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# The quality and value of higher education facilities: a comparative study

## Abstract

**Purpose** - The aim of the paper is to explore the relationship between the quality and value of higher education facilities through comparing the views of different user groups and professionals involved in the procurement and design of such facilities.

**Design/methodology/approach** - The paper adopts a mixed methods approach incorporating a number of interviews and a questionnaire survey, underpinned by the recommendations and input of an expert panel.

**Findings** - The results reveal the potential of facilities management and maintenance to create value for higher education institutions (HEIs) and students, perhaps even greater than the construction of new high-profile facilities, by facilitating student recruitment and improving student learning experience.

**Research limitations** – The sample includes data from a single HEI. Although this was deemed necessary so as to reduce the impact of externalities, the adopted approach has to be applied to a wider sample of HEIs in order to claim more generalisable findings.

**Practical implications** - The paper provides a better understanding of the relationship between the quality and value of higher education facilities. This can potentially support HEIs to achieve improved value for money from their facilities and free up resources to be reinvested in other aspects of student experience.

**Originality/value** - Considering the subjective nature of value the paper incorporates views from a number of different interest groups. These views are correlated with different facility quality standards to provide a holistic approach to assessing the value of higher education facilities.

**Keywords** Expert panel, Higher Education, Quality, Value

**Paper type** Research paper

## 1. Introduction

The role of higher education in enhancing individual and social well being has long been established. However, with the ever-increasing complexity of today's economic, environmental and social systems the importance of higher education becomes even more crucial. Indeed, sustaining a learning society which can progress through an understanding of itself and its world is the fundamental aim of higher education (NCIHE, 1997). The extent to which this goal is achieved depends largely on the effectiveness of the service provided by higher education institutions (HEIs).

From an economics perspective, HEIs can be considered as organisations that seek to optimally allocate resources to maximise educational output. These resources can be categorised as generally related to estates and facilities, human resources, curriculum, and students (Psacharopoulos, 1987; Levin, 1994; Pritchett and Filmer, 1999). From the first three categories, falling within the direct remit of HEIs, expenditure on estates and facilities is the second largest cost item after salaries (Universities UK, 2009). Thus, making best use of buildings and facilities can release significant funds to be reinvested in other aspects of student experience. However, further than freeing up resources, the quality of the estate is also crucial in creating added value by enhancing the university's marketability by strengthening university identity and facilitating the recruitment of quality staff and students (CABE, 2005; Alessandri *et al.*, 2006; Barnett and Temple, 2006).

Given the financial challenges facing the UK higher education sector, especially following the publication of the Browne report (2010) and the government's response, capital investment in higher education becomes critical. At the same time, investment decisions become increasingly complex due to recent and anticipated major changes in educational technology, learning/teaching modes, and learners' expectations (JISC, 2006; SFC, 2006). Accordingly, HEIs have to ensure that buildings, facilities and related

services deliver value for money, the main prerequisite for which is a deep understanding of user's needs (OGC, 2003). A very similar situation, surprising perhaps but indicative of the everlasting importance of the issue, was also captured some 30 years ago by Kowalski (1983) who highlighted that:

"Educational facilities, like other material resources, are consumable. In time, they are used up and must be replaced or revitalized […] In an era of declining resources and dramatically changing educational programs, it is essential that those individuals responsible for solving educational facility problems understand the issues if they are to effectively meet the needs of future generations of students."

The primary aim of the paper is to explore the relationship between the quality and value of higher education facilities and assess the extent to which user views coincide with the perceptions of professionals who are involved in the procurement and design of such facilities. The paper acknowledges the role of higher education facilities in facilitating teaching and learning; however, it focuses primarily on how facilities contribute to value creation for the HEI. The research incorporates a number of interviews and a questionnaire survey, underpinned by the recommendations and input of an expert panel while findings are related to four different quality buildings of a UK HEI. The results demonstrate an increased difficulty in determining investment allocation factors, largely due to different perspectives on the value of HEI facilities. However, useful recommendations are derived indicating the potential of facilities management and maintenance to create value especially for the HEI and the need for a more user-friendly design approach focusing first and foremost on user needs.

## 2. The quality of higher education facilities

Primary and secondary education studies such as these published by CABE (2002), Green and Turrell (2005) and Uline and Tschannen-Moran (2008) have highlighted the importance of learning spaces in teaching and learning and confirmed a positive link between the quality of school facilities and student achievement. In contrast, the study of learning space in higher education has not attracted particular attention (Price *et al.*, 2003; Hamid *et al.*, 2007; Temple, 2008). To assess the quality of HEI facilities several studies have adopted a post occupancy evaluation (POE) approach. A comprehensive review of POE techniques is provided by Riley *et al.* (2010) who highlight that notwithstanding the recent interest on POE only a few methods are specifically suited to evaluate the performance of educational facilities. Amaratunga and Baldry (1999) carried out an assessment of facilities management (FM) performance against functional, financial, technical and behavioural criteria. Similarly, Fianchini (2006) carried out a POE to evaluate the fitness for purpose of university buildings according to functional factors including accessibility, layout, flexibility for different uses and future needs, and functional equipment. A facility audit approach was also utilised by Lavy (2008) who evaluated the performance of a HEI building identifying future needs in terms or maintenance, repair and, more importantly, a FM system which ensures the building maintains its usage status.

The above studies in general reveal the potential of FM to evaluate existing facility quality in order to improve the physical performance and appearance of a building and its systems, increase operational efficiency and offer higher levels of user satisfaction. Indeed, identifying, evaluating and reporting the condition of buildings, grounds, utilities

and equipment are essential aspects of the facilities assessment process (Kaiser, 1989) and critical elements in order for FM to "provide a safe and efficient working environment, which is essential to the performance of any business" (BIMF, 2011). However, assessing the performance of existing facilities reveals little information as to the value for money that they can deliver to a HEI. Indeed, unless information is available about the impact of facilities on their business it is doubtful that HEIs will be in a position to confidently allocate capital investment on estates and facilities. According to Price *et al.* (2003) and Matzdorf (2010) the strong focus of FM on maintenance represents the paradox of FM which claims to enhance value creation and contribution to "business". Although it is suggested that FM can help organisations to achieve their strategic objectives (Alexander, 1996); still, one of the biggest challenges facing the FM profession is to address the poor understanding of the relationship between facilities and the objectives of the organisations that use them (Loosemore and Hsin, 2001). Three major reviews published in 2006 (Barnett and Temple, 2006; JISC, 2006; SFC, 2006) confirm the benefits that the provision of facilities and the design of learning spaces can have on higher education student learning experience. However, given that facilities and buildings can have further impact on users' behaviour, organisational effectiveness and corporate image (Duffy, 1980; Purcell, 1987; Jensen, 2009), it is up to the HEIs to explore the business case for procuring new and/or investing in existing facilities management. The extent to which FM can contribute to value creation for the organisation is the primary concern of this paper.

## 3. The value of higher education facilities

The idea of the university as corporate enterprise was introduced as early as 1985 with the publication of the Jarratt Report (CVCP, 1985). Indeed, in the UK HE system students were considered to be the "primary customers" of a university even before they were liable for the payment of "up-front" tuition fees (Douglas *et al.*, 2006). The customer-oriented approach of HEIs has been particularly encouraged since the introduction of the National Student Survey (NSS) in 2005 (Douglas *et al.*, 2006; Richardson, 2009). The results of the survey greatly affect the reputation and image of HEIs which in turn, can impact significantly on their capacity to attract students, academic staff and external funding, determining ultimately the economic prosperity of HEIs and quality of educational services. Given that the share of universities' income from tuition fees paid by students has increased radically over the last 30 years (Carpentier, 2004) the recruitment of students becomes particularly vital. Therefore, students' purchase behaviour, an essential determinant of the university marking positioning strategy, has been the subject of a number of studies seeking to understand the factors affecting student choice of university. From a FM perspective, these studies investigate the extent to which the quality of facilities can influence student decision to join a particular HEI.

**Table I.** Factors affecting student choice of university (Adapted from Price *et al.*, 2003)

| Item | Average score | Ranking |
|---|---|---|
| Had the course you wanted | 4.80 | 1 |
| Availability of computers | 4.41 | 2 |
| Quality of library facilities | 4.41 | 3 |
| Good teaching reputation | 4.29 | 4 |
| Availability of “quiet” areas | 4.22 | 5 |
| Availability of areas for self study | 4.21 | 6 |
| Quality of public transport in the city/town | 4.13 | 7 |
| A friendly attitude towards students | 4.04 | 8 |
| Quality of lecture theatre facilities | 4.03 | 9 |
| Diversity/range of shops at the university | 4.01 | 10 |
| Quality of bars on campus | 4.01 | 11 |
| Union social facilities | 4.01 | 12 |
| Prices at the catering outlets | 4.00 | 13 |
| Availability of university-owned accommodation | 4.00 | 14 |
| Quality of the university grounds | 3.94 | 15 |
| Cleanliness of the accommodation | 3.92 | 16 |

The results demonstrated in Table I are based on a study conducted by Price *et al.* (2003) and establish that HEI facilities and learning spaces are, not as important as the course itself but, certainly one of the main aspects that students consider when deciding to join a university. Similar results have been reported by Maringe (2006) and Reynolds and Cain (2006). The latter also underlined that a significant number of students participating in their research had rejected institutions because important facilities were missing, inadequate, or poorly maintained, leading to the conclusion that a quality built environment is not a sufficient, but necessary condition to recruit and retain students (Reynolds and Cain, 2006). The report ‘Design with distinction’ (CABE, 2005) has further acknowledged that the existence of well-designed buildings on a campus is a significant factor in the recruitment of students. Indeed, the report highlighted that 60% of students indicated that the quality of the building design had a positive impact on their decision to study at their chosen university.

Summarising the above discussion, it would be safe to assume that apart from facilitating learning, the added value that facilities can bring to a HEI is associated with student recruitment either directly or through enhancing a university’s image. This is strongly supported by Price *et al.* (2003) who claim that facilities differentiation can be a source of competitive advantage for HEIs and perhaps explains why Universities have recently focused on capital intensive, often high-profile, facilities, research and learning spaces (SFC, 2006; Hamid *et al.*, 2007). Given the continuous and increasing pressure on higher education funding, those involved in the maintenance and procurement of such facilities are required to develop a better understanding of how, and the degree to which, the construction of new or refurbishment of existing facilities can maximise value for both students and HEIs.

## 4. Research framework

### 4.1 General approach

Considering the strong practical implications and contemporary nature of the identified problem the research project was developed and executed in cooperation with a group of construction professionals from companies that regularly undertake contracts procured by HEIs. The panel members consisted of seven professionals, including five architects and two quantity surveyors, who were selected purposively so that that the group contains the required in-depth knowledge and experience (Bryman, 2001). The main functions of the panel were first to contextualise value in terms of HEI facilities and later to facilitate a better understanding of the research outcomes.

### 4.2 Conceptual issues

To define the scope of the study, the expert panel considered previous studies (Roberts and Higgins, 1992; Price *et al.*, 2003; Maringe, 2006) which identify an extensive list of factors affecting students' choice of university. Some of these factors, for example entry requirements, university location and cost of living, although significant, are not related to the quality of the facilities. Thus, to remove these external variables and increase the quality and accuracy of the findings, it was decided that the study should focus on a single university. Although the selection of the authors' university seemed a convenient approach, the issue was considered by the expert panel who deemed the site to be of particular interest since it includes a number of buildings with markedly different quality of facilities which could help linking quality to value. Four similar-sized buildings were selected comprised of teaching accommodation, social space and administration offices. The buildings, hosting the departments of computer science, built environment, architecture and education can be described respectively as:

- Building A: Prefabricated, brick faced with a flat roof. Similar sized classrooms some of which have been converted to IT labs.
- Building B: Traditionally built, brick faced, pitched roof construction. Variety of classrooms and seminar rooms equipped with high quality audio visual facilities, open and dynamic learning spaces, informal social places, indoor cafe and dining area.
- Building C: Innovative, high performance with minimal internal finishes. Flexible and open teaching and learning spaces, architectural studios, social space for learning exchange.
- Building D: Modern, natural daylight design, state of the art teaching and learning facilities. Modern seminar rooms, collaborative study areas equipped with subject libraries, small social spaces, indoor and outdoor cafe and dining areas.

To allow comparison and in accordance with Vickers's (1968) suggestion that subjective value judgements are a result of perception, three interest groups were identified. The groups included university students, academic staff and professionals comprising the expert panel.

### 4.3 Research methods

A questionnaire survey was developed relying heavily on advice and recommendations from the university's estates department. The questionnaire, shown in the Appendix, was tested and adjusted through a series of interviews with students and academic staff and then distributed through mass e-mails to the various faculties. Academic staff and construction professionals were asked to provide their views on student - as customer - value which was the subject of measurement. Given that the university's estates strategy is largely based on input from academic staff and construction professionals, the questionnaire aimed to assess the extent to which students and those involved in the maintenance and procurement of HEI facilities share the same views on student value. The subjective nature of value (Thomson *et al.*, 2003) was tackled by mainly using Likert scale questions allowing however respondents to corroborate their views. The survey resulted in a total of 461 usable responses distributed according to building and group of interest as shown in Table II. For reliability purposes, all respondents but the professionals were allowed to enter information only in relation to the building which they use. Thus, the background of students and academic staff was strongly related to the programmes offered by the departments hosted in the relevant buildings as identified above.

**Table II.** Distribution of collected data

| Group / Building | Students | Staff | Professionals* | Total |
|---|---|---|---|---|
| **A** | 35 | 19 | 7 | 61 |
| **B** | 158 | 35 | 7 | 200 |
| **C** | 42 | 9 | 7 | 58 |
| **D** | 125 | 10 | 7 | 142 |
| **Total** | 360 | 73 | 28 | 461 |

*Responses have been provided by the same group of professionals.

Prior to the analysis the data were cleaned and transformed into a SPSS format. It should be noted that professionals assessed all buildings and therefore, their answers were replicated in the analysis. Naturally, some of the questions were only pertinent to students and thus, replies from other groups were classified as "not applicable". Finally, open ended variables were quantified ex post, i.e. transformed into categorical ones. Data analysis incorporated descriptive and inferential statistics as presented in the following section.

## 5. Results and discussion

### 5.1 Comparative analysis among students

Before considering comparisons between the three identified groups it is necessary to check for consistency within the responses provided by students. Students' perceptions were analysed according to the year and area of study using Spearman's rho correlation and Kruskal-Wallis test. The results are demonstrated in Tables III and IV respectively.

**Table III.** Spearman's rho for year and area of study

| | | | Encourage | Expect | Credit | LearnNeeds | SocNeeds | PrNeeds | OverallSatiSF | Building |
|---|---|---|---|---|---|---|---|---|---|---|
| Spearman's rho | **Year of study** | Correlation Coefficient | .046 | .015 | -.051 | -.049 | -.047 | -.095 | -.003 | .050 |
| | | Sig. (2-tailed) | .357 | .767 | .310 | .331 | .350 | .059 | .955 | .319 |
| | | N | 360 | 360 | 360 | 360 | 360 | 360 | 360 | 360 |
| | **Area of study** | Correlation Coefficient | .195** | .335** | .293** | .265** | .034 | .107* | -.018 | .439** |
| | | Sig. (2-tailed) | .000 | .000 | .000 | .000 | .502 | .034 | .718 | .000 |
| | | N | 360 | 360 | 360 | 360 | 360 | 360 | 360 | 360 |

**Table IV.** Kruskal-Wallis test for students (Group variable: Building)

| | Encourage | Expect | Credit | LearnNeeds | SocNeeds | PrNeeds | OverallSatiSF |
|---|---|---|---|---|---|---|---|
| Chi-Square | 52.087 | 124.568 | 121.399 | 84.383 | 59.074 | 18.671 | 8.266 |
| df | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Asymp. Sig. | .000 | .000 | .000 | .000 | .000 | .002 | .142 |

Table III illustrates that no correlations between the student's year of studies and the identified variables are statistically significant indicating that student perceptions did not change significantly over time. Thus, although as underlined by Tam (2002) students change intellectually, socially, emotionally and culturally while progressing from one year to another as their university career develops, this seemed to have no significant influence on their views on the value and quality of the university facilities. Therefore, given that the quality of facilities influences student experience (Barnett and Temple, 2006; JISC, 2006; SFC, 2006), it could be assumed that any variation through the years is more related to facilities improvement/deterioration than changes in student perceptions over time.

In terms of the area of study, the programmes offered by the university were classified into built environment related and other courses. Based on the hypothesis that students following different programmes develop different competences it was expected that students attending built environment courses would be in a position to make a more informed, not necessarily different, decision on the quality of building elements and facilities. Indeed, Table III demonstrates that there is a significant relationship between most of the variables and the student area of study. However, the Kruskal-Wallis test for

different buildings in Table IV indicates that for all parameters, apart from overall satisfaction, the significance value is less than 0.05. Thus, it can be deduced that students' responses have been influenced to a great extent by the particular building that they use. Given the high correlation between the undertaken course and the utilised building it can be confidently suggested that the views of students attending built environment related courses differ from those of students studying other courses mostly due to using a particular building rather than undertaking a particular course.

### 5.2 Comparative analysis between groups

Having established that students can be considered as a single group displaying no significant built-in variability, the overall response provided by each group is presented in Figures 1 to 3. Of immediate note is that more than 80% of students have enjoyed their time in this HEI, considering the Kruskal-Wallis test outcome in Table IV, irrespective of the building they use. Given that all buildings were assessed by the same group of professionals, the statistics presented in Figure 3 are based on 28 responses as indicated in Table II.

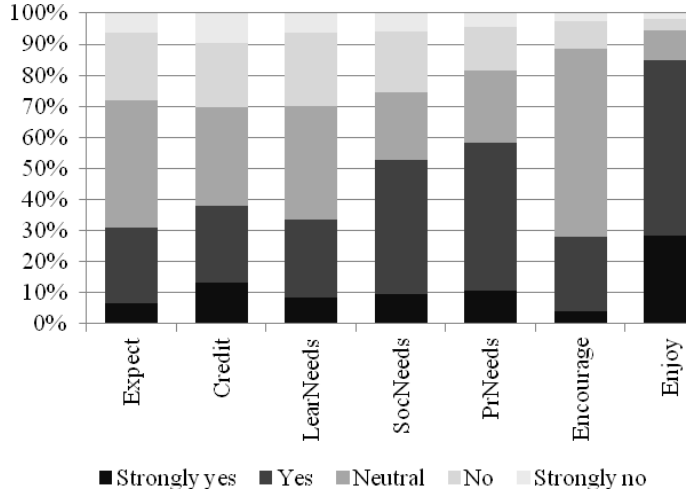


**Figure 1.** Overall response – Students

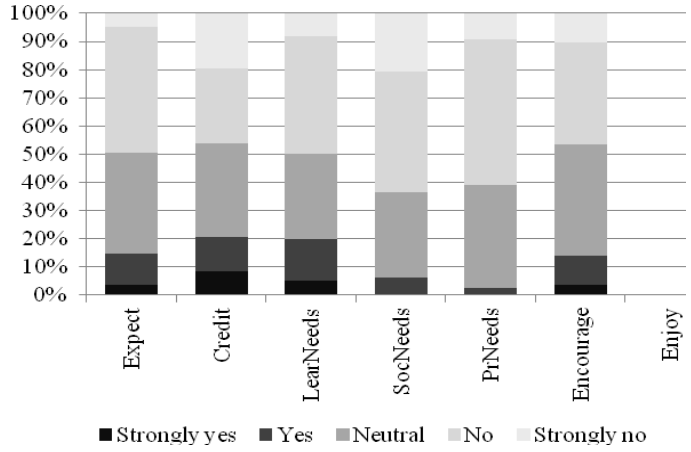


**Figure 2.** Overall response – Staff

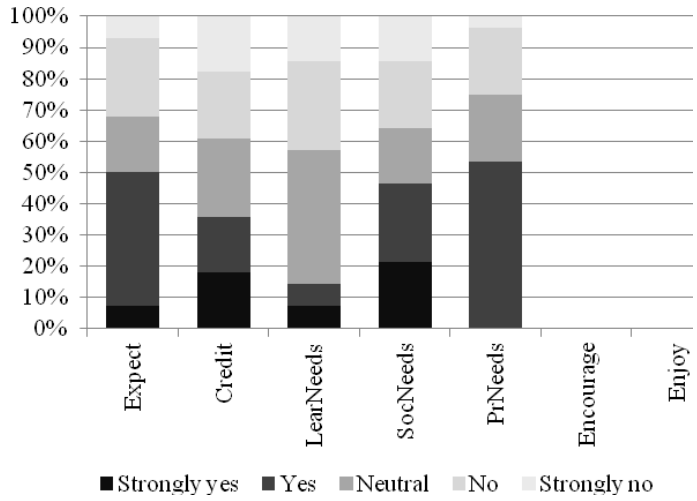


**Figure 3.** Overall response – Professionals

The strong association between the economic prosperity of a HEI and the quality of educational services it can provide, makes it particularly difficult to distinguish between the commercial and educational objectives facilitated by buildings and facilities. However, the debate could benefit from a closer look into the added value that buildings and facilities can deliver to the HEI by increasing student recruitment and to students by improving their learning experience.

*5.2.1 Quality and value for the HEI.* The Kruskal-Wallis result in Table V reveals that views held by different groups vary significantly and confirms the hypothesis adopted in this paper.

**Table V.** Kruskal-Wallis test for all respondents (Group variable: Group)

| | **Encourage** | **Expect** | **Credit** | **LearnNeeds** | **SocNeeds** | **PrNeeds** |
|---|---|---|---|---|---|---|
| Chi-Square | 52.087 | 124.568 | 121.399 | 84.383 | 59.074 | 18.671 |
| df | 5 | 5 | 5 | 5 | 5 | 5 |
| Asymp. Sig. | .000 | .000 | .000 | .000 | .000 | .002 |

As demonstrated in Table VI buildings C and D had a particular influence on student decision to apply to the specific university. Given the higher quality of the facilities in these buildings, as suggested by all groups in Table VII, this finding is consistent with Price *et al.*(2003) who highlighted that facilities factors, where provided to a high standard can have an important influence on students' choice of institution. However, Figure 1 showed that the general consensus among students (60%) is that students did not consider buildings as a strong determinant of their decision to apply to the specific university. This also applies to buildings C and D since the relevant median values in Table VII indicate that, no matter the building, students were neither encouraged nor discouraged to apply to this university because of the quality of facilities.

Considering that CABE (2005) has suggested the existence of a direct link between building quality and student recruitment, this finding suggests a noteworthy inconsistency. Yet, Table VIII indicates that all groups consider facilities to have an effect, positive or negative, on the university's reputation. This is strongly suggested by the expert panel who, when compared to the other groups, seem to overestimate the contribution of facilities and buildings in determining the university's reputation. As highlighted by Alessandri *et al.* (2006) and Douglas *et al.* (2006) university reputation is highly positively correlated with student recruitment. Therefore, it could be stated that buildings do create value for the HEI but principally subsequent to students joining the university by having a positive impact on the university's image, especially when buildings are of high quality. Thus, the results of this research do not disagree, on the contrary, support those of CABE by emphasising that maintaining the quality of facilities to high standards can have a significant impact on student recruitment. The importance of FM as a means of encouraging learning has been emphasised by the majority of higher education related FM studies (Amaratunga and Baldry, 1999; Price *et al.*, 2003; Fianchini, 2006; Lavy, 2008; etc.); in addition, this finding reveals the potential of facilities management and maintenance to create value for HEIs, perhaps even greater than the construction of new high-profile facilities.

However, it should be expected that the quality of facilities will not have an impact on student choice unless it is incorporated into the HEI's marketing strategy. Similarly to the majority of related studies (for example CABE, 2005 Maringe, 2006; Reynolds and Cain, 2006; Hamid *et al.*, 2007) this paper is not focusing on the HEI marketing positioning strategy. Therefore, it must be noted that perhaps the importance of facilities as a determinant of student recruitment might be underestimated due to the lack of relevant information accessible to students during their decision process.

**Table VI.** Students positively encouraged by the quality of facilities

| **Building** | **A** | **B** | **C** | **D** |
|---|---|---|---|---|
| **Students encouraged** | 14% | 14% | 39% | 46% |

**Table VII.** Median values per building per group

| Building | Group | Median | | | | | | Sum of medians |
|---|---|---|---|---|---|---|---|---|
| | | Encourage | Expect | Credit | LearnNeeds | SocNeeds | PrNeeds | |
| A | Student | 3.00 | 3.00 | 2.00 | 2.00 | 3.00 | 3.00 | 16 |
| | Staff | 2.00 | 2.00 | 1.00 | 2.00 | 2.00 | 2.00 | 11 |
| | Professionals | n/a | 2.00 | 1.00 | 2.00 | 1.00 | 2.00 | 8 |
| B | Student | 3.00 | 3.00 | 2.00 | 2.00 | 3.00 | 4.00 | 17 |
| | Staff | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 12 |
| | Professionals | n/a | 3.00 | 2.00 | 2.00 | 3.00 | 3.00 | 13 |
| C | Student | 3.00 | 3.00 | 4.00 | 3.00 | 4.00 | 3.00 | 20 |
| | Staff | 2.00 | 3.00 | 4.00 | 3.00 | 3.00 | 2.00 | 17 |
| | Professionals | n/a | 4.00 | 4.00 | 3.00 | 5.00 | 4.00 | 20 |
| D | Student | 3.00 | 4.00 | 4.00 | 3.00 | 4.00 | 4.00 | 22 |
| | Staff | 4.00 | 4.00 | 4.00 | 3.00 | 3.00 | 3.00 | 21 |
| | Professionals | n/a | 4.00 | 5.00 | 3.00 | 4.00 | 4.00 | 20 |

**Table VIII.** Correlation for different buildings (Grouping variable: Group)

| | | Encourage | Expect | Credit | LearnNeeds | SocNeeds | PrNeeds |
|---|---|---|---|---|---|---|---|
| Students | Pearson Correlation | .301** | .422** | .407** | .340** | .283** | .173** |
| | Sig. (2-tailed) | .000 | .000 | .000 | .000 | .000 | .001 |
| | N | 360 | 360 | 360 | 360 | 360 | 360 |
| Staff | Pearson Correlation | .374** | .389** | .439** | .372** | .225** | .383** |
| | Sig. (2-tailed) | .000 | .000 | .000 | .000 | .032 | .000 |
| | N | 73 | 73 | 73 | 73 | 73 | 73 |
| Professionals | Pearson Correlation | .[a] | .854** | .935** | .674** | .855** | .719** |
| | Sig. (2-tailed) | . | .000 | .000 | .000 | .000 | .000 |
| | N | 28 | 28 | 28 | 28 | 28 | 28 |

*5.2.2 Quality and value for students*. The correlation between the quality of the building and the extent to which buildings contribute to the satisfaction of student learning, social

and practical needs is presented in Table VIII. The table clearly demonstrates that professionals find it particularly difficult to separate the quality of the building from the quality of its performance. However, the significant of the correlations in Table VIII is consistent across the groups, with two important observations emerging from Figure 1. First, students are the least censorious group especially when it comes to the effect that facilities have on their learning experience. Second, university staff are the most censorious group towards the extent to which the existing buildings satisfy practical needs and encourage social interaction.

The former observation coincides with the findings of Douglas *et al.* (2006) who argue that once students have enrolled, they are prepared to tolerate, to a large extent, poor quality of building facilities. This is certainly related to the fact that students consider the most important aspect of a university's service to be associated with the core service, i.e. the lecture, including the attainment of knowledge, class notes and materials and classroom delivery (Banwet and Datta, 2003; Hill et al., 2003; Douglas *et al.*, 2006). Figure 1 and Table VII also reveal that the tepid perceptions of students in terms of building quality are evident for all buildings, except building D, including building C which although is perceived of higher quality appears not to win students' enthusiasm.

In general, academic staff are more critical due to the fact that university employees use buildings for a longer period than students which potentially can affect their views (Amaratunga and Baldry, 1999) and also perhaps it is possible that they compare students perceptions with their own choice of employment (CABE, 2005). When considering buildings as enablers of social interaction students' responses are very similar to the expert panel feedback with staff members being seriously concerned as to whether buildings provide enough opportunity for social interaction. Although, it seems that student zeal overcomes constraints imposed by poor building quality and are satisfied with ad-hoc provision of social space, this finding suggests the need for a better appreciation of the impact of social space on the value of HEI buildings and facilities. This has been also highlighted by all three major reviews mentioned earlier in this paper, i.e. Barnett and Temple (2006), JISC (2006) and SFC (2006), which suggest that the provision of social spaces can create value for both students and HEIs. Indeed, JISC (2006).and Matthews *et al.* (2009) highlighted that the design of informal learning spaces can provide students with a common area in which to gather, relax, socialise and work together outside classes leading to higher levels of engagement in learning, and instil a desire to continue activities beyond timetabled classes. The provision of social spaces can also create the feeling of a learning community which impacts heavily on university social life, together with employment opportunities, the most important predictor of university image formation (JISC, 2006; SFC, 2006).

## 6. Conclusions

The research presented in this paper sought to explore the value of higher education facilities through comparing the views of different user groups on buildings of different quality. The research was based in a UK HEI and developed following the recommendations of an expert panel and the university's estates department. By focusing on buildings at a single university, variables external to the campus physical environment were removed. A questionnaire survey was used in order to obtain information related to the facilities of four buildings from three groups including university students, academic

staff and construction professionals. The subsequent analysis utilised both descriptive and inferential statistics in order to unravel the contribution of building quality to value for the HEI as perceived by the three identified groups. The results revealed that university staff are particularly critical of the value of the existing facilities while professionals, whose views are closer to students', assume that the quality of the building always equates to its performance and vice versa. Students are the least critical among the identified groups and enjoy their time in the university irrespective of the quality of the building. Although they do consider good quality buildings a credit to the university, their needs can be met relatively simply, revealing the increased potential of facilities management and maintenance to create value. The findings demonstrate that the value of higher education facilities depends to a great extent on personal and organisational objectives and needs. Thus, the correlation between the quality and value of higher education facilities can be seen as a dynamic relationship which evolves constantly depending on changes in the education sector, teaching and learning methods and user expectations. To enable HEIs to achieve improved value for money from their facilities further research is required to establish a generic methodology which captures these changes, reveals the strategic aspects of FM and defines the role of facilities as part of the organisational strategy and culture. Furthermore, the findings are particularly relevant to the current economic climate since they demonstrate that improved facilities and better management of existing buildings could potentially yield much greater satisfaction for students than the commission of high-profile facilities. Perhaps this outcome seems to advocate designing rather uninspiring buildings, however it could instead be pointing towards the design and procurement of buildings, facilities and related services which focus predominately on user's needs while delivering value for money for HEIs.

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## Appendix. Data collection tool

| **Questionnaire item** | **Response Group** | | |
|---|---|---|---|
| | **Students** | **Staff** | **Expert panel** |
| 1. Did the buildings/facilities on this campus encourage you to apply to the University? | ✓ | ✓ | |
| 2. Is the building in which you study better or worse than you expected? | ✓ | ✓ | ✓ |
| 3. The building in which I study is a credit to the University. | ✓ | ✓ | ✓ |
| 4. Does the building and facilities in which you study enhance your learning experience? | ✓ | ✓ | ✓ |
| 5. The building in which I study provides enough opportunity for social interaction. | ✓ | ✓ | ✓ |
| 6. The equipment / facilities in the building in which I study meet all my practical needs | ✓ | ✓ | ✓ |
| 7. So far, have you enjoyed your time at this University? | ✓ | | |

# Figures and tables (Submitted in separate files too)

**Table I.** Factors affecting student choice of university (Adapted from Price *et al.*, 2003)

| Item | Average score | Ranking |
|---|---|---|
| Had the course you wanted | 4.80 | 1 |
| Availability of computers | 4.41 | 2 |
| Quality of library facilities | 4.41 | 3 |
| Good teaching reputation | 4.29 | 4 |
| Availability of “quiet” areas | 4.22 | 5 |
| Availability of areas for self study | 4.21 | 6 |
| Quality of public transport in the city/town | 4.13 | 7 |
| A friendly attitude towards students | 4.04 | 8 |
| Quality of lecture theatre facilities | 4.03 | 9 |
| Diversity/range of shops at the university | 4.01 | 10 |
| Quality of bars on campus | 4.01 | 11 |
| Union social facilities | 4.01 | 12 |
| Prices at the catering outlets | 4.00 | 13 |
| Availability of university-owned accommodation | 4.00 | 14 |
| Quality of the university grounds | 3.94 | 15 |
| Cleanliness of the accommodation | 3.92 | 16 |

**Table II.** Distribution of collected data

| Group / Building | Students | Staff | Professionals* | Total |
|---|---|---|---|---|
| **A** | 35 | 19 | 7 | 61 |
| **B** | 158 | 35 | 7 | 200 |
| **C** | 42 | 9 | 7 | 58 |
| **D** | 125 | 10 | 7 | 142 |
| **Total** | 360 | 73 | 28 | 461 |

*Responses have been provided by the same group of professionals.

**Table III.** Spearman's rho for year and area of study

| | | | Encourage | Expect | Credit | LearnNeeds | SocNeeds | PrNeeds | OverallSatiSF | Building |
|---|---|---|---|---|---|---|---|---|---|---|
| Spearman's rho | **Year of study** | Correlation Coefficient | .046 | .015 | -.051 | -.049 | -.047 | -.095 | -.003 | .050 |
| | | Sig. (2-tailed) | .357 | .767 | .310 | .331 | .350 | .059 | .955 | .319 |
| | | N | 360 | 360 | 360 | 360 | 360 | 360 | 360 | 360 |
| | **Area of study** | Correlation Coefficient | .195** | .335** | .293** | .265** | .034 | .107* | -.018 | .439** |
| | | Sig. (2-tailed) | .000 | .000 | .000 | .000 | .502 | .034 | .718 | .000 |
| | | N | 360 | 360 | 360 | 360 | 360 | 360 | 360 | 360 |

**Table IV.** Kruskal-Wallis test for students (Group variable: Building)

| | Encourage | Expect | Credit | LearnNeeds | SocNeeds | PrNeeds | OverallSatiSF |
|---|---|---|---|---|---|---|---|
| Chi-Square | 52.087 | 124.568 | 121.399 | 84.383 | 59.074 | 18.671 | 8.266 |
| df | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Asymp. Sig. | .000 | .000 | .000 | .000 | .000 | .002 | .142 |

**Table V.** Kruskal-Wallis test for all respondents (Group variable: Group)

| | Encourage | Expect | Credit | LearnNeeds | SocNeeds | PrNeeds |
|---|---|---|---|---|---|---|
| Chi-Square | 52.087 | 124.568 | 121.399 | 84.383 | 59.074 | 18.671 |
| df | 5 | 5 | 5 | 5 | 5 | 5 |
| Asymp. Sig. | .000 | .000 | .000 | .000 | .000 | .002 |

**Table VI.** Students positively encouraged by the quality of facilities

| **Building** | **A** | **B** | **C** | **D** |
|---|---|---|---|---|
| **Students encouraged** | 14% | 14% | 39% | 46% |

**Table VII.** Median values per building per group

| Building | Group | Median | | | | | | Sum of medians |
|---|---|---|---|---|---|---|---|---|
| | | Encourage | Expect | Credit | LearnNeeds | SocNeeds | PrNeeds | |
| A | Student | 3.00 | 3.00 | 2.00 | 2.00 | 3.00 | 3.00 | 16 |
| | Staff | 2.00 | 2.00 | 1.00 | 2.00 | 2.00 | 2.00 | 11 |
| | Professionals | n/a | 2.00 | 1.00 | 2.00 | 1.00 | 2.00 | 8 |
| B | Student | 3.00 | 3.00 | 2.00 | 2.00 | 3.00 | 4.00 | 17 |
| | Staff | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 12 |
| | Professionals | n/a | 3.00 | 2.00 | 2.00 | 3.00 | 3.00 | 13 |
| C | Student | 3.00 | 3.00 | 4.00 | 3.00 | 4.00 | 3.00 | 20 |
| | Staff | 2.00 | 3.00 | 4.00 | 3.00 | 3.00 | 2.00 | 17 |
| | Professionals | n/a | 4.00 | 4.00 | 3.00 | 5.00 | 4.00 | 20 |
| D | Student | 3.00 | 4.00 | 4.00 | 3.00 | 4.00 | 4.00 | 22 |
| | Staff | 4.00 | 4.00 | 4.00 | 3.00 | 3.00 | 3.00 | 21 |
| | Professionals | n/a | 4.00 | 5.00 | 3.00 | 4.00 | 4.00 | 20 |

**Table VIII.** Correlation for different buildings (Grouping variable: Group)

| | | Encourage | Expect | Credit | LearnNeeds | SocNeeds | PrNeeds |
|---|---|---|---|---|---|---|---|
| Students | Pearson Correlation | .301** | .422** | .407** | .340** | .283** | .173** |
| | Sig. (2-tailed) | .000 | .000 | .000 | .000 | .000 | .001 |
| | N | 360 | 360 | 360 | 360 | 360 | 360 |
| Staff | Pearson Correlation | .374** | .389** | .439** | .372** | .225** | .383** |
| | Sig. (2-tailed) | .000 | .000 | .000 | .000 | .032 | .000 |
| | N | 73 | 73 | 73 | 73 | 73 | 73 |
| Professionals | Pearson Correlation | .[a] | .854** | .935** | .674** | .855** | .719** |
| | Sig. (2-tailed) | . | .000 | .000 | .000 | .000 | .000 |
| | N | 28 | 28 | 28 | 28 | 28 | 28 |

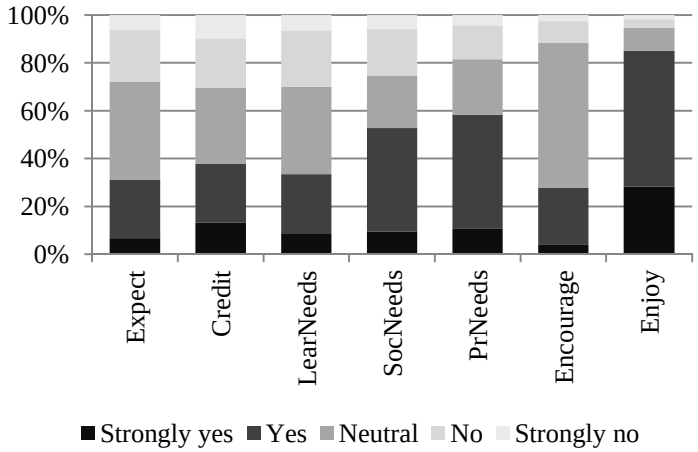


**Figure 1.** Overall response – Students

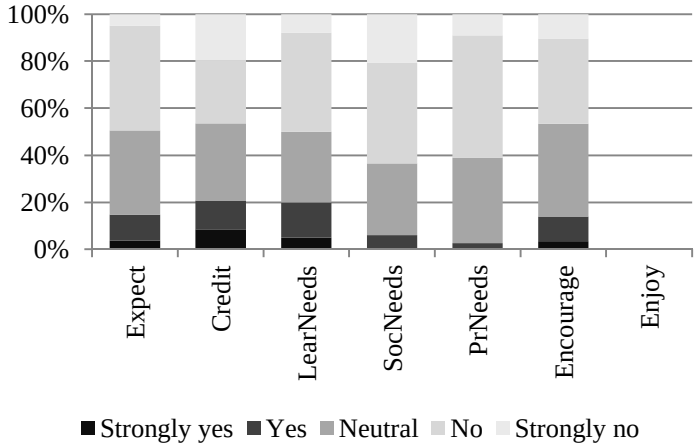


**Figure 2.** Overall response – Staff

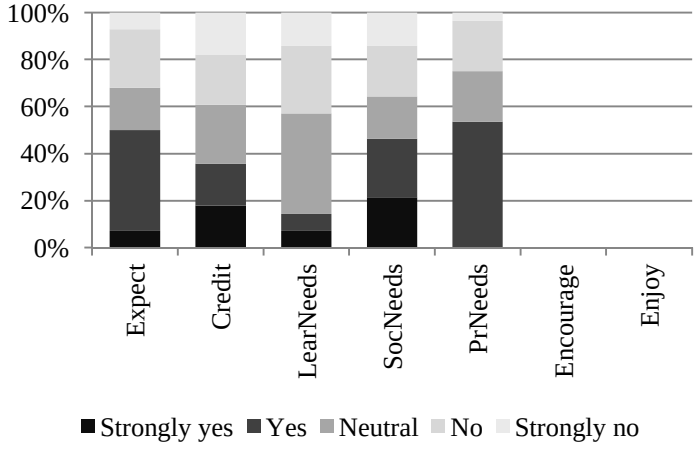


**Figure 3.** Overall response – Professionals