

An Investigation of Student Peer Leaders in an Undergraduate Physics Course.

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Overview of Presentation

- Introduction and background to the project.
- Aims of the study.
- Methodology.
- Findings.
- Conclusions.
- Significance and implications.

Introduction

Is providing opportunities for students to become Peer Leaders in an undergraduate Physics course worthwhile?

Action plan

A Peer Learning study utilising Peer Leaders was undertaken in the Physics Department at the University of Limerick, Ireland.

Background

What is Peer Learning?

- Teaching and learning strategy.
- Involves students working together to solve a problem, complete a task, create a product.
- Students responsible for their own learning and helping their team-mates learn.
- Tutor (Peer Leader) acts as a facilitator of the learning.
- Promotes critical thinking through discussion.



Background

What is a Peer Leader?

- Undergraduate teaching assistant
- Has direct experience of a particular course
- Role model
- Facilitates learning does not re-lecture



Aims of the study

To investigate student Peer Leaders performance in a Peer Learning program in undergraduate Physics.

Research questions

- What are the benefits of becoming a Peer Leader?
- Do the Peer Leaders experience a change in their conceptual knowledge of physics?

Methodology

Methodology:

Mixed method.

Sampling:

3rd year undergraduate Science Teaching students (N = 11)

Recruited on Volunteer bases.

Previously taken physics module (PH4101).

Method of data collection:

Questionnaires.

Conceptual understanding test.

Conceptual Test

Type of test

- A module specific conceptual understanding test was developed.

Breakdown

- It contained three sections.
 - Section 1: Open ended everyday occurrences.
 - Section 2: Multiple-choice (FCI) Force Concept Inventory (Hestenes *et al*, 1992) selection, asked to reason out choices.
 - Section 3: Mathematical manipulation of physics problems.

Conceptual Test continued

Section 1A – Mechanics

Sample Question

Q2. Start a ball rolling down a bowling alley and you'll find it moves slightly slower with time. Why?

Findings

Conceptual understanding test results

- Pre test mean = 32.77%
- Post test mean = 45.39%
- Average % gain from pre to post = 12.63%

Significant difference ($P < 0.05$) between pre and post test ($N = 11$).

Qualitative analysis of Concept test

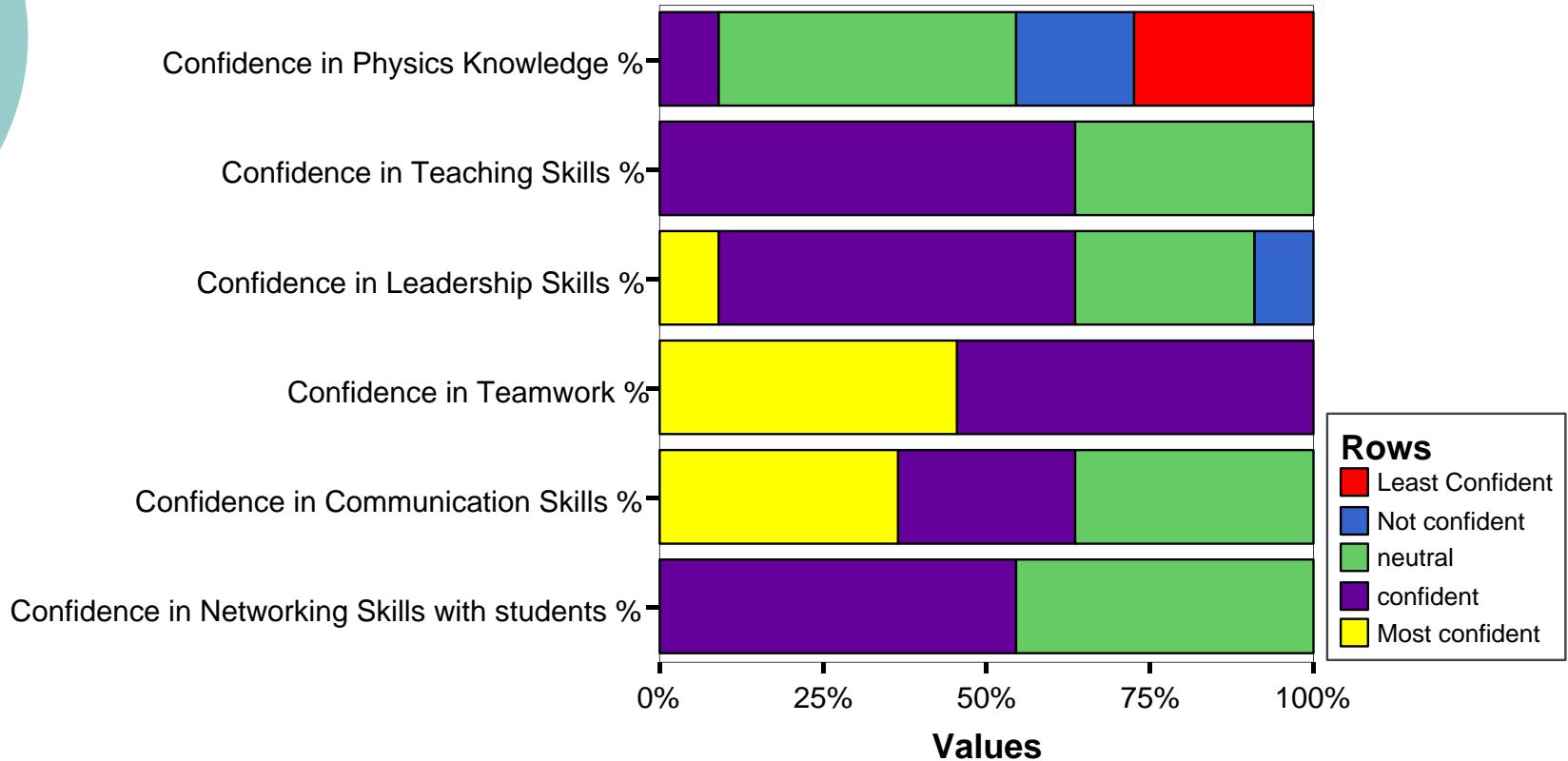
Sample student answer to Q2.

Pre: 'As it rolls down the energy you used to roll it is being lost and it begins to decelerate.' (**Aristotle trail of thought**).

Post: 'Friction between the ground and the ball will slow down the ball as it moves' (**Newtonian concepts**).

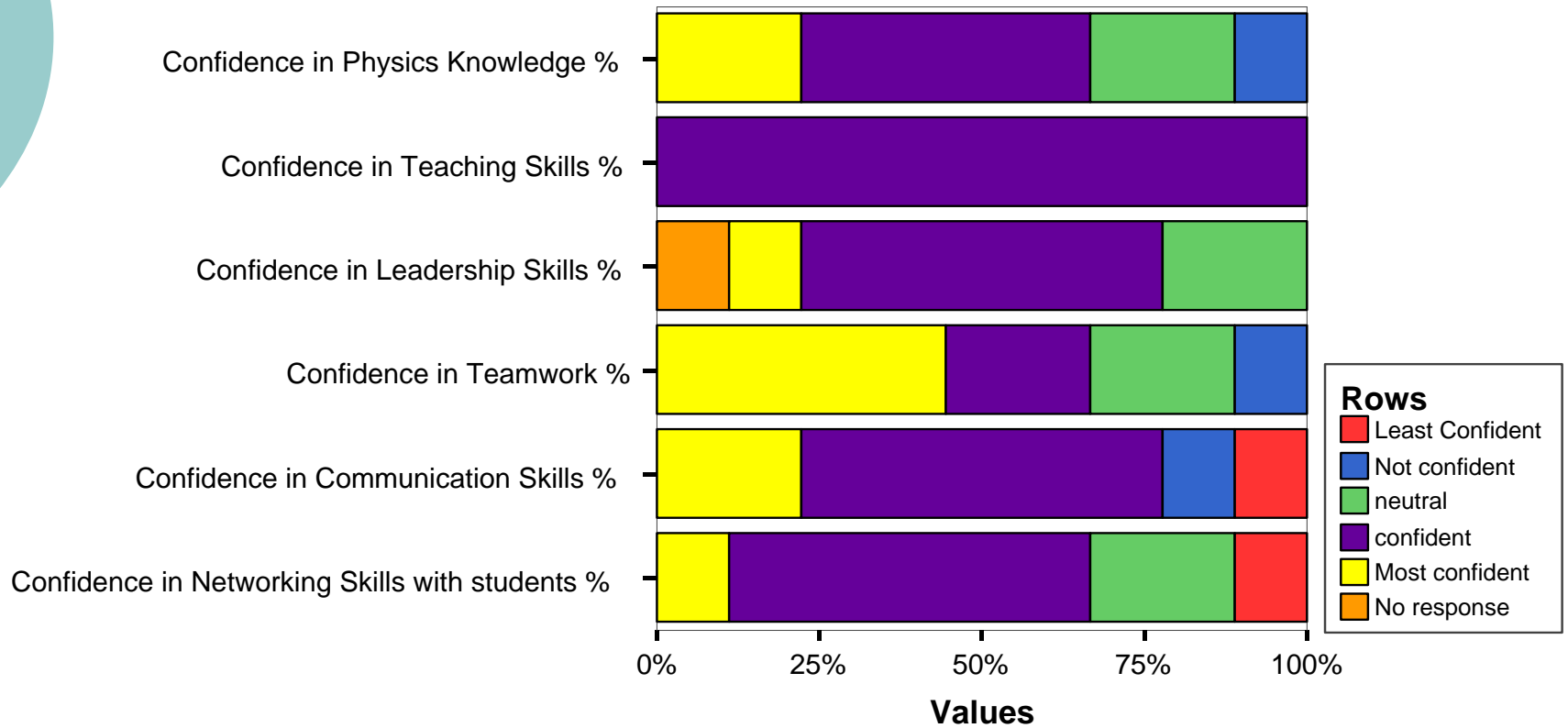
Findings: Confidence Ranking Pre

Columns



Findings: Confidence Ranking Post

Columns

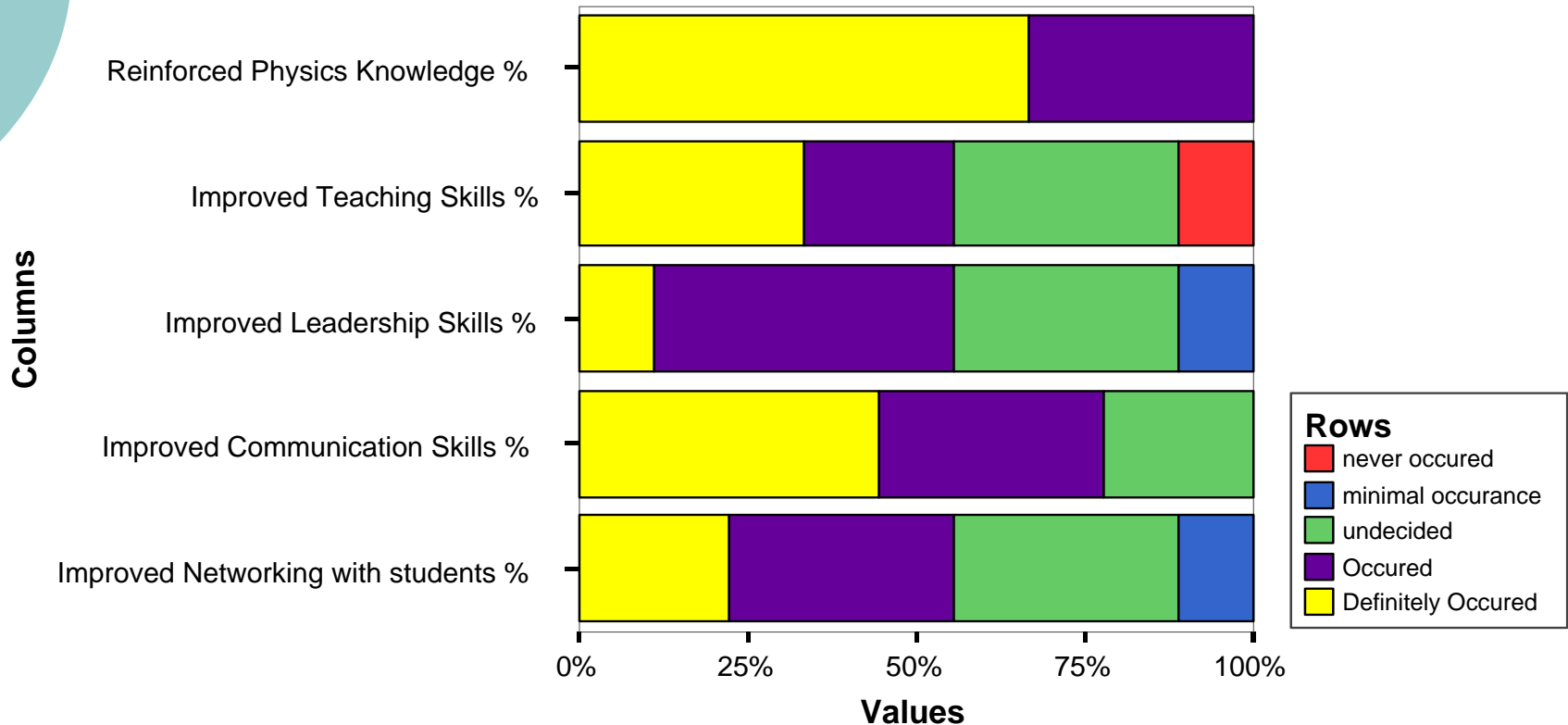


Findings

All the Peer Leaders (N = 11) stated that;

- becoming a Peer Leader improved their physics knowledge.
- they enjoyed being a Peer Leader and that they had a positive experience.
- they felt that the students also benefited.
- preparation time took longer than expected.
- they would take part in the program again.

Benefits of becoming a Peer Leader



Conclusions

Conceptual understanding test

- There was a significant difference ($P < 0.05$) in the Peer Leaders test scores.
- Preliminary results of the qualitative data indicates a change in conceptual understanding.

Questionnaires analysis

- The Peer Leaders felt that their physics knowledge had increased.
- They reported an increase in confidence in their teaching and physics skills.
- They felt they benefited from the experience.

Significance and Implications

- Preliminary findings suggest that the Peer Learning method employed is effective in providing beneficial teaching and learning opportunities to Peer Leaders.
- Initial investigations suggest that the Peer Leaders did experience a change in their conceptual understanding of physics.
- This study presents initial investigations in the field and research is ongoing.

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