

## Mobile learning in veterinary anatomy and histology classes: preliminary results

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**Keywords:** anatomy, cloud storage, learning, smartphone, veterinary.

### Introduction

Gross and microanatomy are essential knowledge for being a competent veterinarian. The anatomy is especially one of the most difficult subjects and can cause veterinary students high stress. A number of reports from different countries revealed that the veterinary profession has a particularly high suicide rate, and this may possibly result from a long-term exposure to the stress during the study and work (1-4).

Mobile learning, also known as 'm-learning', is a novel tool that involves a use of mobile devices such as mobile phones, tablets or laptops in a learning process. It could be usefully implemented to facilitate students' learning as students can conveniently access to the lessons and interact with the contents wherever and whenever they desire (5,6).

In the present study, we tested whether an incorporation of mobile devices and other related technologies, i.e. the cloud storage and social network, in a process of learning gross anatomy and histology can practically enhance students' learning performance and experience. We hypothesized that this tool improves learning performance and helps lower a perceived stress in veterinary students studying these modules.

### Materials and Methods

A hundred and twenty-one, 2<sup>nd</sup> year veterinary students enrolled at Mahidol University, were recruited. They were instructed to complete assignment reports, which was labelling anatomical and histological terminologies to the pictures of the actual specimen captured during the classes, using a smartphone/tablet. The students were required to complete 2 types of assignments: a

group assignment and an individual assignment. In case of a group assignment, the reports were created either by Microsoft PowerPoint prior to being uploaded onto the online cloud storage (Google Drive), or by 'Google Slide' web application. The instructors took 2-3 days to evaluate the reports before providing feedbacks to the students.

As for an individual assignment, the students uploaded the labelled images to the online social media (Facebook/Line groups). The instructors provided instant feedbacks and students were allowed to resubmit a revised work.

Student's learning performance and their stress levels were evaluated using a questionnaire and a face-to-face interview.

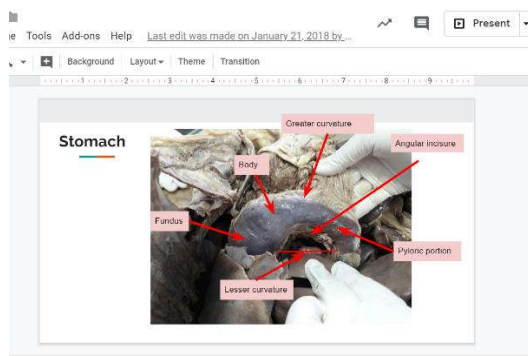
### Results and Discussion

Results from the questionnaire showed that most students found the examined tool helpful for their studying. Seventy-three percent of the students indicated that the technique affected positively on their performance, particularly the memory (78%) and the comprehension (76%). Only 7% of the students associated this learning tool to a high stress, therefore, in general, it tended to be favoured by most students. Overall, the majority of the students (86.0%) rated the technique as being useful for studying gross anatomy and histology lessons.

Students' feedbacks on the tool obtained from the interview were predominantly positive (96%). The only negative comments were not directly relevant to the tool per se but rather involved the individual assignment. The students preferred workmates to help with their assignments, and some complained that their learning experience was hindered due to

them possessing technologically inferior devices.

From these preliminary results, it can be concluded that incorporating mobile learning involving a smartphone/tablet, cloud storage, and social networks can be beneficial to the students' learning performance and experience. The tool is likely to enhance student learning by attracting their interest to focus on the lessons. This can be an academically useful tool to positively affect student's learning performance and experience, particularly for gross anatomy and histology studies.



**Figure 1** An example of the assignment reports produced by Google Slide application.

### *Acknowledgements*

We thank all veterinary students participated in the study, Somchai Sa-engkaew and Techasit Sermphongsurapa for the anatomy and histology classes preparation.

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