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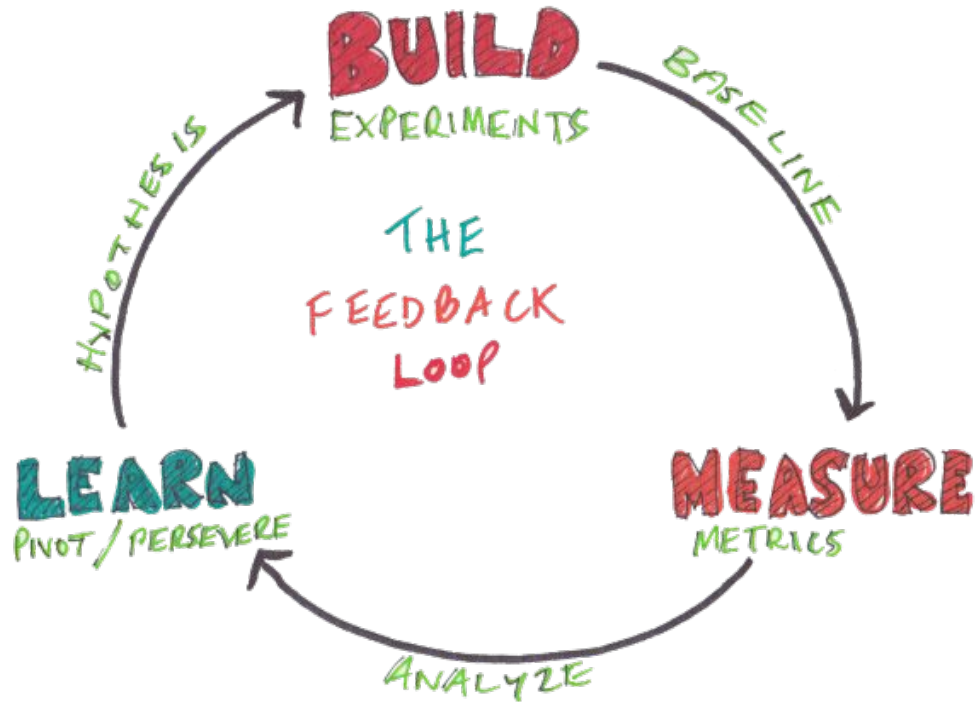
Learning Analytics Workshop

Building accountability into learner centred design

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In digital learning design, 3 pedagogic areas we frequently reflect on and evaluate are:

● **Learning Outcomes**
● **Learner Engagement**
● **Learner Attributes and Development**

Steps
1. Explicitly state high level objectives / goals: What is the intended benefit to learners, users, teachers, university or society? What are you hoping to achieve by using this specific approach?
2. Define your specific actions: What content, intervention or activity will deploy to help you achieve your objective?
3. Success Indicators: If your content, intervention or activity has the intended effect, how would that look? What would learners demonstrate to show success? There will often be multiple success indicators associated with each action. **Success indicators don't have to be obviously measurable right now, but they should be measurable in theory**

What if I want to skip this step and just measure everything?

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Content Engagement Breakdown

⬇ Download CSV

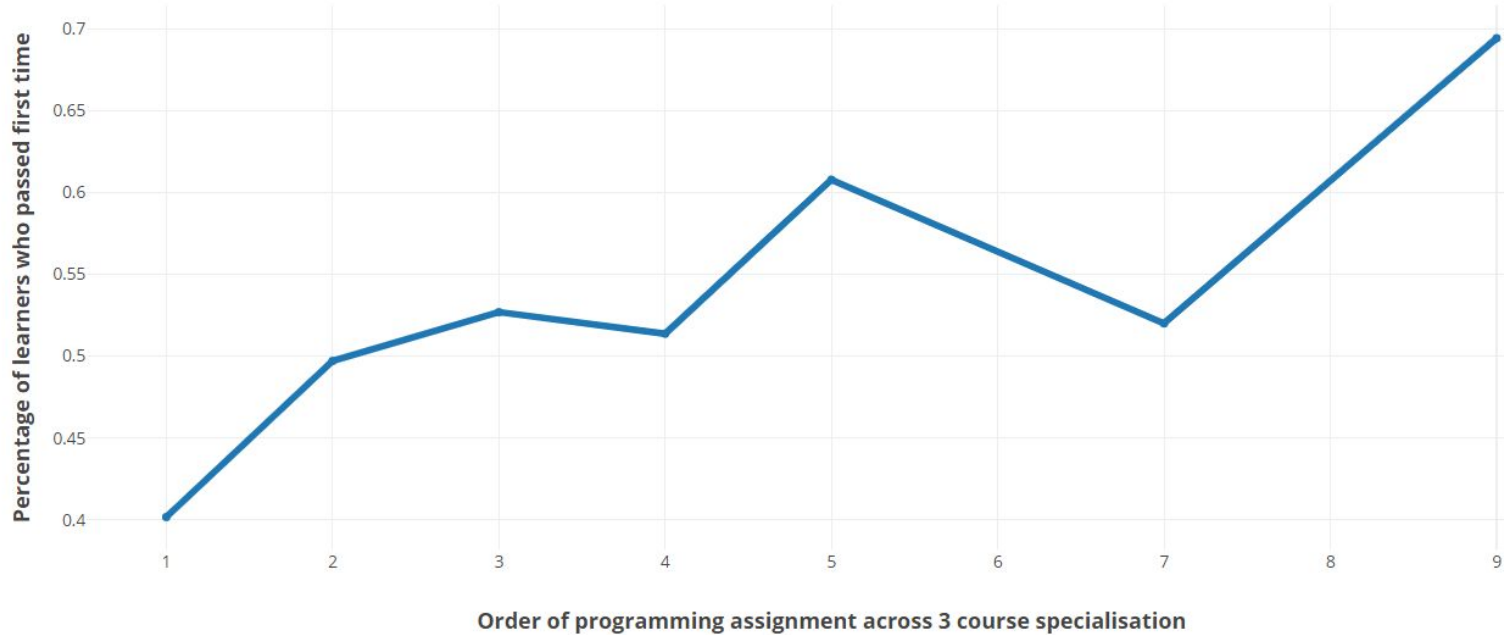| Week Ending ⬇	Active Learners ⬍	Watched a Video ⬍	Tried a Problem ⬍	Participated in Discussions ⬍	Percent of Current Learners ⬍
5 May 2019	360	142	83	28	1.6%
28 April 2019	330	133	71	38	1.5%
21 April 2019	331	128	65	40	1.5%
14 April 2019	348	131	67	43	1.6%
7 April 2019	426	163	91	41	2.0%
31 March 2019	485	153	79	38	2.3%
24 March 2019	418	150	84	40	2.0%
17 March 2019	386	151	80	39	1.8%
10 March 2019	446	173	95	45	2.1%
3 March 2019	497	186	109	62	2.4%

Show 10 entries
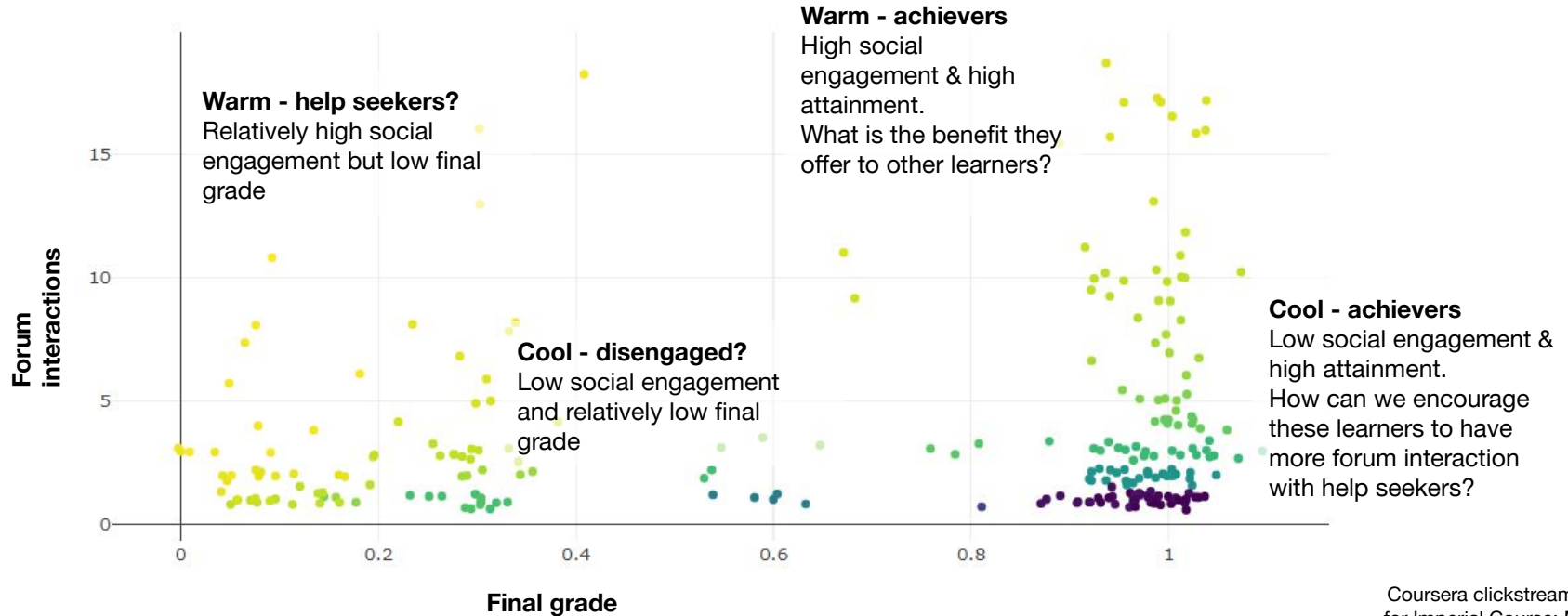
‹ Previous 1 2 3 4 5 6 Next ›

Building confidence in programming skills

As students practice using Jupyter notebooks the percentage of users who pass first time increases, demonstrating the value of problem based learning in developing practical skills

oursera user data: enrolled users across all Imperial Coursera courses

Forum usage / final grade

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Understanding different behavioural groups of our students, with the aim of improving their learning experiences

Warm - help seekers?
Relatively high social engagement but low final grade

Warm - achievers
High social engagement & high attainment.
What is the benefit they offer to other learners?

Cool - disengaged?
Low social engagement and relatively low final grade

Cool - achievers
Low social engagement & high attainment.
How can we encourage these learners to have more forum interaction with help seekers?

Forum interactions

Final grade

Coursera clickstream data for Imperial Course: Maths for Machine learning

How we design

How learners consume
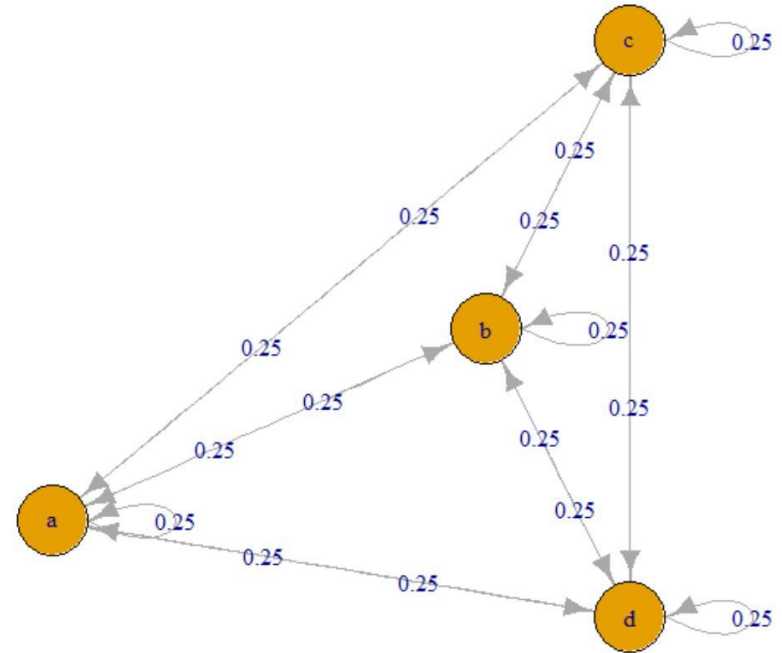

70%
take course items out of order

Markov analysis

A learner can transition from one page to any other page, modelling clickstreams as Markov chains allows us to calculate the probability of each possible transition

- In reality it is much more difficult to transition between some pages than others (e.g. across weeks), we also encourage users to go through pages in order which means the data is not random

We model the clickstream as a 1st order markov chain: this means the transition probability is based solely only on the current page

- In reality a learners likely next page is influence by their recent clickstream history

Optimising course structure

Objective	Action	Success Indicators	Metrics
Improve my health			

Objective	Action	Success Indicators	Metrics
Improve my health	Reduce salt in food		
	Reduce fat in food		

Objective	Action	Success Indicators	Metrics
Improve my health	Reduce salt in food	Blood pressure is reduced	
		More hydrated	
	Reduce fat in food	Lose weight	Δ kg / initial kg
		Reduce visceral fat	

Do it yourself

Examples of different types of objectives

Strategic goals	- Increase reach and retention - Improve diversity of learners and access from low income backgrounds
ILO evaluation	- Learners can model infectious diseases - Learners can critique peer review papers
Digital engagement	- Increase social learning through improved forums - Improve active learning through interactive e-tivities
Learner attributes	- Learners develop good learning habits through revision practice - Learners improve mastery by teaching and supporting other learners

Why are you putting effort into this, what is the benefit to the department, learners, educators or others?

- **DO be specific**: the long term goal may be to improve learning, but there are specific choices you've made about *how* to do this - be clear about your choices and what you hope to achieve.

- **DO state the obvious:** you are the experts, things that seem obvious to you are not obvious to others.

- **Don't worry about what's measurable:** Not every objective can be measured, but defining them is the first step to figuring out how we might be able to measure these in the future

What content, intervention or activity will help you achieve your objectives?

There may be many actions to achieve each objective, try to prioritise the most important ones

It's not necessary to specify each individual item or intervention, where possible generalise

However if there are special cases (e.g. a stand alone innovative e-tivity) identify these as unique actions

If your content, intervention or activity has the intended effect, how would it look?

How would learners demonstrate success?

There will often be multiple success indicators associated with each action - try to choose the most important

1. **Why is defining success important at the start of a learning analytics project?**
2. **When would you use this methodology?**
3. **Next steps**
   a. **Learning Analytics Working Group (talk to your principle learning technologist to feed in high level requirements)**
   b. **Better access to data from learning platforms**
   c. **Support from central ICT**
4. **What are your blockers?**