

## A14. Sustainable landscape design: Introducing permaculture into landscape architecture design

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This case study is based around a learning activity undertaken as part of one of the modules in the Landscape Architecture course at the University of Gloucestershire. The underlying aim of the activity was to introduce some sustainable design principles and approaches found in permaculture to the course, in order to enhance the students' awareness and understanding of what sustainable landscape design could be, while developing the course content and curriculum.

Landscape Architecture itself is a professional discipline that deals with the planning, design and management of both built and natural landscapes. From an educational perspective it is a subject area of unusual breadth, drawing not only from the creative arts and sciences, but also from the humanities and technology, and it is this breadth that allows the work of landscape architects, and hence the teaching of landscape architecture, to impact greatly on many aspects of sustainable development – from a social and economic as well as an environmental perspective.

Permaculture is both a design philosophy and a design system. As a philosophy it has a clear set of ethics that aim for the

*harmonious integration of landscape and people, providing their food, energy, shelter, and other material and non-material needs in a sustainable way*

(Mollison 1988)

As a design system it is concerned with the process by which sustainable human habitats can be created, based on working with, rather than against, nature.

The learning activity took place within Landscape Engineering, a Level 3 module that introduces landscape architecture students to the principles by

which the landscape is engineered. The teaching and learning strategies are based around a landscape design project which focuses on sustainable drainage systems.

### **Aims**

The aim of the activity was to introduce the students to the permaculture design concept of linking the inputs and outputs of a landscape system. The aim of this linking is to create a landscape whereby all outputs from the system (for example, energy, material, produce) are either clean and non-polluting or are redirected back into the system as supportive inputs and hence reused/recycled. For example, a landscape could be designed and managed such that all leaf litter (a polluting output if disposed of as landfill) is composted on site and applied to planted areas to improve soil quality, thus changing an output to an input. The final outputs from the system then become oxygen and water from the plants (as well as improved soil quality and healthier plants).

### **Rationale**

The rationale behind the activity was to introduce the students to a new way of thinking about the process of designing landscapes, the outcome of which would be a more sustainable landscape design proposal. Typically, in both landscape architecture teaching and professionally, a landscape design is seen as a fixed answer to a brief, a finished product to be built and then maintained indefinitely in that form. In asking the students to consider a landscape as a single interconnected network of processes, with each element in the system having a beneficial relationship with at least one other element, it was hoped that their proposed landscapes would have less polluting outputs, encourage more internal recycling of 'waste' material, have more 'clean' outputs, and require less input of external resources. In these ways, the designed landscape would definitely be more sustainable from an environmental, social and economic perspective.

### **Implementation**

The activity was undertaken in two separate sessions - an introductory presentation in the second week of the module and a more detailed presentation and group exercise in the eighth week of the 12 week long module. The reason for doing it in two sessions was to introduce some of the theoretical concepts early in the module, allowing the students time to digest the information, and then run an exercise based on these concepts

later on in the module at the point at which they were beginning to design the landscape itself.

The initial presentation was verbal and supported by PowerPoint text and graphics. It began with a brief summary of the more general issues around sustainability (global warming, peak oil, the industrial mode of development, the separation of nature and culture, large scale destruction of the natural environment and habitat loss). It then discussed the responsibility that landscape designers have in relation to these issues, and finished with a brief introduction to permaculture and some of its design principles.

The second presentation was again an interactive lecture with PowerPoint support. It began with a more detailed look at the concepts of linking inputs and outputs and creating beneficial relationships between elements in a system. It then looked at a couple of simple examples to describe the application of these concepts, and finished with a PowerPoint slide which outlined the exercise that students should undertake (see Figure 1). At this point the class was split into eight groups (three or four students per group). Using the landscape design project around which the module was based, each group was asked to produce a list of possible inputs, outputs and potential beneficial relationships that could connect the two, for one of the headings set out on the slide. They were given approximately ten minutes to achieve this. After the ten minutes, each group was asked to read their list of inputs, outputs and beneficial relationships to the rest of the class, while the tutor noted them down on a whiteboard. This was done by writing two lists - inputs on the left side, outputs on the right side - and arrows connecting them where possible to demonstrate the beneficial relationships.

As this activity was created and initiated only a few weeks before the beginning of the module there was no opportunity to include it in the predetermined summative module assessment. It therefore became a trial project to informally assess a method of how permaculture could be introduced to the curriculum.

## HOW DO WE LINK INPUTS TO OUTPUTS, TO CREATE BENEFICIAL RELATIONSHIPS ?

In groups produce a list of possible INPUTS, OUTPUTS and LINKS for this project, under the following headings...

1. **Water**
2. **Air**
3. **Energy**
4. **Food/Drink**
5. **People**
6. **Plants**
7. **Vehicles**
8. **Other Materials**

**Figure 1. PowerPoint slide showing the 'inputs/outputs' group exercise**

### **Sustainability focus**

One of the advantages of the exercise was that it encouraged the students to think about designed landscapes in a more holistic way than is traditional in the field of landscape architecture. For example, when a student identified the beneficial relationship between the input of surface water run-off from a parking area to its output in a balancing pond wetland system, they then began to think about how the wetland system would be managed - who would be responsible for maintaining the reed beds? And if the reeds were to be harvested, could it provide a source of income for the client or be used as a renewable fuel? Would there be the possibility of creating employment for people to manage these activities? These are key issues for the implementation of sustainable drainage systems, and thus of Permaculture. Through this exercise, the students therefore began considering not only all of the key aspects of sustainability – the technical, environmental, social and economic dimensions– but also how beneficial relationships could be created to link them in a supportive system.

### **Active learning**

The site and brief given to the students for this design project was based on a real landscape design project happening at that time on a local site. From an active learning perspective, this gave a sense of realism to the project, particularly as the students were introduced to the site by the landowner who was able to discuss the 'live' project and all the associated issues with them. Therefore, in the activity, when the students were asked to apply the theory of inputs and outputs to a design project, the link between theory and practice became very clear. It was easy for them to imagine that they could be working on a project like this when they finish the course and are undertaking this 'exercise' for real.

### **Feedback**

The feedback from the students on this activity was very positive – both regarding the introductory presentations and the group exercise. The fact that the exercise held the attention of the students very well and led to a lot of laughter and discussion implied that most students were interested in and engaging with the subject.

During the evaluation at the end of the module (structured discussion between tutors and students) a number of students said that through the presentations they had become very interested in permaculture and hoped to look into it in more depth. Since this time several students have begun researching into permaculture and its connection to landscape architecture as part of another module taken in the following semester.

### **Strengths and weaknesses**

The introduction to permaculture design principles has broadened both the module and the curriculum with regards to sustainability issues. Introducing only one new design concept allowed the students to explore and test the concept easily. This would have been more difficult if several concepts were introduced at the same time. Splitting the activity into two distinct sessions - theory and application – allowed the students time to digest the theory before applying it. It also allowed time for the students to research into the subject if interested, before having to apply it. Furthermore, relating the activity to a 'live' project encouraged a more active approach to learning by the students.

The main weakness of the activity was that the outcomes have not been connected to the formal requirements or assessment of the module so far.

This meant that, while it was interesting and engaging for many of the students, there was no requirement for them to apply what they had learnt and so, perceiving it as 'additional work', most students did not use the permaculture concepts to develop their final design proposal. This could be improved by setting one of the requirements of the module to be a graphic diagram explaining the beneficial relationships between different elements in the designed landscape.

As permaculture had not explicitly been taught on the landscape architecture course before, the University learning centre had very few resources on the subject – this became apparent when several students chose to do some research following the module completion.

### **Programmes**

*Landscape Engineering* is an undergraduate Level 3 module available to students of Landscape Architecture, Landscape and Garden Design and Landscape Management.

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#### ***Key words:***

Landscape architecture; landscape design; design process; permaculture; beneficial relationships; systems analysis; inputs and outputs

#### ***References***

Mollison, B. (1988) *Permaculture – A Designer's Manual*, Sisters' Creek, Australia: Tagari Publications.

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