

Analysis of MediaLab Simulator Metrics in Predicting ASCP BOC Success

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ABSTRACT

Medical Laboratory Science (MLS) students commonly utilize exam simulators to prepare for their Board of Certification (BOC) exam, yet limited research exists on their effectiveness. This study examined MediaLab exam simulator usage patterns and their correlation with ASCP BOC success among 148 MLS students (2019-2023). The research evaluated relationships between simulator metrics (practice exam scores, time spent, and attempts) and BOC performance through correlation analysis. Results showed positive correlation between MediaLab scores and ASCP BOC performance, while practice frequency showed negative correlations. Students passing the BOC consistently achieved MediaLab scores above 61%, identifying this as a critical performance threshold. Programs should prioritize high-quality practice performance over quantity, using the 61% benchmark to identify students needing intervention. Future research should determine optimal intervention timing and explore preparation strategies for both first-time and repeat test-takers.

BACKGROUND

The ASCP BOC exam serves as an outcome for MLS graduate competency and program accreditation. Key predictors of ASCP BOC exam performance in the literature include preadmission grade point average, instructional modes, performance in core MLS courses, and timing of exam completion after graduation. Despite evidence supporting the benefits of practice testing in health professions education, there is limited quantitative analysis linking specific simulator usage patterns to ASCP BOC exam success. The MediaLab Exam Simulator replicates the format of 100 multiple choice questions across key laboratory disciplines, and engagement patterns in online platforms can predict professional exam performance with up to 80% accuracy. Understanding these relationships could help both student preparation and program accreditation status by ensuring graduates meet healthcare workforce requirements.

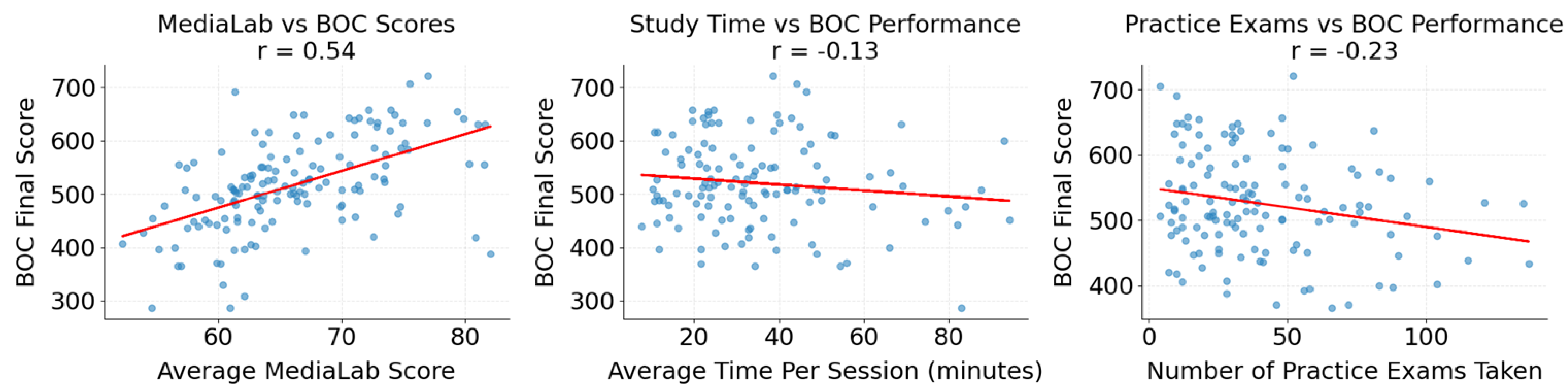
REFERENCES



RESULTS

Figure 1. Correlation Analysis of MediaLab Metrics with BOC Performance

Relationships Between MediaLab Metrics and BOC Performance



Note. Scatter plots showing correlations between BOC scores and: (Left) MediaLab practice scores ($r = 0.54$), (Middle) study time per session ($r = -0.13$), and (Right) number of practice exams ($r = -0.23$). Red lines indicate regression trends.

Figure 2. Predictive Analysis of MediaLab Metrics for ASCP BOC success

Note. (Left) Feature importance analysis shows MediaLab exam scores (0.034) are stronger predictors of BOC success than time spent (0.001). (Right) ROC curve analysis (AUC = 0.653) indicates moderate predictive power with optimal threshold at 61%.

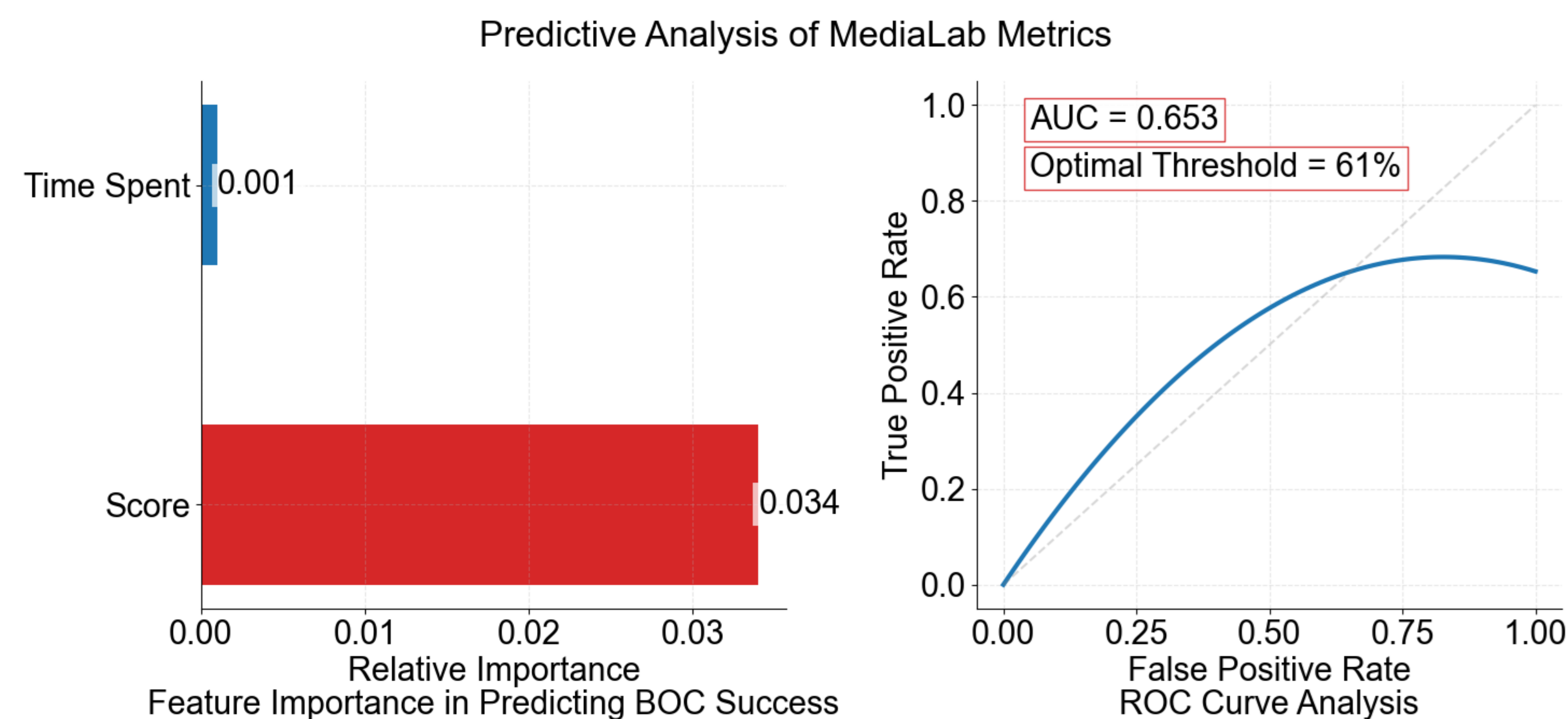
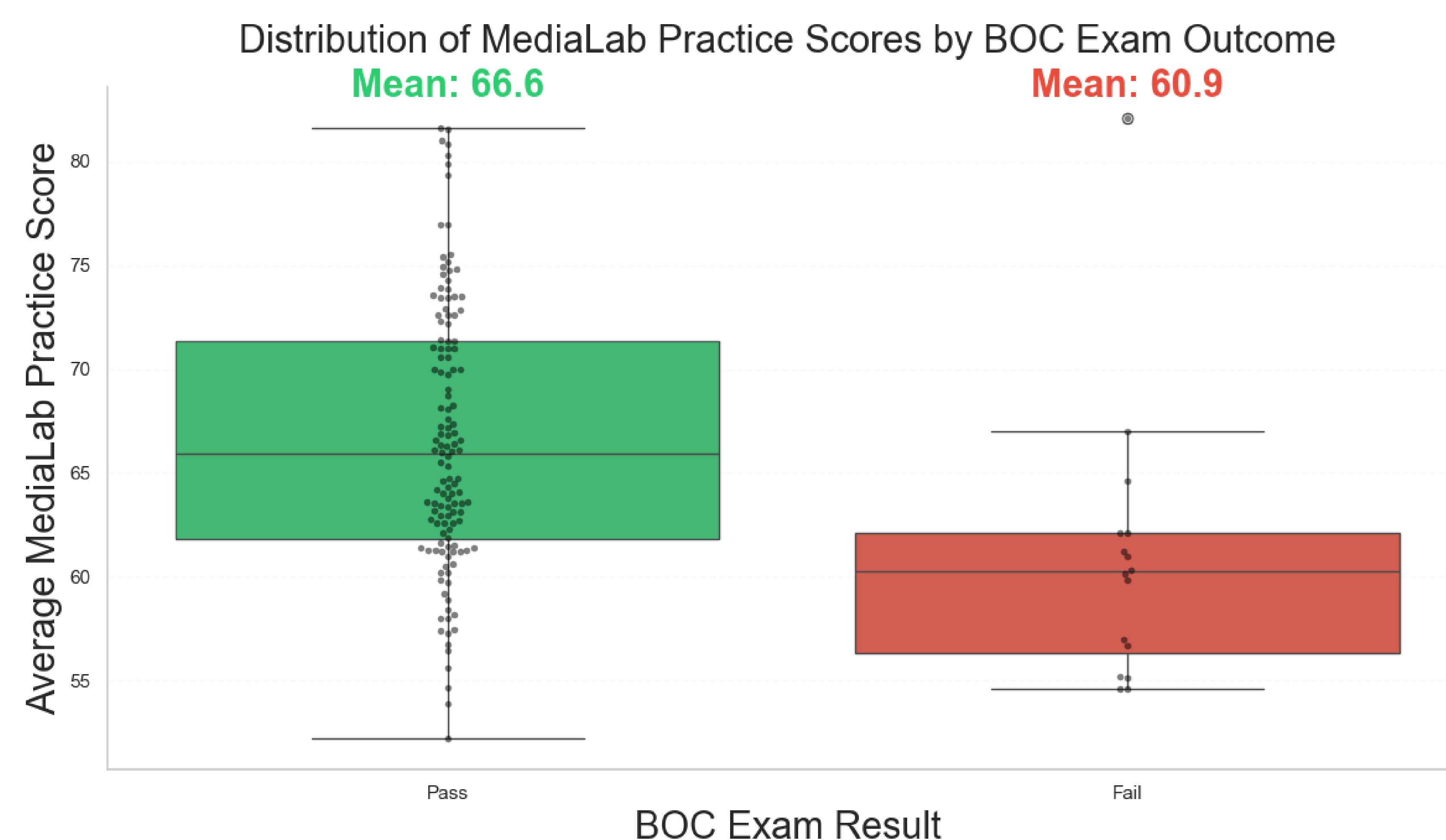


Figure 3. MediaLab Practice Score Distribution by BOC Exam Outcome

Note. Box plot comparing MediaLab practice scores between students who passed versus failed the BOC exam. Students who passed showed significantly higher average practice scores (66.6%) compared to those who failed (60.9%), supporting the predictive value of practice performance.



METHODS

This quantitative study analyzed data from 148 MLS students who graduated between 2019-2023 from a NAACLS-accredited program. Only first-time ASCP BOC attempts were analyzed, including MediaLab practice exam scores, time spent per session, and number of attempts. Statistical analysis included correlation and logistic regression to assess relationships between simulator metrics and exam performance, ROC curve analysis for threshold scores, and feature importance analysis comparing exam scores versus completion time. Performance patterns were analyzed with significance at $p < .05$ and outliers removed using IQR method.

DISCUSSION

Results emphasize practice quality over quantity for ASCP BOC success, with the 61% threshold serving as a crucial intervention indicator. The inverse relationship between attempt frequency and success likely reflects struggling students' increased need for more strategic, quality-focused preparation methods. Study limitations include that while MediaLab Exam Simulator is provided to all MLS students with assigned sessions, they may supplement with alternative exam preparation methods. The model's moderate predictive power suggests simulator metrics should complement other assessment tools, highlighting the importance of maintaining a holistic approach to student assessment and support.

CONCLUSION

Programs should implement early intervention when students consistently perform below 61% on MediaLab practice exams, emphasizing quality of practice over accumulated study hours. Future research should determine optimal intervention timing and explore preparation strategies for both first-time and repeat test-takers. This evidence-based approach to exam preparation strengthens both student outcomes and program effectiveness.