

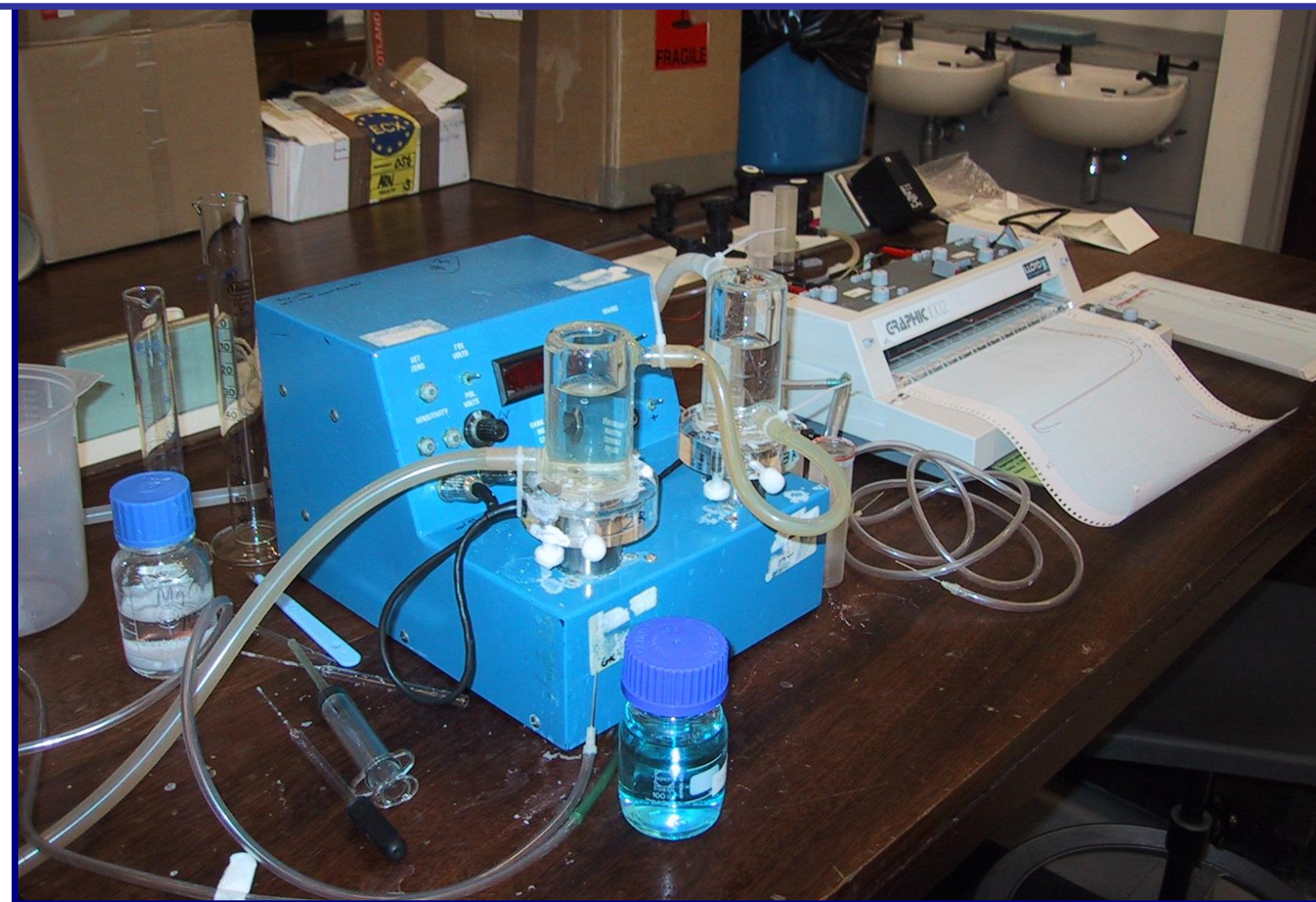


Development and Implementation of a Virtual Practical for Bio-sciences

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The Problem

Though the traditional “wet” practical familiarises students with the practicalities of experimentation, the constraints of available equipment, time and increasing student numbers often results in the generation of a very limited, and often poor, data set.



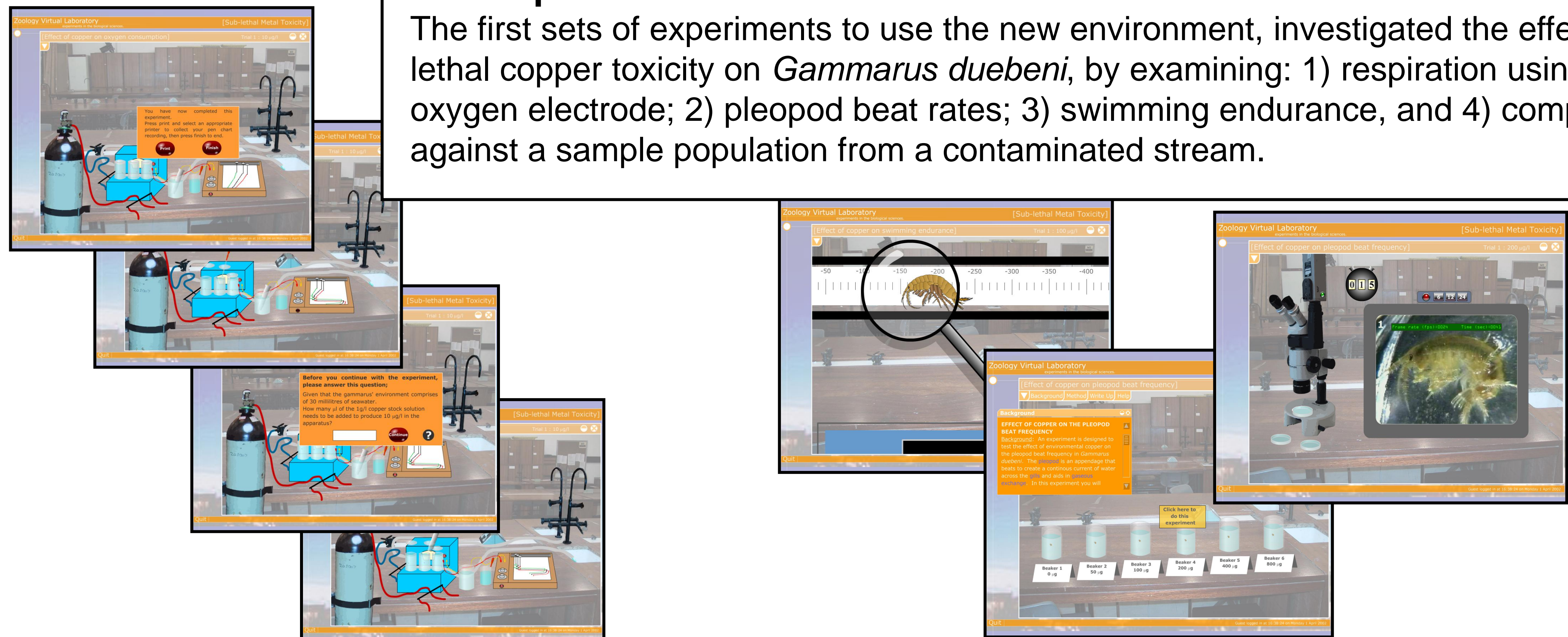
The Action

To mitigate this problem, we developed a self-contained Online Virtual Laboratory shell. The shell consisted of tutorial materials and interactive multimedia experiments emulating a real laboratory, including interactive animations and video clips. Each student was able to generate a unique and rich dataset, which included replicates and multiple variables allowing a range of statistical analyses.



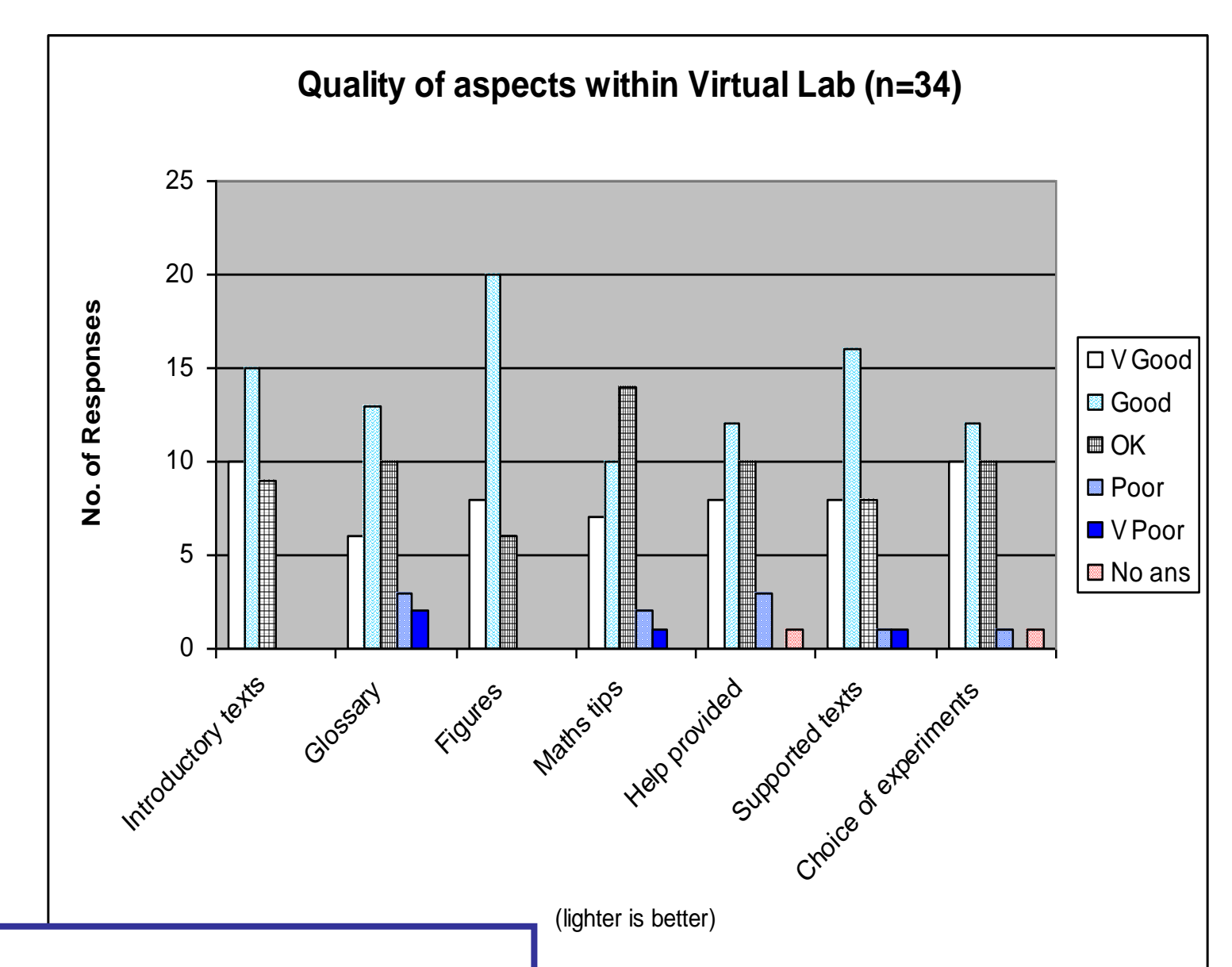
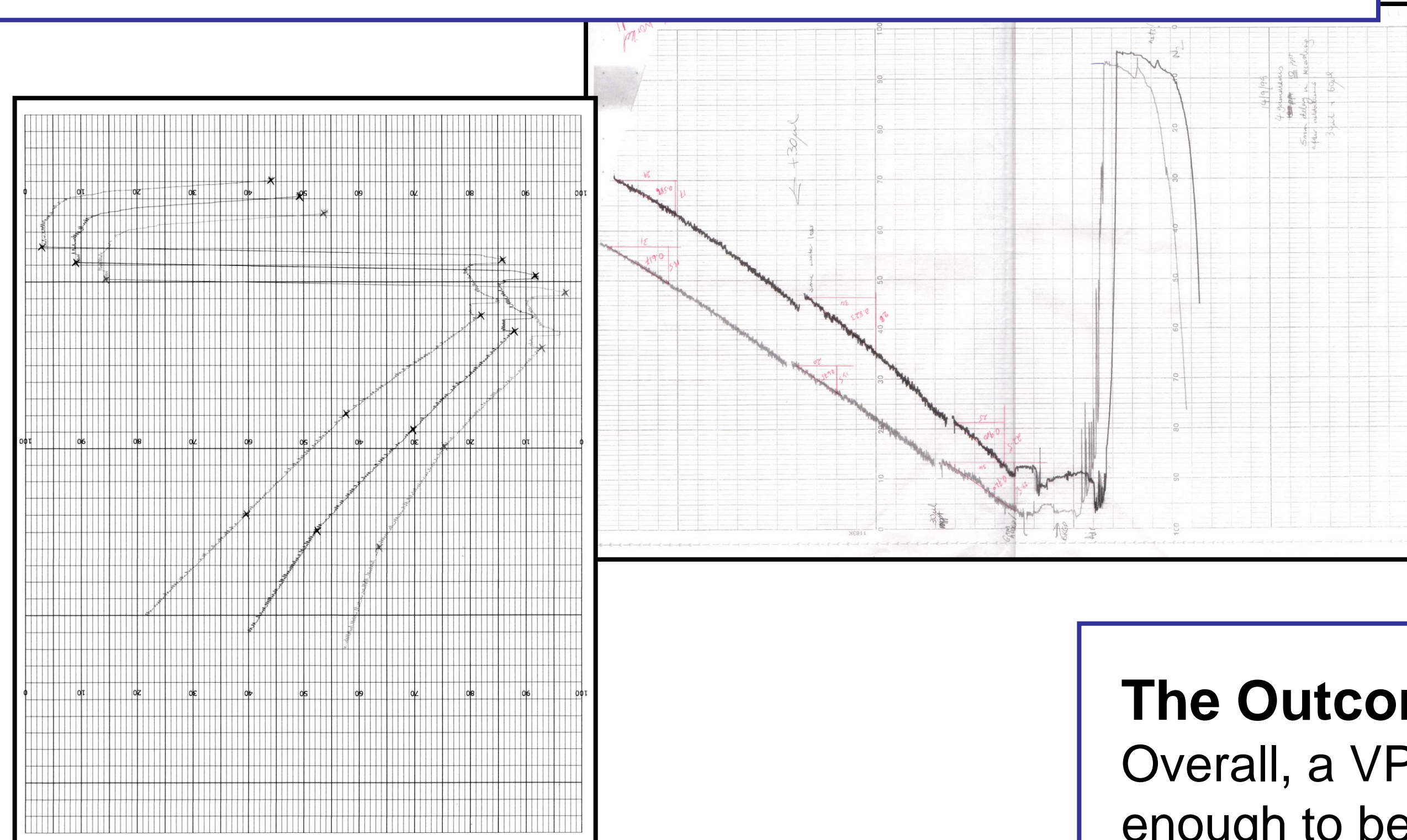
The Experiments

The first sets of experiments to use the new environment, investigated the effects of sub-lethal copper toxicity on *Gammarus duebeni*, by examining: 1) respiration using an oxygen electrode; 2) pleopod beat rates; 3) swimming endurance, and 4) comparing against a sample population from a contaminated stream.



The Practice

While the Virtual Laboratory was timetabled for half the usual allocated laboratory time (normally a day), the students were able to complete a greater number of experiments and their write-ups showed a greater understanding of the phenomenon due to the multi-faceted experimental approach. Grades were comparable with the other “wet” practicals of the course.



The Outcome

Overall, a VP was developed that is engaging enough to be of interest to the student, allows a series of experiments to be “performed” that time and equipment would normally prevent and provides a rich and accurate dataset for a practical write-up.