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## Introduction

- Applying scientific theory in a practical context has long been a strong component of the teaching of the physics at school and university. Students entering their 1<sup>st</sup> year of study were asked to give their views on their learning in the practical context at school (SL). They were then re-surveyed as they completed their first year of university physics (L1).
- The study covered the views of students at the Universities of Edinburgh, Glasgow and St Andrews. Due to space limitations, this poster covers the Glasgow data only. The questions were a mixture of “tick box” type and free-form answer.

## What are your opinions about your experiences of your practical/lab work?

		Positive (%)	Neutral (%)	Negative (%)	
Useful	L1	61	34	5	Useless
	SL	54	37	9	
Helpful	L1	55	38	7	Not helpful
	SL	50	40	10	
Understandable	L1	30	56	14	Not understandable
	SL	72	22	6	
Satisfying	L1	26	56	18	Not satisfying
	SL	44	45	12	
Interesting	L1	27	55	18	Boring
	SL	46	45	9	
Well organised	L1	46	39	15	Not well organised
	SL	35	46	17	
The best part of physics	L1	27	48	25	The worst part of physics
	SL	29	57	14	
Enjoyable	L1	35	51	14	Not enjoyable
	SL	57	35	8	

Entries in bold show where there was a statistically significant difference between responses.

## Do you agree or not with the following statements about your experiences in practical/lab work?

		Agree/ Strongly Agree (%)	Neutral (%)	Disagree/ Strongly disagree (%)
I prefer written instructions for experiments	L1	88	8	4
	SL	77	19	3
Practical work helps my understanding of physics topics	L1	65	26	9
	SL	80	16	4
Discussion in the practical work enhances my understanding of the subject	L1	69	24	8
	SL	86	12	2
I had few opportunities to plan my experiments during the lab work.	L1	36	49	15
	SL	46	35	19
I felt confident in carrying out the experiments in physics	L1	32	32	36
	SL	58	30	12
The experimental procedure was clearly explained in the instructions given.	L1	29	35	36
	SL	56	30	14
I was so confused in the lab that I ended up following the instructions without understanding what I was doing.	L1	37	35	27
	SL	16	16	68
There was good linkage between experiments and the relevant theory.	L1	56	31	13
	SL	69	23	8

Entries in bold show where there was a statistically significant difference between responses.

## Pick three reasons why you think lab work is an integral part of a physics course.

	SL (%)	L1 (%)
Physics is a practical subject	30	52
Experiments illustrate theory for me	68	64
Lab work allows me to test out ideas	29	11
Experiments assist me to plan and organise	6	5
New discoveries are made by means of experiments	48	40
Experimental skills can be gained in the lab	34	49
Experimental work allows me to think about physics	62	53
Experimental work makes physics more enjoyable for me	23	26

Students had three votes in this question.

## Imagine you're in charge next year – what would you do differently?

L1 (Top 5 themes)	SL (Top 5 themes)
1. Quick run through at start	1. Better/clearer instructions
2. Better/clearer instructions	2. Link theory to practice
=3. Link theory to practice	3. Better/working equipment
=3. Better demonstrators	4. Let students do more of the work themselves
=5. Better/working equipment	5. Let students plan experiments
=5. More demonstrators	

## Conclusions

- Students arrive at university with a positive view of the practical side of physics. For the most part, this positive view is maintained through first year.
- There is evidence of a shift in opinion, though, away from the positive end of the spectrum in certain areas.
- This shift could be a result of the students being required to take more responsibility for their work, and the fact that laboratory work becomes formally assessed at university.

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