

# Innovative Clinical Simulation Training for Lincolnshire's Next Generation of Pathologists

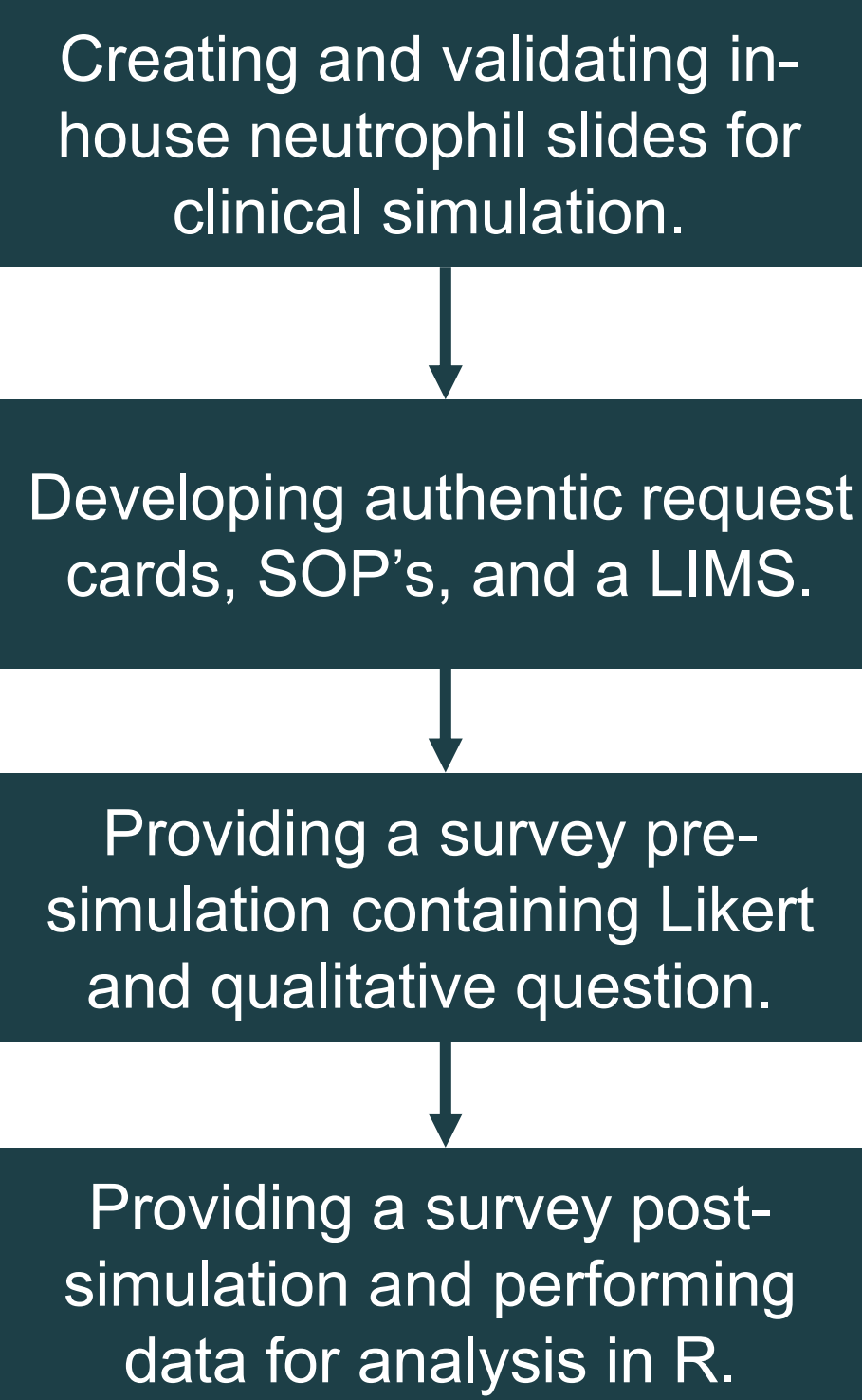
By Callum Barnes, supervised by Dr Matthew Simmonds, Dr Issam Hussain, Dr Andy Gilbert, and Dr Claire Walker

University of Lincoln

## INTRODUCTION

- Simulation in clinical education is used in the training of medics but not biomedical scientists.
- Lincolnshire has a massive shortage in trained biomedical scientists despite having a local IBMS accredited course.
- Clinical simulation could be the educational tool that is needed to increase interest in biomedical science as a career, as well as the quality of biomedical scientists that graduate university.
- To this end, we aimed to create an authentic clinical experience for level 5 students at the University of Lincoln that increased knowledge retention and was also cost-effective.

## METHODOLOGY



Immunology Request Card

Immunology Request Card

Immunology Request Card

Figure 1 – Examples of one of the request cards and laboratory tests available of the LIMS. Each patient had their own request card, with 5 additional laboratory tests available per patient for participants to look at in the LIMS.

Demographic	Most Prevalent Population	Number of Participants (N, %)
Previous Education	A-levels	131 (71.98%)
Program of Study	Biomedical Science	97 (53.30%)
Gender	Female	116 (63.74%)
Age	18-20	125 (68.68%)

Table 1 – Demographics collected by those that answered either the pre or post-simulation survey (N = 182). Where participants submitted both surveys, they were anonymously paired and counted as a single person to omit duplicate participant data. Participants were all Level 5 students at the University of Lincoln.

## ACKNOWLEDGEMENTS

- A huge thank you to Dr Matthew Simmonds for his role as programme lead of Biomedical Science at the University of Lincoln. He has had a huge impact on so many students, and has been a great mentor to many.
- Thank you to Michael Jewsbury and the entire microbiology department at Pilgrim Hospital for the access to their LIMS for re-creating.

- Thank you to the University of Lincoln for access to their facilities, this research wouldn't have been possible without them.
- Thank you to the participants of the study for taking part in the clinical simulation.
- Thank you to the technical team for their crucial role in the maintenance and set up of reagents and equipment for the clinical simulation.
- And finally thank you to my supervisors, who have been incredible and full of insights during this project.

## RESULTS

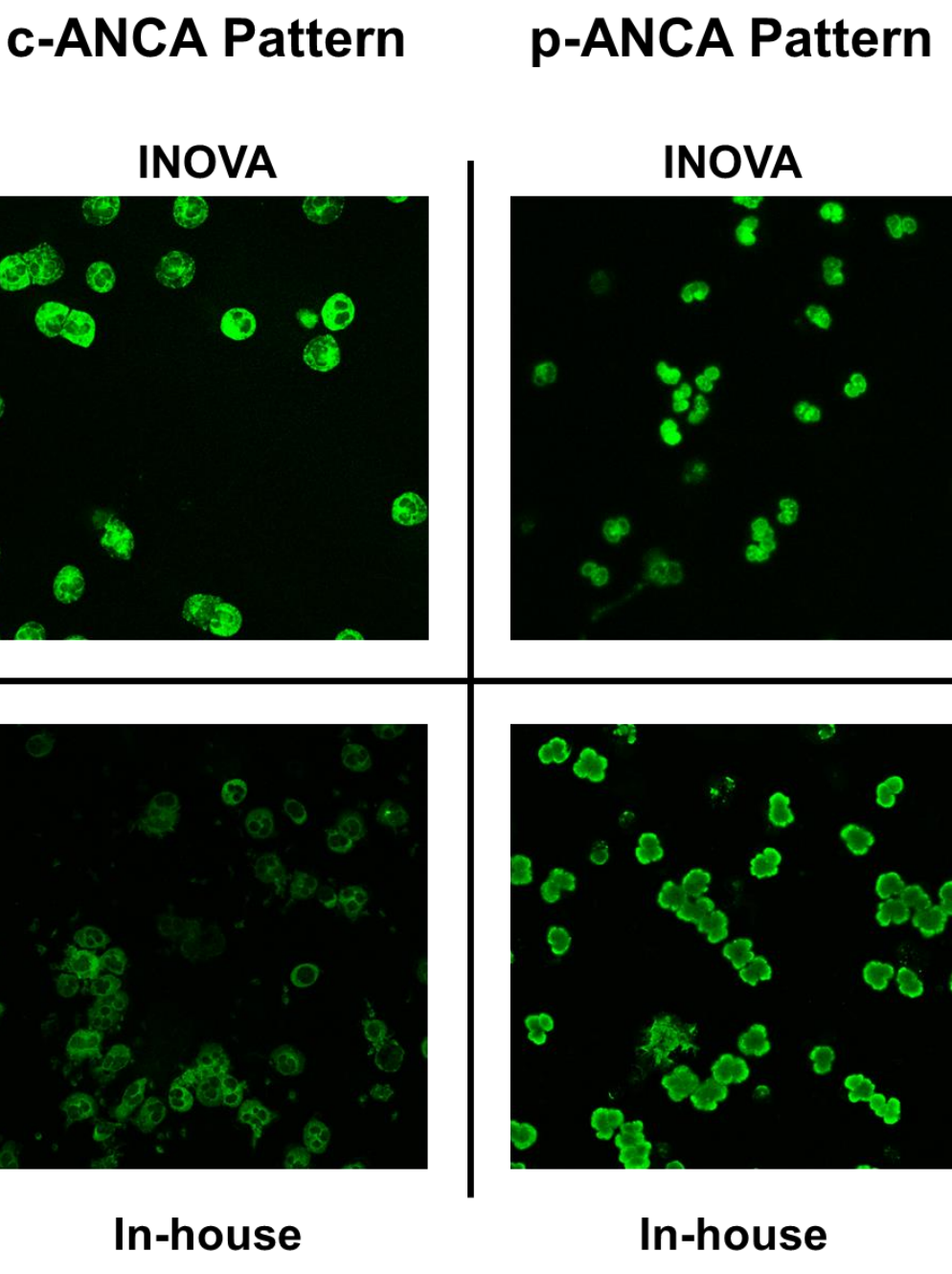


Figure 2 – Validation of in-house neutrophil slides. Commercial slides were purchased from INOVA to compare against in-house developed slides. Slides were stained using p-ANCA and c-ANCA positive controls.

- Figure 2 shows that the in-house slides were at least comparable to INOVA commercial slides.
- These were produced at a fraction of the cost, making the clinical simulation much cheaper for the university to run.

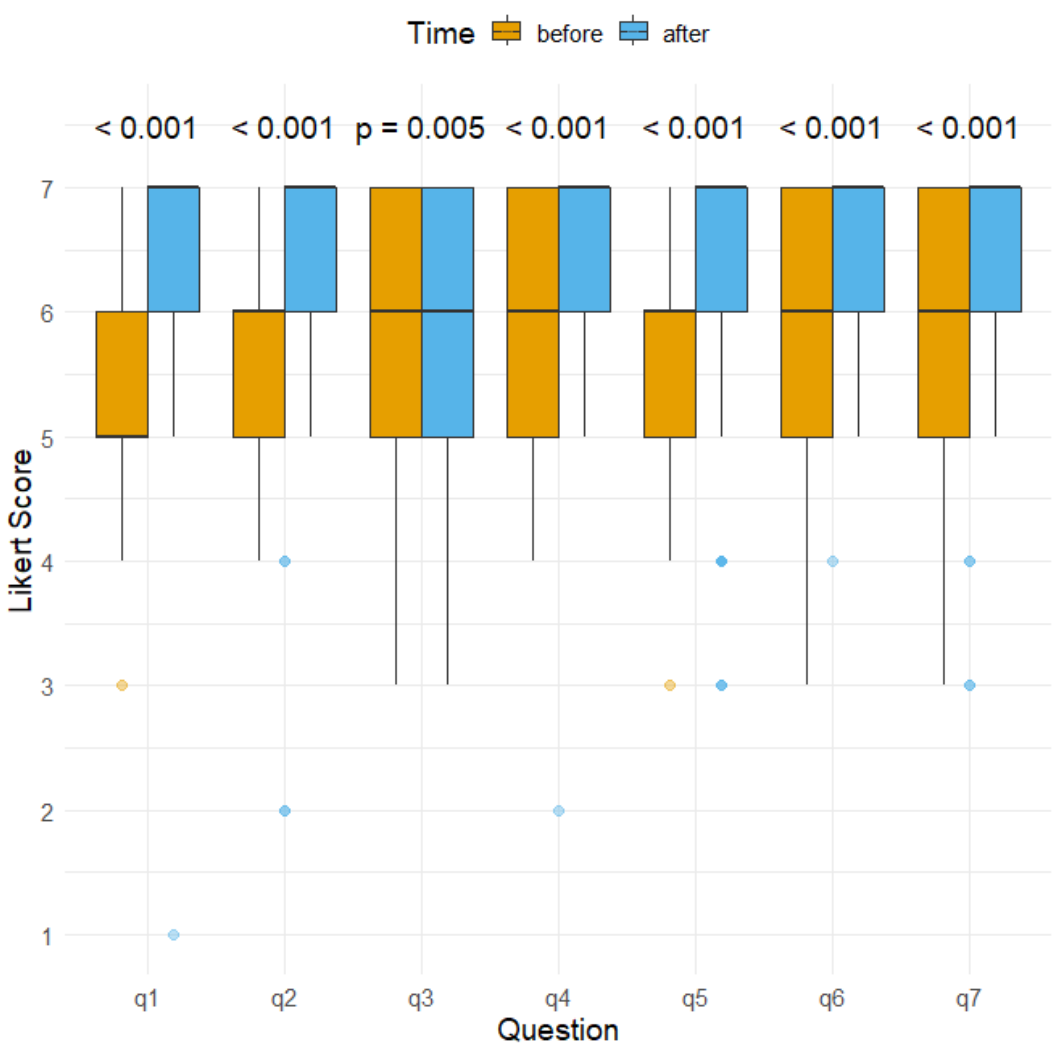


Figure 3 – Boxplots of paired responses per survey question. Statistical analysis was performed in R using Wilcoxon Ranked Sign Test. Results of the analysis are shown above the boxplots for each question.

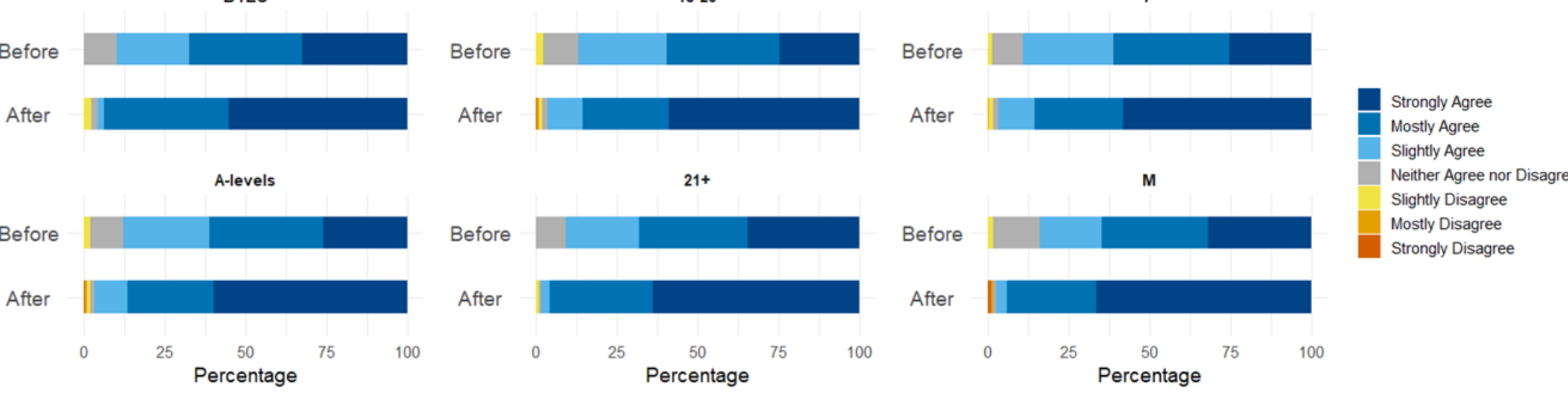


Figure 4 – Stacked bar charts visualising the difference between before clinical simulation and after by Likert scores, grouped by demographics. Left to right shows: Previous education (N = 63), age group (N = 73), and gender (N = 70).

- Figure 4 establishes clinical simulation as a universally successful pedagogical tool in the education of biomedical science.
- Previous education, age, and gender show no difficulty in using clinical simulation as a learning tool.

## CONCLUSION

- Clinical simulation can improve various aspects of learning in the education of biomedical scientists.
- This was done at a lower cost than a 'regular' practical session, significant in the current economic climate.
- Further integration of simulation into other disciplines will likely yield a positive impact for the education and profession of biomedical science.



UNIVERSITY OF LINCOLN