



**HKU  
Med**

# Pre-lecture reading and assessment improves retention of knowledge in final year MBBS students

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# Introduction

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- Existing teaching in Orthopaedics can be improved
- Limited knowledge in our graduates
- Information has been taught
  - Poor recall
- Conventional lectures lead to poor knowledge retention
  - Lack of extensive experience
  - Difficulty to store long-term memory
- Lack of guidance in instruction/full constructivism also fails
  - Ineffective learning
  - Misconceptions and frustration with learning
    - Kirschner et al. Educational Psychologist 2006



# e-learning platform

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- Provision of course materials for self-learning
  - Learner centered and responsibility
  - Better knowledge retention with pre-course learning for anatomy courses
    - Kroncke Med Teach 2010
  - Not completely “hands-off” but reduced spoon-feeding
- Constructivist assumption
  - Students can solve problems and acquire complex knowledge, construct their own solutions
  - Knowledge is acquired with experience
    - Ellaway et al. Medical teacher 2008
- Aim to study the benefits of an e-learning platform for final year MBBS students in retention of knowledge



# Student cohort

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- Specialty clerkship on cervical spine disorders
- 7 groups
- Total n=217
  
- First group with e-learning and assessment as compared to all F-to-F meetings with other seminars (17 total)
  
- Pre-lecture demographics: rotation number, prior experiences, gender, age



# E-learning platform

- 1: background
- 2: patient assessment
- 3: imaging
- 4: neck pain
- 5: myelopathy and radiculopathy
- 6: SCI
- 7: deformity
- Literature links
- Face-to-face review and discussion
- Inclusive of 4 PE videos
- Interview of students after interactive session
- 20 MCQs given online
  - Questions raised in lecture, video, self-search
  - Repeated and randomized at 2-weeks after the interactive session



# Interview

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- 1. How did you think the lecture went?
- 2. Did the pre-course questionnaire help with your learning?
- 3. How did the questions prepare you for the lecture?
- 3. Any problems with the questions?
- 4. Did the lecture or pre-course materials cover the information needed to answer the questions?
- 5. Was the e-learning helpful?
- 6. Would you want other lectures to adopt the same pattern?
- 7. How do you think it can be improved?



# Statistical analyses

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- ANOVA test
- Comparing between groups for the two MCQ test scores and time required



# Results

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- Overall scores
- 1<sup>st</sup> test:  $12.4 \pm 3.8$
- 2<sup>nd</sup> test:  $16.8 \pm 2.8$
- Time
- 1<sup>st</sup> test:  $261.1 \pm 825.9$  minutes
- 2<sup>nd</sup> test:  $49.7 \pm 247.2$  minutes
- $P < 0.001$





Group	Score 1	Score 2	Time 1	Time 2
Rotation 1*	12.5±3.5	15.3±3.6	176.8±391.4	21.4±26.6
Rotation 2*	11.1±3.0	16.0±2.9	127.2±315.8	15.7±21.1
Rotation 3*	16.2±4.0	18.1±2.4	297.9±437.7	121.1±528.7
Rotation 4*	11.2±2.8	17.0±2.8	577.4±1906.9	62.9±207.9
Rotation 5*	12.2±3.4	18.1±1.8	222.0±632.9	17.9±14.8
Rotation 6*	12.4±3.8	16.6±2.7	261.2±574.8	80.8±268.0
Rotation 7*	11.5±3.4	16.1±2.6	183.2±439.7	17.5±20.1

\*p<0.001



# Student interview

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- Questions/MCQ
  - Worried about results, better to know if MCQs counted towards grade
  - Better to have the correct answer and explanation
- Can identify knowledge gaps prior to lecture
- Clearer learning objectives, I knew what we needed to know
- We can learn at our own pace, search and pause as needed
- Students unable to catch up in didactic lectures
- Liked having PE videos and having case summary in person
- Better motivation for learning
- Easier understanding of concepts
- Enjoyed repeated viewing for less easily understood concepts



# Conclusions

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- Good knowledge retention
- Improved MCQ results
- Overall student enthusiasm
  
- Further analysis
  - Response rates/questions of students in the interactive tutorial
  - Deeper analysis of MCQ results: questions related to lecture/video/reference search
  - CCT results
  - ?longer-term MCQ results





## Master of Education Health Professions Education

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This joint specialism delivered by the Faculty of Education and the Bau Institute of Medical & Health Sciences Education (BIMHSE) of the LKS Faculty of Medicine aims to advance the field of Health Professions Education (HPE) in Hong Kong and internationally. This specialism is for educators in the health sciences disciplines who are looking to enhance clinical supervision, lead educational change and transform students' lives. It supports innovation in educational design and delivery in light of the latest research on learning and teaching. Graduates will also have the capacity to develop and evaluate educational quality in healthcare organisations. The MEd (HPE) provides a recognised platform from which graduates could pursue research at doctoral levels (EdD or PhD).

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### Application Deadline

12:00 noon, May 15, 2020 (Friday)

### How to Apply?

Online application at: <https://aal.hku.hk/tpg>

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