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Authors(s)	Hunter, Alan, Forrest, Mary, Elliott-Kingston, Caroline, Murphy, L.
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INTRODUCING LANDSCAPE DESIGN TECHNIQUES TO HORTICULTURE STUDENTS

A. Hunter, M. Forrest, C. Elliott-Kingston
School of Agriculture and Food Science
Agriculture and Food Science Centre
University College Dublin,
Belfield, Dublin 4, Ireland.

L. Murphy
Teagasc College of Amenity
Horticulture, National Botanic Gardens,
Glasnevin, Dublin 9. Ireland.

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Abstract

Students majoring in Horticulture Landscape and Sportsturf Management take an introductory module in Landscape Design. During a seven week period through a series of lectures, studio based graphic and design exercises, and site visits students are introduced to landscape design principles. Following an introduction to garden history each student prepares a precedent study based on the work of an international landscape designer. Furthermore, they must prepare a domestic or commercial landscape design plan. In the last academic year the class was invited to develop landscape design proposals for Beech Hill College in Monaghan. Ordnance survey maps of the site were obtained in preparation for the site visit and meeting with the School Principal who outlined the specific requirements. The students were sub-divided into three working groups and assigned a specific area of the school campus to survey and evaluate existing vegetation. Each student created design proposals, drew cross sections and a planting plan for their areas. At the end of the semester each student presented their work to peers, staff and the School Principal and was given immediate feedback. Student response to the project was highly positive and in comparison to previous years, the design proposals were suitable for implementation. Students participated in individual and group work, developed critical thinking skills, presentation skills, and all transferable skills required of university graduates. Engaging in a 'live' project for a school campus emphasised their contribution to a local community. The students have been invited to return and to further develop the site.

INTRODUCTION

More and more frequently passive or surface learning methods continue to be scrutinised and criticised since their primary focus is information transmission to students via the lecturer (Boyer, 1990). Several definitions of passive learning have been offered Harden and Crosby, (2000); Gibbs, (1995). In such situations, students passively absorb and memorise information for regurgitation at a future date. Chickering and Gamson (1987) considered this type of learning was shallow and temporary. Boyer (1990) called it rote learning. Despite this, lectures continue to have a major role in higher education and are considered to be an efficient form of instruction especially in large classes.

Strategies to foster and promote active and student centred learning continue to be reported (van den Bergh et al., 2013, Thaman et al., 2013, O'Neill and McMahon, 2005). Young and Maxwell (2007) dealt with the transition from passive learning to cognitive constructivism while Carlile and Jordan (2005) elicited its implications for teaching practice. Active learning promotes greater student engagement, higher order and

independent thinking, critical judgements about issues and collaborative working (Bonner 2010, Carlile and Jordan, 2005). Additionally, it reflects on experience and prior knowledge to deepen learning and create a unique educational experience. That active learning occurs scholarly teaching is required; in particular the type of teaching used that best fulfils the objective (Ramsden, 2003). Several authors have published comprehensive guidelines concerning good practice in undergraduate education (Ramsden, 2003; Kreber 2002; Trigwell et al., 2000; Boyer 1990). Furthermore, Higgs and McCarthy (2008) suggested that academic teachers facilitate learning by providing scaffolding. Young and Maxwell (2007) reported that the teacher must continually devise strategies to exhort, encourage and help students derive possible solutions to problems and become a guide for them to rely upon. Consequently, the teacher deliberately or subconsciously reflects on their teaching strategies, methods and performance to critically assess them and as Kreber (2002) suggested constantly searches for new solutions to further their understanding of issues or problems encountered.

The key principle underlying active learning is that students learn best when they are actively involved in constructing their own learning Kember (1997). There are many strategies that can be used to encourage this. Some of these include group projects, individual research projects or experiential learning formats (Jennings, 2013b; Thaman et al., 2013). Often, projects are a collaborative effort between student groups or between students and an academic supervisor (Garde Hanson and Calvert, 2007; Hunter et al., 2006). They represent inquiry based learning which leads to knowledge development, makes a creative contribution to the subject under investigation and motivates students to gather information, liaise with one another, formulate ideas, analyse hypotheses and create schema, reports, dissertations or portfolios (Lopatto, 2003). This is typical “learning by experience” as enunciated by Honey and Mumford (1996) and promotes learning and critical thinking (George and Sri Gayathridevi, 2013). It helps students construct their own learning (Gibbs and Simpson, 2004). Undergraduate research and projects has been described as a powerful behavioural and personal experience of discovery (Hunter et al., 2006) and the essence of engaged and active learning (Thaman et al., 2013).

Group teaching is used to encourage student learning and is increasing in popularity. Surgenor (2010) produced a teaching kit for both small and large groups and reported that irrespective of group size, the learning environment should provide for deep learning and understanding. He elicited Bigg’s four components of deeper learning as motivation, activity, interaction and a well structured base. Group learning should also be designed to promote and develop students’ personal and professional skills. Chance et al. (2013) recounted that group learning requires teaching staff to change their thinking from how they teach to what students are learning. Jennings (2013a) highlighted the importance of providing guidance to the groups. Surgenor (2010) listed Brown’s menu of techniques for use in large and small groups; documented Race and Brown’s twenty techniques and also gave guidelines on how to encourage students to learn. Gokhale (1995) reported that the active exchange of ideas between students promoted critical thinking while Thaman et al. (2013) reported increased understanding about a subject.

Hattie (1987) reported that the giving of timely feedback is the most powerful influence on learning. Gibbs and Simpson (2004) outlined ten conditions where assessment supports student learning. Perhaps the most salient of these is that it engages students in productive learning; is provided regularly, is informative and highlights areas requiring improvement. Additionally, it should focus on student performance, rather than

student characteristics and is appropriate to the level of students' understanding of the issue under consideration. They stated that it should be given while still relevant to provide sufficient time for students to utilise and act upon it before they have progressed to another topic. Immediate feedback encourages students to take responsibility for their learning, indicates knowledge gaps and sets the standard they need to aspire to (Nicol and MacFarlane-Dick, 2006). It also improved engagement, especially where a combination of both peer and self assessment for learning operated in tandem. This parallels the thinking of Kearney (2013). It is formative encompassing both assessment "for" and "as" and impacts both current and future student learning (O'Neill, 2011). It provides information to the teacher about students' learning attainments and ability; transferrable skills developed and subject specific achievements. It should also align with module descriptors, objectives and outcomes (Black and Wiliam, 1998).

Assessment also needs to be effective. Effective assessment is defined as "tasks designed to encourage good quality deep approaches to learning" (Bloxham and Boyd, 2007). It should "capture student time, generate appropriate learning activity, provide timely feedback for students and help them internalise the discipline's standards and notions of quality" (Gibbs, 1995). Knight (2000) described the relationships between reliability and validity in both high and low stakes assessment and that frequently a trade off between the two must occur. He pointed out the requirement for high reliability and validity in high stakes assessments such as in degree awards. Elton and Johnston (2002) reported that assessment reliability is greatly enhanced where it has been evaluated by two or more independent reviewers using the same measuring instruments and giving the same outcomes. They also concluded that validity is assured where it assesses what is intended and also aligns with the learning objectives of the module. Thus, effective assessment is central to bringing about a change in student learning (Brown et al., 1997) and should focus on this rather than on marking or grading. However, student assignments have to be evaluated to summarise learning achievement, monitor learning progress, identify students' learning attributes, encourage further learning and for assigning a numerical grade to determine hierarchical placement in the class Crisp (2012).

MATERIALS AND METHODS

The module Elements of Landscape Design has been taught to undergraduate students over many years and is considered an active learning module. Over a seven week period students undertake project work, receive ongoing feedback and are assessed formatively. Traditionally, students were asked to prepare design and planting plans for hypothetical suburban and commercial landscapes. The primary function of these exercises were to relate their classroom learning, scientific and technical training, in this and other modules to an actual project that could be implemented. In autumn 2012 when preparations were being made to deliver the module in spring 2013, the Module Co-ordinator was offered a 'live' project at Beech Hill College, Co. Monaghan. The secondary level College with 600 students, located on a seven hectare campus in a rural town 130 kilometres from Dublin, had recently been refurbished. The School Principal indicated that there was an opportunity for students to design and prepare landscape planting plans for the school campus. The Module co-ordinator considered it was a suitable site for student projects. In January 2013 stage 3 students registered to the module (HORT 30020) were taken on a day long site visit to the College. On the given day, the School Principal addressed the students and described the general requisites for the overall design and the specific requirements for areas within the campus. With copies of Ordnance

Survey (OS) map in hand, the students were shown the campus by the School Principal. The Module Co-ordinator assigned areas to three groups of three students each. They were asked to survey their selected areas, take measurements, prepare sketches and take digital photographs and to note any specific site details such as soil drainage, major contours, aspect, discerning views and or screening requirements. Once the Module Co-ordinator was satisfied that the students had sufficient site detail (on the day), they returned to the landscape studio to undertake their landscape design. Student learning in this module was assessed using a combination of assessment techniques, namely, continuously in class over the duration of the module where timely feedback on their thoughts, ideas and developing plans were given; an end of semester oral presentation and 'crit' before the College Principal, three academic staff and their peers. Copies of the landscape design plans were subsequently presented to the College Principal. Written consent was sought and obtained from all the class participants for permission to refer to the class of 2012/2013 anonymously in this paper.

RESULTS AND DISCUSSION

This landscape design project is a classical example of small group teaching/learning in action. It enhanced student engagement, independent thinking, critical judgements and collaborative working paralleling the works of Bonner (2010); Carlile and Jordan (2005). Most importantly it provided an opportunity to implement the four components of deeper learning as reported by Biggs (1999) thus providing for deep learning and understanding. The students were motivated to produce competent plans because they could be publicly viewed, but more importantly implemented in total or in part. It created student activity since they were actively involved in constructing their own learning paralleling the report of Kember (1997). It enhanced interaction among the students themselves and between the students and their tutor aligning with the report of Gokhale (1995) who noted that the active exchange of ideas between one another enhanced learning and also with Thaman et al. (2013) who suggested that critical thinking and increased interest and understanding about a project was encouraged. Similarly, it fulfilled many of the conditions reported by Gibbs and Simpson (2004). It provided for increased in-class interaction where the students engaged in studio discussion to determine the most appropriate design and plant selection for the different situations, thus aligning with the theory put forward by Carlile and Jordan (2005). The project had a well structured rubric allowing the students to know exactly what was required of them. Thus it involved continual self-assessment; a phenomenon which Knight (2000) reported to be "at the heart of the widely-commended learning practices of reflection". It also improved engagement, especially where peer and self assessment operated together, paralleling the thinking of Kearney (2013). It also created the opportunity for group learning and so promoted the development of students' personal and professional skills. Given that it was an active project, guidance was continually given both to the groups and individual members aligning with the teaching of Jennings (2013a). The project is also an example of inquiry based learning where the students had to gather information, formulate ideas, liaise with one another in their group, and create different planning and planting drafts before producing their own final design. This emulated the principles espoused by Suwondo and Wulandri (2013); Lopatto (2003). This project design is clearly an excellent example of typical "learning by experience" as enunciated by Honey and Mumford (1996). It promoted critical thinking and helped students construct their own learning

paralleling the theory of Gibbs and Simpson (2004). It incorporates the teachings of Gazvoda (2002) since it searches for the best design solution/s for particular situations.

In a module such as this one, which is undertaken within a concentrated time scale, the importance of giving regular feedback to the students was very evident and equated with the suggestion of Hattie (1987). It was provided regularly to support learning and to highlight areas requiring improvement during the timescale while it was still relevant for students to utilise aligning with the reports of Price et al. (2011); Gibbs and Simpson (2004). It was found that such feedback engaged students in productive learning, encouraged them to take responsibility for their learning, indicated their knowledge gaps and set the benchmark that was required. This also concurred with the findings of Nicol and MacFarlane-Dick (2006). This type of feedback can be defined as formative in so far as it encompassed both “for” and “as” assessment because it positively impacted both their current and future student learning and provided information to the teacher/mentor about learning ability; the skills they developed and their specific achievements (O’Neill, 2011). It also paralleled the work of Higgs and McCarthy (2008) by providing learning scaffolding. Such feedback aligns with the advice of Shute (2008) and Carlile and Jordan (2005) and equates with the thinking of Juhah et al. (2004). It is also a clear example of criterion referenced feedback since it related to student skills and competencies developed and was also ipsative given that it considered student work, effort and progress in relation to the actual plans produced, thereby equating with the work of Harlen and James (1997). Formative feedback and assessment are intrinsically interlinked. Four of the most critical aspects of it are its effectiveness, validity and reliability and the relationship that exists between the two. In this work, the assessment of student projects was effective, because it captured student time, generated appropriate learning activity and helped them adopt the values of others together with the discipline’s standards and notions of quality equating with the thinking of Bloxham and Boyd (2007). Assessment effectiveness is undoubtedly linked to validity and reliability; two phenomenon which are interlinked. In this work it is considered that assessment validity occurred since it aligned with the module learning outcomes: “demonstrate a comprehension of the landscape design process, prepare landscape design plans for small sites, draw landscape design and planting plans and present such plans to a client” and assessed what was intended emulating the theory of Knight (2000). It is considered that reliability was also ensured given that the projects were evaluated by at least two independent reviewers using the same measuring instrument and giving similar judgements, judgements that universities make available to potential employers, graduate schools and others by means of transcripts echoing the work of Knight (2000) and Elton and Johnston (2002).

It is generally considered that where undergraduate learning projects are published such as in a peer reviewed journal, their validity and reliability are enhanced. Additionally, undergraduate design projects are an example of work produced by the individual or group of individuals and typify the concept of attribution. Undergraduate Landscape Design projects can be considered to be an excellent example of active learning since it promotes cognitive development together with many positive learning attributes. Undergraduate learning projects such as this one are but one method in bringing about a change in undergraduate education designed to make it more student centred. The learning experience was made very meaningful because the students engaged in a ‘live’ project for a school campus which is considered to be a major contribution to a local community. Landscape design projects overcome the “backwash

effect” that is so often associated with an examination system where according to Elton and Johnston (2002), examination strategy is more important than content and encourages surface learning. This phenomenon cannot occur with this deep intuitive style of learning. The module is also an example of a school programme that is adequately flexible thus incorporating the natural sciences together with the creative character of landscape design as promoted by Gazvoda (2002).

CONCLUSIONS

The key benefits of using active landscape design projects for learning are:

- Students develop a range of skills including design, graphic and organisational
- They analyse, synthesise and communicate new knowledge
- Students create design proposals, draw cross sections, select suitable plant genera and formulate planting plans
- Students recognise the importance of self motivation and application which have enduring learning benefits
- Timely feedback provided to students accurately measures ability as distinct from memory recall
- Active and deep learning together with genuine effort is rewarded, more so because it related to an actual authentic task
- Backwash effect in learning is eliminated
- A definitive paradigm in independent learning encompassing both reliability and validity of complex outcomes in high stakes assessment.

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