

A TQM APPROACH TO CONSTRUCTION EDUCATION

Hill C J, Howarth T A P, McNamara E T, Watson P

School of Construction, Sheffield Hallam University

Many organisations in the construction industry have recognised Total Quality Management as a focus for improvement of the process and the product. Client satisfaction and continuous improvement are accepted as positive strategies for the organisations and individuals who make up the industry to adopt. However, it is recognised that the change in philosophy demanded by the adoption of TQM is by no means straightforward. Research projects undertaken at Sheffield Hallam University and The University of Hull have highlighted the learning outcomes approach as a means of formally recognising the demands of the customers of higher education. The learning outcomes approach is proposed as a means of promoting continuous life-long learning in students, and inter alia, continuous improvement in the construction industry. The paper notes that education must be seen as a provider to the construction industry of its main resource: people. The authors propose that the recognition of, and striving for TQM in higher education will enable both a successful HEFCE assessment, and by extension the adoption of TQM in the construction industry.

Keywords: Education, total quality management, learning outcomes, HEFCE assessment

INTRODUCTION

Attention to the issue of quality in higher education has heightened with the undertaking of both the Dearing Inquiry and the Research Assessment Exercise. The undertaking of HEFCE teaching assessment also reinforces the prominence of the issue of quality within UK higher education institutions.

Total Quality Management (TQM) is widely viewed as improving both the *process* and the *product* of the construction industry.

The recognised adoption of a Quality Assurance system such as ISO 9000 or BS 5750 is essential to maintain a viable market position. Clients, specifically those from the business sector, demand that construction organisations are aware of, and utilise TQM. Frequently also, the application of TQM and certified QA systems has become a prerequisite for contractors' pretender qualification.

TQM

There is no single definition of TQM. There cannot be, as the value of TQM is not inherent in a 'universal, pre-specified system' or set of rules and guidelines. Quite clearly TQM does not, and cannot, exist 'out there' as predetermined sequences or steps for exacting adoption by commercial organisations. The value of TQM is in the application of its *philosophy* to the economic and operative model of the host organisation.

Comprehensive presentation of a philosophy of TQM in construction projects is provided in the literature (Baden Hellard 1993, Ashford 1989) for example, and is not within the scope of this paper. Aspects of organisational management, demanded by the fusion of a TQM philosophy with an organisation, are of central importance to the paper, especially as it is widely recognised that the adoption of TQM is not a straightforward or simple task. Indeed, many difficulties relating to the adoption of a TQM philosophy for the provision of education and training are indicated within the Quality in Higher Education Project:

“These include: the customer-driven ‘definition’ of quality, the difficulty in articulating who is the customer and what is the product; the difficulty in measuring and controlling the process of teaching and learning; and the role of the student in their own learning” (Harvey L. (ed.) 1993).

The philosophy of TQM places an organisations’ focal emphasis upon concepts of *client satisfaction* and *continuous improvement*. It is the concept of client satisfaction that underlies the operative nature of TQM. In undertaking to fuse TQM philosophy with an organisation, an initial and continuing requisite is for the identification of the organisations’ *client*.

Obviously before *client satisfaction* can be achieved and *continuous improvement* embarked upon, an organisation must identify its clients, and recognise their explicit and implicit ‘satisfiable demands’. Without appropriate and rigorous identification of these, the adoption of TQM is unachievable.

IDENTIFYING THE CUSTOMERS OF A CONSTRUCTION ORGANISATION

In determining for the purpose of TQM, the customer or client of a commercial organisation, it is recognised (Muller (1991) after, Oakland et al) that they are both *internal* and *external* to the organisation. It is clear that in TQM terms the customer concept encompasses *all* people economically involved with the organisation.

In the construction TQM context, customers are held as being a) the recipient of the constructed product -the ‘client’ - and b) all people involved at all stages of the design and construction process. Vicariously, the public at large and users of the construction project can be considered customers.

The satisfying output of the construction organisation is the provision of a unique product that fulfils the pre-specified demands of the *external* customer - the client. This satisfying output is achieved through managed interaction *within* the construction process. In TQM terms each person within the construction process, every designer, engineer, site manager, joiner, plumber and the like, are all considered internal customers of the organisation. Each has demands that require satisfying for the enablement of the successful completion of the project.

EXPLICIT RECOGNITION OF THE CONSTRUCTION CUSTOMERS’ DEMANDS

External customer demand is explicitly recognised in the brief, drawings and specifications and other expressive tendering documentation. Where tendering is disregarded and direct negotiation is undertaken between client and construction organisation, demand remains expressed within all documented communication

The construction process that is undertaken to fulfil the demands of the external customer is done so with respect to both external and internal customer satisfaction. With this fundamental consideration in mind, construction customer demands are formally recognised and documented within a projects' quality manual. The manual provides explicit statement of demand-satisfying performance and is applicable to all stages and processes of a project. With underlying focus upon appropriate product provision and external client satisfaction, the project 'manual' clearly outlines internal customer demand within the construction process, from the project initiation stage through to the issuing of the final certificate.

TQM PHILOSOPHY AND HIGHER EDUCATION

In recognising that the value of TQM is in the application of its philosophy to the economic and operative model of an organisation, it can be, and is, effectively adopted by commercial organisations such as those which form the construction industry. However, can and should TQM be adopted in education? Surely higher education institutions should not, and cannot, be considered as being commercial organisations? If they are not commercial organisations, how appropriate is the TQM philosophy to them?

HIGHER EDUCATION

The traditional view of higher education, apparent in Humboldt's model (the founder of Berlin University in 1810) is one of a 'university of culture'. The concept being that a broad education is provided through the integration of research, teaching and scholarship. The *role* of such universities can be regarded as being *within* society - institutions set educational agendas and promoted learning for 'cultural good'. This position, or role, of higher education *within* society is recognised as no longer being the case. Barnett (1994) highlights a modern day change in the nature of the role of higher education when retrospectively commenting on the Robbins report of 1963:

"Robbins marked the end of a transitional era, in which higher education was seen as a cultural or positional good. Post-Robbins, higher education was to be seen as an economic good, not only by the individuals concerned but more importantly by society at large."

Recognition of the changed nature and role of higher education is further provided in relevant literature. Readings (1996), comments that higher education institutes are no longer 'universities of culture' but are instead progressively becoming indistinguishable from the transnational organisations with which they carry out business.

Barnett (1994) also outlines how:

"an overlap of interests and commitments between society and higher education is developing and becoming more pronounced: higher education is becoming an institution of society and not simply an institution in society."

Changes in the operative nature of higher education institutions are not, and should not be seen as being in opposition to a 'fundamental objectivity' of higher education. Rather the adoption of five year business plans, and mission statements, amongst numerous other strategic tools, can be considered as reflecting and reinforcing the shift in higher education's place as being *of* society and no longer simply *in* society.

Such business-like operational changes within higher education are reflective of higher education's own awareness and recognition of its' role and position as a 'provider' to industry and society. Further explicit recognition of this 'provider' role of higher education' specifically in the construction context, is presented in a recent Department of the Environment (1995) publication:

“What is needed is people who know what to do, how to do it, and above all else, who want to do it right. Education and training have a critical role to play in influencing people, the primary input to construction....”

This statement presents a Government view of how policy in construction education can contribute to the construction industry. The role of education as provider to the construction industry is further emphasised:

“...maximise the contribution of education and training to achieve high quality in UK construction”.

Clearly, the modern day repositioning of higher education recognises and promotes the orientation of higher education as a supplier to industry. This is not to say that higher education *is* itself a commercial enterprise. Rather it is to suggest that higher education *realises* that it now serves, amongst others, commercial organisations, and in doing so strives for effective and efficient operation through the utilisation of business like strategies.

IDENTIFYING THE CUSTOMERS OF HIGHER EDUCATION

In recognising that modern day education operates in a business like manner and is, amongst other things, a 'supplier' to industry it can, and must within these business terms adopt a TQM strategy to satisfy the customer.

In order to successfully adopt a TQM philosophy in higher education, appropriate and rigorous identification of customers must be made, along with, as can be seen from the construction example, determination of the customers' explicit and implicit 'satisfiable demands'. Without such, the adoption of TQM is unachievable. This raises the question: who are the customers of higher education, and what are their satisfiable demands?

The term 'customer' in this context is often construed in a contentious manner - some take it to infer that higher education *is* itself a business. Within higher education, as Otter (1992) indicates, there exists a 'partnership of interests' relating to student graduateness. It is in this context, with relation to the embracing of TQM philosophies that the term customer is utilised.

In considering the nature of the customers of higher education they are regarded as being both internal and external to higher education institutions. The taxonomy of customers of higher education can be regarded as including:

- a) industry
- b) professional bodies -industry representatives
- c) families
- d) society
- e) academics
- f) students

(Adapted from Fox (1996))

In outlining higher education's internal and external customers, it is necessary also for the purposes of embracing TQM to explicitly recognise the demands of each of these customers. This is enabled through a curricula approach which uses learning outcomes specification. It is within the expression of higher education's learning outcomes that customer demands must be realised. Such a process of specification of higher education 'graduateness' is an interpreted explication of customer demands.

RECOGNISING THE DEMANDS OF HIGHER EDUCATION CUSTOMERS

In undertaking to represent the demands of customers through learning outcomes specification, the *nature* of the demands must primarily be appreciated.

DEMANDS OF EXTERNAL CUSTOMERS

- a) Industrial customers are the potential employers of graduates - a product of higher education. They have a direct interest in there being available a 'suitable workforce' with which they can efficiently, effectively and professionally operate their organisations. As such graduates are demanded that fulfil specific vocational competence.
- b) Professional bodies - who represent members of industry - and who accredit higher education courses can be considered as another external customer. Although higher education's relationship with industry is expressly reinforced by the accreditation of higher education courses by professional bodies, such accreditation does not simply mean that the customers of a higher education course are, or should be considered as being limited to industry and its' representatives. This would be unrealistic and unusable for any TQM philosophy.
- c) The external customer concept extends to families of higher education students according to Fox (1996).

"The family-wide customer base comes from the idea that each member of the family 'pays' for the education, either directly through cash or loans, or indirectly through changes in their spending habits and reductions in their disposable income".

In Fox's terms, families can be considered as being customers of higher education due to their 'investment' in a student's education. This investment is not necessarily a direct one, it may be in the form of an 'opportunity cost'. As such the demands of these customers are not explicitly relatable to specific aspects of the provided education. Instead demands made concern perception that value being provided to the students. This may take the form of demanding that higher education suitably prepares the student for the demands of another customer - industry.

- d) The demands of society placed upon higher education can be recognised as being broad and generalised. One such demand is that graduates are able contribute positively to society in moral, social and economic terms.

DEMANDS OF INTERNAL CUSTOMER

- e) Academics are internal customers of higher education in so much as they demand the opportunity to operate and attain a sense of achievement and fulfilment.

f) In regarding students as customers a paradox arises. They are both a customer and a product of higher education. Though as White (1993) highlight - some may argue that the product of the system is not the student, but the education.

In this instance demands are not only related to the satisfying nature of the product - the education, they are also immediate and relatable to day to day aspect of classroom and facilities operation. Muller (1991) importantly points out though that there is “limited involvement of the ‘learner as customer’ in specifying the content and style of delivery of learning opportunities”.

This is not to say that the student as customer cannot be empowered within the day to day functioning of the higher education so as to enable the satisfying of day to day demand. Muller (1991) suggests that the ‘centrality of the learner’ is

“an essential component of the application of the notion of quality in vocational education and training.....The process of learning is such that the learner is encouraged and supported so as to become a self-motivated life-long learner”.

INTERPRETING CUSTOMER DEMANDS - THE VEHICLE OF LEARNING OUTCOMES

Once customer demands are recognised, they are then required, for the purposes of higher education TQM to be interpreted into coherent ‘learning outcomes’. For this to be enabled the nature of the term ‘learning outcomes’ must be appreciated.

A ‘learning outcome’ is defined by Ecclestone (1995) as being

“something that the student is able to do that (s)he was previously unable to do”.

Thus learning outcomes can be regarded as changes within a person as a result of a learning experience. For the purpose of using learning outcomes within higher education, assessment must be both possible and appropriate. The desired learning outcomes of higher education course must therefore not only be representative of customer demand, they must also be clearly stated and assessable. In describing learning outcomes, four different approaches to specification were explored in an investigative project into learning outcomes of higher education. The four approaches were based on:

Objectives	- the stated intention of the course.
Subject Knowledge	- the knowledge content commonly identified in syllabuses or course documentation.
Discipline	- the notion of a discipline as a culture and value system to which the graduate is admitted.
Competence	- what a graduate can do as a result of the degree programme, including the narrower notion of occupational competence.

(Otter 1992)

In recognising that the desired learning outcomes are the interpretations of customers’ demand, and that they require to be both clearly stated and assessable it can be appreciated that they are the engine that enables the continual driving forward of higher education TQM philosophy.

In acceptance of this a central aspect of a research project at Sheffield Hallam University is concerned with the learning outcomes of students on Measurement units. Within the investigation, learning outcomes are interpreted from Gadamerian analysis of students' perceptions of the undergraduate education experience. Such determination may be regarded as an indication of the satisfaction provided to those recognised higher education customers.

Research conducted at the University of Hull recognises that only when educational institutions appreciate whom they serve, and the requirements of those they serve, can they put the customer at the centre of its activities. The learning outcomes methodology is seen to provide the mechanism for placing the customer at the centre of organisational activities and for enabling an identification of specific customer requirements. This approach is viewed as empowering the host organisation with the means to gauge its service provision through the monitoring of learning outcomes attainment. The learning outcomes approach provides a focus to educational provision for both organisational and customer activity.

THE LEARNING OUTCOMES APPROACH - ENCOURAGING CONTINUOUS IMPROVEMENT

Learning outcomes are not summative assessment. Rather they are an evaluation of a continuous process - continuous learning. Through successful performance in appropriate learning outcomes assessment, students gain recognition of possessing requisite knowledge and competence related to graduatness. These specified learning outcomes though should not be considered as being an encased limit of what is desired of a graduate. It is also hoped that none specified, none assessable, yet desired learning outcomes are also attained. For example, it is hoped that by participating within the higher education process itself students will develop a 'thirst for knowledge'. Students can then graduate with an awareness of the need for lifelong learning. So one unassessable, yet desired outcome of the higher education process is to develop an awareness within students that learning, in both the vocational and general contexts, is not something that is completed or achieved upon graduation. It is a process of *continuous* improvement. It is proposed that continuous improvement in graduates, enables, and leads to continuous improvement in employing organisations.

In effect, the encouragement of continuous improvement within a student is facilitated through a learning outcomes approach. This encouragement of continuous learning is enabled through *appreciation* that the completion of a course is recognition that a graduate satisfies customer demand, *at that given historical time*. Such recognition by the graduate of the need for continuous improvement in turn enhances the embracing of TQM within employing organisations.

This is not to say that continuous improvement is only evident in graduates and their employing organisations. Higher education itself, by the very process of customer demand interpretation and learning outcomes specification, is continuously improving its recognition of its twenty-first century role as a higher education *of* society.

SUMMARY

This paper has presented the concept that the embracing of TQM philosophies by higher education can enable satisfaction of higher education's modern day role and the continuous improvement of its customers. The embracing of TQM in higher education also enables the adoption of TQM within industry. The provision of an education with

TQM within the curriculum, provides graduates with an awareness and developed understanding of aspects relating to TQM. Graduate knowledge of such aspect is demanded by higher education customers, especially in the construction context. Not only does higher education provide industry's future professionals with a demanded awareness of TQM though, it also, through the embracing of TQM, provides students with the opportunity to actively participate within a TQM system. Graduates not only 'know about' TQM and its necessity to the construction industry, they also have operational experience of participation within a TQM system.

REFERENCES

- Ashford J L (1989) *The management of quality in construction*, E F Spon.
- Baden Hellard R (1993) *Total quality in construction projects*, Thomas Telford.
- Barnett R (1994) *The limits of competence*, Buckingham: SRHE & Open University Press.
- Department of the Environment (1995) *Constructing quality: a strategy for quality in construction*. London.
- Ecclestone K (1995) *Learning outcomes*, Sheffield: Centre for Further and Higher Education, SHU.
- Fox R F (1996) Addressing the paradox of implementing total quality management in construction education, *CIB Beijing International Conference on Construction Modernisation and Education*, China Architecture & Building Press.
- Harvey L (Ed) (1993) Quality assessment in higher education. *Collected papers of the QHE project*. Birmingham: University of Central England.
- Muller D & Funnell P. (1991) An exploration of the concept of quality in vocational education and training. *Education and Training Technology International*, **29**(3).
- Otter S (1992) *Learning outcome in higher education*, London: UDACE.
- Readings B (1996) *The university in ruins*, Harvard University Press.
- White J A (1993) TQM: Its time academia!. *Quality and Productivity Management*, **10**(2), Virginia Quality and Productivity Centre, Virginia Tech, Blacksburg, VA.