

Jockey Club College of Veterinary Medicine and Life Sciences

香港城市大學 City University of Hong Kong in collaboration with Cornell University



## Addressing the Learning Style of 'Gen Z' Veterinary Students

#### Dr. Ákos Kenéz, DVM, PhD

Department of Infectious Diseases and Public Health, Jockey Club College of Veterinary Medicine and Life Sciences, City University of Hong Kong

專業 創新 胸懷全球 Professional・Creative For The World Research Framework:

### Digital Learning Environment for Generation Z Students in Veterinary Problem-Based Learning



#### Teaching Development Grant (2023) Innovative pedagogy to engage Generation Z students



Talent and Education Development Office

香港城市大學 City University of Hong Kong

### Generational attributes



- Generational generalizations could encourage stereotypes
- Acknowledgment of generational attributes may provide insights for selection of teaching strategies







### **Generation Z: Digital Natives**

- Open-minded, inclusive, technologically savvy (Chicca & Shellenbarger, 2018)
- Prefer practical, **real-world** learning experiences but tend to become frustrated when challenged with the absence of **instantly available** information (Seibert, 2021)
- Need support with critical thinking skills and opportunities to enhance perseverance (Twenge, 2016)

#### Love of Technology

Gen Z have never grown up in a world without internet, and so technology has become inextricably intertwined with their lives. They are digital natives and have grown up with the smart phone and social media.



## Generation-specific Learning Opportunities

- Consider that Generation Z learns differently and has a worldview that differs from preceding generations (Twenge, 2016)
- Implement educational approaches that accentuate Generation Z's strengths





Jockey Club College of Veterinary Medicine and Life Sciences

City University of Hong Kong in collaboration with Cornell Universit



*Research Project:* 

# The Use of Digital Tools to Support Learning in PBL

Ákos Kenéz, Brett MacKinnon, Francesca Rizzo, Peter J Schiff, Manuel Vizcaino Serrano, Cheuk Ming Li, Rebecca SV Parkes

Jockey Club College of Veterinary Medicine and Life Sciences, City University of Hong Kong



Jockey Club College of Veterinary Medicine and Life Sciences



Table 1. Generation Z skill gaps fulfilled by PBL or learning strength augmented by PBL

Gen Z	PBL
Prefer real-world, practical, experiential learning	Involves a clinical problem regarding a patient situation
Technologically savvy	Could employ finding missing information through a teaching EHR, database, or other online resource.
Need growth in communication skills and practice with team behaviors	Includes small group collaboration and team effort.
Crave feedback and validation, lack confidence	Includes small group validation of each member's input and feedback from facilitator.
Need growth and practice with critical thinking	Engages student in higher order cognition and in all the elements of thought.
Need growth and practice with perseverance	Includes ill-structured problems that require student motivation and persistence to find information, form conclusions, and make decisions.

Twenge, 2016: Problem-based learning: A strategy to foster generation Z's critical thinking and perseverance



Jockey Club College of Veterinary Medicine and Life Sciences



**Problem-based** learning (PBL)

### **Research** question

• Can the **use of digital tools** in face-to-face PBL tutorials enhance our students' learning?

 Objective: evaluate the learning outcomes and satisfaction in PBL as affected by the type of *learning environment* (conventional vs. digitally enhanced)







## Study design

- The class of 3<sup>rd</sup> year BVM students was enrolled (n=23)
  - Function & Dysfunction course (12 weeks, 3 PBL tutorials each week)
  - Small study groups: 6 students + 1 facilitator
  - Educational research study funded by CityU's Teaching Development Grant
  - Human ethics approval and written consent obtained
- Two experimental PBL environments:
  - "Paper and pen" based OFFLINE (n=2 tutor groups)
  - "Screen and software" based DIGITALLY ENHANCED (n=2 tutor groups)
  - Cross-over after 6 cases





in collaboration with Cornell Universit





ties -	and the second second
	Conclusion 25 to 2 t
PRINCREAS $\xrightarrow{(1)}$ Endurine $\xrightarrow{(1)}$ Revenued (1) $\xrightarrow{(1)}$ Revenued	And an angle of the second sec
Executive: I gets Soft S Securitation active section P Proceeding approximation of the S Securitation of the Securitation of	Aldent
by donne ralls (anno) by donne ralls (by donne) ralls (by donne) ralls (by donne ralls (by don	Torney yes To Hanganes To Hanganes Torney and Security Security Security Torney Security Security Security
A spirit a spectral spect	Alter the colone trailing + by m formation + 0 M + - + - by denote Alter the colone trailing + by m formation + 0 M + - + - by denote my define that the a
shaharhan palaga I - Wanana ayana ala - Sana ayanga - Sana - Manana ayanga - Sana - Manana -	elsaire natio share
Hipspitching hypere (LHE) - chargented by specifications and parts and by the specific terms of	ningen angeleigen. Referense angeleigen. Referense angeleigen. Referense angeleigen.
	+

### **Offline learning environment**

- "paper and pen"
  - hard-copy handouts
  - white-board
  - printed dictionary
  - no electronic devices

### Digitally enhanced learning environment

- "screen and software"
  - soft copies on personal electronic devices
  - internet access instead of the dictionary (quick check)
  - shared files for Facts, Problems,
     Mechanisms, Plan, Learning Issues
  - interactive multimedia screen for drawings and concept map





### Evaluation

- Results: knowledge gain
  - Quiz results: weekly
  - Exam results: mid-term and finals
- Satisfaction
  - Survey after 6 + 6 cases
- Statistical evaluation
  - ANOVA, t-test, and Mann-Whitney test





City University of Hong Kong in collaboration with Cornell University



#### • Survey after 6 cases: Evaluating student satisfaction

Please use the scoring criteria below to indicate how often you experienced these features
during the last 6 PBL cases (1=never, 5=in every case). Your evaluation should reflect how your group worked as a team.

	Left Anchor	Left Anchor			Right Anchor	
	1 (Never)	2	3	4	5 (In every case)	
1. I felt motivated to improve my clinical reasoning processes.						
2. I felt motivated to develop an effective approach to clinical problem solving.						
3. I felt encouraged to take responsibility for my learning, both individually and as a team.						
4. I felt confident explaining the rationale for guestions, mechanisms, plans,						

### Results: Weekly quizzes



Two-way ANOVA: Learning environment: n.s. Weeks: P<0.001 Interaction: n.s.



Jockey Club College of Veterinary Medicine and Life Sciences



### Results: Mid-term and final exams



t-test: Mid-term: P = 0.69Physiology: P = 0.59Pathology: P = 0.15Pharmacology: P = 0.97Case-based: P = 0.56

Means ± SD





City University of Hong Kong in collaboration with Cornell University



### Satisfaction survey results – Motivation

1. I felt motivated to improve my clinical reasoning processes:







3. I felt encouraged to take – responsibility for my learning, both individually and as a team.



4. I felt confident explaining the rationale for questions, mechanisms, plans, and learning issues.



### Survey results – Learning objectives

5. I was able to generate case- oriented learning issues targeting specific outcomes.



6. I was able to summarize and apply newly acquired knowledge to the case at hand.



### Survey results – Learning process

7. The PBL tutorials supported the integration of material across the course disciplines (physiology, pathology, pharmacology).



8. I felt encouraged to formulate questions addressing my knowledge gaps.



9. I felt encouraged to regularly - evaluate and improve the function of our group.



10. The cases helped me appreciate the clinical relevance of the course's subject matter.



### Survey results – Technical setup

11. The technical setup of the PBL environment supported the effective organisation of the facts, problems, hypotheses, and plans.



12. Drawing figures and illustrations helped me better understand the underlying mechanisms of organ function and dysfunction.



14. Constructing concept maps was effective in the current technical setup of the PBL environment.



13. The drawing of figures was convenient and effective in the current technical setup of the PBL environment.

15. Keeping track of the learning

issues was effective in the

PBL environment.

current technical setup of the



## Summary of findings

- Most evaluated aspects of learning remained unaffected: the use of digital tools did not significantly enhance the learning outcomes and experience overall
- Need for adequate hardware and software for drawings







### **OFFLINE** learning environment

• Key benefit: focus on interpersonal communication and learning on the spot





Jockey Club College of Veterinary Medicine and Life Sciences



### **DIGITALLY ENHANCED learning environment**

 Key benefit: information availability and real-time sharing





Jockey Club College of Veterinary Medicine and Life Sciences



香港城市大學 City University of Hong Kong in collaboration with Cornell University

### Conclusions

- Both environments have benefits and weaknesses
- Most students find it easy to adapt to a different learning environment
- Student feedback suggested that a blend of offline and digital elements is most desired:
  - E.g. hand-drawn figures on the whiteboard and online shared tracking of learning issues







### Acknowledgements

**Participating students:** 

Class of 3<sup>rd</sup> year BVM students in 2023



Talent and Education Development Office

香港城市大學 City University of Hong Kong



### Thank you for your attention

**Contact:** akos.kenez@cityu.edu.hk