RESULTS

A lower success rate on the questions overall raising the Bloom level on five questions for each course (Photograph), which of the following is the most likely mechanism underlying the patient’s skin changes?

•••

86%

Joseph Nenow, M.D.
Arthur Samia, M.D.

DNA antibodies, and antiphospholipid antibodies). With respect to this patient’s skin changes and (2) assigned a Bloom taxonomy level for each question with the following:

•••

99%

The successful completion of United States Medical Licensing Examination (USMLE) Step examination multiple choice questions requires the use of “higher-order” cognitive and critical thinking skills.

•••


Phyllis A. Phillips
S. Bruce Smith
Stuart Straus

•••

100%

Our Bloom taxonomy conceptual model allowed us to:

• Analyze the Bloom level of multiple choice questions
• Modify questions to increase their Bloom level to test objectives in the course
• Distinguish among higher and lower scoring students as assessed by question difficulty index, discrimination index, and point biserial metrics in both formative and summative assessments.

This project has helped us to better understand the dynamics of multiple choice question writing for preclinical medical student assessment and allows us to generate questions ranging from Bloom level 1 to Bloom level 4 and position us to help students acquire “higher-order” cognitive and critical thinking skills necessary for successful navigation of USMLE Step examinations.

CONCLUSIONS

METHODS

• Pathology quiz and test questions from the 2019-2020 academic year were (1) analyzed using statistical data including difficulty index, discrimination index, and point biserial calculated for each question as aggregated by the assessment software (ExamSoft, examsoft.com) utilized at our medical school and (2) assigned a Bloom taxonomy level employing a conceptual model we previously developed, assigning a taxonomy level of level 1 for recall of basic concepts and recognition, level 2 for understanding and comprehension, level 3 for analysis, application, and manipulation of content in the question, or level 4 for integration of content.

• For the first-year Foundations of Diagnosis and disease course and for each of the six second-year organ system courses, five quiz or exam questions that were answered correctly by all or nearly all students were modified, manipulating various components of the question based on our model to raise the Bloom level and administered during the 2021-2022 academic year with subsequent data analysis.

• Multiple-choice questions are a standard mechanism of assessment in medical education
• Machine graded
• Optimized over time and use from year-to-year
• In previous generations, “fact-based” questions were commonly deployed.

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REFERENCES


