Laboratory Skills Portfolio – A Voluntary Laboratory Skills Development Program

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The Challenge & The Solution

- Summer 2024 - Academic and technical staff were surveyed for their observations on biomedical science student confidence and competence in laboratories.
- The survey identified that students' laboratory abilities were below expectations and less proficient than previous years. This was suggested to be due to:
  - Covid-19 pandemic (Kedraka and Kaltsidis, 2020; Klemm et al 2020)
  - *"Tik-Tok"* generation (Cervi, 2021)
  - Increased home student numbers
  - Increased international student numbers

An extra-curricular laboratory skills development program, "Laboratory Skills Portfolio (LSP)" implemented.

Figure 2: Unlike regular teaching where individuals are provided with everything they need, in LSP there is a central repository from which they identify and collect items for the activity they are doing. This is to encourage independence.

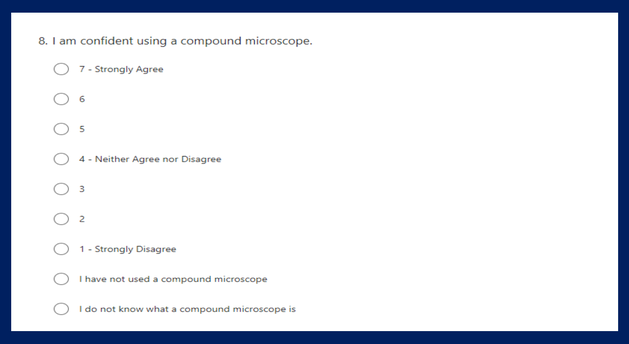

Figure 3: Example survey questions

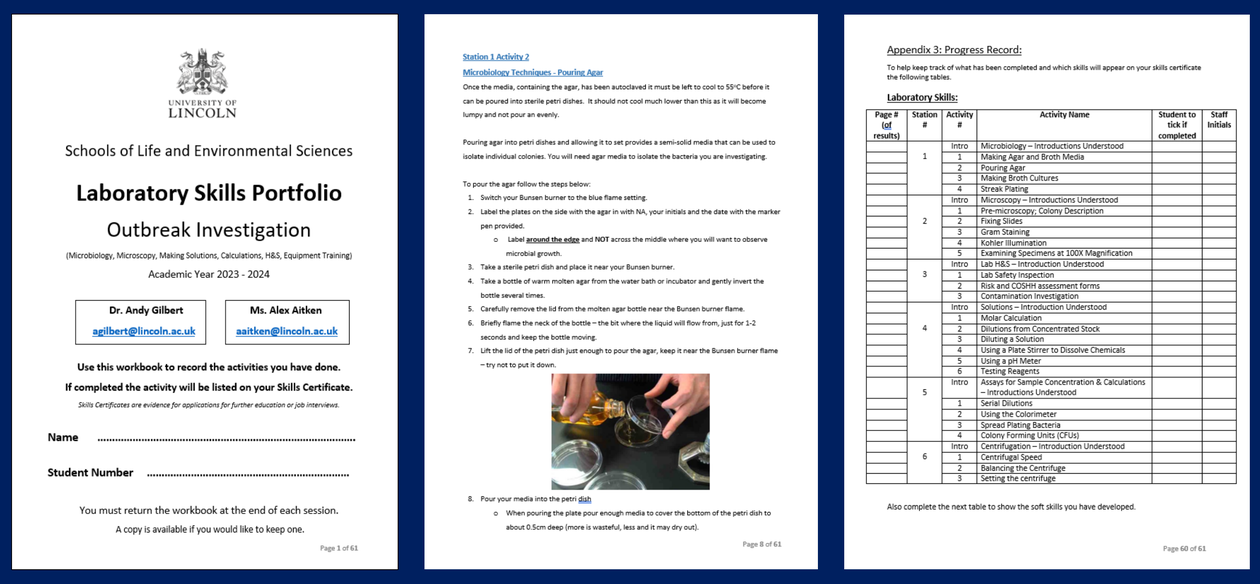

Figure 1: The Laboratory Skills Portfolio Activity Booklet provides detailed instruction for independent work

Laboratory Skills Portfolio

- The LSP is a series of voluntary, interactive, laboratory activities that run in parallel with undergraduate and postgraduate laboratory teaching, which focus on fundamental laboratory skill development, in a psychologically safe environment.
- Students are encouraged to practice skills, identified through self-assessment, from a range of topics such as: microscopy, microbiology and solution preparation.
- Open to all biomedical science students, at all levels in the School of Natural Sciences, University of Lincoln.
- Detailed activity booklet for students to complete.
- Bespoke certificate produced detailing the skills completed.

Surveys – Measuring the Impact of LSP

- Ethical approval granted (**UoL-14313**) to ask students about their confidence both before and after completing the LSP.
- 83 students have completed the pre-attendance survey and 55 have completed the post skills survey. 31 have completed both surveys.
- Information regarding student age, gender, place of previous education, ID number and program of study is requested.
- Students are asked to rate their confidence (7 – Strongly Agree to 1 – Strongly Disagree) on the skills within LSP.

Comparing Students Confidence Before and After Attending the LSP and Other Key Findings

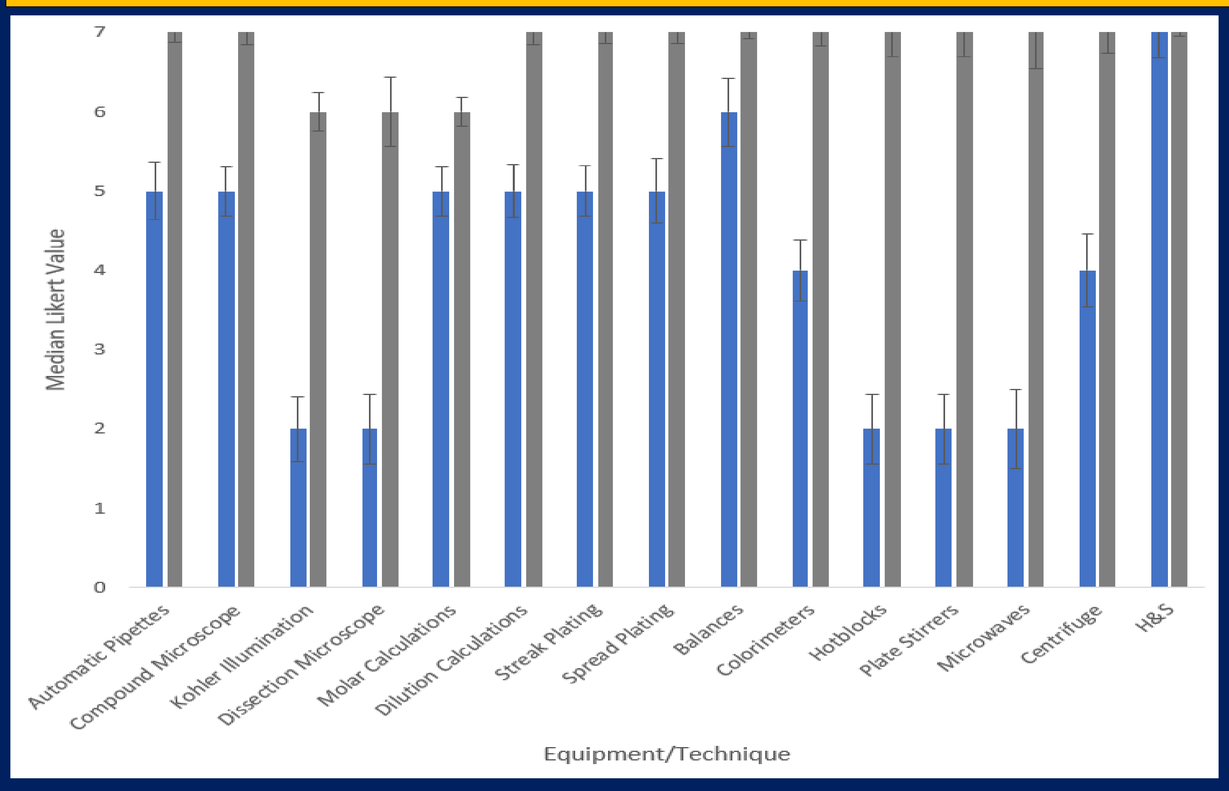

Figure 4: Median student confidence before and after attending the Laboratory Skills Portfolio where individual students answered both surveys before and after attending LSP.

Equipment Comparison	Significance (p-value, * denotes significance)
Pipettes	p<0.001*
Compound Microscopes	p<0.001*
Kohler Illumination	p<0.001*
Spread Plate	p<0.001*
Streak Plate	p<0.001*
Centrifugation	p<0.001*
Colorimeters	p<0.001*
Dilution Calculations	p<0.001*
Molar Calculations	p<0.001*

- **Additional Student Data**
- 47% took A-Levels, 17% BTECs, 21% had a Degree
- 63% were female, 35% were male and 2% were nonbinary
- 52% were aged 18-20, 27% were aged 21-25, 11% were aged 26-30, 8% were aged 31-35 and 1% were aged 36+
- 59% were home students and 27% were international students.

Student Responses

It is very helpful, i like not having pressure to get the work fully done and that we can go at our own pace, they are helpful when we need to ask questions. helps me gain confidence using equipment and at different techniques.

Thank you very much for running this!

Big thank you for helping me with my lab skills. It's my final year in my course but I was super afraid of leaving it when I was still not confident in the lab. I feel so much better and more confident now. Thank you so much for being so patient and kind with me, I really appreciate your time taken to help us. This was a very useful program and hope I will be able to attend more sessions in semester B.

Really enjoyed the skills portfolio, has really helped me understand different techniques more.

References

- Cervi, L. (2021) Tik Tok and generation Z. *Theatre, Dance and Performance Training*, 12(2) 198 – 204 . Available from https://www.tandfonline.com/doi/full/10.1080/19443927.2021.1915617
- Kedraka, K. and Kaltsidis, C. (2020) Effects of the Covid-19 Pandemic on University Pedagogy: Students Experiences and Considerations. *European Journal of Education Studies*, 7(8) 17 - 30. Available from https://oapub.org/edu/index.php/ejes/article/view/3176 [accessed 05 February 2024].