

# Student Satisfaction and Educational Outcomes: The Transformative Impact of a New Digitalized Histology Laboratory at the University of Medicine, Tirana

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## Abstract

**Background:** The "Digitalization of the Histology Laboratory" project, funded under the 2023 higher education budget, aimed to modernize teaching laboratories by integrating advanced digital technologies. The project focused on improving the quality of the teaching process and facilitating the learning of histology-embryology as a core subject for students in medicine, dentistry, and pharmacy programs.

**Methods:** This was a cross-sectional study evaluating student satisfaction regarding the Histology Laboratory Unit at the University of Medicine, Tirana, with data collected between December 10 and 21, 2024. Of the 650 students, 407 participated in the study: General Medicine students mostly used both traditional and

digitalized laboratories, Dentistry students mostly used the digitalized laboratory, and Pharmacy students mostly used the traditional laboratory. Data were collected via an online structured questionnaire evaluating demographics, satisfaction with resources, comparative experiences, and overall impressions. Statistical analyses comprised descriptive statistics (including Likert scale analysis), Mann-Whitney U tests, Fisher's exact test, and Wilcoxon signed-rank test.

**Results:** The students had a mean age of 19.33 years (SD = 1.12), predominantly female (83.5%), with 58.5% having experience with both classical and digital laboratories. Students rated the digital laboratory superior in equipment

quality (mean 4.51 vs. 4.00), variety of histological slides (mean 4.10 vs. 3.77), support from academic staff (mean 4.53 vs. 4.21), ease of use (mean 4.49 vs. 3.99), and overall satisfaction (mean 4.49 vs. 4.00; all  $p < 0.01$ ). Median satisfaction scores were significantly higher for the digital laboratory (87, IQR 22) compared to the traditional laboratory (72, IQR 43;  $p < 0.001$ ). The digital laboratory achieved higher ratings for a comfortable environment (mean 4.33 vs. 3.80;  $p < 0.01$ ) and alignment with international standards (mean 3.94), while its positive impact on improving knowledge and practical skills compared to the traditional laboratory was reflected in a mean score of  $4.06 \pm 0.69$ . Open-ended feedback underscored the positive impact of digital tools on learning while suggesting improvements in access and resources.

**Conclusions:** The digital histology laboratory significantly improved the learning environment, offering a more comfortable and modern setting compared to the traditional laboratory. Students expressed higher overall satisfaction, emphasizing that the digital tools enhanced their knowledge acquisition and practical skills, making the learning process more interactive and aligned with contemporary educational standards.

**Keywords:** Student Satisfaction, Digitalized Laboratory, Traditional vs. Digital Laboratory, Histology Education