

## ***What makes the best learning experience for a materials student?***

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In my experience there are a few key issues that help materials students to learn. Materials is an almost lost discipline, that is not thoroughly understood, and consequently the numbers studying materials courses may be small. However, there is a growing need for materials graduates, be it in industry or in direct materials applications. Thus, materials students need encouragement and support throughout their entire degree, arguably more than other engineering or science disciplines.

One of the ways that this can be accomplished is to relate subject matter to industry and show how theory becomes practice. Ideas of future employment opportunities will also help materials not only to become acknowledged by the general public, but also to keep undergraduates motivated and provide a good learning environment. Practical experiments and work placements will also help to reaffirm the importance of course material to real life and industry. Active learning in laboratories is an important and useful way to cement ideas taught in theory in lectures; it helps to explain the relevance of what could, potentially, have been a very confusing and seemingly inconsequential lecture.

As the American theologian Tyron Edwards (1809-1894) once said:

‘The mediocre teacher tells, the good teacher explains, the superior teacher demonstrates but the greatest teacher awakens interest and kindles enthusiasm and this is the sure way to teach easily and successfully.’

Enthusiastic staff should also be one of the instruments employed to help create a great learning environment for students. A successful tutor is able to relay his or her passion for the subject in question and is able to deliver lectures in a way that makes the learning material accessible and interesting to all. This one thing could be the crux to all students’ learning needs.

Detailed feedback from assignments and coursework is also beneficial since it helps students to see where they have gone wrong and what they can improve upon. This includes things like worked examples to questions that can be followed and understood; after all we all learn by our mistakes.

Provision of academic support such as tutorial groups and extra maths classes are especially important, since not all materials students find mathematics a strong point. The area of mathematics is one where most students seem to run into significant problems. Thus, additional help in this area would be deeply appreciated by all.

One of the main problems that materials students encounter is that technical language may be used in many lectures and laboratories during the period of the course. In view of the fact that many materials students are from overseas, this can cause a problem in understanding and can seriously hinder learning and enjoyment of the course. Thus to help these students a list of technical terms and explanations could be provided to clarify the terminology.

Occasionally teaching staff do not appreciate that there is a broad spectrum of working abilities, especially in subjects that are not prerequisite for materials and so only target their lectures at the more advanced student level. This is something that can be severely detrimental to the working morale of many students and could cause them to lose interest in the course, and hence, eventually to drop out.

In addition, few teaching staff are actually trained teachers; they are academics, with maybe pressing research matters, not able to donate much time to the eager student. They may not be able to communicate their ideas about the subject matter effectively, finding it difficult to comprehend why some harder topics are not understood. I therefore believe that it is essential that all teaching staff have some basic training so that the lecturer and student are able to communicate on a learning basis, thus aiding both alike.

However, there are mechanisms that can be put into place to solve many of the problems experienced by materials students. One of the main issues is to make the general public more aware of the materials discipline. With greater knowledge of materials, more funding could be appropriated and so this would directly benefit the working environment of all materials students. Also, more team work and year group bonding exercises would help to make sure that students would feel comfortable asking each other questions about parts of the course that maybe they do not totally understand. This would benefit both parties and would help the overall morale and course understanding of the year group.

More problem solving exercises would help put the theory behind many courses into practice. Better still, tutorials going over these problem sheets would aid the learning experience of materials students, especially since courses are quite practical and applying knowledge always makes learning more enjoyable.

Making resources more readily available is a very important issue to consider; even making books and computers easily accessible would help the learning of the students. Having increased funding and more work placements available to students would significantly enhance the enjoyment and hence understanding of the students on the course.

In my opinion, materials students are a rare breed and need to be nurtured and aided in every way possible to assist their learning environment, and ability to enjoy the course and succeed at it. After all the students of today are the inventors and pioneers of tomorrow, and it is in students' hands that the populous must place their trust, so the great unrelenting work of previous generations is scrutinised and sustained.