

## Background

- An in-depth knowledge of livestock industries, husbandry, welfare and production are an important part of VetEd.
- Hong Kong has a limited agriculture industry. Therefore, it is essential that our students are well-prepared to maximise learning opportunities provided during field-trips, extramural studies and clinical placements.
- Technology is increasing in veterinary education, and the COVID-19 pandemic highlighted the value of diversity in educational delivery techniques, particularly remote options.<sup>1</sup>
- Online resources allow for preparedness for and continuity of learning, even when farm visits are not feasible. For example, incursions of African Swine Fever (ASF) into Hong Kong saw scheduled pig farm visits cancelled as part of the immediate response and risk-mitigation measures.
- Students can prepare and revise at their own pace, revisiting materials or pausing within the virtual reality (VR) landscape.
- The flipped classroom approach is proven in efficacy in veterinary medicine across a range of topics,<sup>2-4</sup> and is linked to increased student satisfaction.<sup>2</sup>
- Students have a high preference for recorded materials, allowing for repeated reference.<sup>5</sup>

## Objectives

- Hypothesis: virtual reality farm and facility tours would facilitate student learning
- Objectives
  - Develop virtual tours for local dairy cattle, poultry and pig farms, and an equine facility
  - Integrate these tours into relevant courses
  - Gather and evaluate student feedback on their perceived value of these new resources

## Materials and Methods

- Alongside a local technology company, we developed VR tours for local dairy cattle, poultry and pig farms, and an equine facility.
- VR tours were integrated into our Bachelor of Veterinary Medicine Year One Livestock Husbandry course
  - Cattle tour available before the in-person farm visit and the poultry tour after
  - Students did not visit the pig farm or equine facilities in-person that semester
- Enrolled students (n=36) anonymously surveyed using an online platform about their learning experience and outcomes\*. Statements were evaluated using a 5-point Likert scale where 1=strongly disagree, 3=neutral, 5=strongly agree.
- Responses:
  - 17 cattle
  - 12 poultry
  - 14 equine
  - 12 swine

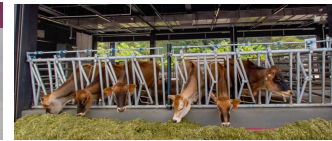
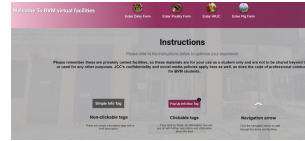


Figure 1. A screenshot of the landing page for the tours. Figure 2. A screenshot taken from the virtual dairy farm tour.

\*This project was reviewed and approved by City University of Hong Kong Human and Artefacts Ethics Sub-Committee; approval number 6000761

## Results

### Previous experience

- Few students had prior experience of these species; none had visited a cattle, pig or poultry farm, and only three had visited an equine stable before joining the BVM program.

### Time spent in VR landscape

- Students typically spent approximately 10 - 20 minutes working in the virtual reality landscape (50.0 to 66.7% of students for each tour), although 42.9% spent >20 minutes on the equine tour.

### Impact on learning experience

- Students were positive about the impact of the virtual tours on their learning experience (Table 1), with the majority agreeing or strongly agreeing that the virtual tours were useful for their learning, were a good use of their time, and would be utilized in a self-directed manner to prepare for future practical placements.

Table 1. The proportion and percentage of students that agreed or strongly agreed with a selection of statements regarding the virtual tours.

	Dairy farm	Poultry farm	Pig farm	Equine facility
1. The virtual farm/facility tour was useful for my learning	17/17 (100%)	12/12 (100%)	11/12 (92%)	14/14 (100%)
2. I will use the virtual tour as a refresher before future visits to the farm/facility (e.g., before EMS)	16/17 (94%)	11/12 (92%)	11/12 (92%)	14/14 (100%)
3. The virtual farm/facility tour was a good use of my time	14/17 (82%)	11/12 (92%)	11/12 (92%)	12/14 (86%)
4. The virtual farm tour helped prepare me for the visit to the dairy farm	17/17 (100%)			
5. Even if I went to a real pig farm, I would still like access to the virtual farm			9/12 (75%)	
6. The virtual farm tour helped consolidate what I learnt during the real poultry farm tour		11/12 (92%)		
7. The virtual HKJC tour improved my understanding of the husbandry of thoroughbred racehorses in Hong Kong				13/13 (100%)



Figure 3. Virtual reality tours were developed for local dairy cattle, poultry and pig farms, and an equine facility

## Conclusions

- Virtual reality farm and facility tours can be developed and integrated into veterinary education
- CityU Year 1 veterinary students had limited prior experience with production animals or horses
- Students perceive benefits from the use of virtual reality as an educational tool
- Benefits included:
  - Improved understanding of husbandry
  - Preparing for live-animal classes and on-farm visits
  - Consolidation of learning
  - Revision before future teaching and learning activities

## Future Directions

We hypothesize that these types of resources will be beneficial and well-received by neurodivergent learners; as it will enable them to become familiar with an unusual or new environment (i.e., farms) before they have to attend scheduled classes there. We could also consider including audio (i.e., real-farm sounds) as another layer for this familiarity.

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