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Lloyd Scott

Technological University Dublin, lloyd.scott@tudublin.ie

Christopher Fortune

University of Salford

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FRAMEWORK FOR FORMATIVE ASSESSMENT LEARNING STRATEGIES IN BUILT ENVIRONMENT HIGHER EDUCATION PROGRAMMES

Lloyd Scott¹ and Christopher Fortune²

¹ *Dublin Institute of Technology*

² *University of Salford*

Formative assessment has begun to be recognized as a driving force for enhancing student learning. This paper addresses the context of Built Environment (BE) undergraduate programmes and the findings from a research project in the context of the changing Higher Education (HE) environment. The analysis of the literature on formative assessment shows that there is a common concern among the educational researchers about the function and position of assessment in HE today. The overall aim of this research is to contribute to an improvement in the quality of student learning in BE undergraduate education through the development of a theoretical framework for formative assessment. The application of a mixed methods approach and more particularly a constructivist stance to the research was adopted. A four-phase sequential approach has its key characteristic assessed and the advances in conducting and evaluating this design are presented. The results and analysis of all four phases of the research, which gives the views and preferences of senior academics, programme managers/leaders and lecturers/teachers in the BE in Ireland, are presented. From this ongoing research work a framework for a more scholarly approach to assessment in BE has been developed and piloted with selected student groups. The purpose of this framework is to provide an opportunity for undergraduate learners through their lecturers/teachers to change approaches to assessment practice so that their learning is enhanced to a level where they can become more self-regulatory and autonomous.

Keywords: assessment, formative, summative, higher education, built environment, mixed methods research, undergraduate.

INTRODUCTION

Assessment is recognized as being central to the education experience (Askham, 1997; Black & Wiliam, 1998; Stiggins, 2002; Biggs, 2007). Indeed recent research has emphasized the importance of assessment and feedback in the learning process, facilitating diagnostic self-monitoring, developing the ability to evaluate and make judgments and helping to foster learner self-regulation (Nicol & Macfarlane-Dick 2006; Sadler 2010). Rapid developments in networked, mobile and social technologies

¹ Lloyd.scott@dit.ie

in the last decade have presented new opportunities to support assessment processes. When considered along with the expansion of further and higher education, technology has an important role in ensuring the sustainability of assessment practice (JISC 2010), be it summative or formative in nature. Common barriers to assessment change tend to be organisational, cultural and linked to the availability of resources, with existing codes of practice relating to assessment often misaligned with current and emerging practices.

Assessment is about measuring achievement and it usually involves giving feedback of some kind on the work being assessed. In examination terms that feedback is normally given as a mark or a grade. But what does the person being assessed learn from that? In HE, assessment practices and processes have been the topic of wide ranging conversations over the last fifteen years (Bryan & Clegg, 2006). Discourse about the current state of assessment often refers to unease as to its suitability for the twenty-first century and the need for it to be 'fit for purpose' (Brown, 2004). Knight (2002) posits the view of 'practices in disarray' where assessment has become a site of conflict, even a power struggle, founded on the unequal relationship between the two parties (student and institution). This disarray not only pertains to HE in Ireland and the UK; such discourse has also taken place in the US. It is argued that an in-built lack of clarity in the methods of assessment used to convey judgement on performance is an underlying factor. Assessment in the discipline of the BE, like in other disciplines, is required to fulfil a multiplicity of purposes and to play many different and often conflicting roles. The provision and embedding of opportunities for assessment to aid learners in more formative ways has been highlighted as currently failing students (Struyven, Dochy & Janssens, 2005).

This paper discusses the need for a project to research formative assessment in the context of the changing HE environment. A mixed methodology approach to research and a signpost of improvements in the quality of student learning in BE undergraduate programmes through the assessment process are proposed. This paper reports on the study so far, where seminal literature is explored in order to identify, inform and shape the assessment practices of academics. The results of the research are presented with an in-depth analysis of the findings of the already completed four phases (Scott & Fortune 2010, 2011). The emerging views and preferences of academics teaching on the identified undergraduate programmes are analysed, informing the development of a framework for formative assessment where the enhancement of student learning underpins the evaluative process. While this framework has been developed from research in the BE arena, it is applicable in other HE environments.

FORMATIVE ASSESSMENT AND LEARNING

Research into formative assessment techniques has pointed to feedback as being an essential mechanism in the learning process (Gibbs *et al.* 2004). Ramaprasad (1983) defined feedback as information about the gap between actual performance level and the reference level, which is subsequently used to alter that gap. Feedback, therefore, needs to be meaningful, understood and correctly acted upon. Lecturers/teachers not only need to undertake formative assessment, they also need to evaluate how effective any feedback has been in enhancing learning and more particularly in addressing the gaps in learning. In practice, formative assessment that allows students to receive meaningful feedback should make a difference in student learning (Black & Wiliam, 1998). However, Higgins *et al.* (2002) raise doubts as to what extent this is reality. They argue that students may recognise the central importance of formative feedback

for their educational development, but the ways in which they use that feedback are not clear.

Sadler's definition of formative assessment/feedback, 'to shape and improve the students' (Sadler, 1989:120) competence by short-circuiting the randomness and inefficiency of trial and error learning' is appropriate. Indeed, Sadler (1998) suggests that the role of the lecturer/teacher could broadly be described as 'working to reduce the rate of error production in trial and error learning and thereby to make learning more efficient'. In order to do this the lecturer/teacher needs to have an understanding of (a) subject and skill based knowledge and (b) the needs of the learner (Black & Wiliam, 1998). This study encompasses a key issue confronting lecturers/teachers in HE today i.e. how to bridge these two factors such that students can be given meaningful feedback to enhance their learning.

Summative assessment, usually undertaken at the end of a period of learning in order to generate a grade that reflects the student's performance, is not regarded as having any intrinsic learning value. The traditional unseen end of module examination is often presented as a typical form of summative assessment. Two important points arise from this differentiation. Firstly, there is no compelling reason why only summative assessment should be included in any formal grading of student performance. It is perfectly appropriate to have elements of formative assessment as part, or even all, of the final grade. Secondly, the distinction between formative and summative assessment may be a false one. Whilst some elements of assessment may generate a greater formative learning experience than others, it can be argued that all forms of assessment have some formative element. Students undertaking a degree course where assessment consists only of end of module unseen examinations will, over the period of the course, improve their examination technique. This formative learning experience was identified by some students during the preliminary research. It demonstrates a clear need for an appropriate level of discourse in BE education as to the position of formative assessment in regard to the learning experiences of students.

Assessment for learning acknowledges that assessment should occur as a regular part of teaching and learning and the information gained from assessment activities can be used to shape the teaching and learning processes. It can, most importantly, also be used by the learner to enhance learning and achievement. Gibbs and Simpson (2004), in their seminal work, have developed a model that promotes eleven conditions under which assessment supports learning, as outlined in table 1 below. Seven of the eleven conditions refer to feedback. The underlying principle and theory of this model forms the rationale for the survey of the lecturers on BE programmes.

Table 1 Gibbs and Simpson (2004) promoting 11 conditions under which assessment supports learning

Conditions where assessment supports learning	
1	Assessment should contribute positively to students' learning
2	Assessment is considered by academics and students as an integral component of the learning and teaching process
3	Tackling the assessed task engages the students in productive learning activity of an appropriate kind
4	Assessment communicates clear and high expectations
5	Sufficient feedback is provided, both often enough and with sufficient detail
6	The feedback focuses on students' performance, on their learning and on actions under the students' control, rather than on the students themselves and on their characteristics
7	The feedback is timely in that it is received by students while it still matters to them and in time for them to pay attention to further learning or receive further assistance
8	Feedback is appropriate to the purpose of the assignment and to its criteria for success
9	Feedback is appropriate to students' understanding of what they are supposed to be doing
10	Feedback is received and attended to
11	Feedback is acted upon by the student

The analysis of the literature on formative assessment shows that there is an agreed concern among the educational researchers around the function and position of assessment in HE today. This concern in regard to BE education is echoed by the researchers and hence the explorative research into how academics in BE education in Ireland view and engage with formative assessment practices.

METHODOLOGY AND ANALYSIS

This research reports on the overall investigation of the conceptions, attitudes and position of academics in BE in Ireland in regard to assessment practices. It involved four phases of research in which academics in the field of BE from the main providers of Architecture, Architectural Technology, Construction Management and Construction Economics (Quantity Surveying) programmes on the island of Ireland participated (see table 2). A mixed methods research typology resulted following the consideration of many other typologies, as well as several other dimensions. For example, the embedding of mixed-modal designs by mixing qualitative and quantitative approaches within and across the stages of research was a focus of the research enquiry. The mixed-methods design is based on the crossing of paradigm emphasis and time ordering of the quantitative and qualitative phases.

A primary justification for mixed methods is pragmatism and the identifiable fit in the educational research field. Pragmatism asserts no first or foundational principles and suggests that all human knowledge is empirical. To justify mixed methods, one must reject the incommensurability argument, i.e., the argument that the differences in epistemological theories cannot be overcome.

Table 2 The four phases of the research mapping the current approaches of BE academics in Ireland to assessment

Phases of the research	
Phase 1	Review of college regulations, programme documentation and student handbooks
Phase 2	Interviews with senior academics (management) (8)
Phase 3	Interviews with heads of dept./programme managers (20)
Phase 4	Online survey of BE lecturers/teachers

Phase 1

The first phase looked at finding out the current position and practices in the institutions chosen for the study. It was viewed as vital to review institutional documentation, school and programme documents, external examiner reports, student handbooks and any other resources that might allow a value judgement to be made as to the institutional, college, school, department or programme culture and approach to assessment in undergraduate education.

Phase 2

Semi-structured interviews were conducted with eight senior academics in management positions between September 2009 and March 2010 in Schools in the University/Institutes of Technology sector on the island of Ireland. There was evidence of what Rowntree (2003) refers to as the ‘traditional’ view of assessment. Within A and AT there appeared to be a more holistic approach to assessment in undergraduate programmes. In the areas of CM and QS there was evidence that a more traditional approach pertained, where assessment was viewed as a means of measuring learning and compliance with regulations was important. One senior academic made reference to the SA being the most important aspect of a learner’s education. The quote below is his direct comment:

“we have to know what the students know. We have to know that and the question is how you find that out and that is the starting point Now, we also have to encourage students to learn and it seems to me that how do you do that is through forcing them into having to learn for an unseen paper - that traditional exam - and they will study that because assessment drives learning” Interviewee B

If a senior manager is of this mindset then it could be argued that innovative and more learner-centred methods of assessment will not be encouraged and learning, teaching and assessment will follow the traditional approach.

Phase 3

Interviews were conducted with some 20 heads of dept./programme managers across BE programmes in Ireland. The analyses of the interviews identified their views and conceptions around assessment. The emerging common themes included the purposes of assessment, learning and teaching, summative and formative assessment (Scott & Fortune 2010). One clear theme alluded to by all was a recognition of the importance of assessment in the educational process, with particular importance given to formative assessment in student learning. However, the mechanism on how this was to be achieved differed with each manager interviewed and was highly dependant on the particular conceptions on learning, teaching and assessment held by the programme team.

An identifiable emerging concept among the programme managers was the difference in philosophical position with respect to the assessment of student learning, i.e. the purpose of assessment. It was seen as multi faceted, examination orientated, part of a holistic approach, inclusive of both summative and formative assessment processes. The differing positions can be seen in the quotes below:

- ‘Assessment is about measuring what the student understands and can do’ Interviewee B
- ‘Assessment is about exams’ Interviewee E
- ‘If you want students to learn, they have to be assessed and I would see assessment as being more than just an end of term exam’ Interviewee D

Phase 4

The online survey was circulated, having been piloted, reviewed and amended to some 130 academics from a survey population of those teaching on undergraduate programmes in A, AT, QS and CM. This reflected an overall response rate of 53% breaking down to 72.5% male and 27.5% female, reflecting the male/female proportions teaching on BE programmes. Thirty of the respondents came from the construction management discipline equating to 43% of the respondents. The level of lecturing experience varied among those participants with only three indicating they had less than three years’ experience.

One interesting point from the analysis of the function of assessment was that 86% of respondents agreed or strongly agreed that assessment should provide feedback to students on their learning, yet it would appear that, in practice, they seemed to focus on the measuring of learning rather than more formative approaches. A similar response rate relates to both questions on providing comment/direction to students about their learning and on encouraging students to apply and demonstrate their understanding. Academics worked with and wanted to work with their students and what was an issue was 'the need for more time' and/or the lack of educational theory as a foundation to their planning. When questioned about the issues around assessment the respondents identified the following as impacting negatively on their engagement with students:

Time management (more particularly time available); large classes, workload, student conceptions, academic regulations, academic research out put, plagiarism.

Issues in regard to providing feedback to students included; transparency, the time factor associated with marking, institutional policy, student engagement - the lack of student attendance and student attitudes. Many cited student indifference as a matter for concern.

Overall analysis and findings

Reflecting on the literature on assessment in HE and linking this to the views expressed by academics in the BE in Ireland, what was identifiable was that a conceptual framework for assessment should be based on the following key assumptions:

- Assessment should contribute positively to students’ learning
- It should focus on what is to be learned (learning outcomes) and how that learning might contribute to both the programme of study and beyond
- It must develop students' ability to make judgments about what constitutes good work

- It should be student centred and place the learner as ‘active’ in the learning process
- Assessment must engage students in the process of seeing themselves as people who will contribute to practice, whatever that practice might be (Scott & Fortune 2011)

Based on the analysis of the four phases the findings indicated there was a clear need for a framework that supports academics in their approach to aiding learners in today's complex constructivist environment. The expectations from all stakeholders indicate a desire for a framework that allows meaningful learning, teaching and assessment to take place. The framework as outlined in figure 4 below provides such a supportive structure. It was developed around the need to consider each course of study in a holistic way where the learner is considered with reference to their development through the programme of study. Significant support or scaffolding should be provided in the more formative years of study and as the student develops, more autonomy and peer support is advocated. Part of an approach such as this requires investment in the necessary early stage induction. The Formative Assessment Led Learning Strategies (FALLS) framework, as presented in figure 1, provides for a constructivist learner-centred approach to developing autonomous, self-reflective individuals.

DISCUSSION

Assessment is of central importance in HE and the more one researches the field the more there seems a ‘lack of commonality’ (Taras, 2005) across the disciplines within the BE. There is a growing interest in the quality of the student learning experience but how to enable change to take place requires a readiness to share the responsibility for the management of an assessment system in a way that allows learning to flourish.

An understanding of the perspectives and pedagogical positions of BE academics on the assessment of student learning is vital in any attempt to improve assessment practice. Firstly, it provides a firm starting point within the wide field of improving assessment practice. The areas where academics perceive that they have needs and experience problems can be targeted. Secondly, changing assessment practice does not merely involve the adoption of a set of new techniques leaving all other matters of pedagogy unaffected. Any significant change in assessment practice requires ‘seeing things differently’ (a conceptual change) alongside ‘doing things differently’ (a behavioural change) (Biggs 2007). The FALLS project has the potential to engage lecturers/teachers in doing formative assessment and so enable them to see formative assessment in more developed ways by actively engaging them in the processes of developing student feedback as part of authentic assessment tasks that provide the opportunity for significant learning.

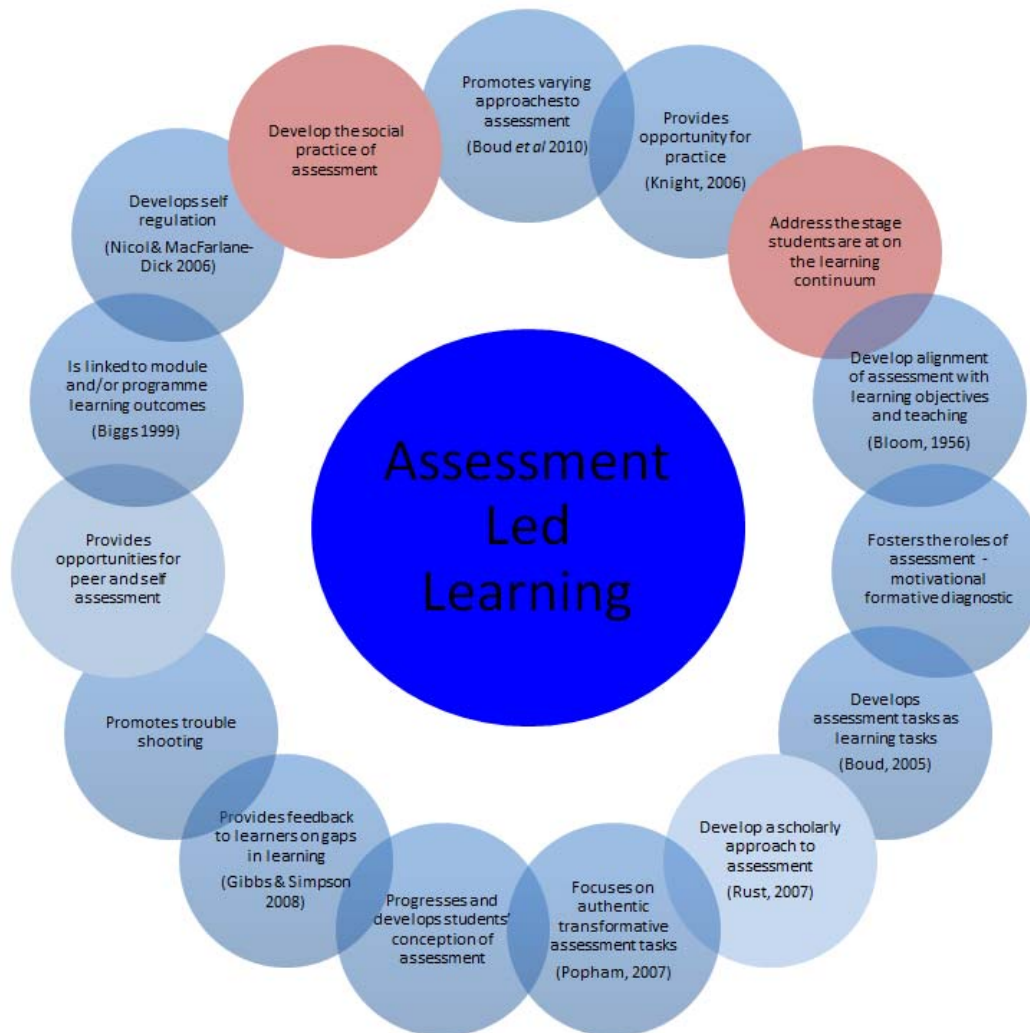


Figure 1: The FALLS framework addresses the four stages in an undergraduate programme of study

The FALLS project can provide the support and direction for developing lecturers'/teachers' views of assessment, especially formative assessment aspects. In the short pilot, one lecturer/teacher responded to say that many lecturers in his area, when asked, did not even know what formative assessment was. The ways in which some of the lecturers/teachers involved are now implementing formative assessment provide further demonstration. One example is the lecturer who has recognised the need for a formative assessment approach that promotes mastery of basic knowledge and competencies in first-year students. He allows students to take in-course tests up to four times until they demonstrate that they have reached the threshold mastery level.

For lecturers/teachers

Being aware of the influence of the department that you work in as well as the epistemology and practices of your discipline may help when attempting to introduce new or different methods of assessment, or when changing marking and feedback practices. Sometimes, it is only possible to exert change at the level of the course or programme for which you have direct responsibility, but taking a collaborative approach and 'getting colleagues on board' can begin to make assessment change happen, as can presenting *evidence* of any change initiatives. Such evidence may need to be presented at departmental meetings and as high in the institution committee

structure as you can get. It is also worth remembering that the student voice is part of the evidence base and can be a powerful trigger for change.

For students

Since assessment is such a fundamental and important part of a degree course, it is essential for candidates to understand as much as they can about the context of the programme of study, what it means to learn at third level and how the assessment system works in the course (both formative and summative). The process of students becoming independent learners, able eventually to judge the value of their own work takes time and so a high level of support and guidance should be concentrated in the first year of study, gradually lessening as the students grow in experience and confidence.

CONCLUSIONS

Academics must, as Boud (2010) proffers, 'build capacity for judgment' and move away from conservative approaches to assessing students. A move to developing and implementing assessment strategies that use the most appropriate means of producing reflexive learners is what is required. Formative assessment led learning strategies (FALLS) is important because it uses these elements to support learning. It is, therefore, at the heart of the learning and teaching cycle.

It is important that opportunities to include assessment led learning should be embedded in programmes and this learning should receive the necessary credit. Striking a better balance between assessment 'of' and 'for' learning is key to enhancing the learning experience of students at undergraduate level in the BE. The evidence indicates that there is a willingness to effect change in the approach to supporting student learning through sustainable and authentic assessment strategies.

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