Teaching Biomedical Engineering undergraduates how to keep a lab notebook

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Introduction
Keeping a lab book is a key skill for biomedical engineers, but teaching on this is often inadequate[1], with students reaching postgraduate level with out understanding how or why they should keep a lab book.

This year we trialled a method inspired by a driving instructor’s competency chart; combining aspects of rubric and ‘live marking’[3].

Methods
Key aspects of good lab notebook keeping were identified by the authors, in consultation with colleagues.

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“changes well documented, but you need to write down what you observed, not just the numbers on the oscilloscope”

Results & Discussion
Students responded well to the lab grids. Productive conversations were had during the live marking and students engaged more with the verbal feedback than they had with written comments. Staff load was much less than offline marking of lab books (5 minutes per student vs 1h per lab book for offline marking).

Whilst it proved difficult for a facilitator to get round all the students (~20) in one session, it was easy to spot which students were not improving and focus more time on them, allowing them to make immediate changes, and to provide additional feedback in subsequent weeks, and subsequent modules.

We give them written instructions and examples at the start of their first lab module, but knowing what and how much to include in your lab book is as much art as science, and only comes with experience… a process which can be speeded up by provision of feedback…

Future work
Lab notebooks will be collected from each year group and the quality of lab book records systematically compared for work completed before and after the introduction of the grid.

Conclusion
Observations show that the method enabled constructive feedback to be given in a more frequent and timely manner. Thus it was better used by the students, yet the process took less staff time. This method shows much more promise than other approaches tried. It will be used again, with minor refinements, next year.

References

We have tried giving extensive personal feedback, and like others, have found this very time consuming[2], and unsustainable, particular with an increasing cohort size.