Longitudinal Evaluations of Student Satisfaction with a Postgraduate Unit using Importance-Performance Analysis

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Abstract

The Australian tourism tertiary education sector operates in a competitive and dynamic environment, which necessitates a market orientation to be successful. Academic staff and management in the sector must regularly assess the perceptions of prospective and current students, and monitor the satisfaction levels of current students. This study is concerned with the setting and monitoring of satisfaction levels of current students, reporting the results of three longitudinal investigations of student satisfaction in a postgraduate unit. The study also addresses a limitation of a university's generic teaching evaluation instrument. Importance-performance analysis (IPA) has been recommended as a simple but effective tool for overcoming the deficiencies of many student evaluation studies, which have generally measured only attribute importance or importance at the end of a semester. IPA was used to compare student expectations of the unit at the beginning of semester with their perceptions of performance ten weeks later. The first stage documented key benchmarks for which amendments to the unit based on student feedback could be evaluated during subsequent teaching periods.

Key words: longitudinal studies, student satisfaction, importance-performance analysis

Introduction

There can be few industry sectors as demanding as tertiary education when it comes to achieving customer satisfaction. The potential for critical incidents to occur during students' encounters with administrative, academic, library, security and hospitality staff, which can impact on satisfaction, is high. Critical incidents are those exchanges between the customer and service provider that result in a particularly positive or negative experience for either party (Bitner, Booms, & Tetreault, 1990). Many such encounters are in group situations such as lectures and tutorials, in which the student has limited control.

The Australian tourism tertiary education operates not only in a competitive market (James, 2001), but also in a dynamic environment with shifting demand created by a diverse range of trends such as the emergence of Generation Y, heterogeneity of demand from international markets, labour market shortages and economic conditions. Such a competitive setting demands staff take a market orientation, recognising the achievement of organisational goals requires an understanding of the needs of the market, and delivering satisfaction more effectively than rivals (Kotler, Adam, Brown & Armstrong, 2003). Two different research approaches are required to effectively monitor this process, if service delivery decisions are to be made with the customer in mind. Management must assess the perceptions held of the university by prospective students (see for example Lawley & Blight, 1997), as well as track the satisfaction levels of existing students (see for example McInnis & James, 1999). This paper is concerned with the latter.

Expectations of a course of study can only be realised after consumption. Therefore, perceptions play an important role in the decision process, and may only have a tenuous relationship with fact (Reynolds, 1965). For example it has been suggested that the

perceptions of university reputations held by most domestic applicants to Australian are based on "very flimsy hearsay evidence" (Baldwin & James 2000, p. 147). Thus, an insight into how well a university unit is perceived to perform across a range of attributes is not sufficient to guide future delivery, without any evaluation of student expectations at the commencement of a period of study. Satisfaction can be measured by assessing expectations about important attributes and then subsequently assessing perceived performance on those attributes (Myers & Alpert, 1968). However, previous research studies of student satisfaction have traditionally only measured attribute importance or performance at one point in time (Nale, Rauch, Wathen & Barr, 2000). It is argued then the results of end of semester performance evaluations may be misleading if there is no corresponding indication of expectations at the outset of the semester.

As a means of measuring both expectations and performance, Martilla and James (1977) developed the Importance-Performance Analysis (IPA) technique. The technique considers both the importance of product/service features to the individual, as well as the perceived product/service performance across the same range of attributes. In IPA, importance and performance are analysed separately, rather than summed as in Fishbein's (1967) multi-attribute model. This is important since two summed scores could represent either high importance/low performance or low importance/high performance (Ennew, Reed & Binks, 1993).

The versatility of the IPA technique has been reported in a diverse range of applications, such as the evaluation of: hotel service quality (Deng, Chen & Pei 2008, Deng & Pei 2008), guest technologies in the lodging industry (Beldona & Cobanoglu, 2007), long distance highway transport service quality (Huang, Wu & Hsu, 2006), critical incidents at a destination

(Pritchard & Havitz, 2006), satisfaction with an automotive industry supplier (Matzler, Bailom, Hinterhuber, Renzl & Pichler, 2004), determinant short break holiday destination attributes (Pike, 2002), perceptions of wineries (O'Neill & Charters, 2000), employee satisfaction (Graf, Hemmasi & Nielsen 1992, Havitz, Twynam & DeLorenzo, 1991, Novatorov 1997, Williams & Neal 1993), operations improvement priorities (Slack, 1994), banking (Ennew, Reed & Binks, 1993), dental practices (Nitse & Bush, 1993), national competitiveness (Leong & Tan, 1992), a new sports complex (Bartlett & Einart 1992), tourism policy (Evans & Chon, 1989), communication effectiveness (Richardson, 1987), therapeutic recreation services (Kennedy, 1986), and breakfast food brands (Sethna, 1982).

A key strength of IPA is the ability to enable managerial decision-making due to the simplicity and power of the matrix used to map measures of importance and performance on key attributes. As shown in Figure 1, the IPA matrix represents two dimensions and four quadrants. The Y-axis plots respondents' importance ratings of salient attributes, and the X-axis plots perceived performance on the same attributes. The goal is to identify the attributes in Quadrants 1 and 2, since these are likely to be more determinant in terms of satisfaction. Quadrant 1 features attributes rated most important, but where the performance is not perceived to be strong. This signals a need for remedial action to improve perceived performance, hence the need to 'concentrate here'. Quadrant 2 features attributes rated important, and where performance is perceived to be strong, hence the need to 'keep it up'. Quadrant 3 features attributes rated less important, and where product performance is perceived to be low. Quadrant 4 features attributes rated less important, and where the product is perceived to perform strongly. Chon, Weaver and Kim (1991) labeled the four quadrants: 'missed opportunities' (Quadrant 1), 'strengths' (Quadrant 2), 'who cares' (Quadrant 3), and 'wasted effort' (Quadrant 4).

(FIGURE 1 ABOUT HERE)

IPA effectiveness relies on the visual interpretation of the matrix, which is dependent upon the placement of the axes. Martilla and James (1977) recommended the IPA value identify relative measures of performance, rather than absolute measures. The X-axis cross-hair placement may then be subjectively placed in the attempt to identify a smaller sub-set of determinant attributes. There have been four main approaches used to divide the axes: the scale mid-point, one unit above the scale mid-point, the grand mean, and the median. Adaptations in previous IPA studies are highlighted in Table 1.

(TABLE 1 ABOUT HERE)

Despite the simplicity of the technique, IPA has been under-reported in education marketing and student evaluation research. Contributions in this regard have included the evaluation of adult education (Alberty & Mihalik, 1989), faculty course quality (Ortinau, Bush, Bush & Twible, 1989), business schools (Ford, Joseph & Joseph, 1999), business school curriculum (Nale, Rauch, Wathem & Barr 2000), students' perceptions of service quality (Wright & O'Neil, 2002), market positioning of North American colleges (Chapman, 1993), and in Australia the identification of determinant university attributes (Pike, 2004). No applications were identified within the tourism education literature. Of interest in this study is the potential efficacy of IPA as a tool for tracking service improvements and customer evaluations over time. This study therefore extends the work of the previous contributions to the education literature, by following the recommendation of Nale, Rauch, Wathen and Barr (2000), and applying the technique to a series of longitudinal evaluations of student satisfaction. One

example of this type of approach in another field was reported by Guadangalo (1985), who used of the method to evaluate a 10-kilometre running race over three consecutive years. Recommendations from the first year IPA results were implemented, and then tracked for improved performance in the following year.

The purpose of this study was to trial IPA in a longitudinal evaluation of student perceptions of a postgraduate unit. It was felt IPA would enable i) the identification of gaps between expectations and performance, and ii) monitoring the effectiveness of any resultant changes made to the unit as a result of the feedback over time.

Method

Students of a postgraduate unit were invited to participate in the research in Semester 1, 2005. This point in time was chosen due to the introduction of a new teaching team and textbook. The teaching team consisted of a lecturer and two tutors. Advance notice to all students describing the purpose of the study and the longitudinal design was provided ten days prior to the first lecture, and a copy of the research information sheet was posted to the unit web site. Of the 107 students initially enrolled in the unit, 90 attended the first lecture and 85 participated in the first questionnaire. Of these, 60 were female and 25 male, 66 were full time and 17 part time, 61 were international students and 23 were domestic students. The questionnaire was based on the university's generic evaluation of teaching instrument. Whereas this instrument would usually only be applied at the end of semester to measure performance, the questionnaire was adapted to ask students to rate the importance of the 20 attributes. A seven-point scale was used, anchored at 'Not important' (1) and 'Very important' (7). A zero non-response option was also provided for those students who might be unsure about any particular attribute. Such a 'Don't know' option minimises the risk of

uninformed responses. Two open-ended questions were included to elicit any other attributes that were considered important by participants, but were not included among the scale items.

A second and final questionnaire was administered during the Week 10 lecture, by the one of the researchers who was not part of the teaching team. Standard practice at the university is for evaluation instruments to be administered impartially with no members of the teaching team present. The co-researcher ensured the confidentiality of the data until the completion of the semester. This instrument again asked students to rate the importance of the attributes, and then rate performance of the unit and teaching based on the students' experience through the semester. The performance of unit and teaching used a seven point scale.

Two additional attributes were included in the final questionnaire due to a critical incident, which involved the unexpected departure of one of the tutors in Week 9. The 22 scale items are shown in Table 2. The two additional items are Questions 21 and 22.

(TABLE 2 ABOUT HERE)

At the time of the second questionnaire, 98 students remained enrolled in the unit, of which 73 participated in the survey. Of these, 52 were female and 21 male, 59 were full time and 14 part time, while 51 were international students and 22 were domestic students. It was felt the results would provide useful benchmarks, for which comparisons could be made by surveying students participating in the unit during future semesters.

The reliability of the university's generic evaluation instrument was supported with a Cronbach Alpha of 0.9. Also, that all attribute importance items were well above the scale mid-point is an indication of face validity. The mean attribute importance and campus performance ratings are listed in Table 3, where two issues are apparent. First, all of the attribute importance means were lower in Week 10 than in Week 1. It is not clear whether this was an indication of a general lowering of expectations over the course of the semester. Second, all of the attribute performance means were lower than the attribute importance means. For Week 1 attribute importance, independent-samples t-tests did not reveal any significant differences in the attribute importance ratings by gender, full time or part time, and international or domestic origin. However, for Week 10 attribute importance, t-tests indicated significant differences at the $p<.05$ level between full time and part time students for eight items, and between international and domestic students for three items.

The IPA matrix for the Week 10 results is shown in Figure 2, where the scale midpoint was used to place the cross hairs. The use of the scale midpoint was considered appropriate for the research aims. Figure 2 graphically highlights in Quadrant 1 those attributes deemed important to the class, but where the unit was perceived to perform relatively poorly. Perhaps not surprisingly, given the nature of the critical incident, the worst performing attribute was 'tutor performance' (mean 3.5, standard deviation 2.1). A total of five attributes rated below the scale midpoint, two of which related to assessment information and three related to tutor issues. These were also reflected in qualitative comments provided by participants. The aim was then to initiate action that would improve the perceived performance on the attributes over time. Pleasingly, even though the performance means were all lower than the importance

means, the majority of items are plotted in Quadrant 2. This indicates that in general the unit performed higher than the scale mid point. The highest rating attribute in terms of importance (mean 5.6, standard deviation 1.3) and performance (mean 5.0, standard deviation 1.7) was 'lecturer performance'.

(TABLE 3 ABOUT HERE)

(FIGURE 2 ABOUT HERE)

Semester 2

For the following semester, changes were made to the unit to address the performance of the five attributes that rated below the scale midpoint during Semester 1. Due to the poor rating for 'tutor performance', which was as a direct result of the Week 9 critical incident, an experienced tutor was appointed to the team during Semester 2. This was the second semester of involvement for the second tutor and the lecturer. Also, student feedback suggested a critical incident occurred in the dissemination of information about one of the assessment items. A change in this regard was also made. The objective was to move the performance of these five attributes in the IPA Matrix from Quadrant 1 to Quadrant 2. Again, advance notice about the questionnaire was provided to all students. In week one a total of 86 students were enrolled in the unit, with 67 attending the first lecture. Of these, 66 completed the questionnaire. The characteristics of these students were similar to those participating the previous semester, 21 male, 45 female, 56 full time, 10 part time, 47 international and 10 domestic students. In the Week 10 lecture, the second questionnaire was completed by 56 students of the 76 students still enrolled. Of these 20 were male 36 female, 49 full time, 7 part time, 40 international and 16 domestic.

The results for attribute importance and attribute performance are shown in Table 4, while the IPA Matrix is shown in Figure 3. As can be seen, all attribute performance means were above the scale mid-point. This is a positive indication the improvements made to the unit based on student feedback from the previous semester were relatively successful. Indeed all performance means were higher. Likewise, the grand mean for all the performance items increased from 4.2 in Semester 1 to 5.0 in Semester 2, which reduced the gap with the performance grand mean (5.4). This is graphically illustrated in the IPA matrix where all attributes are placed in Quadrant 2. However, there remained two concerns. The first was that all the performance means were still below the importance means. Second, there was again a general decline in mean importance between the Week 1 and Week 10 measurements. While there was a negative gap for all attributes, the differences do represent an improvement on the previous semester. In this regard the continued use of IPA highlighted the future challenge for the teaching team and is therefore an additional measure of accountability.

Semester 3

The survey was repeated with a third and final cohort during Semester 3. Once again, an information sheet was posted to the unit website 10 days prior to the first lecture. In Week 1 there were 103 students enrolled. Of these, 85 students attended the first lecture, with 84 participating in the questionnaire. By Week 10 there were 92 students still enrolled, of which 59 completed the second questionnaire.

The results shown in Table 5 indicated a further improvement in general performance over the previous two semesters, with a grand mean of 5.1. For the first time, the mean performance ratings for two attributes, 'Overall performance of the unit', and 'Overall performance of the lecturer', were equal to the mean Week 10 importance ratings. Disappointingly, a change in

one of the tutors generated the worst performance mean. This in turn could have impacted on those attributes most influenced by the tutors. As shown in Figure 4, one attribute 'tutor performance' is located in Quadrant 1, with the remainder in Quadrant 2.

TABLE 5 ABOUT HERE

FIGURE 4 ABOUT HERE

Discussion

The Australian tourism tertiary education sector operates in a competitive and dynamic environment. Shifting demand for services and the diverse composition of student cohorts necessitates a market orientated philosophy with some consideration of students as consumers. In addition, service delivery and evaluation in tertiary education is a relatively long term process, compared to the more immediate delivery and evaluation evident in many other service sectors. The likelihood of critical incidents occurring during the delivery of a unit over a 13-week semester is high.

The study demonstrates IPA's application as an effective tool for teaching evaluation in such an environment. Importantly, IPA addresses some of the key limitations of traditional teaching evaluation instruments, particularly using an end of semester survey to evaluate student satisfaction. The validity of any teaching evaluation instruments relies on the salience of the attribute scale items to respondents. Traditional teaching evaluation instruments in university settings often do not consider the variance in the level of importance placed on the battery of scale items used to measure student satisfaction. IPA provides a simple tool which adequately considers both importance and performance across scale items, providing useful perspectives for both evaluation and planning.

The purpose of this study was to trial the application of IPA to provide insights into student expectations as well as evaluation. Three separate longitudinal studies that used IPA for the university's generic evaluation of teaching instrument were used to track student evaluations of a postgraduate unit. The results highlighted clear gaps between the means for attribute importance and performance, as well as the impact of two critical incidents during the first semester. The IPA matrix graphically highlighted five attributes where corrective action was required. These related to tutor performance and assessment information dissemination. In this regard the first semester results provided valuable benchmarks for a new teaching team. The use of IPA again in the following two semesters enabled the effectiveness of resultant changes to the unit to be monitored with new student cohorts.

In this study, the power of the IPA matrix was not as evident as in many of the previous studies published in other fields. In those studies, listed at the beginning of the paper, clear distinctions are often made between those attributes deemed important in Quadrants 1 and 2, and those attributes placed in Quadrants 3 and 4. In this study however, no attributes rated low enough to be placed in Quadrants 3 and 4, which is an indication of the validity of the standard university unit evaluation questionnaire and the salience of the attributes to the students in general. However, the IPA format did enable gap analysis to be undertaken. It is this aspect that ultimately provided the most value to the teaching team, who were able to track an improvement in performance, while understanding future challenges. Further research is required, however, to better understand the consistent difference in mean importance ratings between Weeks 1 and 10 each semester.

There are a number of opportunities to build on the findings of this study through future research. Regular periodic use of IPA provides a means to test the validity of the teaching evaluation instrument to different cohorts, over time. This suggestion is underpinned by the results of the independent-samples t-tests, which indicated some differences between groups. Informal discussions with students suggested a change in future applications of this nature is recommended for the Week 1 survey. That is, the oral introduction by the lecturer to the survey should more explicitly explain how crucial it is that students carefully consider the attribute importance items.

It is suggested researchers could adapt the longitudinal IPA approach used in this study by applying the evaluation instrument across multiple cohorts of undergraduate and postgraduate students. Such data could be used to evaluate individual units, and be pooled to enable data reduction techniques such as Exploratory Factor Analysis and Cluster Analysis. Separate IPA matrices could then be easily developed to plot the scores for resultant factors across different segments.

The IPA approach could also be extended to better reflect the two-way process of teaching and learning. In addition to considering the importance and performance of attributes linked to teaching, an IPA instrument could be developed allowing students to consider importance and performance of attributes linked to learning. This could involve both self and peer assessment. The teaching team could also rank importance and performance of attributes linked to learning. Such an approach presents some complexity, but is worthy of further exploration and consideration for future research.

Conclusion

IPA has been underutilised in the tourism education literature. In this study, the IPA approach provided greater insights into student satisfaction than those provided in the traditional end of semester unit evaluation. On this basis IPA is recommended to other educators, particularly those becoming involved in a unit for the first time when expectation-performance benchmarks would be of particular value. The IPA approach enables teaching staff to plan and track changes made to the unit based on students' feedback. It also provides additional accountability and opportunities for educators to demonstrate, over time, refinements to and the effectiveness of their teaching methods.
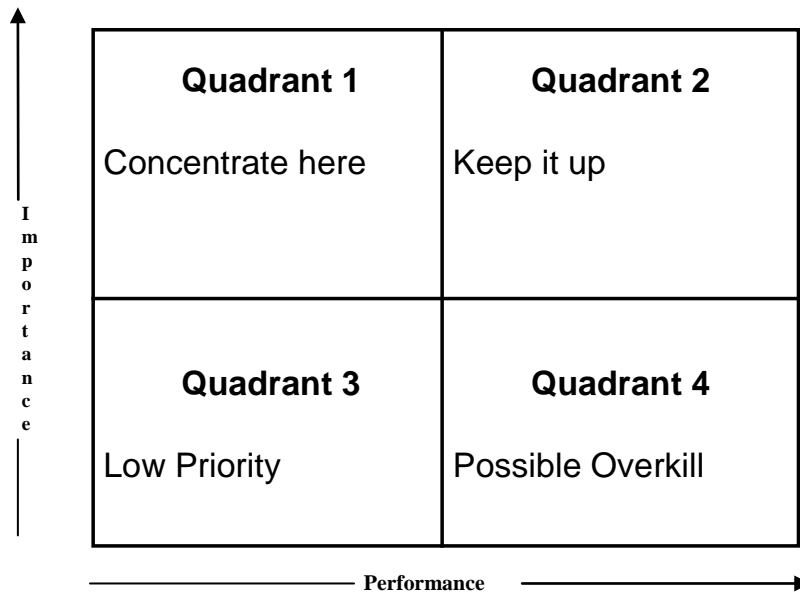
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Figure 1 – IPA Matrix

	Quadrant 1 Concentrate here	**Quadrant 2** Keep it up
Importance	**Quadrant 3** Low Priority	**Quadrant 4** Possible Overkill

Performance →

Source: Martilla and James (1977)

Table 1 - Comparison of IPA Axes Placement Methods

Scale mid-point	One unit above scale mid-point	Grand mean	Other
Evans and Chon (1989)	Martilla and James (1977)	Graf, Hemmasi and Nielsen (1992)	Uysal, Howard and Jamrozy (1991)
Havitz, Twynam and DeLorenzo (1991)	Crompton and Duray (1985)	Hollenhorst, Olson and Fortney (1992)	Leong and Tan (1992)
Williams and Neal (1993)	Guadangolo (1985) Kennedy (1986)	Saleh and Ryan (1992)	Martin (1995)
Chapman (1993)	Mengak, Dottavio and O'Leary (1986)	Nitse and Bush (1993)	Vaske, Beaman, Stanley and Greiner (1996)
	Chon, Weaver and Kim (1991)	Keyt, Yavas and Riecken (1994)	Go and Zhang (1997)
	Bartlett and Einart (1992)	Oppermann (1996b)	Hudson and Shephard (1998)
	Novatorov (1997)	Chu and Choi (2000)	Dale, Rauch, Wathen & Barr (2000)
		Pike (2002, 2004)	
		Huang, Wu & Hsu (2006)	
		Beldona & Cobanoglu (2007)	
		Deng, Chen & Pei (2008)	

Table 2 – Questionnaire scale items

1. The unit materials (eg unit outline, study notes, OLT materials, handouts etc) will enable me to understand why the learning in this unit is important to my course.

2. The unit materials will enable me to understand what knowledge and skills I am expected to learn by studying this unit.

3. The teaching methods used in this unit (eg lectures, tutorials) will work together to help me learn.

4. The topics and content in this unit will be clearly related to what I am expected to learn.

5. The assessment tasks will be clearly related to what I am expected to learn.

6. I will be provided with guidelines or criteria which give me a clear explanation of how individual assessment tasks will be marked.

7. I will be able to understand the requirements of the overall assessment program (eg minimum unit requirements).

8. The resources recommended for this unit (eg text book, websites) will help me to learn.

9. Feedback students provide will be used to improve this unit (eg structure, content, assessment or materials).

10. Overall, how important is this unit to you?

11. The teaching staff in this unit will help me to understand what I am expected to learn in this unit.

12. The teaching staff in this unit will know how to develop a class atmosphere that helps me to learn.

13. The teaching staff in this unit will be friendly, enthusiastic and helpful to my learning.

14. The teaching staff in this unit will show genuine interest in my learning and my learning needs.

15. The teaching staff in this unit will give me feedback that helps me to improve my learning.

16. The teaching staff in this unit will help me to develop my knowledge, understanding and skills, beyond the memorisation of content.

17. The teaching staff in this unit will use teaching and learning resources and aids (eg: PowerPoint, text books, etc) in ways that help my learning.

18. Feedback students provide will be used by the teaching staff in this unit to improve their teaching.

19. The teaching, learning and assessment tasks will be used by the teaching staff in this unit in ways that will help me learn.

20. Overall, how important will the teaching in this unit be for you?

21. Overall, how important will the tutor in this unit be for you?

22. Overall, how important will the lecturer in this unit be for you?

Table 3 – Attribute means (Semester 1)

Attribute	Importance Week 1	Importance Week 10	Performance Week 10
1	5.8	5.3	4.5
2	5.7	5.2	4.6
3	6.1	5.1	4.2
4	5.7	5.2	4.4
5	5.7	4.9	4.1
6	6.1	5.1	3.6
7	5.9	5.1	3.7
8	6.1	5.4	4.8
9	5.6	5.1	4.0
10	5.6	4.9	4.1
11	6.1	5.1	4.0
12	6.0	4.9	4.2
13	6.4	5.2	4.5
14	6.0	5.0	4.2
15	6.3	5.2	3.8
16	6.2	5.1	4.1
17	6.1	5.3	4.7
18	5.8	5.0	3.7
19	5.8	5.1	4.2
20	6.1	5.3	4.2
21	n/a	5.0	3.5
22	n/a	5.6	5.0
Grand mean	**5.9**	**5.1**	**4.2**

Figure 2 – Week 10 IPA matrix (Semester 1)
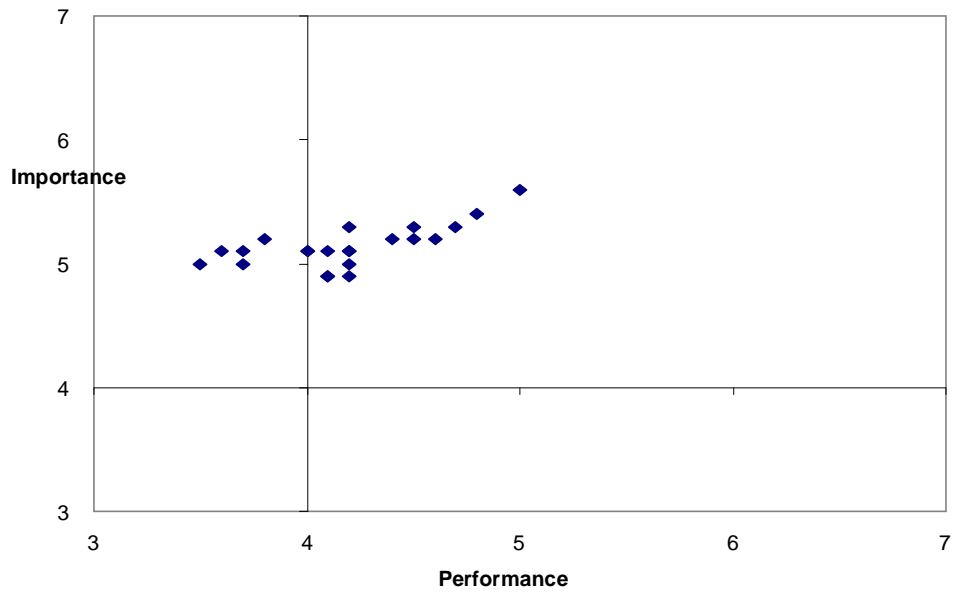
Table 4 – Attribute means (Semester 2)

Attribute	Importance Week 1	Importance Week 10	Performance Week 10
1	6.0	5.5	4.8
2	6.0	5.4	4.8
3	6.0	5.9	5.1
4	5.6	5.3	5.0
5	5.6	5.0	4.7
6	6.0	5.3	4.9
7	5.6	5.3	4.8
8	5.7	5.5	4.9
9	5.1	5.2	4.8
10	5.7	5.0	4.8
11	6.0	5.4	5.1
12	5.8	5.3	5.2
13	6.2	6.7	5.3
14	5.7	5.2	5.0
15	6.1	5.5	4.8
16	6.1	5.4	4.9
17	6.0	5.4	5.1
18	5.3	5.2	4.8
19	5.7	5.2	5.0
20	6.1	5.4	5.2
21	6.0	5.6	5.1
22	6.3	5.6	5.4
Grand mean	**5.8**	**5.4**	**5.0**

Figure 3 – Week 10 IPA matrix (Semester 2)
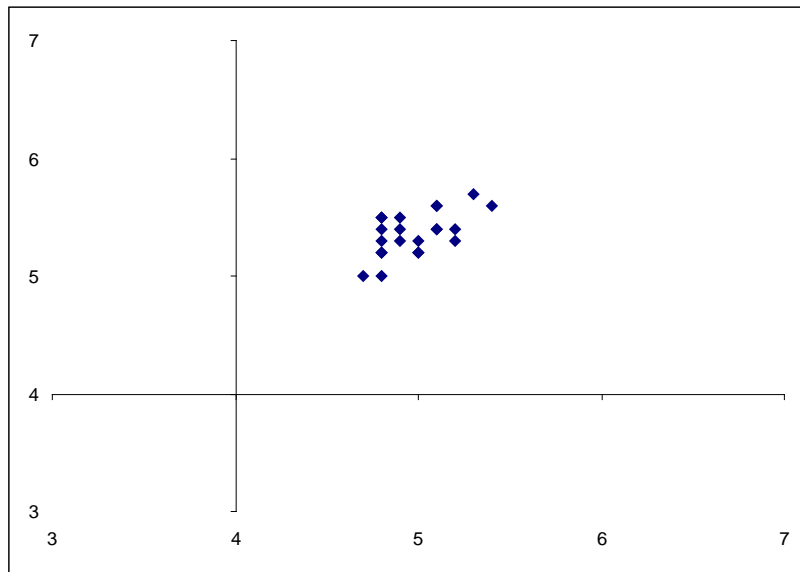
Table 5 – Attribute means (Semester 3)

Attribute	Importance Week 1	Importance Week 10	Performance Week 10
1	6.1	5.7	5.3
2	6.2	5.8	5.3
3	6.2	5.5	5.1
4	6.0	5.8	5.5
5	6.1	5.8	5.4
6	6.3	5.8	5.3
7	5.8	5.6	5.3
8	6.0	5.7	5.3
9	5.6	5.2	4.1
10	5.8	5.2	5.2
11	6.3	5.8	5.3
12	6.0	5.7	5.4
13	6.2	5.9	5.5
14	5.9	5.4	5.0
15	6.2	5.6	4.6
16	6.2	5.8	5.1
17	5.9	5.7	5.5
18	5.5	5.2	4.2
19	5.7	5.6	5.3
20	6.2	5.8	5.3
21	6.2	5.2	3.7
22	6.4	6.1	6.1
Grand mean	**6.0**	**5.6**	**5.1**

Figure 4 – Week 10 IPA matrix (Semester 3)