



Untapped potential of BEST network: An active learning tool to engage 21st century learners

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BACKGROUND

A vast majority of medical students are either millennial or Gen Y learners who were raised in an entertainment rich, multi-media environment¹. They are technology savvy and like to be in control of their learning in terms of choice, pace, sequence and content². Millennial learners expect immediate feedback and meaningful assessments³. As educators, we face growing challenges with a new generation of students using technology that is constantly evolving³. At Eastern Virginia Medical School (EVMS), innovative digital tools and virtual images are being used to teach immunology with histopathological context to engage the first year medical students. In this study, we evaluated the effectiveness of BEST network as an educational tool using exam data and survey questionnaire.

MATERIALS AND METHODS

The basic concepts of Immunology- the innate and adaptive immunity are taught in the foundation science module (FS) II module of the M1 curriculum. An interactive learning session with the integration of immunology concepts with pathological examples (Pneumonia and Lymph-node hyperplasia) was developed by using an adaptive e-learning platform (smartsparrow.com) and high-resolution virtual images from Slice digital database of BEST (Biomedical Education Skills and Training) Network (best.edu.au)⁴, (Fig 1&2).

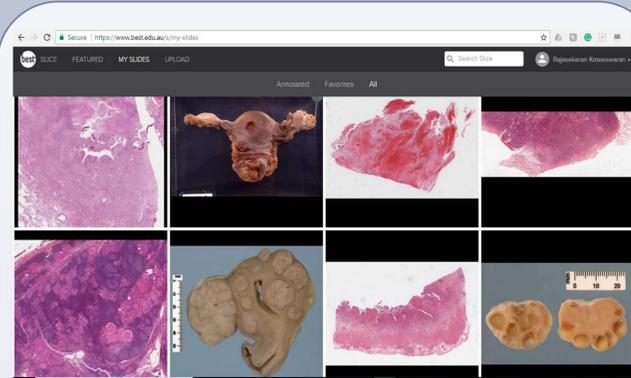


Fig 1: BEST network SLICE digital image database

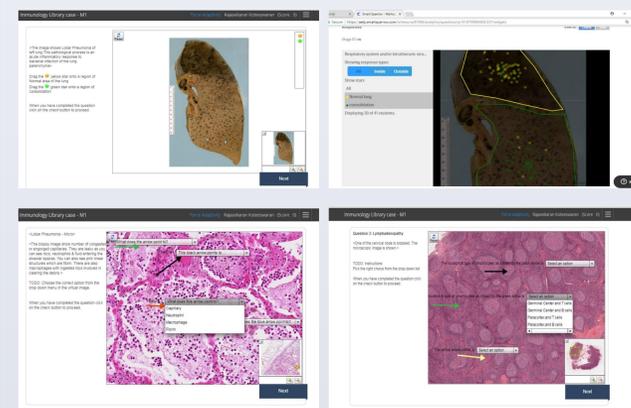
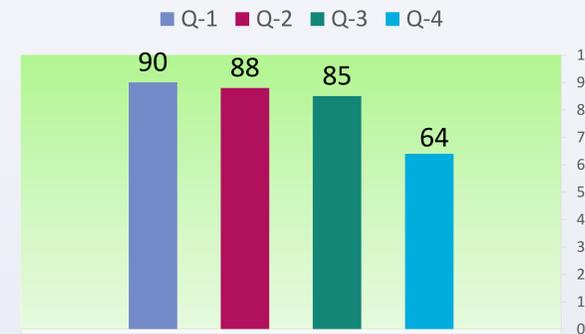


Fig 2: Lessons designed through BEST network /Smartsparrow

The students were engaged in a live demonstration by a tutor, problem-solving exercises, and discussion in small groups. The students were also given access to the lesson and a survey questionnaire to assess the students' perception was deployed at the end of the FS-II module.

RESULTS

40 students out of 117 students enrolled in the course (34% participation rate) completed a survey questionnaire. 90% of the respondents either agreed or strongly agreed that designed interactive session was interesting and engaging. 88% of the respondents felt that it was valuable to their understanding of concepts. 85% wanted more lessons in a similar format.



RESPONSES (AGREED/STRONGLY AGREED)

Chart 1 – Results of Likert style questionnaire

- Q-1) The designed lesson with the virtual images was interesting and engaging
- Q-2) I would like to see more of these adaptive lessons in other courses
- Q-3) It was valuable in understanding the topics
- Q-4) It was easy to find the lesson and navigate my way through

64% felt that it was easy to navigate the lesson in the adaptive learning platform (chart 1). The exam data for the FS-II module during 2016 & 2017 was compared which showed no statistically significant change in grades. The comments from students indicated that it was a helpful activity, appropriate for first-year medical students, consolidated their knowledge and enhanced their understanding of complex concepts.

STUDENT COMMENTS

"I liked having questions that came with detailed explanations of the material. The only issue which is probably just a browser issue for is that I could not see the images. But I remembered from the actual small group activity. I like having a case walk through and re-establishing my understanding of the immune system. Having more of these for students to navigate through would be helpful in my opinion."

"I liked the lessons and thought it was appropriate for first year med student"

"This was a great activity! It was helpful to map out the timeline of the immune system with my classmates. I would definitely include this in future courses".

CONCLUSIONS

BEST (Biomedical Education Skills and Training) Network is a not-for profit network of biomedical Schools developing and sharing next-generation courseware and technology⁵. It was founded in 2014, as a joint venture of Australian Universities funded by an education grant from the Australian government. The BEST network has a database of over 20,000 macro and microscopic images in partnership with leading institutions across Australia and the United States. With a number of institutions moving towards integrated curriculum, educators often struggle to provide clinical relevance and pathological correlations while teaching basic sciences. Our results showed that the virtual images with annotations from BEST network are an effective tool to engage medical students in learning immunology. This technology can be applied broadly across other modules and benefit educators who are interested in promoting active learning.

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