

The New Zealand Society for
Sustainability Engineering and Science



INTEGRATING SUSTAINABLE DEVELOPMENT INTO THE HIGHER EDUCATION BUILT ENVIRONMENT CURRICULUM.

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The Study

This study explores the pedagogical and practical questions of how best to embed sustainable development in the *higher education (1)* curriculum in order to provoke a cultural shift in *student behaviour (2)* in the *built environment (3)* disciplines, within the constraints of the current *operating environment (4)*.

Methodology

It is a small, qualitative study intended to add to the discussion on how best to embed sustainable development in the higher education curriculum.

Interview data were collected from four key informants from academia and one from the professions. These data were supplemented by the analyses of policy and operational matters associated with the institutional promotion of sustainability.

Methodology



The findings of the study were applied to a previously devised, theoretical model for programme-based assessment and the paper concludes with a proposed model for embedding sustainable development in the higher education curriculum of the built environment disciplines.

The findings should inform other disciplines.

TIMING



- As we are approximately halfway through the Decade of Education for Sustainability(2005-2014), it is an appropriate time to reflect on our educational practices.

(1) Why Higher Education?



"Education is not the filling of a pail, but the lighting of a fire."

Often attributed to WB Yeats; but possibly Plutarch.

Why Higher Education?

- Education is a powerful tool. We can have a profound influence on students

- BUT...Careful!

Avoid indoctrination in approach



What are we trying to do?

UNESCO

'seeks to integrate the principles, values, and practices of sustainable development into all aspects of education and learning, in order to address the social, economic, cultural and environmental problems we face in the 21st century' (UNESCO, 2010).



How do we best achieve this integration?

The Environmental Association for Universities and Colleges (EAUC) proposed that most courses fall into one of the following categories:

- SD is fully integrated into the course.
- SD is mentioned in a particular module of the course.
- SD is not mentioned but you can see where it might fit.
- SD cannot be easily integrated within the course.

(EAUC, 2010).

What can Higher Education do?

No of Students in HE

UK Approx 2M

QUB 25K approx UU 28K approx

US Approx 14M -18M

NZ 469,107 students enrolled in higher education. Of this total, 33 percent were enrolled at a university

Sources: HESA 2009; US Bureau of Labor Statistics 2010 and the US Census Bureau 2007; Wikipedia

H.E. can provoke thought



H.E. can motivate



Sitting in a 3.8-metre sea
kayak and watching
a four-metre great
white approach you is
a fairly tense experience

<http://www.moneyisjustanidea.com>

Slide: courtesy of Paul Murray;
University of Plymouth

Key influences of H.E.

Values:

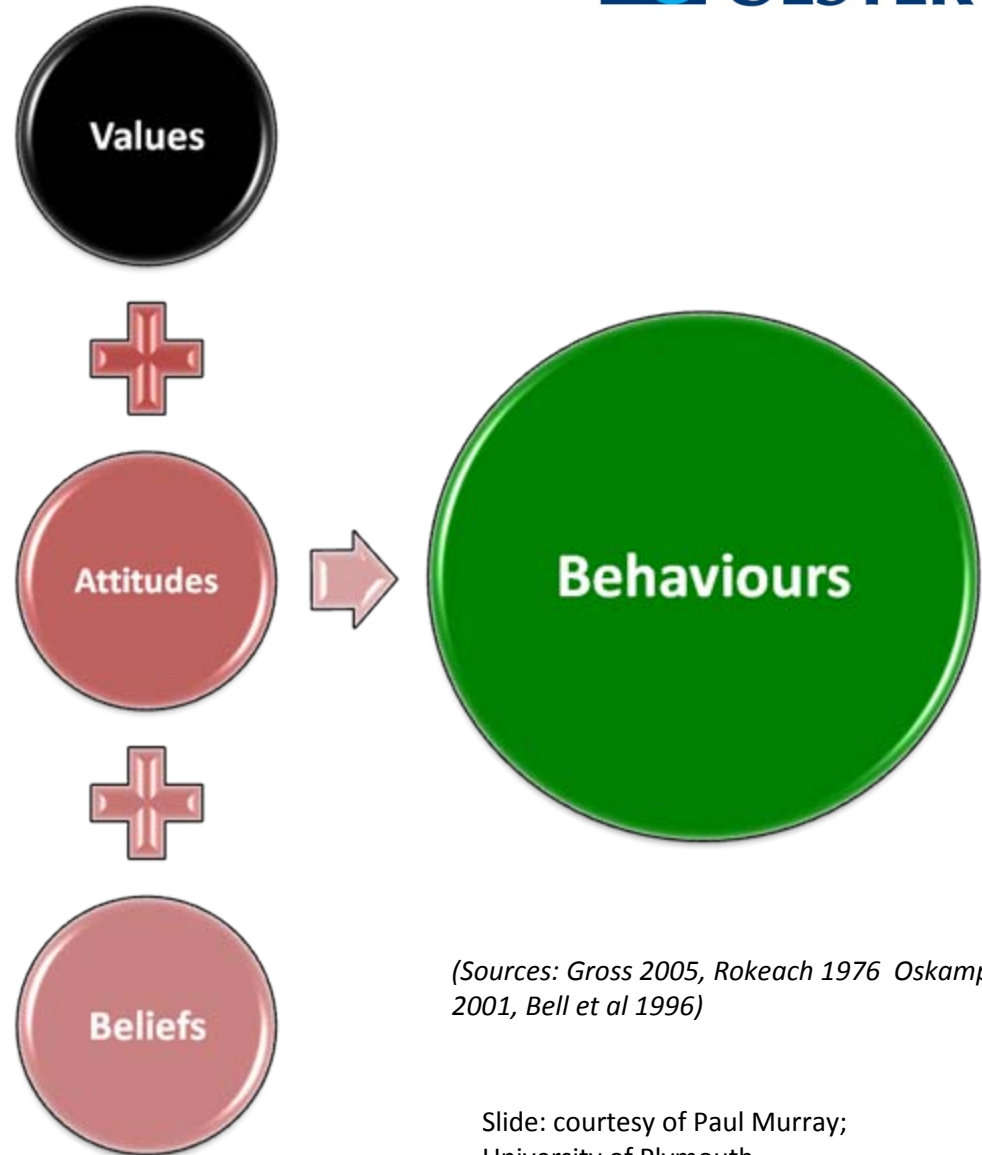
What I see as important,
life goals

*“saints, sinners and sex fiends
are determined by what
they value most”*

Attitudes: Judgements
that predispose actions;

Beliefs: Parameters of
our world; personal
‘facts’ and truths’

‘God exists’,



*(Sources: Gross 2005, Rokeach 1976 Oskamp
2001, Bell et al 1996)*

Slide: courtesy of Paul Murray;
University of Plymouth

(2) Human Behaviour Matters

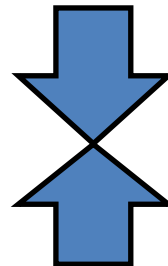
Technology has its role

Governments have their role

Businesses have their role

Institutions have their role

Communities have their role



Individuals count

Educational steps towards provoking a cultural shift in student / graduate behaviour

Making meaning

Making connections

Cultivating motivation:
Core Values

Becoming empowered:
Beliefs

Feeling equipped:
knowledge & skills

**Sustainable
behaviour**



(3) Why is the Built Environment discipline an important one?



(3) ...Why is the Built Environment discipline an important one?...



The built environment plays a central role in human existence and behaviour. It sets the agenda for such key, sustainable matters as transport, communication, social interaction, housing, social divisions, construction, waste, power and its generation, energy, culture, architecture, conservation, impact on the natural environment and the depletion of natural resources...

...Why is the Built Environment discipline an important one?...



Additionally and crucially, planning, development and property as an investment asset has had a significant impact on the world's economic and social well-being in recent years.

Human activity depends on the built environment. The built environment is expanding and developing at an increasing pace to meet the diverse social and economic needs of human activity. It is clear that the current usage of natural resources to meet the demands of the built environment is not sustainable...

...Why is the Built Environment discipline an important one?



In order to foster innovation and transformation for building products and performance to be sustainable, the philosophy and, more importantly, the practices of sustainable development should be embedded in the curriculum of the built environment discipline in higher education.



BUT – Take care...

Colleague from Architecture:

“Building Regulations call for the ‘supersealed’ house. Good for the carbon footprint; bad for human health!

Concentrates germs and allergens. Ears pop when the door is closed!

One must look at the whole picture!”

(4) The U.K. Higher Education Operating Environment



- Many changes over the last 25 years and particularly over the last decade.
- Challenges:
 - funding and tuition fees
 - global competition
 - status of teaching *vis-à-vis* research
 - the maintenance of quality and standards
 - student numbers
 - *etc...*

The U.K. Higher Education Operating Environment - ...



Modularisation and Semesterisation:

An analysis of some of the literature associated with modularisation and semesterisation suggests that, in summary, the advantages associated with the processes accrue to the management of higher education, with little or no advantages accruing to the enhancement of educational outcomes to the student.

The U.K. Higher Education Operating Environment - ...



Modularisation and Semesterisation:

Goodhew (2002) presented several educational arguments against modules and semesters. These included matters such as:

- Over- examining, because each module is individually assessed.
- Surface learning, because the module is taught in a twelve week semester teaching period.
- Putting a straightjacket on programme design, because elements of learning must 'fit' the unit size of a module. If you introduce an additional module, you must drop an equivalent one out.

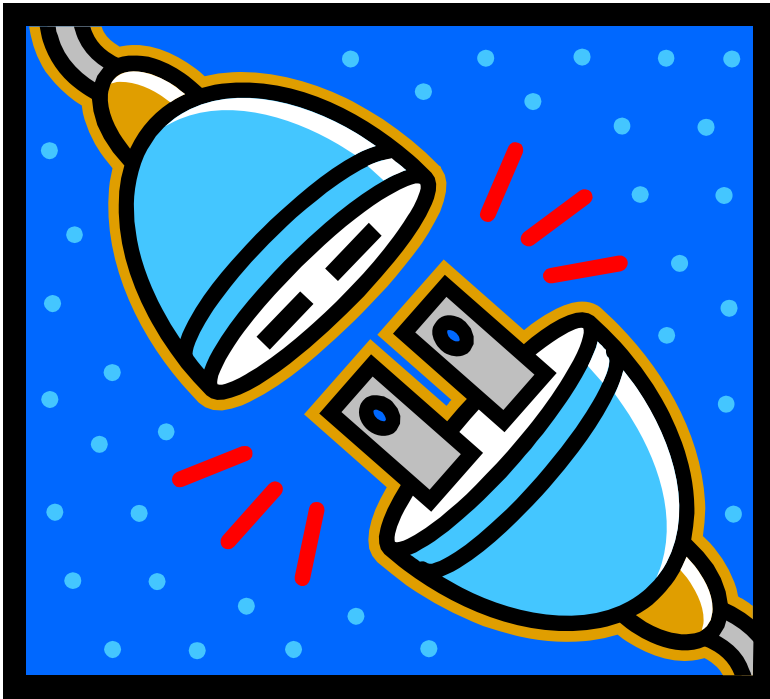
In addition, modularisation may tend to compartmentalise knowledge.

The U.K. Higher Education Operating Environment



Modularisation and Semesterisation:

It is in this context that ESD has to be embedded. In many ways, the current modular system now embedded in UK higher education, mitigates against sound, integrative learning and can create a learning environment ***in which students have difficulties in making necessary connections.***

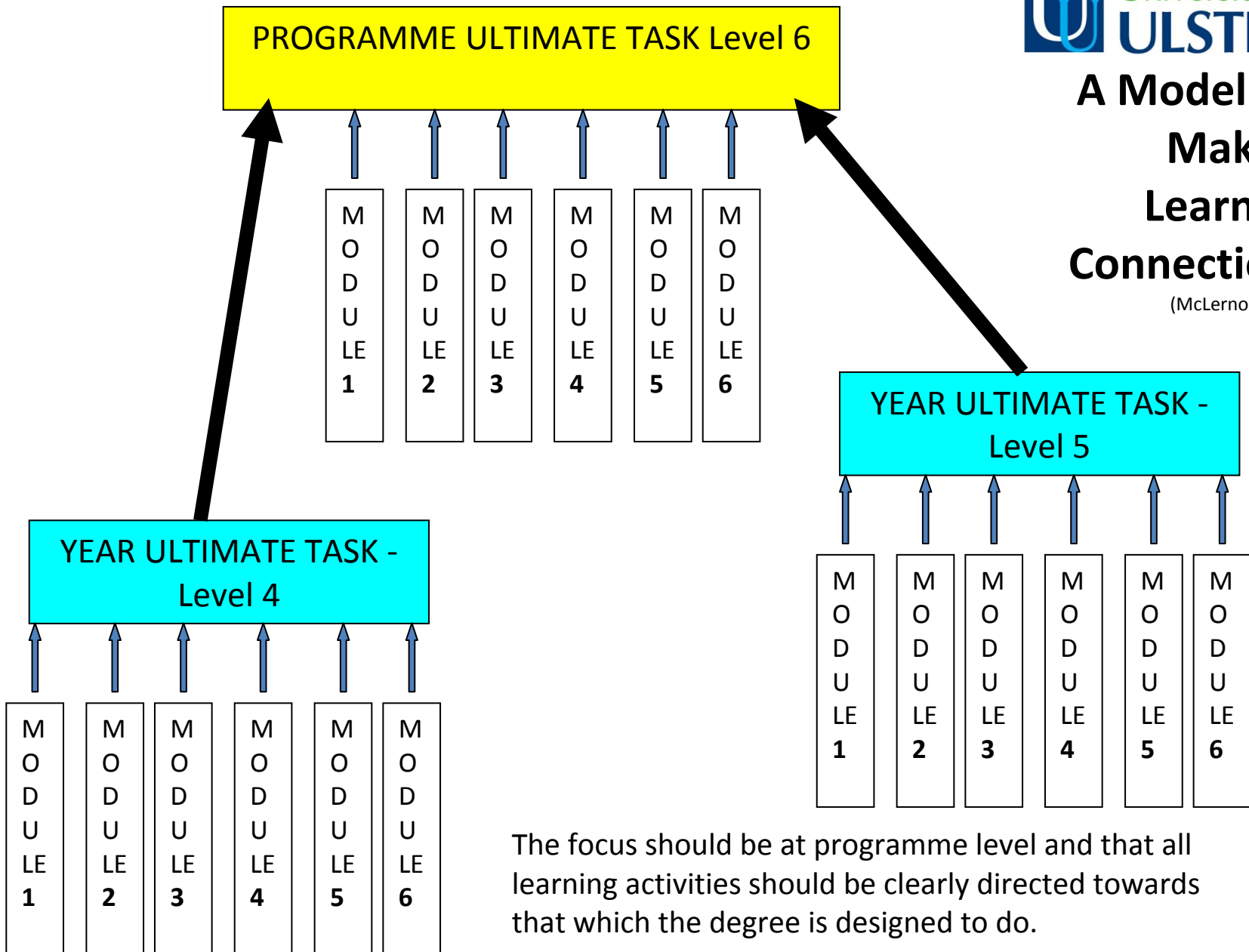


A Model for Making Learning Connections

In order to alleviate the perceived educational inadequacies caused by the disconnections inherent in the modularised and semesterised programmes, McLernon (2010) proposed an assessment model as a method of making learning connections in the programme. The theory driving the model is that, rather than assessing each module separately, the programme should be assessed holistically at each level using an 'ultimate task'. The ultimate task, at each level, would be designed to incorporate the intended learning outcomes of each module, thus provoking the student to make the necessary connections amongst the learning elements. Such an assessment regime, it was proposed, should induce deeper learning, should encourage flexibility in the curriculum and would reduce the assessment load.

A Model for Making Learning Connections

(McLernon, 2010)



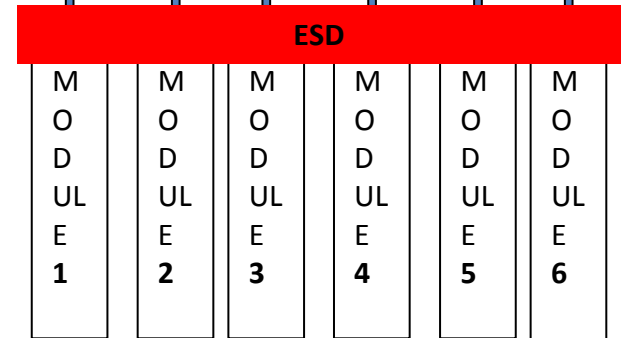
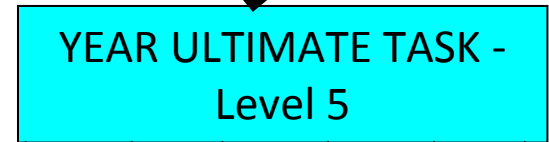
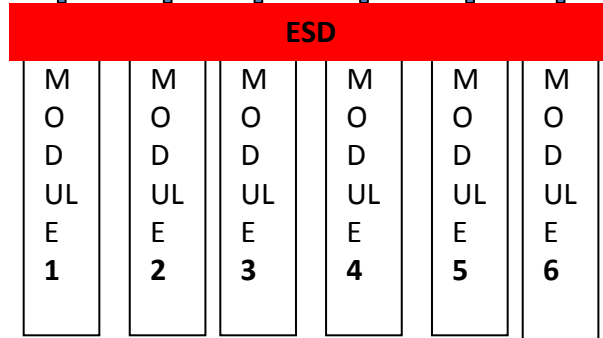
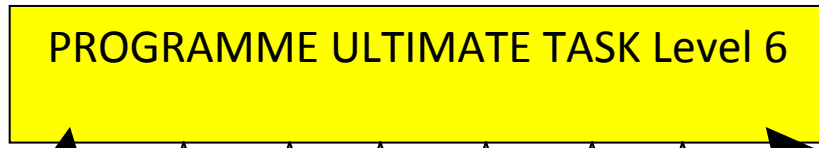
The focus should be at programme level and that all learning activities should be clearly directed towards that which the degree is designed to do.

Interpreting the Findings of the Study

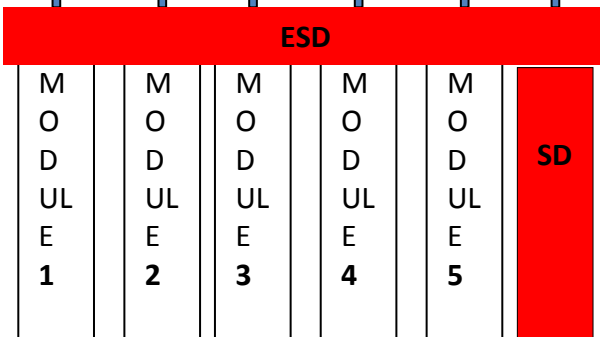
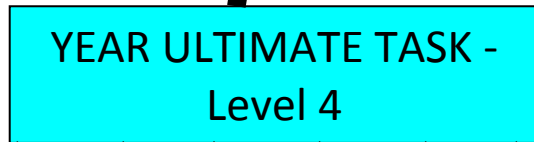
1. It's better to have a proportion of dedicated, explicit sustainability education.
2. Sustainability should be continuous throughout the duration of the programme.
3. Professional bodies place an emphasis on sustainability as a requirement for professional qualification.
4. Behavioural change should be the prime focus for learning outcomes.

Applying the Interpreted Findings to the Model for Making Learning Connections...

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ESD should emphasise interconnections amongst the environmental, social, economic and cultural aspects of SD



Applying the Interpreted Findings to the Model for Making Learning Connections...

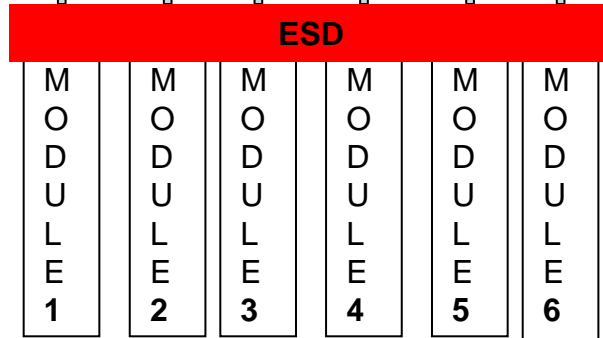
In this model, SD would be explicitly addressed at level 1 using a discrete, bespoke module to prepare and equip students with the necessary underpinning skills, knowledge and attitudes for the programme. SD would be explicitly spread across the remaining modules and would feed into the ultimate task at that level. SD, at level 5, would similarly be explicitly spread across all of the modules and feed into the ultimate task at that level.

...Applying the Interpreted Findings to the Model for Making Learning Connections

- The programmes in the School of the Built Environment at the University of Ulster are sandwich programmes incorporating, in the third year, a period of industrial placement for that year. Sustainable Development would be incorporated through the assessment regime for that industrial placement period during which the student would reflect on and apply the principles of SD.
- In the final year, level 6, SD would be explicitly spread across all of the modules and feed into the programme ultimate task which would incorporate the learning outcomes from levels 4 and 5 and including those from the industrial placement period.

i.e.

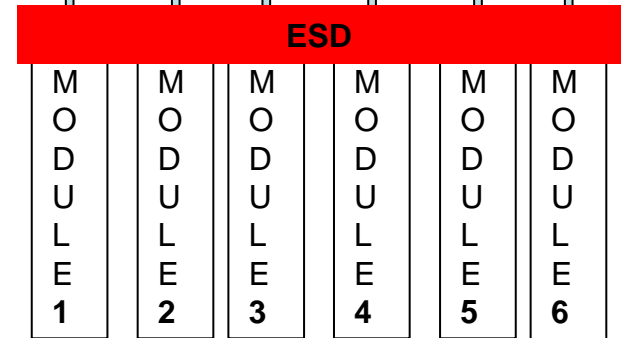
PROGRAMME ULTIMATE TASK
Level 6



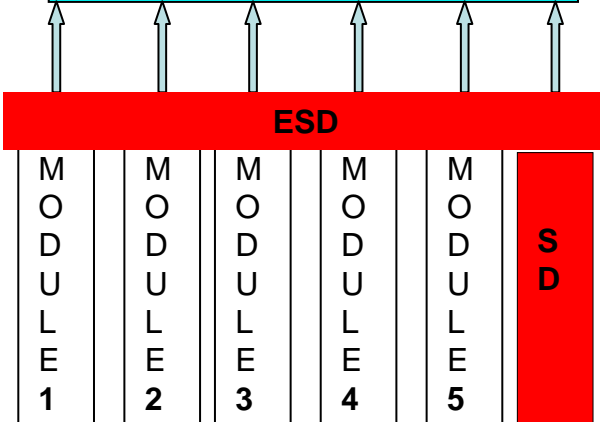
Industrial Placement



YEAR ULTIMATE TASK - Level 5



YEAR ULTIMATE TASK - Level 4



ESD should emphasise interconnections amongst the environmental, social, economic and cultural aspects of SD

END of 'INTEGRATING SUSTAINABLE DEVELOPMENT INTO THE HIGHER EDUCATION BUILT ENVIRONMENT CURRICULUM.'



- Thank you for listening
- Any questions?

Tim McLernon