Using Technology to Enhance Undergraduate Pathology Learning During the COVID-19 Era at Helwan Medical School

Fatma Alzahraa A. Elkhamisy[1], Asmaa Fady Sharif[2]

[1]Pathology Department, Faculty of Medicine, Helwan University, Cairo, Egypt
[2]Forensic Medicine and Clinical Toxicology Department, Faculty of Medicine, Tanta University, Tanta, Egypt and Clinical Medical Sciences Department, College of Medicine, Dar Al-Uloom University, Riyadh, Saudi Arabia

Background & aims:

Lack of students' interaction and inability to develop competencies are significant reported challenges in e-learning during COVID-19. To overcome these challenges, an innovative interactive e-pathology course had been implemented and evaluated.

Methods:

o **Context:** The pathology course, taught for first level medical students at Helwan University, Faculty of Medicine, Cairo, Egypt (March through May 2021).

o **Study design & grouping:** A case-control study enrolled 696 medical students distributed into two groups: the Control group (n=360) underwent traditional online learning (prerecorded lectures and labs), and the Test group enrolled in the interactive e-course (n=336).

o **Intervention:** The interactive e-course was conducted using Zoom™ online platform where multiple instructional and assessment methods had been used as follows:

1. **Lectures:** Traditional live interactive lectures, Virtual Learning Stations, flipped classrooms with case-based discussion, and Virtual Patient Role-Plays.
2. **Practical labs:** Digital pathology slides and pots [1,2] & digital histopathological reports in case-based format
3. **Formative assessment:** Quiz-competitions using Kahoot! Game-based platform including case-based format, and Project-based Learning where students created e-mind maps & funny memes that simplify diseases for the public.
4. **Office hours:** Telegram™ platform.

o **Evaluation of students' satisfaction** via an online survey using five-point Likert scale and close-ended questions.

Results:

The mean of students' satisfaction in the test group (3.81±0.45) was significantly higher than the control group (2.78±1.35), (p<0.001). Among the test group, 83.3% were satisfied by the used methods, and 73.5% found these methods good alternatives for the unavailable face-to-face learning. The highest-ranked learning methods were digital pathology slides and pots, followed by histopathological reports and Kahoot! competitions **(Figure 1)**. **Figure (2)** depicts the advantages of the used methods. The primary reported limitation was an unstable network (36.2%).
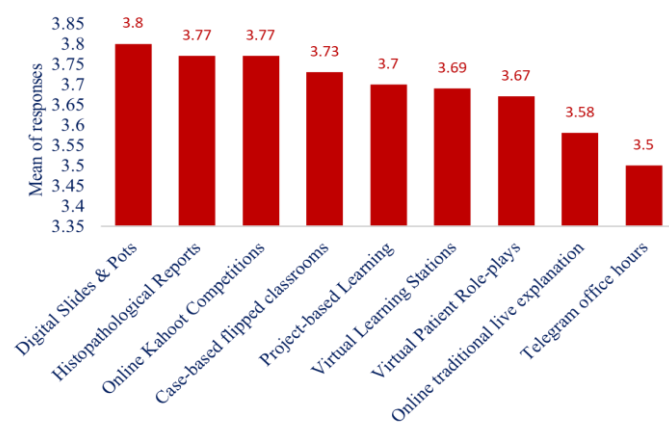

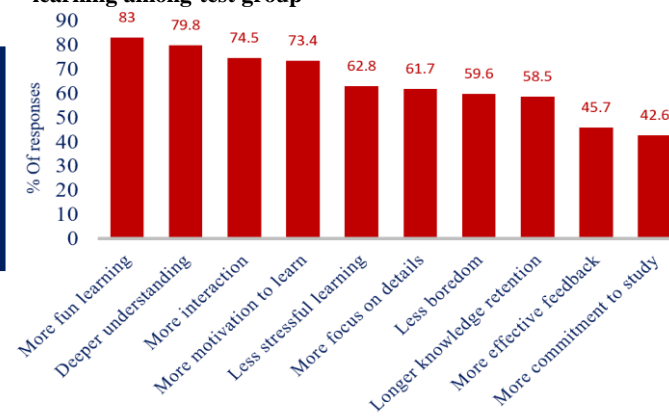Fig 1. Mean satisfaction of each interactive digital tool used in learning among test group

Fig 2. Advantages of interactive digital tools used in learning among test group

Conclusions:

Enriching Pathology learning by interactive activities motivates students and enhances their competencies. From students' perspectives, interactive digital learning of practical skills is the most satisfying.

References:

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