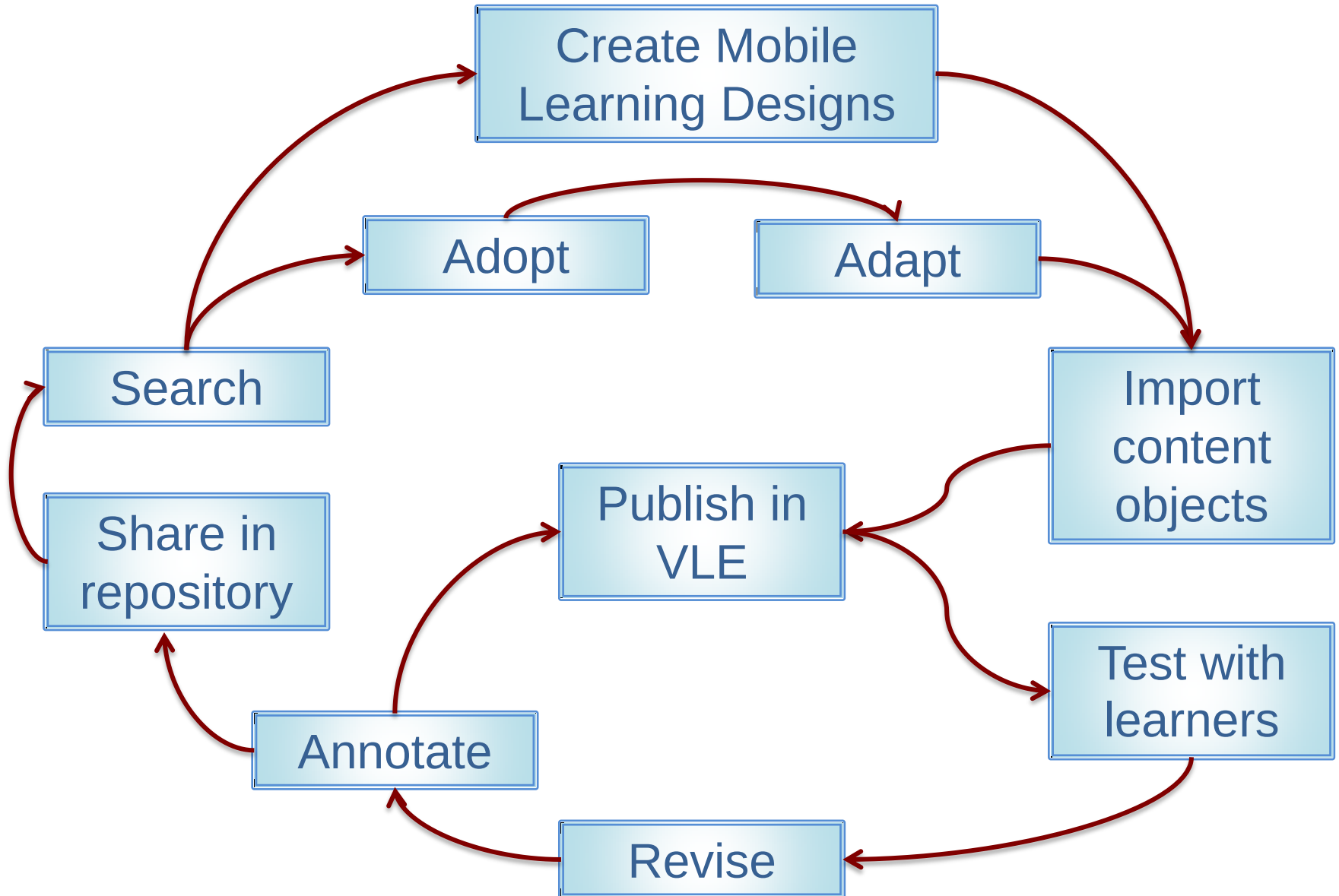
Discuss why you get the results you do - can you explain them in terms of how the patient simulator works?

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

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

[Automatic export to Moodle and other VLEs under development]

Teachers' collaborative design practice



Teachers as innovative co-creators of optimal mobile learning designs

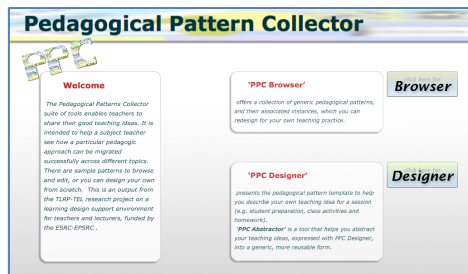
Features of teaching as 'a design science':

- Teachers adopting, adapting, testing, improving, sharing learning designs
- Teaching as collaborative learning, supported by online collaborative design tools and repositories
- A theory-based computational representation of pedagogic design and teacher workload to clarify learning benefits and teaching costs

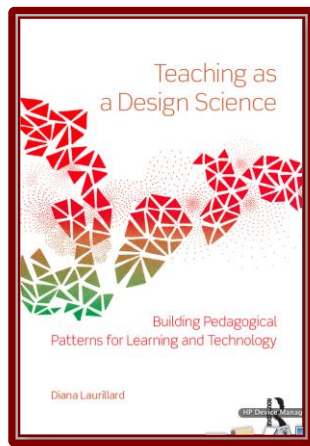
Further details...



www.ldse.org.uk



tinyurl.com/ppcollector3



Teaching as a Design Science: Building pedagogical patterns for learning and technology (Routledge, 2012)

d.laurillard@ioe.ac.uk

The LDSE project team

Oxford

Liz Masterman (CoPI)
Marion Manton (CoPI)
Joanna Wild (RF)

LondonMet

Tom Boyle (CoPI)

IOE/LKL

Brock Craft (RF)
Diana Laurillard (PI)
Dejan Ljubojevic (RF)

LSE

Steve Ryan (CoPI)
Ed Whitley
Roser Pujadas (PhD Student)

Birkbeck/LKL

George Magooulas (CoPI)
Patricia Charlton
Dionisis Dimakopoulos

RVC

Kim Whittlestone (CoPI)
Stephen May
Carrie Roder (PhD Student)