Enhancing learner engagement in asynchronous online learning through adaptive learning usin H5P in Moodle

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ILOs

- Illustrate the features of adaptive learning that might encourage students' engagement in asynchronous learning
- List the three major content types offered in H5P
- Illustrate the steps to create basic content types in Moodle

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Why this project?

HKU community	PCTLHE
Frequently mentioned challenges by teachers	*A compulsory professional training for teachers*

- Engage students with diverse backgrounds (e.g. prior experience/knowledge)
  - The diverse background of the participants (e.g. disciplines, prior working experiences, working schedule)
- Engage students with pre-class preparation or asynchronous online learning
  - A compulsory entrance programme for all newly recruited academic staff → an opportunity to engage them with different options and help them reflect
- Enhance universities' malleability in offering quality teaching and learning experiences in different "weathers"
  - Enable the online learning options of some PCTLHE contents, increasing its flexibility of delivery
- Expand one's professional skills in e-learning
  - One option for pre-class learning; a case for analysis during the module

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Why adaptive learning?

- A type of customized learning process.

- Only possible with e-learning technology.

- It is about having the learners move through a learning path based on their actions within the course.

- Uses assessment to organize the materials.

- Learners are the major users of adaptive learning.

- Aims at making the learning adaptive and personalized *(but the whole process is still within predetermined contents and options – the importance of accumulating experience/data obtained beforehand!)*

- Started with the idea of having a personal tutor; many e-options now: Smart Sparrow, Knewton, H5P, etc.

- Branching is one of the approaches; also learning preferences (diverse versions of the input); diagnosing and identifying each student's misconceptions and providing feedback;

- Formative assessment-feedback loop

- Feedback for teachers on what is going on with the learners; help teachers customize subsequent face-to-face sessions to address students' learning needs.

Why adaptive learning?

Adaptive learning: Since 1950s

- A means to adapt instructions to learners' backgrounds, goals, preferences, and prior knowledge (Papert, 1980)

- Has been proved to be effective in many studies (Afini Normadhi et al., 2019; Xie, Chu, Hwang, & Wang, 2019).

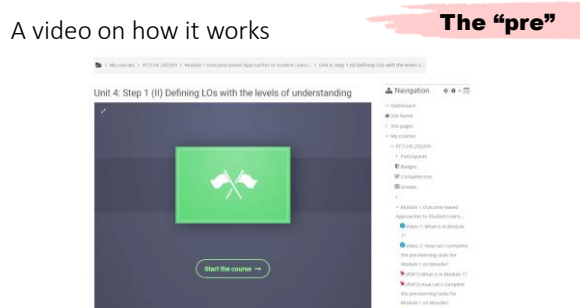Just-in-time teaching for better engagement during synchronous learning

(Kuh, 2009; Kuh, Kinzie, Buckley, Bridges, & Hayek, 2006; LeeTiernan & Grudin, 2001; Martin & Bolliger, 2018; Muir et al., 2019; Nortvig, Petersen, & Balle, 2018; Ragusa & Crampton, 2018; Stone, O'Shea, May, Delahunty, & Partington, 2016)
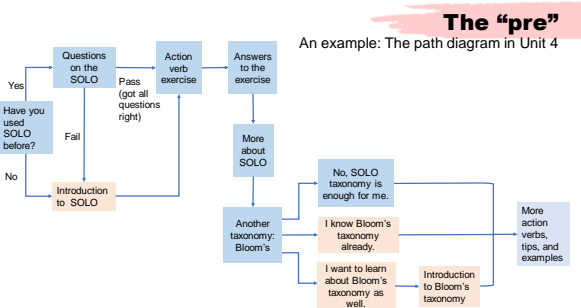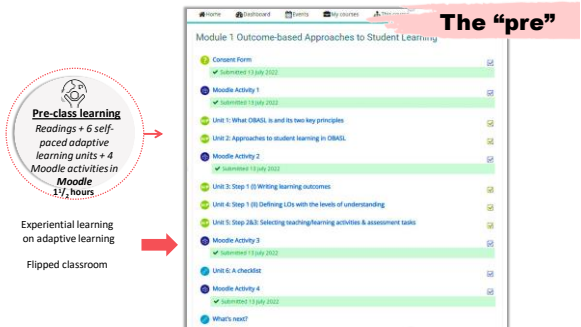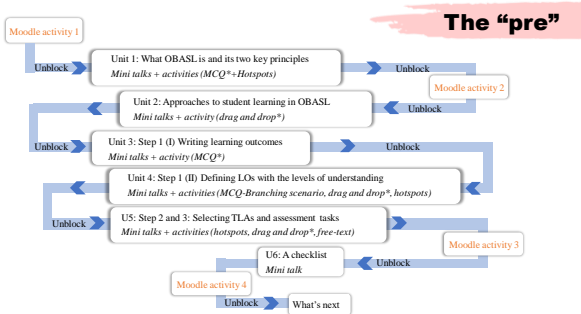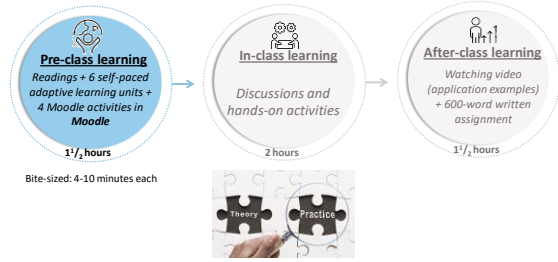

Why adaptive learning?

- The interest in the community: Record high participation in a previous TEFS seminar by the PI on adaptive learning

- A survey at the end of the workshop:
  - 69% of the participants came to the seminar to look for new/good practices for online teaching
  - 21%: particularly interested in adaptive learning

The instructional design

A flipped learning design

Pre-class learning
Readings + 6 self-paced adaptive learning units + 4 Moodle activities in Moodle
$1^1/_2$ hours

In-class learning
Discussions and hands-on activities
2 hours

After-class learning
Watching video (application examples) + 600-word written assignment
$1^1/_2$ hours

Bite-sized: 4-10 minutes each

Theory Practice

The "pre"

Moodle activity 1

Unit 1: What OBASL is and its two key principles
Mini talks + activities (MCQ*+Hotspots)
Unblock → Moodle activity 2

Unit 2: Approaches to student learning in OBASL
Mini talks + activity (drag and drop*)
Unblock

Unblock → Unit 3: Step 1 (I) Writing learning outcomes
Mini talks + activity (MCQ*)
Unblock

Unit 4: Step 1 (II) Defining LOs with the levels of understanding
Mini talks + activities (MCQ-Branching scenario, drag and drop*, hotspots)

Unblock → U5: Step 2 and 3: Selecting TLAs and assessment tasks
Mini talks + activities (hotspots, drag and drop*, free-text)
Moodle activity 3

U6: A checklist
Mini talk
Unblock
Moodle activity 4

Unblock → What's next

The "pre"

Module 1 Outcome-based Approaches to Student Learning

Pre-class learning
Readings + 6 self-paced adaptive learning units + 4 Moodle activities in Moodle
$1^1/_2$ hours

Experiential learning on adaptive learning

Flipped classroom

- Consent Form ✓ Submitted 13 July 2022
- Moodle Activity 1 ✓ Submitted 13 July 2022
- Unit 1: What OBASL is and its two key principles
- Unit 2: Approaches to student learning in OBASL
- Moodle Activity 2 ✓ Submitted 13 July 2022
- Unit 3: Step 1 (I) Writing learning outcomes
- Unit 4: Step 1 (II) Defining LOs with the levels of understanding
- Unit 5: Step 2&3: Selecting teaching/learning activities & assessment tasks
- Moodle Activity 3 ✓ Submitted 13 July 2022
- Unit 6: A checklist
- Moodle Activity 4 ✓ Submitted 13 July 2022
- What's next?

The "pre"
An example: The path diagram in Unit 4

Have you used SOLO before?
Yes → Questions on the SOLO → Pass (got all questions right) → Action verb exercise → Answers to the exercise
Fail
No → Introduction to SOLO

More about SOLO

Another taxonomy: Bloom's
- No, SOLO taxonomy is enough for me.
- I know Bloom's taxonomy already.
- I want to learn about Bloom's taxonomy as well. → Introduction to Bloom's taxonomy

More action verbs, tips, and examples

A video on how it works

The "pre"

Unit 4: Step 1 (II) Defining LOs with the levels of understanding

Start the course →

The "pre"

Introductions in video and PDF formats

- *What is in Module 1?* (around 6 minutes)

What is in Module 1?

- *How can I complete the pre-learning tasks for Module 1 on Moodle* (around 7 minutes)

How can I complete the pre-learning tasks for Module 1 on Moodle?

Course administration → Reports → **Activity completion**

The "pre"

Course administration → Reports → **Activity report**

The "pre"

Grades → **Grader report**

The "pre"

Grades → **Grader report**

The "pre"

Course administration → Users → Enrolled users → More → **Complete report**

The "pre"

Slide 1

The "in"

The pre-class learning:		
Topic/activities		**LOs**
Moodle activity 1		1, 2
Unit 1. What OBASL is and its two key principles	Full mark: 1 / Average: 1	1
Unit 2. Approaches to student learning in OBASL	Full mark: 6 / Average: 5.64, 5.77, 5.85, 5.50	1
Moodle activity 2		1
Unit 3. Step 1 (I) - Writing learning outcomes (LOs)	Full mark: 1 / Average: 1	2
Unit 4. Step 1 (II)- Defining LOs with the levels of understanding	Full mark: 12 / Average: 9.75, 11, 9.43, 8.43	2
Unit 5. Step 2&3: Selecting teaching/learning activities & assessment tasks	Full mark: 3 / Average: 3, 3, 2.71, 3	2
Moodle activity 3		2
Unit 6. A checklist		2
Moodle activity 4		1, 2

Slide 2

The "in"

Go to www.menti.com and use the code 12 47 40 7

Vote for what you want to discuss today:

Vote for what you want to discuss today:

Slide 3
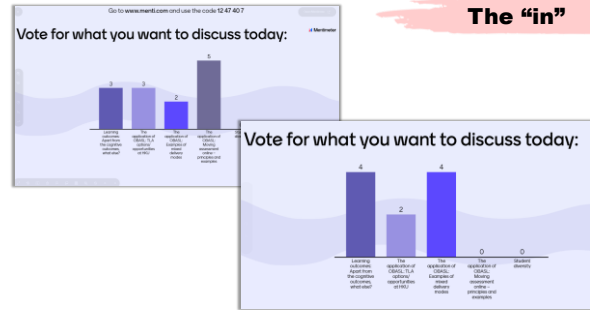
Was it worthwhile?

Achievement and engagement

Slide 4

Measurement

- Pre and post: Practices (writing LOs; writing TLAs/assessment tasks)
  - Low cognitive demand:
    - Description of target knowledge/skill/attitude
    - Use of formula
  - Higher cognitive demand:
    - Use of action verbs
    - Alignment between LOs and TLAs and assessment tasks
- Perceived achievement of LOs (α=.82)
  - e.g.
  - *I am aware of the key principles of OBSAL for course/programme design now.*
  - *I am able to use the taxonomies of learning to write the learning outcomes and plan for TL activities and assessment.*

- Perceived engagement (α=.96)
  - e.g.
  - *I enjoyed participating in the activities.*
 - *The activity made me reflect on my previous understanding of the topic.*

Slide 5

Participants

		Zoom group	AL group	Total
Years of teaching experience	0	12	5	17
	<1 year	9	14	23
	≥ 1 and ≤ 2 years	3	7	10
	>2 years	10	27	37
Total		34	53	87

Slide 6

Changes in practices (within groups; Min=0, Max=3)

2.5-hour ZOOM mode (n=34)

1.5-hour adaptative learning mode (n=53)
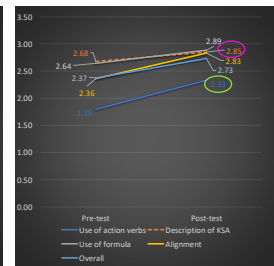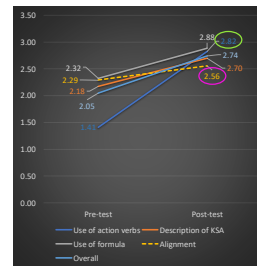
Changes in practices (cross groups; Min=0, Max=3)
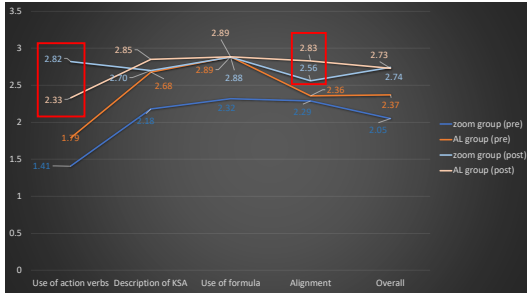
Difference across groups with different years of experience (> 0 year sample)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	2.838 ª	2	1.419	5.993	.004	.152
Intercept	57.677	1	57.677	243.620	.000	.784
Pre_ alignment	.905	1	.905	3.800	0.055	.054
Group	1.776	1	1.776	7.504	.008	.101
Error	15.862	67	.237			
Total	529.000	70				
Corrected Total	18.700	69				

ª R Squared = .152 (Adjusted R Squared = .126)

Engagement

	Leven's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean difference	Std. Error Difference	Lower	Upper
Equal variances assumed	1.667	.199	-.771	84	.443	.146	.189	-.523	.231
Equal variances not assumed			-.729	56.297	.469	-.146	.200	-.547	.255

Perceived achievement of LOs

	Leven's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean difference	Std. Error Difference	Lower	Upper
Equal variances assumed	.868	.354	.164	8584	.870	.021	.130	-.236	.279
Equal variances not assumed			.151	51.636	.881	.021	.141	-.262	.305

Conclusion and takeaway messages

- About the programme
  - Both groups had significant improvement in practices that Module 1 aimed at achieving.
  - Adaptive learning might be a worthwhile alternative given it resulted in better or the same levels of effectiveness (engagement and achievement of LOs).

- For practice
  - Learning to use action verbs seems less challenging to the participants. Having an alignment seems to be more challenging.
  - AL mode seems to work better for the LOs involving higher challenge → asynchronous mode allowed more time for input/absorbing the content?
  - Despite these findings based on the direct measurements of achievement, no significant difference was identified across groups in their perceptions of achievement → and the importance of direct measurement

Conclusion and takeaway messages

- About H5P
  - No cost
  - Good enough for basic activities normally seen
  - Choose another/smarter tool if your activities require students' short elaborated answers or you want to give more customized feedback.

- About TDG
  - Might be easier to get a TDG using "free" tools
  - Add interviews
  - May have to use another funding source since it is difficult to find an RA with relevant pedagogical, instructional and technological knowledge and skills

Content types in H5P and how to set it up in Moodle

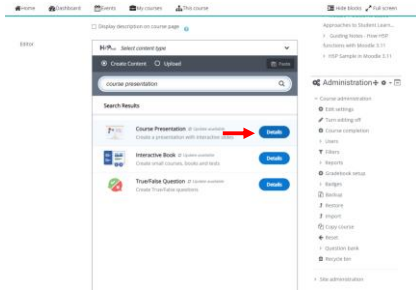Login using your
HKU ID and password

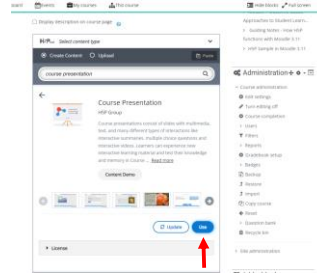**Turn editing on**

Add an activity or resource

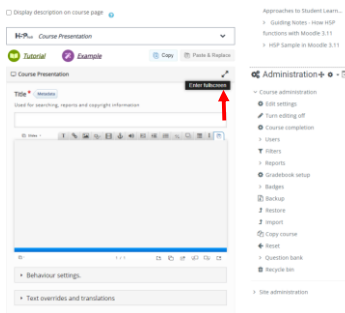**Select Interactive Content**

Search for Content Types

Click Details when the content type appears in the search results
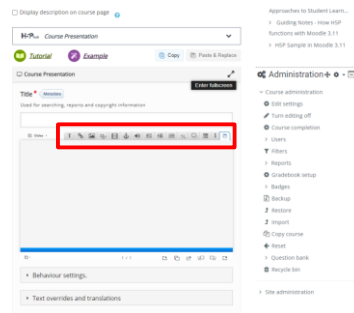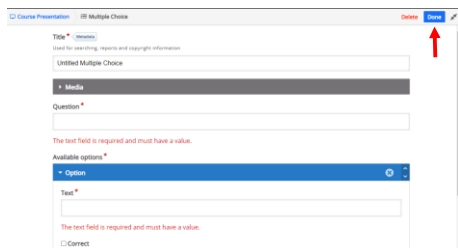

Click Use

You may enter full screen for editing

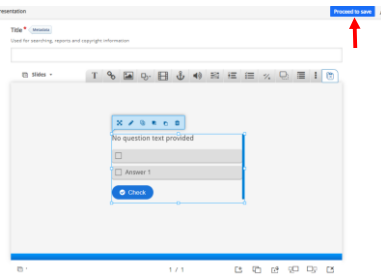**Select features to create your course content and activities**

Example: create a MCQ
Click Done when you finish

Example: create an MCQ
Click Proceed to save

Example: create an MCQ
Click "Save and return to the course" or "Save and display"

Content types available in H5P in Moodle

- **Interactive videos:**
  - **Basic features:** Label, Text, Table, Link, Image, Crossroads, Navigation hotspot,
  - **Tools for activities:** Statements, Single choice set, Multiple choice, True/False question, Fill in the blanks, Drag and drop, Mark the words, Drag the words, Questionnaire, Free text question
- **Course presentation:**
  - **Basic features include**: Text, Links, Image, Shapes, Video, Go to slide, Audio, Audio recorder, Table, Twitter user feed, Continuous text, and Exportable text area;
  - **Tools that can create activities**: Fill in the blanks, Single choice set, Multiple choice, True/False questions, Drag and drop, Summary, Drag the words, Mark the words, Dialog cards, Interactive video

- **Branching scenarios:**
  - Course presentation, Image, Image Hotspots, Interactive Video, Video, Branching question

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Questions?