

Utility of an e-learning platform and its impact on medical student performance

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Disclosure Statement

Dr Adonis Wazir offers paid consultancy services to Lecturio.

Dr Mohammad Al Houqani has no disclosures.

Introductions



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Medical Education Consultant, Lecturio

Agenda

1. Background
2. Methods
3. Results
4. Discussion & Limitations
5. Conclusion & Next steps

E-learning in Medical Education

Gaining popularity over the past 2 decades

Highly variable use among medical schools (pre-COVID)

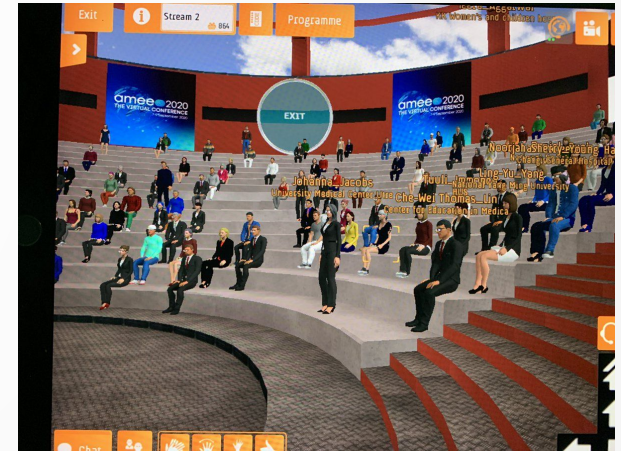
Increasing utility and research in the past few years

Rise in e-learning usage during COVID-19

Since early 2020, medical schools needed to adapt their teaching.

Most institutions rapidly moved to e-learning, and most struggled

Silver lining: a lot to learn from their experiences on the use of e-learning



Evidence for Effective E-learning

Not straightforward to study, but results consistently show

- Good usefulness of platforms
- Cost-effectiveness
- Learner satisfaction

E-learning methods in healthcare professions education is at least equivalent to traditional methods (or better according to some studies)

The failure of e-learning research to inform educational practice, and what we can do about it

David A Cook ¹

Affiliations + expand

PMID: 19330674 DOI: [10.1080/01421590802691393](https://doi.org/10.1080/01421590802691393)

“E-learning is not inherently superior nor inferior to traditional instruction, rather they are different and complementary”

[E-learning research needs] to clarify **how and when to use e-learning.**

Project Aims

Understand an e-learning platform usage trends during the COVID-19 pandemic

Evaluate the impact of the platform and its functionalities on medical student performance

Identify factors that impact student outcomes, and trying to understand how to best use the platform

United Arab Emirates University (UAEU)

Public research university located in Al Ain, United Arab Emirates.

The College of Medicine & Health Sciences (CHMS) has a six-year MD program and has been using Lecturio since 2019.

This project focuses on the Respiratory module, conducted by Dr. Al Houqani.

Healthcare professions education company based in Leipzig, Germany providing an e-learning platform utilized by students and universities.

Designed with learning science principles in mind and allows for in-depth data collection and analysis.

This project is part of an ongoing research initiative to contribute to the healthcare professions education literature.

Diuretics – Osmotic Diuretics

Mannitol

- Acts as an osmotic agent
- Water is "pulled"
- Also works in intracranial hypertension



The diagram illustrates the mechanism of Mannitol as an osmotic diuretic. It shows a nephron with a green proximal convoluted tubule in the cortex and an orange descending and ascending loop of Henle and distal tubule extending into the medulla. Mannitol is introduced into the proximal tubule, creating an osmotic gradient that pulls water out of the surrounding tissue and into the tubule lumen. This process is indicated by a bracket on the right side of the orange portion of the nephron.

×Due Today
34Learned
1⋮

At which vertebral level is the apex of the lung?


☐ C5


☐ C2


☐ C7

☐ C3

☐ C4







Question 2 of 40
ID: 84

Mark

Previous

Next

Lab Values

Notes

Calculator

Reverse color

A 25-year-old man was referred to a neurologist for right-hand weakness. He was involved in a motor vehicle accident 2 months ago in which his right hand was injured. On examination, his grip is weak, especially in fingers 2, 4, and 5 and he is unable to adduct these fingers. Which of the following groups of muscles is most likely affected?

<input type="radio"/> A. Extensor digitorum	5%
<input checked="" type="radio"/> B. Palmar interossei muscles	45%
<input type="radio"/> C. Lumbrical muscles	16%
<input type="radio"/> D. Dorsal interossei muscles	9%
<input type="radio"/> E. Flexor digitorum profundus	22%

Next

Result:


Correct

Explanation:

Correct answer B: The palmar interossei muscles are a group of muscles in the hands that adduct the fingers towards the midline. They also extend the interphalangeal joints and flex the metacarpophalangeal joints. There are 3 palmar interossei muscles, which are attached to the index, ring, and little fingers (fingers 2, 4, and 5). The thumb contains its own powerful adductor, the adductor pollicis muscle, so there are no palmar interossei of the thumb.

Likewise, the middle finger has no palmar interosseous muscle as it lies in the middle and cannot be adducted towards itself. The dorsal interossei abduct the fingers, i.e., move the fingers away from the midline. There are 4 dorsal interossei muscles, 2 are attached to the middle finger to move the middle finger away from the midline on either side; the other 2 are attached to the index and ring fingers.

The thumb and the little finger do not have dorsal interossei because they contain their own abducting muscles within the thenar and hypothenar eminences respectively. The palmar interossei adduct and dorsal interossei abduct the fingers (PAD and DAB). All the interossei muscles, palmar and dorsal, are innervated by the ulnar nerve.



Related Videos:

Palmar Aspect – Anatomy of the Hand

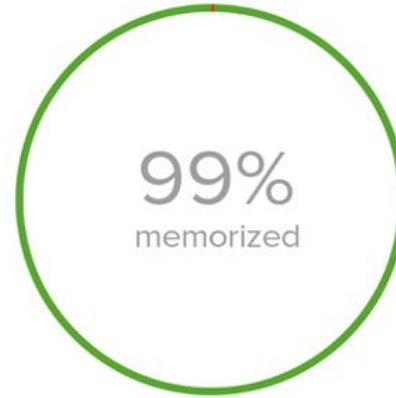
06:24 min

First Aid References:

First Aid for the USMLE Step 1 (2019, 29th ed): 439

First Aid for the USMLE Step 1 (2018, 28th ed): 436

First Aid for the USMLE Step 1 (2017, 27th ed): 429

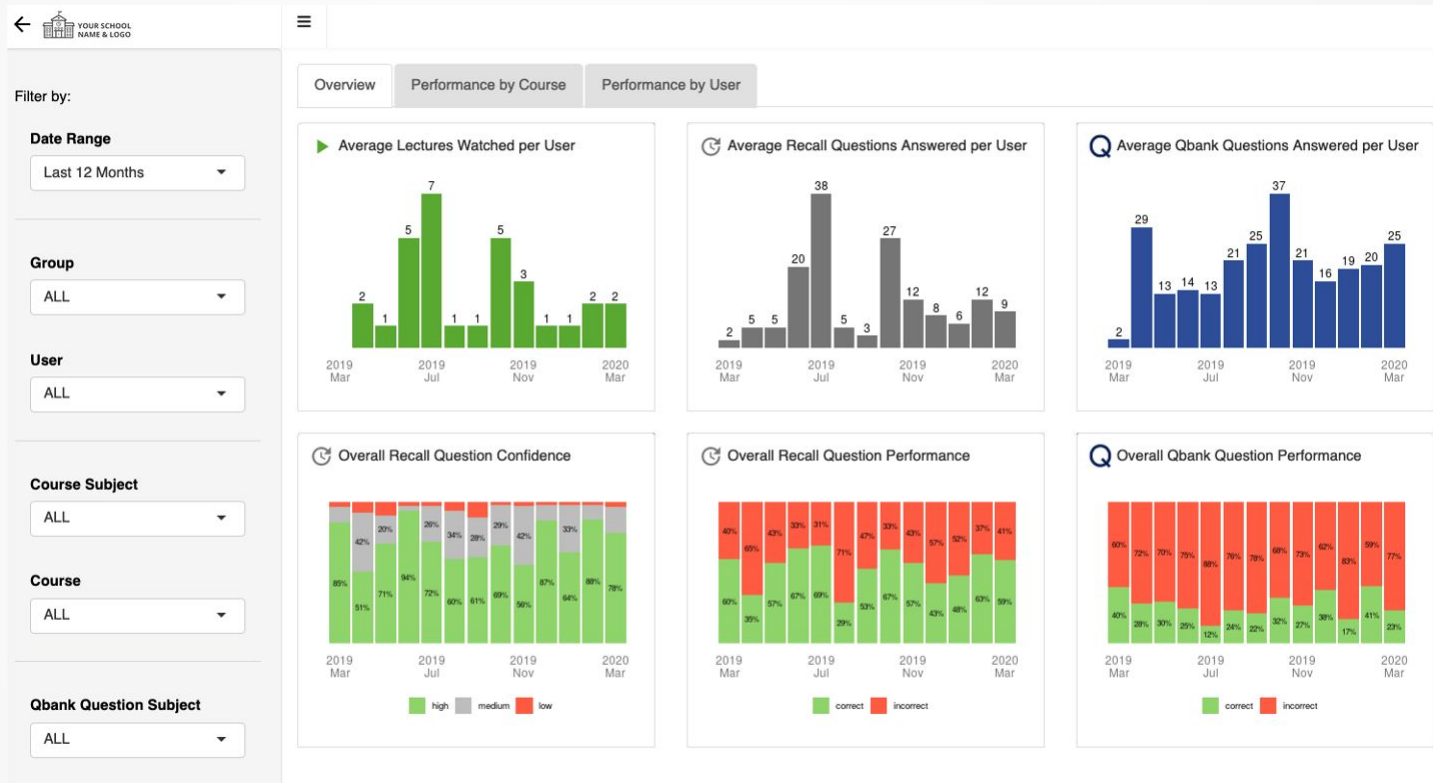


1000 questions in your deck

⚡ 10 Due Today

✓ 990 Memorized

REVIEW DUE QUESTIONS



Sampling & Ethical Considerations

Third-year medical students undergoing the Respiratory module over the year 2019, 2020, 2021, 2022.

Ethical approval from the Institutional Review Board of the UAEU.

Data Collection

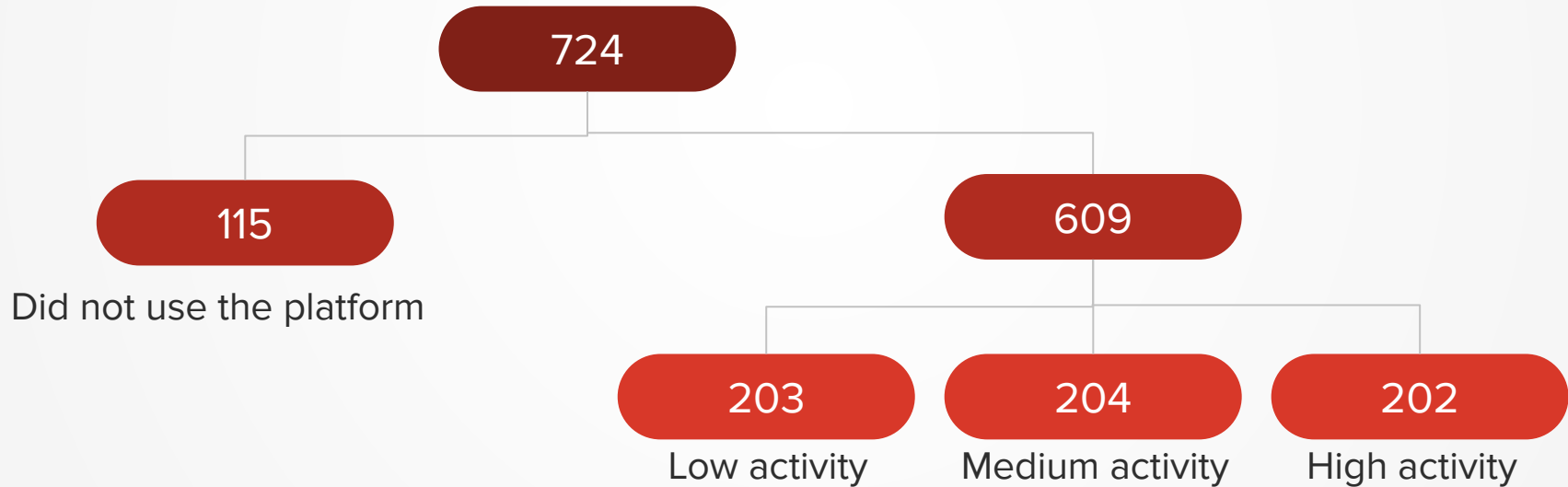
Lecturio
Usage Data

UAEU Exam
Data

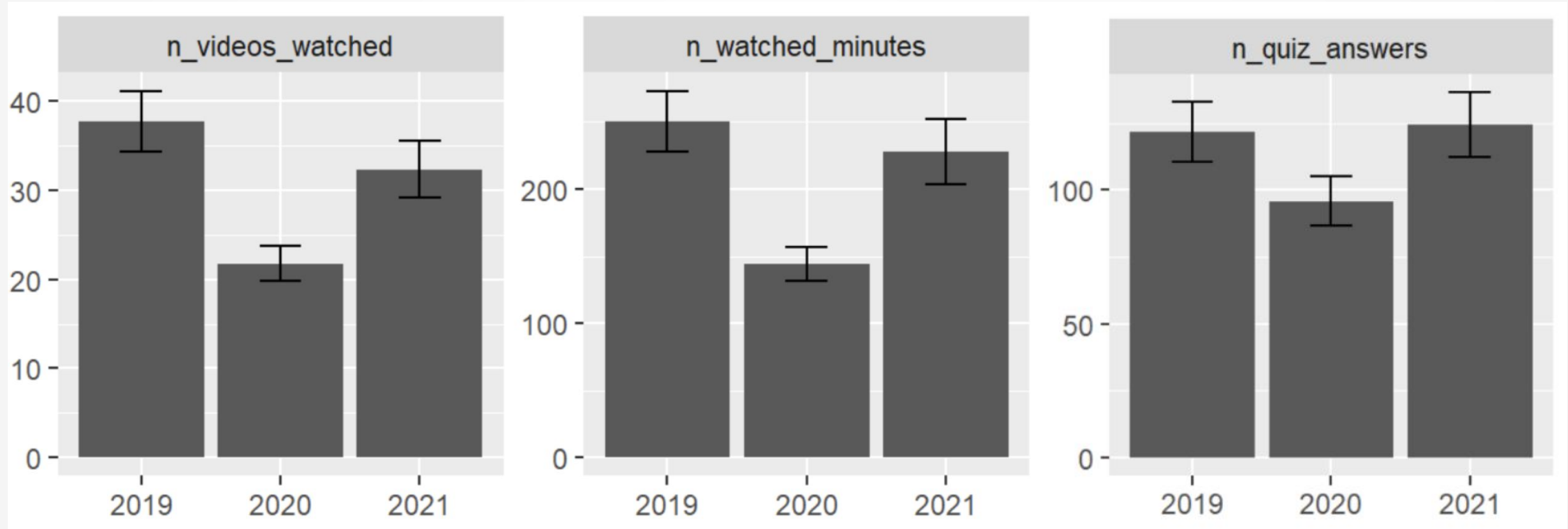
Student
Survey and
Interviews

Overview of results

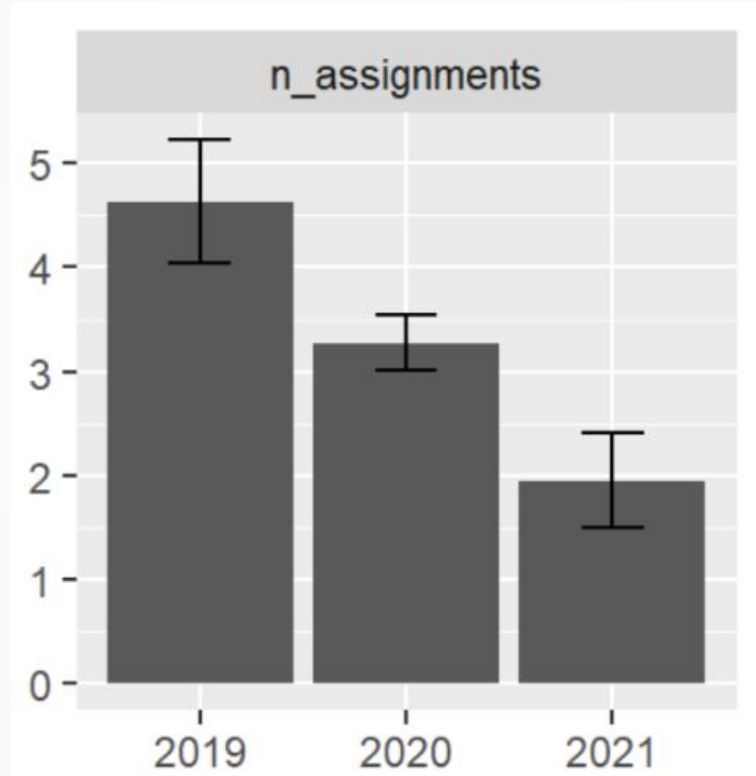
724 students had access to the platform, with 113 faculty members.



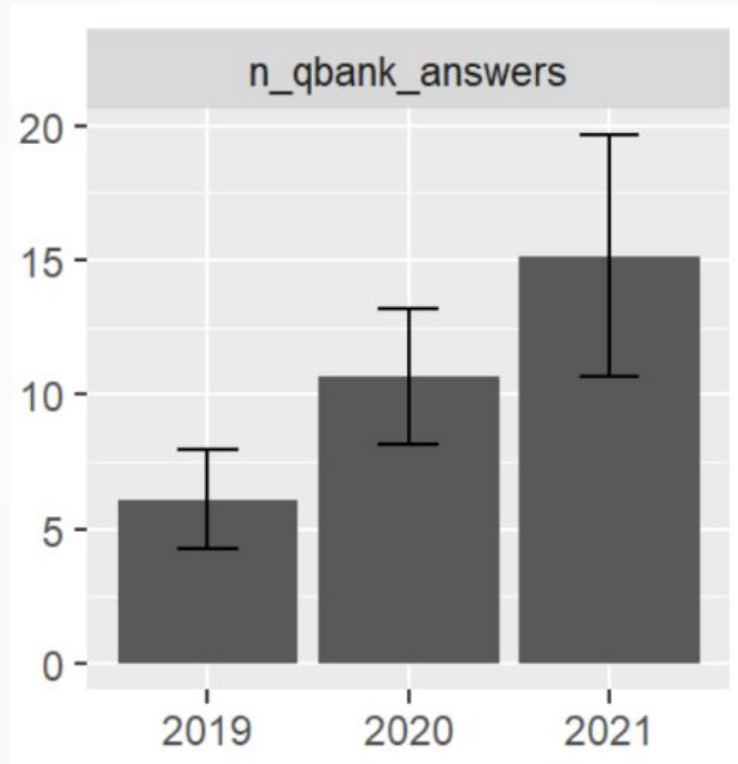
Activity trends with time



Activity trends with time



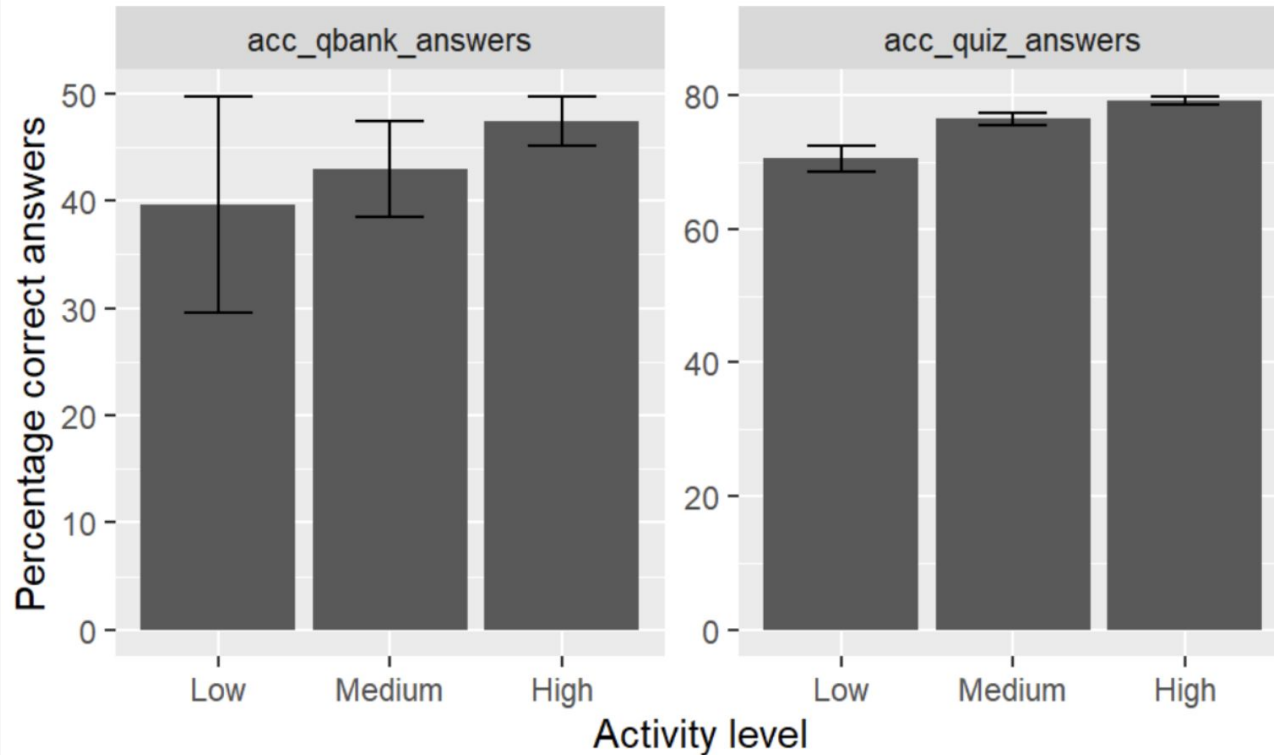
Activity trends with time



Activity trends with time

	Low activity			Medium			High activity			Overall		
	2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
N Videos watched	1.8	1.5	1.8	9.6	13.4	15.6	75.8	45.2	69.5	37.7	21.8	32.3
N minutes watched	11.6	11.0	11.8	67.4	83.2	100.4	500.8	303.1	499.7	250.5	144.0	227.9
N Quiz answers	6.9	7.5	7.1	42.2	67.6	66.6	236.6	190.9	260.6	121.8	95.9	124.3
N QBank answers	0.6	0.1	0.1	2.8	2.1	1.8	11.3	26.6	38.4	6.1	10.7	15.1

Impact of activity on performance



Usage of e-learning during COVID-19

While literature reports increased usage of e-learning during COVID-19, this was not immediate at UAEU. This could be due to the disruption witnessed and the difficulty to rapid shifting to relying on online resources.

2020 had less Lecturio usage compared to 2019, but rose again in 2021, suggesting more stability and return to a new normality.

Insights from students and faculty would help clarify and give insights.

Higher usage correlating with better performance

Results indicate that higher usage of the platform could indicate better performance - this is in-app performance.

Better, more accurate performance data from student exam results.

Our next steps include analysing student exam performance as the outcome, as well as conducting surveys and interviews to factor in possible confounding factors.

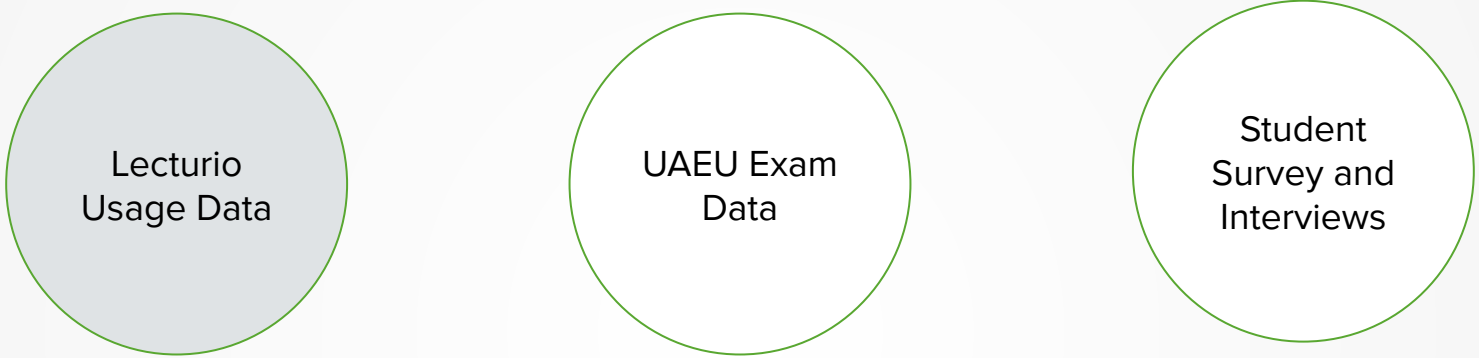
Data-driven teaching: Opportunities

Use of e-learning platform can provide insights into student usage and learning habits, which has great potential for research once optimised.

Design of e-learning platforms should be tailored for accurate and representative data collection, to facilitate insights for educators.

Data can provide insights into gaps in student learning, highlight areas that need improvement, and allow for optimising learning and teaching.

Conclusion & Next Steps



Lecturio
Usage Data

UAEU Exam
Data

Student
Survey and
Interviews

Exam data will allow for more representative student performance data.

Student surveys and interviews will explore study habits, resources used, 'how' the platform was used, among other factors.

Conclusion & Next Steps

Research is needed to understand how and when to best use e-learning platforms and their functionalities.

Does adherence to spaced retrieval algorithms enhance performance?

Does spacing the learning improve test scores?

How can we optimise the use of e-learning platforms to improve learning outcomes?

Thank you for your attention

Please feel free to send us your questions or comments:

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