



Reinventing tutorials for medical undergraduates

Combining 'flipped classrooms' with
interactive e-learning platform

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Flipped Classroom

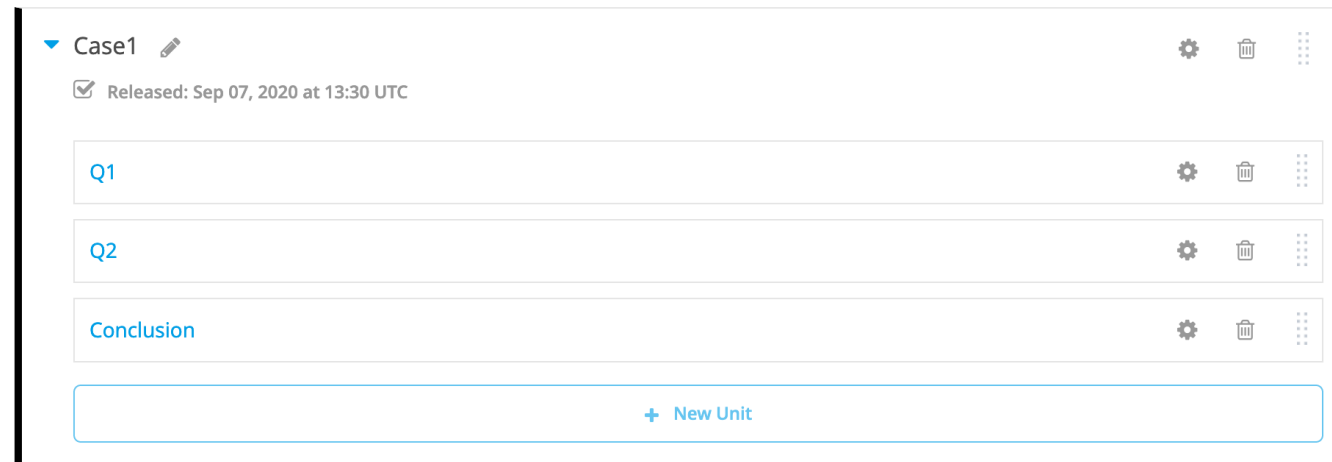
- A **flipped classroom** is an instructional strategy and a type of [blended learning](#) focused on student engagement and active learning, giving the instructor a better opportunity to deal with mixed levels, student difficulties, and differentiated learning preferences during in-class time.
- It moves activities, including those that may have traditionally been considered homework, into the classroom. In a flipped classroom, students watch [online lectures](#), collaborate in online discussions, or carry out research at home while engaging in concepts in the classroom with the guidance of a mentor.

Medical Education

- A working knowledge of the clinical applications of various medical imaging modalities is a core learning outcome for undergraduate medical programs.
- We present here a model of flip classroom approach combined with the use of a multi-functional eLearning platform as an alternative to traditional small group radiology teaching.

Video Lecture

- The didactic components of the teaching materials were converted into online videos using Panopto and uploaded onto the Moodle.
- Clinical cases used during tutorials for illustrating learning objectives were converted into vignettes.



HKU moodle



Panopto™

eLearning Platform

- Functional interaction between Tutor and students in live class
- Dependent study at home by themselves
- Case vignettes review periodically

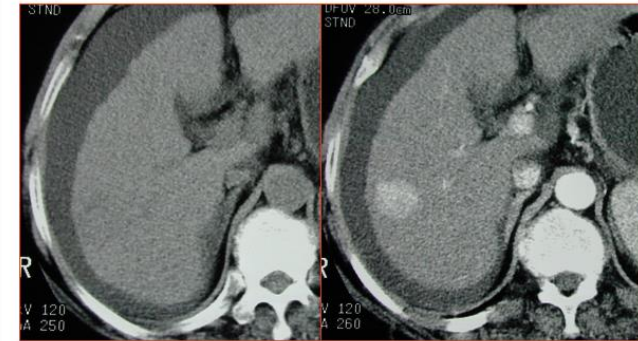
Text

A 70-year-old gentleman attended General Out-Patients Clinic He is a hepatitis B carrier and has been complaining of weight loss, loss of appetite and malaise. On examination, he was cachexic and there was a palpable liver (hepatomegaly) with mild jaundice. Blood tests showed mildly deranged liver function and a raised serum AFP.

Checkboxes

CHECKBOXES (1 point possible)

A CT scan was performed. What are the abnormalities seen on this scan?



Liver cirrhosis

Dilated biliary tree

Ascites

Varices

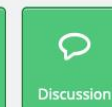
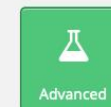
Hypervascular mass

?

CHECK

SHOW ANSWER

Add New Component



eLearning Platform


































- We have transferred all cases in routine teaching lectures into each section
- Each section has a corresponding instruction video by expert radiologist

Content

Skill Outline

+ New Section

Skill Start Date: Sep 07, 2020 at 13:30 UTC

- ▶ **Hepatobiliary Radiology**   
 Released: Sep 07, 2020 at 13:30 UTC
 Contains staff only content
- ▶ **Neuroradiology**   
 Released: Sep 07, 2020 at 13:30 UTC
 Contains staff only content
- ▶ **Imaging of Body Trauma**   
 Released: Sep 07, 2020 at 13:30 UTC
 Contains staff only content
- ▶ **Gastrointestinal Radiology**    
 Released: Sep 07, 2020 at 13:30 UTC
 Contains staff only content
- ▶ **Musculoskeletal Radiology**   
 Released: Sep 07, 2020 at 13:30 UTC
 Contains staff only content
- ▶ **Urinary System**   
 Released: Sep 07, 2020 at 13:30 UTC
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- ▶ **Thoracic Radiology**   
 Released: Sep 07, 2020 at 13:30 UTC
 Contains staff only content
- ▶ **WOMEN'S IMAGING**   
 Released: Sep 07, 2020 at 13:30 UTC
 Contains staff only content

Case Vignettes

- Each case adopted a three-step approach that incorporates **history taking, examination, and investigations** to synthesize differential diagnoses and management plans

History

VIEW UNIT IN STUDIO

Mr. Chan, 84-year old, male was brought in by ambulance following a fall at home. He was found confused at home on the floor by the building security guard. He is a widower who lives independently at home and walks unaided. The security guard noticed he had not left the building for the past 2-3 days and decided to check up on him. He has a past medical history of gout and depression which he is on medication for.

What are the possible causes of the patient's confusion?

	Yes	No
Constipation	<input type="radio"/>	<input type="radio"/>
Electrolyte Imbalance	<input type="radio"/>	<input type="radio"/>
Hypoglycaemia	<input type="radio"/>	<input type="radio"/>
Infection (e.g. UTI / Pneumonia)	<input type="radio"/>	<input type="radio"/>
Stoke	<input type="radio"/>	<input type="radio"/>

Submit

View results

Examination

VIEW UNIT IN STUDIO

The patient was restless with a GCS of 14/15. The patient was disoriented to time and place.

The patient's blood pressure was 160/66 with a pulse rate of 85 bpm regular and a temperature of 36.2°C. Blood glucose level was 5.6 mmol/L

On neurological examination, the upper limb power was 5/5 bilaterally with normal tone and reflexes. Both lower limbs had slightly reduced the power of 4/5 with normal tone and reflexes. The lower limb examination was limited by pain in the knees. The cranial nerves were intact. Normal reactive pupils bilaterally.

The cardiovascular, respiratory, and abdominal examinations were normal.

What imaging investigation would you request for this patient and why?

	Yes	No
CT Brain	<input type="radio"/>	<input type="radio"/>
CT Thorax	<input type="radio"/>	<input type="radio"/>
MRI Brain	<input type="radio"/>	<input type="radio"/>
Skull X-ray	<input type="radio"/>	<input type="radio"/>
Whole Body PET	<input type="radio"/>	<input type="radio"/>

Submit

View results

Investigation

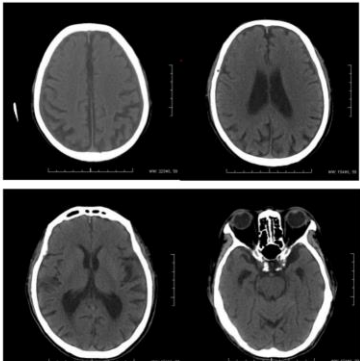
VIEW UNIT IN STUDIO

What does the CT show?

- Cerebellar infarction
- Cerebral infarction
- Epidural haemorrhage
- Subarachnoid haemorrhage
- Subdural haemorrhage

Submit

View results



Case Vignettes

- Students are required to answer a series of questions before moving on to the next stage of the scenarios.
- Additional functions such as image zooming, contrast adjustment, and scrolling were provided for radiological images to simulate 'real-life' interpretations.
- To improve in-class interactions, tutors can see anonymized polled results of students' answers and thereupon adjust the pedagogical approach.

Result

- Eight radiological tutorials covering the junior and senior clerkships were converted to online videos, and 54 case vignettes were constructed.
- Tutorials from different radiological subspecialties were recorded with into bite-size sessions.
- We were able to conduct tutorials either ‘in person’ or ‘virtually’ without the need to alter contents substantially, thus providing an interactive yet consistent learning environment.

Conclusions

- This approach of flipping the classroom with an interactive eLearning modality enabled the department to provide quality and consistent teaching in challenging circumstances such as during the Covid-19 pandemic.
- It retained elements of traditional teaching methods, promoted self-directed learning, and compelled students to exercise their clinical reasoning skills.
- It has demonstrated flexibility in uncertain and disruptive times, and we think it has the potential of up-scalability thus

Thanks