



University of
Strathclyde
Glasgow

Investigating undergraduate physics in Scotland

Strathclyde
University
Physics
Education
Research group

Introduction

Anecdotal evidence of issues

Drivers in SE

The importance of SE on HE

Linking the two

(SU)PER at Strathclyde

Strathclyde Institute of
Education

Department of Physics

Cross faculty
collaboration

Who are we?

- The research team for this project is a subset of SUPER
- Laura Gray
- Iain Moore* iain.g.moore@strath.ac.uk
- Michael Murray
- Brian Patton
- Helen Vaughan

Scottish system

- Start school at 4 or 5 (age range slightly different)
- 7 years of primary school
- Start secondary at 11/12
- 6 years, 2+2+2 (2+2+1+1) or 3+3 (3+1+1+1)
- National 5 $\approx$ GCSE
- Highers $\approx$ AS level – Main university entrance
- Advanced Highers $\approx$ A level
- 4-year honours degree

What's happened so far?



Secondary school practical physics research
Session 2023-2024



S1/S2 research



KE to promote practical work

What do we know now?



REDUCTION IN
TECHNICIAN SUPPORT



BUDGETS ARE SERIOUSLY
STRETCHED



GENERAL CONCERN
OVER TIME TO TEACH
COURSES

SUPER - Initial project



Practical declining



High school being
researched



Unknown impact in
Scotland

Why this initiative?

- Anecdotal so far
- Need for real data:
 - Has there actually been a change in students?
 - In staff? (Is this just the old complaining about the young!?!)
- Institution – Scotland – Wider impact
- Is the changing school curriculum affecting HE?

Why now?

- What are the current challenges around required changes to delivery?
 - COVID
 - GenAI
 - IOP accreditation
 - QAA benchmarks
 - EDI
 - Enterprise
 - Education for Sustainable Development
- Falling recruitment to physics despite growth in N5/Higher (much lower AH)

Session content

Session 1

- Transition
- Resilience
- Skills

Session 2

- What next
- Answers
- Ideas



What is working?



What data do you collect?



What are your ideas?



What would you like to try?

How it worked



Table groups randomly assigned



Discussed the specific topic given



Added post its to the sheet



Moved to the next group



Repeated the process (without seeing the previous)



Repeated with final topic



Reported

Analysis

- Every post it transcribed
- Sorted by three members of the research team
- Initial themes considered
- Sorting of individual statements
- Reconfiguring as subthemes
- Three themes emerged

Themes

Theme	Subthemes
Perception	Purpose
	Expectations
Teaching	Staffing
	Assessment
Preparedness	Schools
	Technical skills

Perception – staff views

Purpose

- Students undervalue labs
- More than academic challenge/change
- Concerns about resilience

Expectations

- Following of scripts
- Development of skills
- Concerns over ‘wrong’ answers

Teaching

Staffing

- Stronger definition required for demonstration
- Clearer relationship development
- Feedback understanding

Assessment

- Assessment not understood or clear
- Competency and improvement, reflection
- How should marking work?
- Growth for students

Preparedness

Schools

- Teaching to the test culture
- Rigid marking experience
- Belief issues come from school

Technical skills

- Labs are most intensive change
- Lack of technical skills
- Includes issues of coding/excel

Afternoon

- Sharing of best practice
- Assuming no practical or mathematical skills
- Recipe labs, plus staged labs
- Mentoring and summer schools – appropriate
- Staff balance – including balance
- Trust in marking
- Explanation of why
- Improvement in training
- Reduction of fear of failure

The future – grant proposal

Becoming clear
there is no point
in small

Need contacts
from UG Physics
universities in
Scotland (UK?)

Going to be quite
a big project

We need to do a
good quality
literature review

Employers and
students need to
be consulted

The future – grant proposal continued



This will involve partners across Scotland (UK?)



Aggregating the data reduces the risk



Understanding our students means we can help them



This directly leads to further work and collaboration

The future – the funding issue

EPSRC is not the funder

If it is UKRI – it is ESRC

Significant competition

Difficulty of 'off to the side'

Get involved!

- 12th of June at 11.30am at the University of Strathclyde for noon start
- Developing the outline of a significant grant proposal
- Deciding on the work packages involved
- Opportunity to lead sub-projects

Undergraduate physics teaching in
Scotland - Research collaboration
development meeting



<https://forms.office.com/e/LGZBBiFkcH>