

Math workshop as a valuable vehicle to learning

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Aim

The project aims to develop and deliver Math Workshops for foundation year engineering students designed to provide wider access to accredited honour degrees for students **without the typical A-level entry qualifications**.

The math problems are not the classical mathematical exercises, but wording questions, puzzles, games and brain teasers **to develop problem solving, analytical thinking, self-learning and independence**.

Methodology

The workshop sessions were organized :

1st Session: It was elaborated to create awareness and reflect on the learning process based on Gibbs' approach [1].

2nd – 10th Session:

* **0 - 20 minutes:** it was allocated to a gaming activity to be performed individually and competitively [2-3]. The Kahoot session was used as a warm-up to revise key points of the weekly topic.

* **20 – 50 minutes:** It was dedicated to a group activity where a list of mix exercises covering selected topics for that week. Peer learning was encouraged, and students were invited to present the working on the whiteboard or visualiser.

Focus group

A set of volunteer students participated in a two-hour focus group to gather feedback about Foundation Year engagement, assessment and maths provision.

Key findings:

- Disseminate regularly the **learning support** (Math Café, Science Café, office hours, etc).
- **Full answers** provided at the end of each example class to allow students to compare their work to the correct responses.
- **Kahoot quizzes held at the end of maths workshops** rather than at the beginning, to test understanding and highlight areas for revision.
- **Diagnostic tests** at the beginning of the year to identify students struggling with certain topics, with compulsory sessions to cover basic content for students that need this (but not compulsory for students who do not need to learn this content).

Background

- The broad range of Math background makes teaching challenging.
- There are quite a few with specific learning difficulties, BTEC qualifications or mature students.
- The foundation students take more supplementary exams than students that enter directly in year 1 and some of them struggle to complete the degree.

Findings of 1st session

The students comments were on the lecturer capabilities, teaching techniques and learning environment. However, the question was **“How do you learn?”** not **“How you want to be taught?”**.

The findings highlight the importance of the lecturer figure in the learning process but very little is said about the **student process of learning and their ownership in the learning process**.

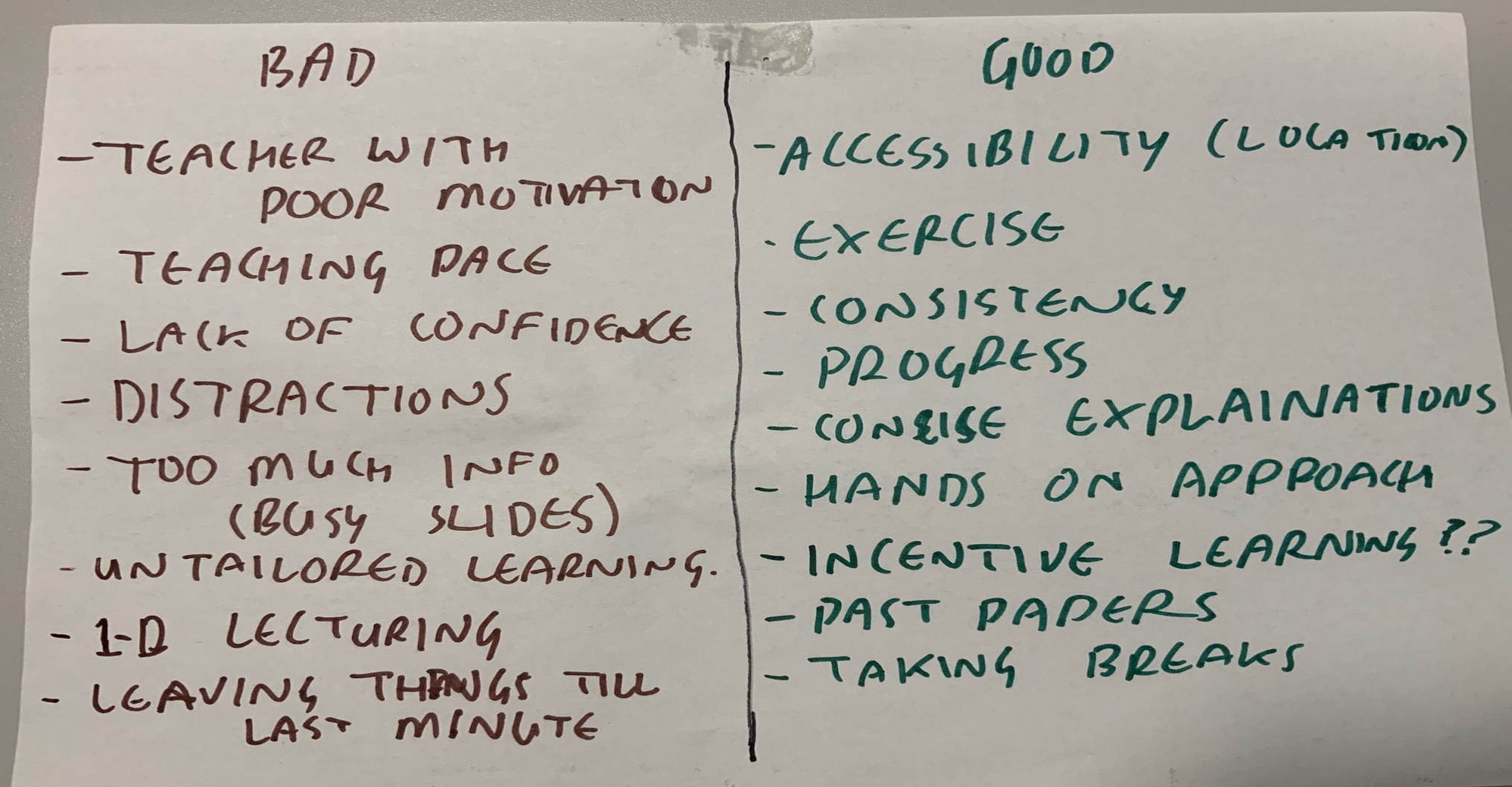


Figure 1: Collated students' responses on "How do I learn" during the plenary of the first session based on Gibbs' approach.

Good practice

- Students enjoyed the **lecture recording** across the board and **example video clips** in Engineering Science.
- Students enjoyed the option of booking additional **one-off individual** or **small group appointments** with lecturers in **addition to office hours** for Foundation Chemistry and Engineering Science.

Conclusions

The activity showed that the students arrive to the university with a preconception of the professional training at the Higher Education Institution (HE). They are taught with tailored materials and past exams to train to succeed in the GCSE and A-Level exams. Less attention is spent on the learning opportunities, self-centred learning techniques and transferrable skills.

The outcomes of the work demonstrate the importance and need to offer more learning support, welfare service, to build a constructive and positive learning experience, and a rewarding life experience during the stay in the HE.

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