



Learning and Teaching Support Network

Materials Subject Centre

UK Centre for Materials Education

Materials Subject Centre Update

Welcome

The Materials Subject Centre, hosted by the University of Liverpool, is one of a new network of 24 Subject Centres, funded by the HE funding councils for the UK. Together the 24 Centres form the Learning and Teaching Support Network (LTSN). Each Subject Centre is committed to supporting teaching and learning activities within a specific subject area.

The Centre aims to be a valuable resource for all teachers of materials, either in materials department (e.g. materials science, ceramics, textiles, paper or polymer technology) or in one of the many other science or engineering departments which teach materials as a core part of their programmes.

First Newsletter

Each newsletter will feature articles related to teaching and learning in materials. It will also feature news of relevant events, workshops and conferences, plus give reviews on resources that may be used to support teaching and learning activities in materials education.

Centre Launch

The Materials Subject Centre was officially launched at the IOM Materials Congress 2000 held in Cirencester, April 12-14 by Professor Peter Goodhew, the Centre Director. The launch on 13 April followed a workshop on 'Encouraging Creativity and Innovation in Material Scientists' facilitated by Dr Caroline Baillie, the Deputy Director of the Centre.



Professor Peter Goodhew, Ian Jones, Ann Fretwell and Susan Doyle at the launch of the Materials Subject Centre at the IOM Conference Congress in April

Industrial Needs Symposium

The Materials Subject Centre is hosting a full day symposium on 7 November 2000 on the issue of 'Industrial Needs for Materials Graduates: focus on curriculum design'. We hope to attract a good balance of academics and industrialists to provoke informative discussions around the important themes of:

- What is the shared responsibility of industry and university for the professional development of materials graduates?
- Are we developing our graduates for a research career or a career in industry or both?

- Are we adequately developing materials students' skills for lifelong learning?
- How much should industry influence the content of materials degree programmes?

This symposium will be of relevance to industrialists and also to academics with an interest in curriculum design. We will disseminate the findings of the symposium to all Heads of Departments in materials. If you are interested in joining us for this symposium please contact Susan Doyle for further details: itsnmat@liv.ac.uk

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New Developments for Materials Education: LTSN and FDTL

Introduction

The Higher Education Funding Councils in the UK have recently placed a high priority on developing schemes to foster and support education developments embedded within disciplines. Part of the rationale for this is an acknowledgement that academics best appreciate, assimilate and implement a pedagogic approach when it is presented to them within their own discipline. In addition, it is felt that many university centrally based educational centres have not been as effective as predicted. This may in part be due to their generic nature and their inability to enter into subject level discussions with academics.

There are now two major national schemes that provide a subject-based approach to tackling educational issues. These are:

- the Fund for the Development of Teaching and Learning (FDTL), and
- the Learning and Teaching Support Network (LTSN).

FDTL Projects

The FDTL is largely concerned with the development and dissemination of best practice. Almost half of the projects announced in phase three are in engineering related areas, including three projects within the area of materials technology. These projects are:

DOITPOMS

Cambridge University, Prof Bill Clyne

The aim of this project is to build on recognised expertise in the use of Information Technology (IT) in enhancing the student learning experience and to disseminate these techniques within the materials education community.

Tutoring Materials

Imperial College, Dr Caroline Baillie

The overall aim of this project is the identification of good practice in materials tutoring and the encouragement and provision of support for lecturers and tutors who are interested in improving their practice.

The Keynote Project

Nottingham Trent University, Dave Allen

This project will focus on discipline aspects of textiles, fashion and printing. It is designed to develop key skills in the curriculum and prepare students for future employment and life-long learning.

LTSN Materials Subject Centre

The Learning and Teaching Support Network (LTSN) is a new national initiative for the implementation of 24 Subject Centres, with the aim of stimulating the sharing and dissemination of good practice and innovation in learning and teaching through the provision of subject based support. A Centre has been funded for materials education, in addition to a separate Centre for engineering education.

The Materials Subject Centre is funded to support the unique need of programmes specialising in materials, including metallurgy, ceramics, textiles, paper and polymer technology. The Centre aims to develop and support a national network and community of academic staff interested in materials education. The Centre will support this network with a library of teaching resources, web-site, publications, workshops, visits to departments, and individual support.

Issues for Materials Education

Within the UK materials is considered a very particular discipline with a broad remit. Students in materials need to develop their ability as physicists, chemists, and often biologists as well as applying their training to all other branches of engineering. At present however, materials programmes in the UK are closing or being subsumed by engineering programmes. This is largely due to the low numbers of applicants. This deficit is considered to be due to a lack of knowledge and understanding about the subject by school teachers and careers advisors. The new Centre will help to maintain the existence of materials as a unique 'interdisciplinary' discipline alongside the provision of materials taught within engineering and related programmes.

Summary

The LTSN Materials Subject Centre aims to support a collaborative network of academics interested in developing materials education and also provide a forum to address issues relevant to teaching and learning in materials. Three FDTL projects will be actively engaged in developing teaching practices within materials education. The Centre will help disseminate the outcomes from these projects to help all departments to offer modern programmes, which will prove attractive to students.

'academics best appreciate, assimilate and implement a pedagogic approach when it is presented to them within their own discipline'

Resources for Teaching and Learning in Materials Education

Resource Collection

The Materials Subject Centre is in the process of building up a library of resources to support teaching and learning of materials. We are collecting resources and reviews that are currently available, plus where there are obvious gaps we are inviting academics to contribute to this collection, for which small grants may be available.

The types of resources that we envisage might be useful to academics include:

- Ideas for case studies of innovative teaching practices. For example, many departments are moving towards incorporating more project based work in their programmes, ideas to support this could be shared. We have established a small grant scheme to help this effort.
- Reviews of software e.g. MATTER, Cambridge Materials Selector, and text books.
- Accumulation of a library of video and photographic resource material for teaching use. Initially this would be on conventional media but we expect that all material will be available across the web at some point in the future.
- Development of a library of lecture demonstrations and laboratory experiments. Most lecturers have developed a very small number of successful classroom demonstrations and laboratory experiments. This has been achieved in a fairly primitive form in the USA by J A Jacobs (Experiments in Material Science, CD-ROM).
- Development of a reviewed list of potential industrial visits. Most departments try to give their students some experience of industrial processes and laboratories but it is not easy in all parts of the country, to find suitable (welcoming and technically rewarding) sites to visit. Shared experience would be very helpful.

Useful sources

Examples of useful web-based resources for teaching and learning materials at various educational levels include:

Undergraduate level

www.matter.org.uk/
Web-site from the MATTER team providing highly interactive resources for undergraduate studies in ferrous metallurgy, diffraction and solidification. Also gives details of 'Materials Science on CD-ROM'.

www.umist.ac.uk/material/research/intmic/
Internet microscope from the Manchester Materials Science Centre which provides quality micrographs of many different materials. It provides an image library that aims to duplicate the feel of a real microscope. All samples can be seen from low to high magnification, each supported by descriptive text.

Post 16-18

www-materials.eng.cam.ac.uk/mpsite/
Web-site providing resources to aid the understanding of materials and material processing for engineering from the University of Cambridge, University of Manchester and TEP. Provides case studies: notably a 13A plug case study.

School level

www.nmsi.ac.uk/on-line/challenge/
A gallery and web-site about materials from the Science Museum aimed at stimulating the interest of younger pupils in materials that surround us.

www.matter.org.uk/schools/
Web-site from the MATTER team providing interactive resources designed to assist teachers and students of physical sciences at both 11-16 and A-level.

General interest

post16.iop.org/shaping/psm.html/
The IOP web-site gives details of a series of booklets intended to promote debate about the way forward for physics education in schools and colleges. This resource looks specifically at issues for materials education.

Small grant scheme

The Centre has funds available with which to support the compilation of case studies of innovative teaching practice. We are also bidding for further funds to encourage academics to engage in small education development projects.

If you are currently engaged in developing innovative teaching practice and are interested in producing a written case study of your practice please contact us. These case studies will be included in a guide to 'Innovative Practice in Materials Education', which will be disseminated to all departments. The Materials Subject Centre will pay up to £500 per selected case study.

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UK Centre for Materials
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or would like to be involved in any way with the
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