

A Practical Approach for Incorporating Integrated Teams into the Surveying Curriculum

Paul WATSON and Richard DAVIS, United Kingdom

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SUMMARY

The paper establishes the importance of curriculum design when trying to attain an integrated approach to undergraduate teaching. The vital components of unit, learning outcomes and assessment methods have been advocated. Further a practical example for obtaining integrated team working for surveyors is described. Thus the approach explored within this paper has valid transferability for other surveying higher education courses.

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1. INTRODUCTION

Professional bodies and recent reports Latham (1994) and Egan (1998 and 2002) have advocated the need for further integration in the construction process. Within higher educational establishments there has been a drive to attain the advocated integration. This paper describes a practical approach that has been deployed and evaluated with positive results obtained. In order to get students working in integrated teams the starting point is the curriculum. The curriculum is based upon learning outcome statements.

The incorporation of learning outcomes into the delivery of the curriculum requires planning. Brown and Atkins (1996, p.35) purport

“The essential skill of effective lecturing is preparation not presentation. Obviously presentation is important but without a clear, coherent lecture structure a presentation may have a short-lived affect.”

The planning activity not only incorporates the material to be taught but also impacts upon the teaching approach to be adopted by the staff who will be influenced by the learning outcomes. This issue is corroborated by Cox (1994, p.27) who wrote *“teaching methods/learning activities should be matched to the objectives of the course”*.

At Sheffield Hallam University the above valid points have been noted and incorporated within a ‘Unit Guide Learning Outcomes Framework’.

The first phase in the production of Unit Guides is to determine the required learning outcomes of the student upon completion of the unit. This allows further consideration to be given to the methods of teaching the unit. It also provides for the identification of the most suitable assessment strategies to be employed. Therefore there is a link between outcomes, delivery and assessment.

2. THE UNIT GUIDE FORMAT

A unit guide format requires the following sections to be addressed.

2.1 Rationale

- Provides the educational, commercial and/or industrial need for and context of a unit;
- Makes clear any relationship with any previous learning and/or associated or subsequent units;

- Includes any information on student target group, including professional, vocational and educational stages and needs.

2.2 Summary of Aims

Aims can include the development of attributes as interests, desirable attitudes, appreciation, values and commitment as well as knowledge, understanding and application. They are concise, broad statements against which the success of the unit can be evaluated.

2.3 Learning Outcomes

These are what you expect the student will be able to demonstrate at the end of the unit. This is because in current educational discussions on assessment the term 'output' has been replaced by the concept of 'learning outcomes'. The Otter (1992) Study, for example, was based upon the belief that the measurement of learning outcomes (what a learner can do as a result of learning) rather than the more traditional description of learning input (syllabus or course content) was a more valid approach to gauge the learning process.

This educational approach has been strongly supported by many respected authors upon education, for example Ecclestone (1995).

2.4 Teaching and Learning Strategy and Methods

This provides the overall strategy of how the learning outcomes are to be achieved, and a rationale for the methods to be employed, with their degree of emphasis within the unit e.g.: reference to lectures, directed reading, use of learning resources including IT (can be expressed in percentage terms) all resource implications should also be established.

With specific reference to the attainment of being a reflective practitioner greater emphasis is placed on problem-based learning. This is well suited to our Integrated Projects where students are confronted with real world problems, requiring a multi-disciplinary solution(s).

Integrative and developmental approaches to teaching, learning and assessment have resulted in a good quality learning experience. Formal lectures provide the vehicle for disseminating information with the use of smaller groups of tutorial and specialist laboratory or computer suite work, where students have access to academic staff.

Teaching, learning and assessment strategies and methodologies move progressively from tightly structured didactic approaches in the earlier semesters where recall and comprehension form the basis of assessed performance, to a much more strongly student centred approach. This requires greater levels of independent learning. Application, analysis, synthesis and evaluation of more complex vocationally related data and processes characterise the final units of study. Learning processes require that students understand the objectives of the educational process. Unit leaders are responsible for ensuring that students are made familiar with the objectives and assessment criteria of a unit and the role of the unit in relation to other aspects of the course are clearly understood.

2.5 Assessment and Feedback Strategy

The assessment and feedback strategy should describe the approach and indicate the following:

- the balance of formative and summative assessment;
- the quantity and timing of assessment;
- the timing and type of feedback to students;
- where the assessment process is intended to provide a vehicle for learning as well as an assessment of learning.

2.6 Assessment Criteria

The assessment criteria which form the basis of formal assessment should be listed, showing, where appropriate, which criteria are to be used for different components of assessment. Criteria should establish the level of achievement that is required for a student to pass the unit and be directly related to the unit learning outcomes.

Assessment strategies are designed to give the student the opportunity to demonstrate competence in the subjects assessed and to provide an accurate evaluation of the student's overall proficiency, at each stage of the course. Assessment also acts as a source of student feedback.

Having established the importance of the learning outcomes approach to curriculum design we may now consider how this led to the design of an integrated project. The project curriculum was designed for Construction Managers, Quantity Surveyors and Commercial Managers on undergraduate courses.

3. INTEGRATED PROJECT

A reflective practitioner learns from previous experience in a drive for continual improvement. With specific reference to the attainment of being a 'Reflective Practitioner' greater emphasis is placed on problem-based learning. This is well suited to our integrated project where students are confronted with real world problems, requiring multi-disciplinary solutions. This concept is incorporated into the Learning, Teaching and Assessment (LTA) methodology.

Staff advantages included savings in delivery time and the opportunity to bring to life Unit content such as financial analysis (this advantage is not mutually exclusive from students). Staff were also engaged in some team teaching and this provided the opportunity for staff development and peer observation.

The project revolved around a pre-documented 'case study'. The Unit is 'Integrated Project A' and is a final year semester one Unit. Students were exposed to 'real life' issues of interdisciplinary group working, co-ordinating, peer assessment, communication, written presentations (reports), conducting meetings with senior staff and analysis and evaluation of

documentation with recommendations. Finally a formal group presentation was made to the Managing Director and his associate (staff).

The 'Case Study' approach employed simulates, as far as is possible, industrial practice with students being required to work in groups of four (mixed Construction and Commercial Managers and Quantity Surveyors). After an initial introduction to their fellow students they formed their own groups. Students were then talked through the Unit Guide, concentrating on LTA strategies and the actual Case Study. They then worked through the specific questions, these being in four parts, three of which are written reports and the final one consisting of a presentation.

This approach enabled students to learn through mixed peer group discussions whilst being supported by Unit tutors. The importance of 'group maintenance' was explained to them in some detail.

3.1 Teaching Methods

The 'Case Study' involved the following learning outcomes:

- Development of a critical self awareness within the context of team working.
- Demonstrate the ability to develop and employ written and verbal communication and presentation skills.
- Define, analyse, evaluate and report on the different management and commercial business functions related to the Built Environment.
- Evaluate and report on business functions and information relating to technological, business, economic and management topics.

Work submitted should demonstrate original thinking within the context of recognised expertise and existing practices. To achieve this students had to read around the subject area and bring referenced material into their work. This work, supported by a comprehensive discussion, calculations and graphs, where appropriate, must demonstrate analysis and evaluation of the problem domain, and provide considered conclusions leading to recommendations for the Managing Director.

Lecturing staff on the Unit were available for consultation and teaching consisted of a composite of lectures and group workshops in which student activity and participation played a key role. Workshops provided the opportunity for the application of taught material.

3.2 Assessment and Feedback Strategy

The Unit is concerned with the application of theory to relevant core studies and therefore the workshops provided the opportunity for students to work collectively on problem solving exercises. The workshops were used to introduce each new topic area. Assessment was based upon work undertaken in mixed groups over one semester (12 weeks). The 'Case Study' required the completion of a comprehensive report and its formal presentation. Topics incorporated in the reports and presentation included:

- financial accounts analysis
- capital appraisal
- cash flow analysis
- budgetary control
- corporate planning
- quality issues

Students were expected to explore and evaluate the relationships between the various techniques/issues. Student support and formative feedback was provided during the workshops.

Unit assessment consisted of:

- Financial Analysis and Capital Investment Appraisal (25%)
- Project Cost Control (25%)
- Corporate Strategy and Quality (25%)
- Presentation (25%)

The fundamental rationale for this approach to assessment was to allow for timely formative advice and feedback supported by summative assessment and feedback. This allowed students to fully engage in the educational process of learning by application. To this end the work was marked and returned within one week. This enabled a cumulative approach to be adopted to the LTA strategy. Students were able to build on and incorporate 'timely feedback' and also subject material from one report could be related to succeeding reports.

However, it should also be pointed out that the introduction of the 'Peer Assessment' was a vital component of the LTA strategy. Students appreciated this aspect of the Unit and did take full advantage of its application. A further quality check is incorporated as all group members had to produce a 'group' "Reflective Statement" about their contributions to the assessment and a further comment upon what they had gained from the assessment. They could comment upon any associated problematic issues encountered. The thoughts of Brown and Atkins were considered before the 'Case Study' design. "The essential skill of effective lecturing is preparation not presentation. Obviously presentation is important but without a clear, coherent lecture structure a presentation may have a short-lived affect." (Brown and Atkins 1966, p.35).

It was foreseen by the Unit tutors that getting mixed groups to work together could be a difficult issue, but in practice, the students did not hesitate in getting together and establishing a working relationship. We believe this was a result of reassurance regarding the peer assessment process.

There was some trepidation by students that the workload for the Unit was too demanding. However, when it was explained that the whole Case Study would be broken down into four components with each being interlinked, their unease was removed. They appreciated the lecturers' promise to return all assessments incorporating a comprehensive written feedback within one week and a verbal summary/discussion with students. This promise was kept. This process did enable the incorporation of feedback from one assessment to be noted and if required action taken to improve the next assessment.

Staff, students and external examiners were pleased with the way the project and assessment process progressed. It was a critical point that tutors supported the innovative LTA strategy.

3.3 Student Feedback

Student feedback clearly indicated that they liked the challenges of relating the Unit content to 'real-life' issues. Part-time students were able to bring in their work experiences. However, not all students were employed but the majority had been on a work placement. This had an added advantage because students did appreciate that any conflicts they experienced with their peers were mirrored with those they were likely to encounter in the 'real world' work environment.

The request by Unit tutors to produce a reflective statement on each assignment certainly did develop the 'Reflective Practitioner' aspect. Students had to reflect upon contributions and problematic issues of producing the assessment. But further, they were asked to reflect upon what they would do 'now' in the light of the previous experience.

3.4 Lessons Learned

3.4.1 Teamwork

- Students need to be made aware of the demands of our industry in relation to the importance of 'team working'. It would be worthwhile running through the CIB Common Learning Outcomes. This would reinforce the necessity for engaging in group activities.

3.4.2 Reflective Skills

- Further encouragement is required to ensure a critical reflective statement to be produced for each Unit with an overall Unit reflective statement. Some very good reflective statements were produced but some lacked a critical edge.

3.4.3 Student Briefing

It is vital that students are fully briefed on the Unit and its LTA strategy. To some students this will be a new approach, certainly the inter-course aspect.

4. CONCLUSIONS

The only real barrier is forming groups at the outset, mixing construction managers, commercial managers and quantity surveyors. This can be overcome by having each student present a brief outline of themselves at the start of the Unit. One of the most useful enablers to reassure students about group working was the utilisation of Peer Review Proformas.

The 'Case Study' deployment was so successful that other courses will be brought into the mix in the future. This will require some staff development and may involve staff to staff mentoring. Support of its success is provided in Student Review Questionnaires and external examiners' comments.

REFERENCES

- Brown, G and Atkins, M (1996) *Effective Teaching in Higher Education*, Kings Lynn: Thomson Publishing Company ITP, ISBN 0-415-03675-5.
- Cox, B (1994) *Practical Pointers for University Teachers*. London: Kogan Page Ltd, ISBN 07494 111 04.
- Ecclestone, K (1995) *Learning Outcomes*, Sheffield: Centre for Further and Higher Education, Sheffield Hallam University.
- Egan, E (1998), *Re-thinking Construction*. A Task Force Report, HMSO, London.
- Latham, M (1994), *Constructing the Team - Final Reports of the Government Industry Review of Procurement and Contractual Arrangements in the UK Construction Industry*, HMSO, London.

BIOGRAPHICAL NOTES

Paul Watson is currently Subject Group Leader for Construction Management at Sheffield Hallam University and a Principal Lecturer. He has a wide range of experience related to Construction Management gained from being both a practitioner and a researcher.

Richard Davis is a Chartered Quantity Surveyor and currently a Senior Lecturer and Head of Quantity Surveying at Sheffield Hallam University. His career includes extensive periods in both the public sector and private practice within the UK and overseas.

CONTACTS

Dr. Paul Watson
School of Environment & Development
Sheffield Hallam University
City Campus
Howard Street
Sheffield S1 1WB
UK
Tel. + 44 114 225 3968
Fax + 44 114 225 3179
Email: p.a.watson@shu.ac.uk

Mr Richard Davis
School of Environment & Development
Sheffield Hallam University
City Campus
Howard Street
Sheffield S1 1WB
UK
Tel. + 44 114 225 3098
Fax + 44 114 225 3179
Email: r.w.davis@shu.ac.uk