



University  
of Glasgow

THE AWARDS  
2020

UNIVERSITY  
OF THE YEAR

## Three Case Studies in Incremental Moodle Course Enhancements

15th Annual University of Glasgow Learning & Teaching Conference  
March 2022

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# Cognitive Load Theory – Cognitive Processing



## Extraneous processing

- “cognitive processing that does not support the instructional objective and is created by poor instructional layout (such as having a lot of extraneous text and pictures)”

## Essential processing

- “cognitive processing aimed at mentally representing the core material (consisting mainly of selecting the relevant material) and is created by the inherent complexity of the material”

## Generative processing

- “cognitive processing aimed at deeper understanding of the core material (consisting mainly of organizing and integrating) and is created by the motivation of the learner to make sense of the material and can be supported by instructional methods that promote engagement with the material.”



# Cognitive Load Theory

- “good instructional design should **reduce extraneous cognitive load** and use the liberated cognitive resources to **increase germane cognitive load and learning**” (Plass et al., 2010: 4; emphasis added)

Long term  
Memory



Working  
Memory

# Mayer's 15 Principles of Multimedia Design

## Extraneous processing

- Coherence
- Signalling
- Redundancy
- Spatial Contiguity
- Temporal Contiguity

## Essential processing

- Segmenting
- Pre-training
- Modality

## Generative processing

- Personalisation
- Voice
- Image
- Embodiment
- Immersion
- Generative Activity

A

### How a Bicycle Moves

1. Pedal (a) is pushed down
2. Chain ring (b) moves forward and pulls chain (c)
3. Back wheel (d) rolls forward and propels bicycle



### How a Bicycle Moves

1. Pedal (a) is pushed down
2. Chain ring (b) moves forward and pulls chain (c)
3. Back wheel (d) rolls forward and propels bicycle



B

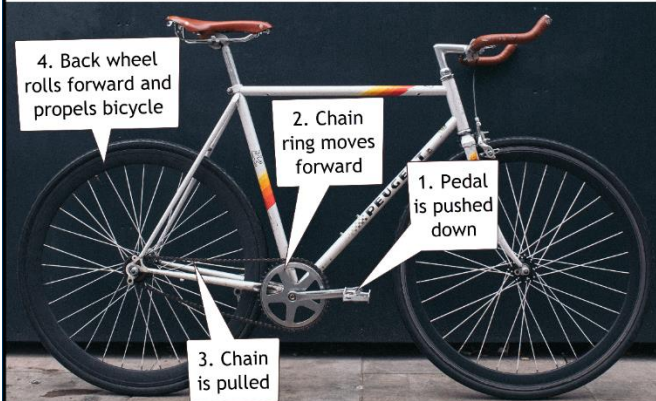
### How a Bicycle Moves

4. Back wheel rolls forward and propels bicycle

2. Chain ring moves forward

1. Pedal is pushed down

3. Chain is pulled



C

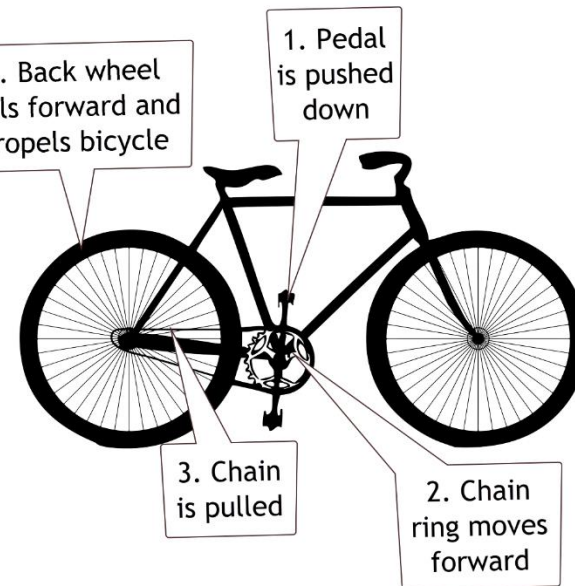
### How a Bicycle Moves

4. Back wheel rolls forward and propels bicycle

1. Pedal is pushed down

3. Chain is pulled

2. Chain ring moves forward



D



# Coherence Principle

“Do not use unneeded words, sounds, or graphics.”  
(Clark and Mayer, 2016: 39)

## How a Bicycle Moves

1. The pedal (a) is pushed down
2. The chain ring (b) moves forward and pulls the chain (c)
3. The back wheel (d) rolls forward and propels the bicycle



## How a Bicycle Moves

1. The pedal (a) is pushed down
2. The pedal cog (b) moves forward and pulls the chain (c)
3. The back wheel (d) rolls forward and propels the bicycle





# Spatial Contiguity Principle

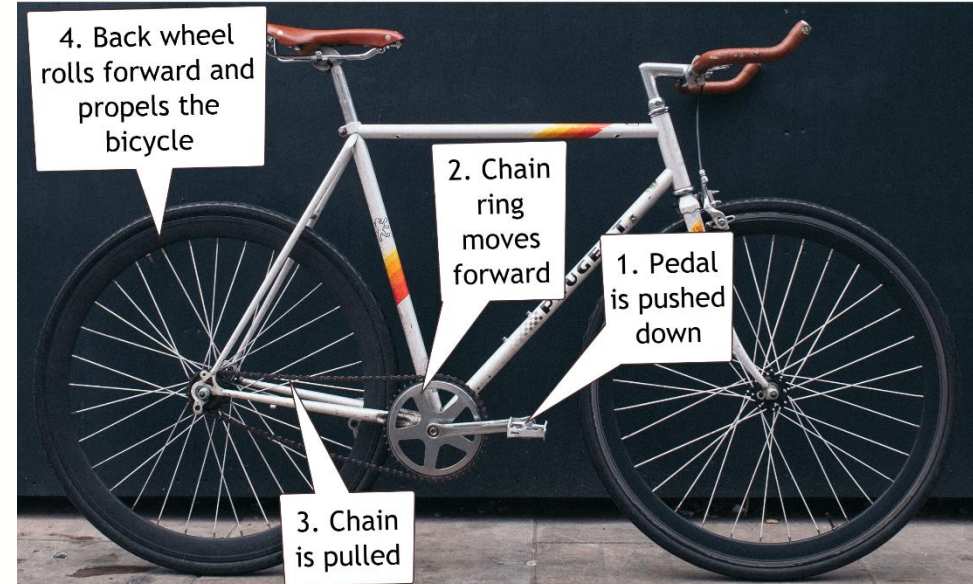
“Place printed words near corresponding part of graphic.” (Clark and Mayer, 2016: 39)

How a Bicycle Moves

1. The pedal (a) is pushed down
2. The pedal cog (b) moves forward and pulls the chain (c)
3. The back wheel (d) rolls forward and propels the bicycle



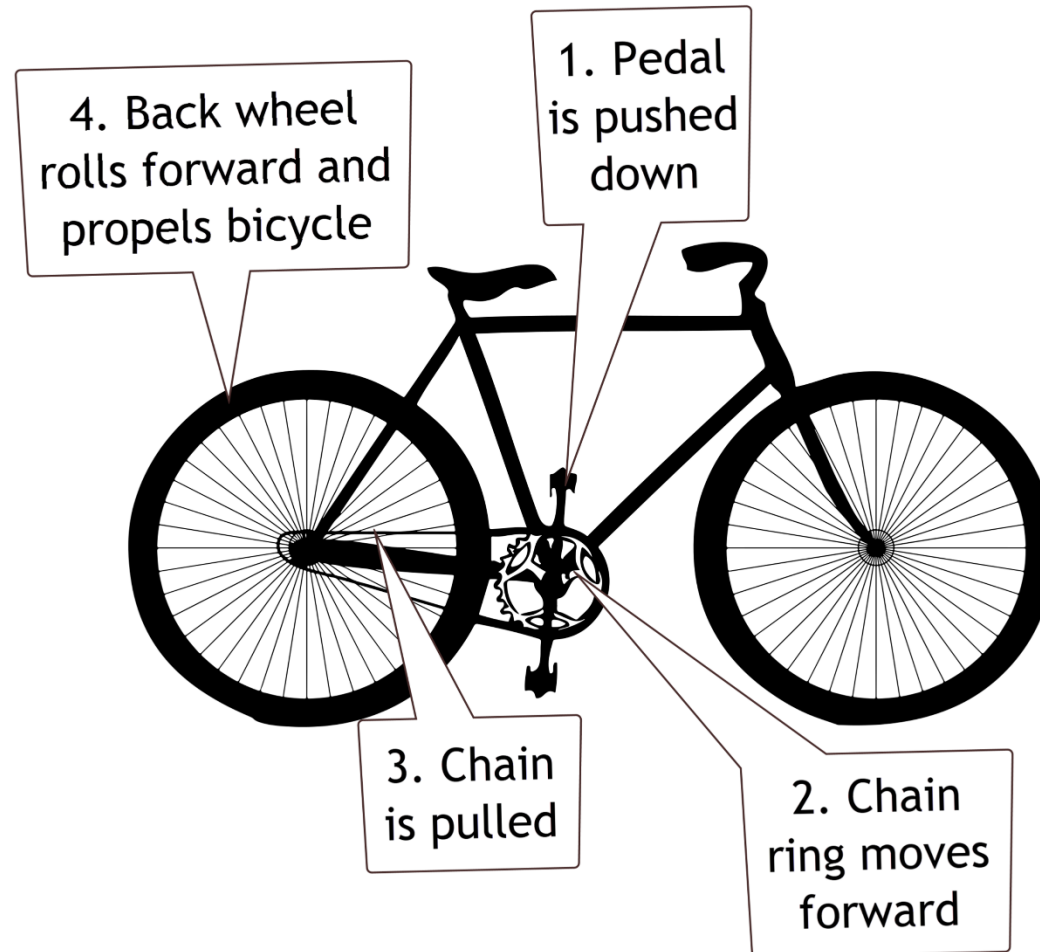
How a Bicycle Moves





# Coherence and Spatial Contiguity Principle

## How a Bicycle Moves







# Using 'Available but not shown on course page' and Labels – Coherence and Spatial Contiguity

## Original Content

[Video - Explaining personality](#)

This short video briefly explains the differences between personality through the 5 factors model.

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[Video - The Dark Triad of personality](#)

This short video briefly explains the differences between 3 factors that can be associated with more negative aspects of individual difference - the dark triad

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[Unit 1: Online group workshop 1: Exercise - The cost of being nice p. 163](#)

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[Unit 1: Portfolio - Multicultural awareness questionnaire](#)

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[Unit 1: Slides](#)

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[Unit 1: Portfolio activity: Hexaco personality inventory](#)

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[Transcripts for unit 1](#)

This folder contains the transcripts for unit 1's videos

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[Unit 1: supplementary materials](#)

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[Quiz 1: Reading linked to chapters 2 and 4](#)

[View](#) [Receive a grade](#)

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[Unit 1: Using insights about personality - thought piece and example for reflective example](#)

## Redesigned Content

individual differences for organisations in terms of HR recruitment and selection processes.

**Essential Online Anytime lectures**

Once you have completed the quiz you will be able to access two **essential online anytime audio enhanced slides shows** that develops your knowledge about individual differences further, and then applies that insight for organisational recruitment and selection. In addition to these essential resources, there are links to two short animations that **explain personality and its dark side** about different personality factors. There is also a short cartoon outlining why selection makes such a difference in detecting "bad apples."

**Essential Portfolio**

To support your reflexive portfolio - click on that file to find the three surveys that you can complete concerned with individual differences. These include **multicultural awareness scale, personality hexaco tool** and the **values exercise**. These personality assessment must be included in your reflexive portfolio assessment.

There are also some **additional materials** that are designed to help you in preparing for your individual assignment.

**Essential tutorial**

Finally, you should also ensure that you read and prepare your own notes for **the exercise** for your synchronous tutorial. This will take your learning further about individual differences and why they matter.

**How does this unit connect to the United National Sustainability goals?**

An important related topic here is diversity – which links to the UN **SDG 5 - Gender Equality, 10 - Reduced Inequality**. Diversity also has implications for **SDG 3 – Health And Well-Being**, and **8 - Decent Work and Economic Growth**. Please find a link to a **The Conversation article** that highlights the important health outcomes for individuals



## Feedback (1)

- Prof Rosalind Searle, Course Convenor
  - “ ... it was a great way to hide the components and **[make] clear essential and desirable components that they could simply click [on]** ... students could focus on the touch down page for the unit and everything was there for them”
- Student feedback
  - “The **assignments are all clearly listed and the unit materials are well explained** on the moodle.”
  - “**course structure and plans are clear**”

# Scaffolding Student Progression with Completion Tracking – Segmenting and Contiguity (1)

- Students must **complete a formative quiz before accessing the lecture slides**

organizations


- Ways of categorizing people in terms of their personality & values - Found in Robbins and Judge chapter 4 - Personality and values

You should read and make your own notes on these two Robbins and Judge (2019) chapters. **The formative 5 item quiz will allow you to progress** taken at any time. This content will also be assessed in a subsequent summative assessment on the 11<sup>th</sup> October. Please ensure that you complete the summative assessment for the individual level on the 11th Oct


It would also be useful to read page 579 - 587 that examines the applications of individual differences for organisations in terms of HR recruitment and selection processes.

**Essential Online Anytime lectures**

**Once you have completed the quiz you will be able to access two essential online anytime audio enhanced slides shows – that develops your knowledge about** individual differences further, and then applies that insight for organisational recruitment and selection. In addition to these essential resources, there are links to two short animations that **explain personality** and **its dark side** about different


 Unit 1: Slides

Not available unless: The activity **Unit 1 Formative Quiz** is marked complete



# Scaffolding Student Progression with Completion Tracking – Segmenting and Contiguity (2)

- **Completion tracking**
- **Restricted view** requires students to **view all the activity pages before opening the final essential activity**

[ ACTIVITY 2.5 ] Your Value Proposition (Essential) 

[View](#)

Having completed activities 2.1 to 2.4, you now need to work on Microsoft teams together, to address the first component of the Business Model Canvas (value proposition).



**Instructions:**

Having completed activities 2.1 to 2.4, you now need to work on Microsoft Teams together, to address the first component of the Business Model Canvas (value proposition).

In this exercise, you need to demonstrate team working and an ability to justify your choices using critical analysis and using evidence to support your points.

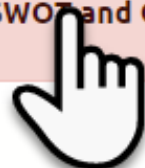
For guidance on [how to use MS Teams, do teamworking, critical analysis and referencing](#), click here and complete the relevant academic skill lessons before beginning the task below.

Please use the Microsoft link below to complete the 1st section of the Business Model Canvas:

 [ ACTIVITY 2.5 ] Your Value Proposition (Essential) 

Not available unless:

- The activity [ **ACTIVITY 2.2** ] **PESTLE** is marked complete
- The activity [ **ACTIVITY 2.3** ] **Empathic Design** is marked complete
- The activity [ **ACTIVITY 2.4** ] **SWOT and Generic Strategies** is marked complete



...e proposition for your

...tional College)

...; College of Medicine)

...ces)



## Feedback (2)

- Prof Rosalind Searle, Course Convenor
  - “it helped me to deliver the course by **ensuring students had the necessary foundations from the reading**”
- Student feedback
  - “**Quiz is help students to reading well** before preparing tutorial.”
  - “Each unit test and summary test can **urge me to keep up with the course** as soon as possible.”



Essential Resources

Video ECI Unit 1 Part 1 - Ines Alves

Video ECI Unit 1 Part 2 - Mel Ainscow

Live session

ECI Unit 1 PowerPoint Slides

Read pp. 24-36 of UNESCO (2020) Towards inclusion in education: status, trends and challenges

Additional Resources

Armstrong, Armstrong & Spandagou (2011) Inclusion: by choice or by chance?

Armstrong, Armstrong & Spandagou (2010) Inclusive Education: International Policy & Practice

Clough & Corbett (2000) Theories of Inclusive Education: A Students' Guide

Meijer & Watkins (2016) Changing Conceptions of Inclusion Underpinning Education Policy

Phasha, Mahlo & Sefa Dei (2019) Inclusive Education in African Contexts A Critical Reader

Poplin, M. S. (1988) 'Holistic/constructivist Principles of Teaching/Learning

Poplin, M. S. (1988) 'The Reductionistic Fallacy in Learning Disabilities: Replicating the Past by Reducing the

Slee (2011) The Irregular School : Exclusion, Schooling and Inclusive Education

Pre Class Activities

Task - Unit 1\_1: Who is excluded from education?

Consider an educational context that you are familiar with and that is relevant to you.

- Who is excluded from education in that context?
- Can you think of any examples from your own lives/ professional experience which illustrate inclusion?

Post your thoughts in the ALL WEEKS Discussion Forum (URL link)

Task - Watch the video Unit 1\_ Part 1



ECI Unit 1 PowerPoint Slides

Task - Watch the video Unit 1\_ Part 2 with Mel Ainscow



Task - Read

Read the UNESCO Recommended Actions to inform actions to promote inclusion and equity within education systems on pp. 24-36 of UNESCO (2020) Towards inclusion in education: status, trends and challenges



# Segmentation Principle

Group related content

Aid students to perceive the underlying structure

Define event boundaries

### Pre Class Activities


**Task - Unit 1\_1: Who is excluded from education?**

Consider an educational context that you are familiar with and that is relevant to you:

- Who is excluded from education in that context?

[Post your thoughts in the ALL WEEKS Discussion Forum](#) (URL link)

### Task - Watch the video Unit 1\_ Part 1



ECI\_Unit1\_Ines

The evolving concept of Inclusion

Unit 1: What is inclusion  
Ines Alves

WORLD CHANGING GLASGOW

0:00 / 16:27

ECI Unit 1 PowerPoint Slides

### In Class Activities

**Zoom Session**

Synchronous Zoom session - Saturday, 18th of September at 10am-12pm UK time

- [Selecting this link will allow you to join the Zoom session](#) (URL link) Meeting ID: 922 9417 2990; Passcode: 708011

### Post Class Activities

**Task - Collaborative Glossary**

We have created a collaborative Glossary where we would invite you to add any relevant concepts and definitions you come across in your readings.

# Signaling Principle

Use cues to highlight the organisation of the material

Signifiers

Headings

Graphic organisers

Typographical cues

## Pre Class Activities



### Task - Unit 1\_1: Who is excluded from education?

Consider an educational context that you are familiar with and that is relevant to you:

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ECI Unit 1 PowerPoint Slides



### Task - Watch the video Unit 1\_ Part 2 with Mel Ainscow



### Task - Read

Read the UNESCO Recommended Actions to inform actions to promote inclusion and equity within education systems on pp. 24-36 of [UNESCO \(2020\) Towards inclusion in education: status, trends and challenges](#)

Customised labels  
assist visual  
organisation



# Flipped Learning

“The flipped classroom model of teaching focuses on moving content that fits in the lower levels of Bloom’s Taxonomy (understanding and remembering) outside class, reserving in-class time for the higher order levels (creating, evaluating, analyzing, and applying)” (See and Conry, 2014: 586)

## Pre Class Activities



### Task - Unit 1\_1: Who is excluded from education?

Consider an educational context that you are familiar with and that is relevant to you:

- Who is excluded from education in that context?
- Can you think of any examples from your own lives/ professional experience which illustrate inclusion?

Post your thoughts in the [ALL WEEKS Discussion Forum](#) (URL link)



### Task - Watch the video Unit 1\_ Part 1



ECI Unit 1 PowerPoint Slides



### Task - Watch the video Unit 1\_ Part 2 with Mel Ainscow



### Task - Read

Read the UNESCO Recommended Actions to inform actions to promote inclusion and equity within education systems on pp. 24-36 of UNESCO (2020) [Towards inclusion in education: status, trends and challenges](#)

Customised labels  
assist visual  
organisation

# A flipped model (1)

“The flipped classroom model of teaching focuses on moving content that fits in the lower levels of Bloom’s Taxonomy (understanding and remembering) outside class, reserving in-class time for the higher order levels (creating, evaluating, analyzing, and applying)” (See and Conry, 2014: 586)

## In Class Activities

### Zoom Session

Synchronous Zoom session - Saturday, 18th of September at 10am-12pm UK time

- [Selecting this link will allow you to join the Zoom session](#) (URL link) Meeting ID: 922 9417 2990; Passcode: 708011

**\*You can decide whether to attend the synchronous session on Zoom or face-to-face**



### Task - Unit 1\_2: How do you define Inclusion in Education?

Answer the questions:

1. How do you define Inclusion in Education?

Share the challenge with your group and work with them to discuss it.

[Post your thoughts in the ALL WEEKS Discussion Forum](#) (URL link)



### Task - Unit 1\_3: Case Vignettes

The following case vignettes have been used to illustrate inclusion.

- If you are attending the synchronous you will be working in small groups during the live session to discuss the questions below and post your discussion on Moodle. If you are posting on behalf of a group make sure you include the names of all the people in the group.
- If you cannot attend the synchronous session, please complete this activity independently.

Select **one** of the vignettes and answer the following questions:

- In what ways would you agree or disagree that these case vignettes illustrate inclusion?
- Are there any differences between the case examples?

Case vignette: Mark

Mark is a wheelchair user and has attended a special school since he started Primary 1. He is now in P5 and through liaison between the special school and a local mainstream primary it has been arranged for him to attend the local mainstream primary for one afternoon per week. Mark is provided with a taxi from his special school and arrives in time for the usual afternoon classes. The activities which are timetabled for the afternoon he attends are library time, practical science and

learning... everyone would... boy was to be... that how... young boy in the class changed the way she taught and led to her managing teaching and learning for the better.

[Post your thoughts in the ALL WEEKS Discussion Forum](#) (URL link)



# A flipped model (2)



## Post Class Activities



### Task - Feedback on the first session

We would love to know about your experiences related to the first session:

- What went well?
- How could your experience be improved (Even better if...)?
- Is there any specific content you would like to see covered?

We have created a Padlet to collect your feedback anonymously. Only you and the tutors will be able to read what you write - and it will all be anonymous.

[Post your feedback here](#) (URL link)



### Task - Collaborative Glossary

We have created a collaborative Glossary where we would invite you to add any relevant concepts and definitions you come across in your readings.

This should allow you, when writing your assignments, to quickly go back to relevant readings and find different definitions of key concepts.

For this you must ensure you reference the source accurately - this is also useful to help you practice referencing as required in all assignments.

[Post your definitions in the Collaborative Glossary](#) (URL link)



## Additional Learning Material

### Readings



Armstrong, Armstrong & Spandagou (2011) Inclusion: by choice or by chance?



Armstrong, Armstrong & Spandagou (2010) Inclusive Education: International Policy & Practice



Clough & Corbett (2000) Theories of Inclusive Education: A Students' Guide



Meijer & Watkins (2016) Changing Conceptions of Inclusion Underpinning Education Policy



Phasha, Mahlo & Sefa Dei (2019) Inclusive Education in African Contexts A Critical Reader



Poplin, M. S. (1988) 'Holistic/constructivist Principles of Teaching/Learning



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## Student Feedback

What went well?

"I really like the way that Moodle is set up with **clear, pre-class, in-class and post-class activities**. This makes it easy for me to keep track of where I am and make sure I am prepared for the synchronous sessions."

"The **mixture of tasks** required to be completed pre and post zoom sessions **is really good**."

"I really like the fact that there are many pre-session and post-session activities and also that **reading for each session is structured** in separate units by weeks."

"I really **like the way that Moodle is set up** with clear, pre-class, in-class and post-class activities. This makes it easy for me to keep track of where I am and make sure I am prepared for the synchronous sessions."

"Enjoying everything so far - like **the balance between pre-class activities, in-class activities and post-class activities**. Also enjoy the breakout groups a lot"

"Very **good balance of pre, during and post class activities**. Excellent that we can also carry out our tasks in an asynchronous fashion."

# Migrating Zoom Videos to Kaltura Media Gallery Playlists

## Unit 1 Lecture Video: Clip 1

Basic concepts

Passcode: ECON4052\_2021

Length: 13 minutes

## Unit 1 Lecture Video: Clip 2

Particular features of health and health care

Passcode: ECON4052\_2021

Length: 28 minutes

## Unit 1 Lecture Video: Clip 3

Why health economics is important

Passcode: ECON4052\_2021

Length: 10 minutes

## Lecture video

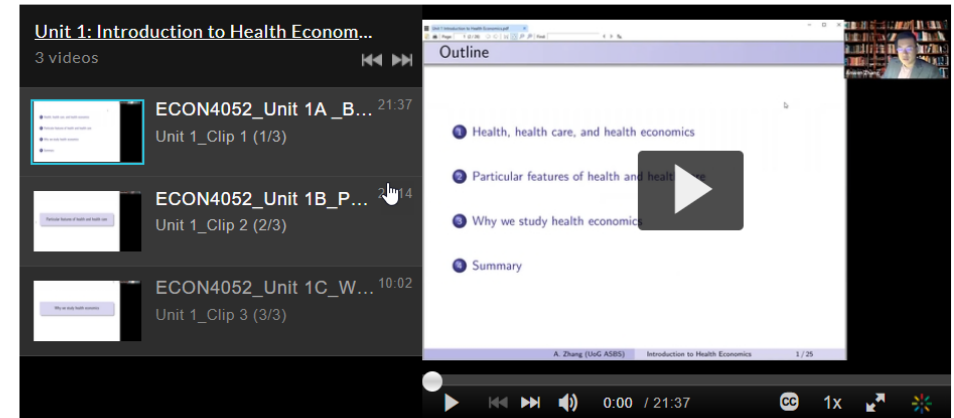
The playlist comprises of 3 video clips:

Clip 1: Basic concepts

Clip 2: Particular features of health and health care

Clip 3: Why health economics is important

If you click on the playlist heading ("Unit 1: Introduction..."), it will take you to **Kaltura Media Space**, where you can utilize more interactive learning functions, such as taking notes and leaving comments.



The screenshot shows a video player interface for a playlist titled "Unit 1: Introduction to Health Econom...". The playlist contains three videos:

- ECON4052\_Unit 1A\_B... (Unit 1\_Clip 1 (1/3)) - 21:37
- ECON4052\_Unit 1B\_P... (Unit 1\_Clip 2 (2/3)) - 28:04
- ECON4052\_Unit 1C\_W... (Unit 1\_Clip 3 (3/3)) - 10:02

The video player is currently showing the first clip, "Health, health care, and health economics". The player controls show a progress bar at 0:00 / 21:37, a play button, and a volume icon. The video title is "A. Zhang (ECON 4052) Introduction to Health Economics 1 / 28".



## Convenor Feedback

"I don't have formal evidence, but based on student feedback it's much better than links to Zoom videos. The playlist for sure was a nice feature from my perspective, making the structure of the video much clearer and more visible."



## Conclusions

- Applying the principles of coherence and contiguity help to reorganise content on a Moodle course in ways that improve navigation and user experience
- A flipped learning approach can be improved by drawing on design elements to segment and signal the different stages of the lesson – pre-class (pre-training), in-class, and post-class



# Bibliography

- Mayer RE (2020) *Multimedia Learning*. Cambridge, UK: Cambridge University Press. DOI: 10.1017/9781316941355.
- Plass JL, Moreno R and Brünken R (eds) (2010) *Cognitive Load Theory*. Cambridge: Cambridge University Press. DOI: 10.1017/CBO9780511844744.002.
- See S and Conry JM (2014) Flip My Class! A faculty development demonstration of a flipped-classroom. *Currents in Pharmacy Teaching and Learning* 6(4): 585–588. DOI: 10.1016/j.cptl.2014.03.003.
- Sweller, John (2010) Cognitive Load Theory: Recent Theoretical Advances. In: Plass JL, Moreno R, and Brünken R (eds) *Cognitive Load Theory*. Cambridge: Cambridge University Press, pp. 29–47. DOI: 10.1017/CBO9780511844744.002.





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