

Taking a SecondLook™ at a Time-Efficient Self-Evaluation Resource

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ABSTRACT

Background: Interactive review tools are highly valued by today's students. The SecondLook™ Histology resource was developed for University of Michigan students to test their knowledge and skills in analyzing micrographic histology images. Originally conceived as a series of PowerPoint files, it is also available as a mobile application.

Actions, Methods, or Intervention: Efficient time management is a major concern for many students. Students want to know whether they have learned the required material and developed the expected skills to do well in an upcoming examination. As a consequence, "high yield resources" that make the most of limited study time are in high demand [1]. In order to help students review the material, gauge their knowledge of histology and assess their competency of recognizing/identifying cells and tissues, we developed the SecondLook™ self-review tool. This resource is available to University of Michigan (U-M) students as a series of PowerPoint files and, through collaboration with U-M Medical School Information Services, to students worldwide as a mobile application. Each PowerPoint file/app set covers the material of a specific tissue or organ on 10-35 slides, each slide containing histological images with 1-8 questions about these images. The questions on each page are asked sequentially in a logical succession, one question often building on the answer to the previous. Using the PowerPoint animation feature, a click/tap reveals the answer together with any follow-up question. The questions use a variety of open-ended formats, avoiding a "select-the-best-answer" MCQ design. Each set takes 10-15 minutes to complete, enabling students to quickly uncover deficiencies in their knowledge and skill sets and allowing them to target their study efforts to fill these gaps. This didactic approach relies heavily on active learning – it uses technology and electronic devices (computers, tablets and smartphones) and lets students receive immediate feedback, often with a brief explanation why an answer is correct. To expand the accessibility of the SecondLook™ tool, the U-M Medical School's Learning Design and Publishing team has generated a strategy that allows the easy translation of SecondLook™ PowerPoint files into HTML-based applications for a range of mobile devices (both iOS and Android). The application version has several features not available with a PowerPoint file, such as a slide randomizer function, easy navigation between slides, question and page indicators, and a limited zoom ability.

Results: Over 95% of recent U-M medical students named the SecondLook™ PowerPoint files as one of their three most important histology learning resources. A similar percent of U-M medical and dental students also reported that they always or frequently used the SecondLook™ files [1, 2]. Since its release 2.5 years ago, the SecondLook™ histology application for the iPad has been downloaded over 11,000 times from 115 different countries.

Future Applications and Next Steps: Although the SecondLook™ concept was originally designed for a subject represented largely by visual material, it can easily be adapted to other fields, including clinical case studies. SecondLook™ series for Neuroanatomy, Gross Anatomy, and Oral, as well as Basic Medical Radiology are currently in development and will serve students in a number of different biomedical career paths. Making SecondLook™ tools available for a wide range of basic science and clinical topics will encourage students from all fields of the health sciences to apply a scientific approach to learning and will integrate the Socratic process in clinical problem solving.

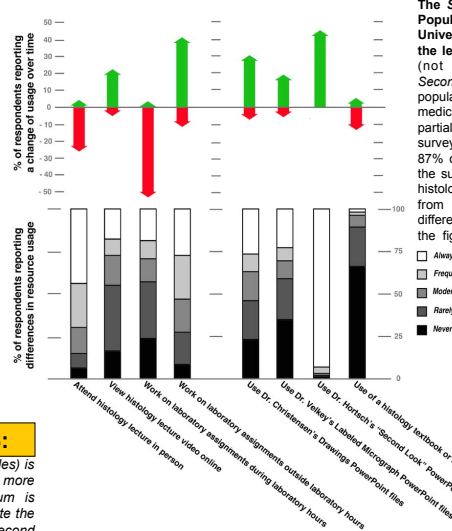
References

- 1.) Holaday L, Selvig D, Purkiss J, Hortsch M. Preference of interactive electronic versus traditional histology learning resources by University of Michigan medical students during the first year histology component. Med. Sci. Educ. 2013; 23(4):607-19.
- 2.) Johnson S, Purkiss J, Holaday L, Selvig D, Hortsch M. Learning histology – dental and medical students' study strategies. Eur. J. Dental Educ. 2014; 19(2):65-73.

COMMENTS BY MICHIGAN STUDENTS:

"... I think why students are so drawn to them (the SecondLook files) is because they actually make us "think". They hold your attention a lot more than the other learning resources. So much of our curriculum is information fed to us in a passive way, so I think students appreciate the interactive elements in histology. Yes, I could definitely see if the second look format was extended it would start to overtake the other forms of learning, because it is just a superior learning tool. The second look PPTs highlight important concepts, and link identification with higher order knowledge of function and organization. I think students also like the variety in the different ways the questions are asked."

"Dr. Hortsch's SecondLook teaching resource is a groundbreaking study tool. Beyond teaching histology skills, this study resource helps students to understand the importance of active studying and self-testing to make broader connections and to recognize patterns within the material – a skill which carries over into all disciplines."



The SecondLook™ Review Tool is the Most Popular Histology Learning Resource Among University of Michigan Students. Figure to the left: Among 14 histology learning resources (not all are shown in this figure), the SecondLook™ PowerPoint series is the most popular resource among first year Michigan medical students. The figure to the left shows partial results from a post-histology component survey of the Medical School Class of 2014. 87% of the class (146 students) participated in the survey and reported their usage of different histology learning resources on a five-step scale from "Always" to "Never" (reflected by the different shading of the bar fields. Bottom part of the figure) and change thereof over time (top panel: increased use is indicated by green arrows versus decreased use by red arrows) (Figure adapted from Reference 1).

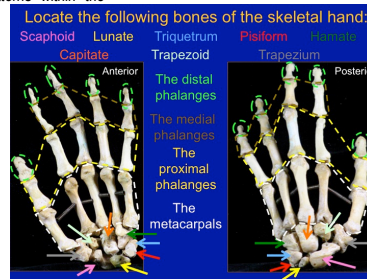
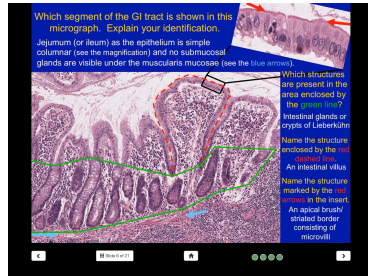
ACKNOWLEDGEMENTS

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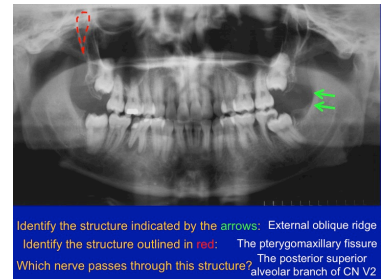
New SecondLook™ Resources in Preparation:

Several new SecondLook™ resources are currently being developed. A series for Neuroanatomy involves Dr. Kelli Sullivan and Neuroscience student Chelsea Cumminford. A series for Musculoskeletal Gross Anatomy is assembled by Dr. John Stribley and medical student Virginia Sheffield and a series for Head & Neck Gross Anatomy by Dr. David Brzezinski. Drs. Kate Klein, Karen Guy, Charles Fang, Karen Rodrigues, Caitlin Hackett and medical student Zhe Guan collaborate on a Basic Radiology series. Dr. Erika Benavides with dental students Jacob Fischer and Anna Caplis create a SecondLook™ series for Oral Radiology.

The SecondLook™ Histology Resource:



Sample from the Musculoskeletal Anatomy SecondLook™ series.



Sample page from the Oral Radiology SecondLook™ series.