

Using Data Logging in Biology Experiments with Limited ICT Resources

Background

The equipment available was one computer, 4 Go-Links and one each of the following sensors: heart rate, CO₂, O₂, pH, gas pressure and temperature.

5th year students researched data logging experiments on the internet. It was decided to carry out two experiments:

- 1 The effect of exercise on pulse rate.
- 2 The effect of varying light intensity on the rate of photosynthesis.

Students worked in group of three or four.



Students' opinions on limited equipment

"If there was more equipment there would be more time for each group to do the experiments and record their results."

"With more equipment the experiment could be expanded or we could view it from different angles."

"There weren't enough computers available – we felt rushed doing the experiment."

"We used what we needed, got good results and we understood."

"Even with limited equipment there are many more ways of doing the experiment."

"Get more equipment. We had many more ideas for experiments we were unable to do because of limited resources."

Challenges encountered

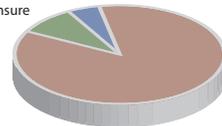
The O₂ sensor measured the level of O₂ in air and not dissolved O₂ – so a land plant had to be used instead of the *Elodea* students were used to.

The air in the bell jar had to be flooded with CO₂. This was done by adding water to an Alka-Seltzer tablet in a side-arm test tube connected by rubber tubing.

Student survey

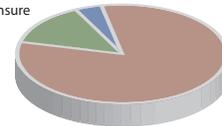
Liked using computer?

86% Yes 9% No
5% Unsure



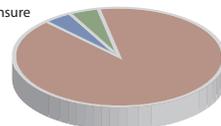
Improved understanding?

82% Yes 14% No
4% Unsure



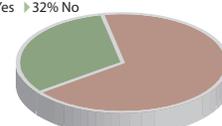
Would you like to use data logging in the future?

91% Yes 4.5% No
4.5% Unsure



Did you feel having limited equipment has an effect on carrying out the experiments?

68% Yes 32% No



Section B Leaving Cert. Biology questions

Students performed well on a Pulse Rate question. They found the Photosynthesis question more difficult and in some cases reverted back to the method they had used counting bubbles of O₂ from *Elodea*.

Teacher's thoughts

- ▶ Overall a very worthwhile experience which students enjoyed and want to use in the future.
- ▶ It improved my computer skills.
- ▶ More ICT equipment needed to make it more efficient .