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Sustainable, low carbon teaching systems are part of the carbon reduction strategies needed to meet the targets set for U.K. higher education (HE) institutions. The challenges of supporting the transition to sustainability have not been fully addressed by current systems, models and practices. Few studies have considered the whole system environmental impacts of different Teaching Models in U.K. institutions, which are being transformed by significant changes in the use of Information and Communication Technologies (ICTs), leading to blended traditional and ICT-based teaching methods.

With funding under the JISC Greening ICT Programme, the SusTEACH project undertook an assessment of the environmental impacts associated with the teaching and learning delivery methods of different HE Teaching Models, and examined the impact of the use of ICTs on carbon reduction. This involved a detailed carbon-based environmental assessment and data analysis of 30 HE courses and modules, representing different Teaching Models, delivering teaching and learning using traditional and more online methods in several UK institutions.

For the first time, the SusTEACH project developed an online toolkit arising from the data analysis and findings that includes a suite of Sustainability Tools for the Environmental Appraisal of the Carbon Impacts of HE Teaching Models, aimed at lecturers, qualification directors, students and senior managers in higher education. The SusTEACH Toolkit includes various tools and resources which have been carefully designed to support:

- Awareness of sustainability issues;
- Education about sustainability;
- Reflection on current practices;
- Modelling of HE teaching carbon impacts;
- Planning more sustainable HE teaching;
- Reduction of the negative environmental impacts of teaching, learning and assessment;
- Research and further data collection on the carbon impacts associated with HE;
- HE carbon reporting and carbon reduction policies.
This original online toolkit is available online [http://www9.open.ac.uk/SusTeach](http://www9.open.ac.uk/SusTeach). Promotion of this toolkit is underway and includes the wider aim to promote institutional transformation towards a sustainable future.

**SusTEACH toolkit**

**The SusTEACH Planning Tool**

The SusTEACH Planning Tool is an online tool which helps lecturers and academic designers to design and rate their teaching delivery plan for a module/course and produces personalised feedback on the likely environmental impacts associated with this plan. The tool uses qualitative measures to assess a proposed design or plan for teaching and learning in terms of whether it is delivered using face-to-face, online ICTs (including digital resources and learning technologies), and/or specially developed printed teaching materials within a HE teaching system. This tool was developed by modelling the energy impacts associated with specific teaching delivery methods and Teaching Models. This educational tool produces a detailed report based on a comparative analysis of the environmental impacts of different teaching delivery models.

**The SusTEACH Modelling Tool**

The SusTEACH Modelling Tool is an operational desk tool (Excel based) for the lecturer and qualification director which permits the modelling of one or several courses/modules within a qualification programme to estimate the energy impacts associated with different HE teaching delivery methods. This tool includes a user guide and allows more sensitive modelling of the likely carbon impacts of the teaching methods being used on a course/module, including the particular impacts associated with student travel and purchases of books and ICT devices. This tool may be used also to model the impacts of several courses or modules within a qualification programme, which allows estimations of the impacts created by the balance of Teaching Models used in HE institutions.
The SusTEACH Carbon Calculators aim to help lecturers and students calculate their teaching-related carbon impacts, and students to calculate their study-related carbon impacts. The (Excel based) calculators include user guides to support the calculation by students and lecturers of the carbon impacts associated with course/module-related travel, materials, purchase and use of ICT devices and campus site operations (attributable to teaching) and residential accommodation. The carbon assessment is measured against CATS credits or study hours applicable to a course/module and the duration of the course/module.

The SusTEACH Environmental Impact Assessment Methodology - The SusTEACH methodology is a downloadable guide to support senior management with conducting a carbon-based environmental impact assessment of courses and modules in Higher Education. This builds on the SusTEACH team experience with conducting an environmental assessment and provides advice on gathering environmental impact data, measuring energy consumption, and calculating carbon impacts associated with courses/models utilising the latest carbon conversion factors.

We would very much welcome your views and feedback. Dr Sally Caird, s.caird@open.ac.uk, The Open University.
To provide online feedback see http://www9.open.ac.uk/susteach/views.htm
For further project information see http://www.open.ac.uk/blogs/susteach/
To access the Toolkit tools, resources, references and further details see http://www9.open.ac.uk/SusTeach/