

**Service Quality Assessment in higher education: the case of Technological Educational Institute
(T.E.I.) of Serres, Greece**

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Abstract: Education service quality has become a major issue in higher education worldwide. In Greece it is beginning to gain attention in the last few years, mainly because it is an integral part of EU-funded programmes granted to the academic institutions. This paper presents students' perceptions of education service quality as experienced at a higher educational institute of Greece. The survey used the original SERVQUAL questionnaire, in which only language adjustment was made, in order to fit in the academic environment. The results provide evidence that SERVQUAL can partially be used to record and attribute students satisfaction for major educational issues.

INTRODUCTION

The search of quality has become an important consumer trend (Parasuraman et al. 1985) and a major field of concern in the literature of marketing. The nineties can be described as a "decade of heightened interest in quality" (Srikanthan 1999), a fact that is also reflected by the number of proposed definitions for quality. In short, the definition of quality has evolved from "quality is excellence", to "quality is value", to "quality is conformance to specifications", to "quality is meeting and/or exceeding customers' expectations" (Pariseau and McDaniel 1997). Many of the well-known definitions of quality emphasize the relationship between quality and customer need and satisfaction.

Initially, quality improvement systems were implemented in product engineering but soon became evident that the concept of quality also applies to services. Despite the fact that service quality is more difficult to be measured than goods quality (Parasuraman et al. 1985) instruments for measuring service quality have been developed and validated. Parasuraman et al.(1985) for example, developed the "gap model of service quality" and proposed SERVQUAL as an instrument to measure service quality. Their research suggested that there is a set of five gaps regarding the executive perceptions of service quality and the tasks associated with service delivery (Parasuraman et al.. 1985, Zeithalm et. al.1988, 1990). Based on this theoretical background, SERVQUAL was proposed as an instrument for measuring service quality. It was tested for reliability and validity in multiple service

sector settings and it was considered to be a concise multiple-item scale with good reliability and validity.

Higher education is a service since it exhibits all the classical features of services: it is intangible and heterogeneous, meets the criterion of inseparability by being produced and consumed at the same time, satisfies the perishability criterion and assumes the students' participation in the delivery process (Cuthbert 1996a). The concepts of service quality are therefore directly applicable to higher education. According to Tam (2001), however, quality in higher education is a "relative concept", with respect to the stakeholders in higher education and the circumstances in which it is involved. In other words, quality means different things to different people as well as the same person may adopt different conceptualisations at different moments. This raises the issue of "*who is the customer in education*". Hill (1995) suggests the student as the primary consumer in higher education. Rowley (1997), on the other hand, advises that the attempt to measure quality in general terms should take into account all stakeholders' perspectives, which include students, parents, staff, employers, business and legislators.

Higher education institutes is increasingly attracting more attention to service quality mainly due to the fact that there is a social requirement for quality evaluation in education. In many countries this requirement is expressed directly through the establishment of independent quality assurance bodies, which place emphasis on student experience as one of the assessment criteria. In other countries the social requirement for improvement in education is often expressed indirectly. In Greece, for example (where there is no national system for quality assurance) the Ministry of National Education and Religious Affairs has granted to higher education institutions a number of programmes in which quality evaluation is an integral part. T.E.I. of Serres has been granted a number of curriculum reform programmes that include quality evaluation as an indispensable activity. In the framework of these curriculum reform programmes, the academic departments of T.E.I. of Serres have used a number of evaluation instruments.

In this paper we present the implementation a well-known instrument, namely SERVQUAL, in our institute. The results obtained at T.E.I. of Serres are compared with the results reported by other institutions, while further work that builds upon this experience is highlighted.

LITERATURE REVIEW

SERVQUAL was developed as a general instrument to measure quality in service sector. There have been quite many attempts to apply SERVQUAL in the academic environment, despite the fact that the language and some of its items involved embody the philosophy of the business world (Soutar and McNeil 1996).

SERVQUAL was modified and/or used as a basis in a number of research reports (Soutar and McNeil 1996). Pariseau and McDaniel (1997) used SERVQUAL to measure quality in two small private business schools, using the same questionnaire for both faculty and students. The research revealed that students and faculty may have different perspectives on quality of education, a situation that introduces difficulties as far as direction of improvement and leads to mutual misunderstanding.

Chua (2004) used SERVQUAL to assess the attitudes of university stakeholders (including students, parents, faculty members and employers). The findings revealed that the dimensions of SERVQUAL are primarily related to the “process” stage of the “Input-Process-Output framework”. Sherry et al. (2004), on the other hand, used SERVQUAL to assess the perceptions of international students (as opposed to local students), with intention to serve better the legitimate needs and expectations of services offered to this group of students. They conclude that SERVQUAL offered useful insights and is a good starting point to measure education quality, but a more in-depth analysis of the areas of concern would be needed.

Cuthbert (1996a) also proposes SERVQUAL as an appropriate instrument for service quality measurement in the context of higher education for various reasons. However, when Cuthbert (1996b) used SERVQUAL, the results obtained did not turn up to be as good outcomes as expected: although the mean scores for perceptions on each of the dimensions (except tangibles) exceeded the mean expectations score, further analysis on the median and the mode revealed that there might be comprehension difficulties, due to unsuitable words and negative clauses.

O'Neill (2003) sought to understand the influence of time on students' perceptions of service quality running a longitudinal study with SERVQUAL. The sample comprised first year students in two stages: a) prior to orientation process (t) and b) after one month (t+1). Service quality as measured at time t, was found to be unidimensional in nature, with all 22 variables loading heavily on a single factor for expectations, perceptions and the recorded difference scores. In stage two, factor analysis revealed a more complex structure with three components being extracted. This, in itself, is

an interesting finding and seems to confirm the hypothesis that the very dimensionality of the service quality construct for a particular service may not be stable over time.

STUDY DESIGN

This study uses the standardized SERVQUAL instrument to record students' attitudes towards education service quality. The paper besides presenting the SERVQUAL factors that are most significant to describe the students' attitudes, it investigates whether SERVQUAL can effectively be used to describe most of the educational issues, which concern the academic community and are considered to crucial for the advancement of education.

A total of 335 questionnaires were administered to the undergraduate students of all the departments of the institute. The field research took place during November 2004. Table 1 presents the sample profile. The sample was designed to include as many students with higher-class level as possible. In this way it was expected that students would have had enough time during their studies to form their perceptions regarding quality. Proportionate sampling was used to capture the various departments' size differences (Table 1). In Table 1 we can see that the Departments of Business Administration and Accounting are the densest, since they account for nearly one half of the students population. Information and Communication Science Department and especially Topography and Surveying Department are two newly founded departments and hence their students' attitudes may differ from the others' who attend more stabilized departments. Also Departments of Mechanical and Civil Engineering may reflect differences in their students' attitudes because of differences in infrastructure, laboratories, study practices etc.

The standardized SERVQUAL instrument was used, in which only language adjustment was made, in order to fit in the academic environment. It is constructed from 22 items, which form five factors namely:

- Assurance: Knowledge and courtesy of employees and their ability to inspire trust and confidence,
- Responsiveness: Willingness to help customers and provide prompt service
- Empathy: Caring, individualized attention the firm provides its customers
- Reliability: Ability to perform the promised service dependably and accurately
- Tangibles: Condition of facilities, equipment, and appearance of personnel.

Each item is repeated because the students are asked to rate both the perceived service quality

originated from their home institute and the expected service quality originated from the ideal institute the students have in mind using a five points Likert scale. Resembling the original SERVQUAL instrument, five more questions regarding the relative importance of SERVQUAL factors were added to the questionnaire. In this way the total SERVQUAL score could be calculated as a weighted mean of the SERVQUAL factors. Finally the questionnaire contained a battery of questions concerning the students' satisfaction about educational issues such as the infrastructure of the institute, the academic qualifications of the staff, the library, etc. Again five points Likert scales were used for these questions, where 1 stands for "not at all" and 5 for "very much".

By subtracting perceived minus expected rating we can estimate the net satisfaction from quality for each student for each item. SERVQUAL factors are the means of these differences for specific questions. Total SERVQUAL score is calculated as the weighted mean of SERVQUAL factors, taking the factors importance evaluations as weights. Finally, we present the average values of the SERVQUAL factors and the total SERVQUAL score.

Table 1. Sample description

		Frequency	Percent %	Numbers of students actually attending the institute
Sex	Male	180	53.73	
	Female	155	46.27	
Class level	Freshman	11	3.28	
	Sophomore	50	14.93	
	Junior	94	28.06	
	Senior	180	53.73	
Department	Business administration	68	20.30	2015
	Accounting	83	24.78	2475
	Mechanical engineering	54	16.12	1591
	Civil engineering	57	17.01	1696
	Information and Communication Science	44	13.13	1304
	Topography and surveying	29	8.66	870
	Total	335	100.0	9951

Table 2. Cronbach's alphas of SERVQUAL dimensions.

Dimensions	Cronbach's Alpha
Tangibles	.70
Reliability	.75
Responsiveness	.70
Assurance	.65
Empathy	.79

FINDINGS

Cronbach's Alphas were used to test for reliability of the SERVQUAL factors (Table 2). All the factors produced high alphas, in most cases exceeding 0.70, with the exception of Assurance, which produced a value of 0.65. Hence SERVQUAL instrument is considered to be reliable. This is not always the case in the research that employed the SERVQUAL instrument. For example Cuthbert (1996b) calculated Cronbach's Alpha for his revised version of SERVQUAL to be about 0.50 or less. Although Cronbach's Alphas offer some support for reliability of the scales, further analyses should be performed for testing the validity of the instrument.

Students in our study were asked to evaluate the relative significance of SERVQUAL factors so that the total SERVQUAL score could be calculated (Figure 1). Students considered Reliability, Assurance and Responsiveness to be the most significant factors that form service quality, since they presented the highest importance percentages.

Table 3 presents the mean scores for the SERVQUAL factor scores and the total SERVQUAL score along with mean factor scores for the Expected and Perceived quality. SERVQUAL score demonstrates that Perceived Reliability, Assurance and Empathy deviate from the relative expected values more than Tangibles and Responsiveness do. Figure 2 presents both the scores of the factors and the total SERVQUAL score as well. The total SERVQUAL score exceeds one unit and so do Assurance, Empathy and Reliability. It seems, therefore that these three factors are the ones that the institute suffers more regarding service quality. Responsiveness and Tangibles follow with somewhat lesser scores.

A department wise breakdown in findings would be useful and might provide additional insights. The departments not being uniform in size are likely to have different infrastructure and laboratory requirements by students (for example Accounting versus Civil Engineering or

Topography and Surveying) and therefore varying quality expectations and perceptions. Or since some of them are elder and stabilized while others, like Information and communication science and topography, are newly founded, they may reflect different attitudes to their students. Table 4 describes means for the SERVQUAL dimensions followed by ANOVA tests and Student-Newman-Keuls post hoc tests. It is noticeable that the Department of Topography and Surveying and Information and communication science to a lesser degree present lower discrepancies between expected and perceived values. In fact further analysis, not reported here for space economy, proves that students from these two departments actually present lower expected and higher perceived values than the students from the rest departments in all the dimensions. These differences may be attributed to different infrastructure and culture differences due to the fact that the two departments are newly founded and they employ new staff and new laboratory equipment.

While so far SERVQUAL factors were used to describe the status quo in the institute, only limited evidence was provided to support that it is a suitable instrument for recording service quality. Cronbach's Alphas supported reliability whereas some distinction was made regarding the significance of each factor and the total SERVQUAL score. In order to establish that SERVQUAL is suitable for recording and attributing some issues considered crucial for the provision of education quality, SERVQUAL should be compared and converge with them. For example if by using correlations and regression models, we found out that certain SERVQUAL factors can attribute to relative issues, this might be an indication that SERVQUAL is suitable for measuring these issues.

At first it is interesting to notice that all SERVQUAL factors are intercorrelated having not only high but also significant correlation coefficients (Table 5). According to Zeithaml et al. (1990, pp 24-25) this should not be the case since the construction of the original instrument had already taken intercorrelations into account. The five SERVQUAL factors produced after consolidation of some dimensions should present minimum intercorrelations. On the contrary, our findings, regarded as part of a confirmatory analysis, suggest that there is an overlapping among factors and possibly students attribute multiple meanings to each one, have no clear understanding of their meaning and in any case the implementation of SERVQUAL to educational settings deviates significantly from its original purpose and meaning. For example Table 5 reveals that since factors are intercorrelated they may be associated with each other. They may carry relative meanings to the students and hence in this way they may measure relative issues. In this sense it might be sensible to incorporate some factors to others resulting in this way to a different instrument from SERVQUAL.

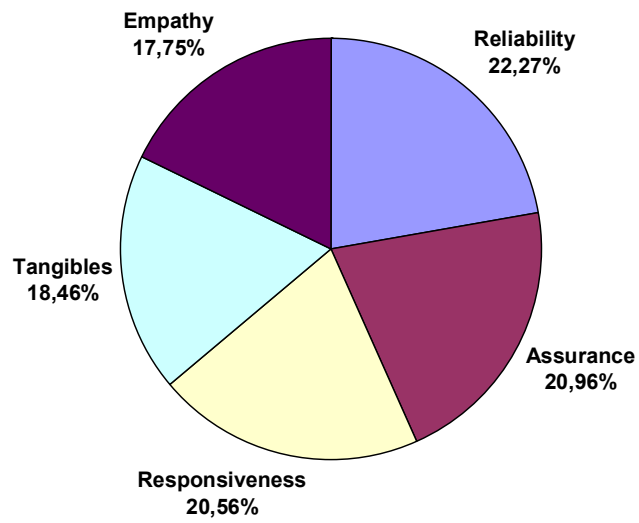


Figure 1. SERVQUAL factors mean importance evaluations.

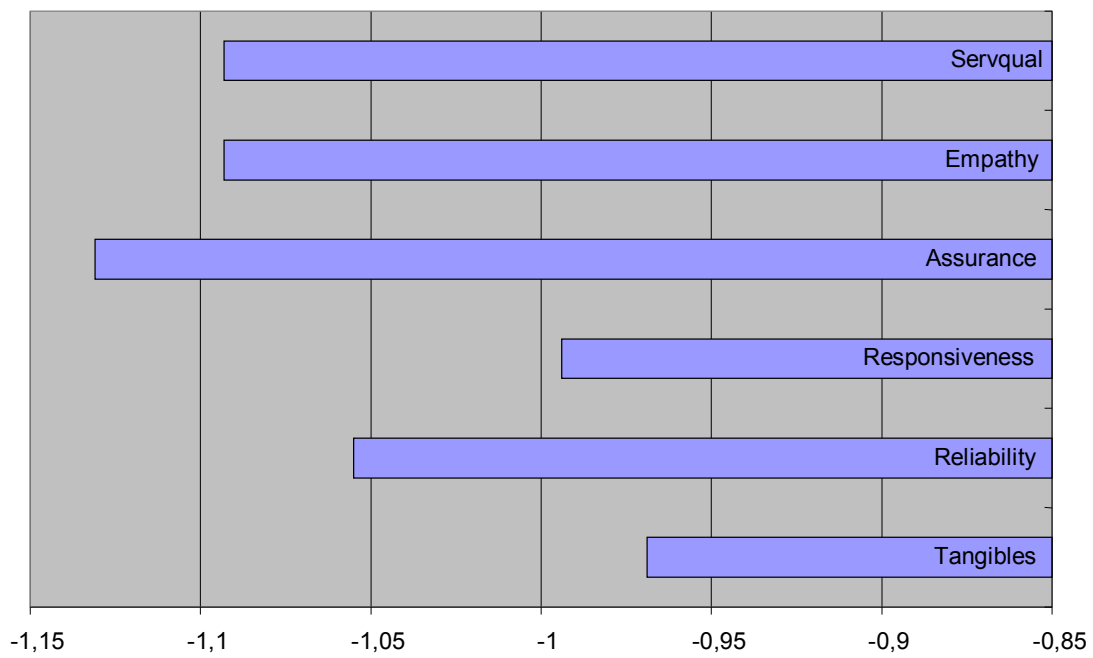


Figure 2. The SERVQUAL scores.

Table 3. Mean scores of SERVQUAL dimensions

Total	Expected		Perceived		SERVQUAL factors	
	Mean	SD	Mean	SD	Mean	SD
Tangibles	3.595	.933	2.624	.829	-.969	1.154
Reliability	3.813	.869	2.765	.765	-1.055	.980
Responsiveness	3.857	.864	2.872	.780	-.994	1.001
Assurance	3.892	.845	2.760	.808	-1.131	1.040
Empathy	3.428	.959	2.346	.785	-1.093	1.135
SERVQUAL					-1.093	.899

Table 4. Departments' scores breakdowns

Dimensions	Tangibles	Reliability	Responsiveness	Assurance	Empathy	SERVQUAL
1) Business administration	-1.114	-1.215	-1.231	-1.344	-1.481	-1.294
2) Accounting	-1.114	-1.248	-1.223	-1.264	-1.128	-1.211
3) Mechanical engineering	-0.942	-1.013	-0.862	-1.143	-1.092	-1.049
4) Civil engineering	-1.000	-1.058	-0.927	-1.117	-1.000	-1.099
5) Inf. & Com. science	-0.891	-0.831	-0.755	-1.056	-0.955	-0.944
6) Topog. & surveying	-0.327	-0.534	-0.514	-0.381	-0.466	-0.534
Total	-0.969	-1.055	-0.994	-1.132	-1.093	-1.093
ANOVA tests	*	*	**	**	**	**
S-N-K post hoc tests, homogeneous subsets	(1,2,3,4,5)(6)	(1,2,3,4,5)(5,6)	(1,2,3,4,5)(3,4,5,6)	(1,2,3,4,5)(6)	(1,2,3,4,5)(6)	(1,2,3,4,5)(6)

(*: p<0.05, **: p<0.01)

Table 5. Pearson Correlation coefficients among SERVQUAL factors.

	Tangibles	Reliability	Responsiveness	Assurance	Empathy	SERVQUAL
Tangibles		.576(**)	.542(**)	.523(**)	.558(**)	.751(**)
Reliability			.719(**)	.621(**)	.699(**)	.853(**)
Responsiveness				.629(**)	.660(**)	.844(**)
Assurance					.654(**)	.808(**)
Empathy						.841(**)

(** Correlation is significant at the 0.01 level)

Table 6 presents the correlation coefficients between SERVQUAL factors and total score, and the educational issues investigated using the same questionnaire. Most of the issues are positively and significantly correlated with the SERVQUAL scores. Only the satisfaction from the Career office and The city where the institute is established seem to have no linear connection with SERVQUAL scores. Sports facilities only correlate significantly with Tangibles. The issues, which do not correlate with every factor, are those concerning supportive services such as dining facilities, Library, Sports facilities and the Career office. Because, as seen before in Table 5, all SERVQUAL factors are intercorrelated, the analysis should consider the use of a method that isolates these intercorrelations and keep only the factors that really attribute significantly to the issues. To bypass the problem of multicollinearity, stepwise linear regressions were used, taking the educational issues as the dependent variables and the SERVQUAL factors as the independent. Table 7 presents only the factors entered in each model and have a significant B ($p < 0.05$). The first thing that strikes is that neither Responsiveness nor Reliability are considered suitable to enter. Assurance, Empathy and Tangibles are the core factors that attribute to the explanation of educational issues when all the factors are considered jointly from the beginning. Assurance attributes to Scientific adequacy and teaching capability of the staff, Behavior of the Staff, Administration services, Cultural activities, The institute in general. It is Assurance “Knowledge and courtesy of employees and their ability to inspire trust and confidence” which is connected to the issues regarding interpersonal communication.

Empathy attributes to Scientific adequacy and teaching capability of the staff, Student dining facilities and services and Library. Empathy, “Caring, individualized attention the Institute provides its students”, is associated with services concerning teaching, reading, dining, that is all the major activities which enroll students, teachers and facilities, fill up the students’ day and are the products of the institute’s care and attention to them.

Tangibles are connected with Textbooks, notes and educational material quality, Infrastructure of the establishment and laboratories equipment, Sports facilities. The links between them are obvious.

The findings and discussion of Table 7 offer some strong indications that SERVQUAL factors can to a certain degree adequately describe and record some major educational issues regarding our institute. Of course the fact that not all the SERVQUAL factors are eventually used to attribute to the issues, presents some evidence that SERVQUAL is partially suitable for our case. Some more

indications are offered in the next section.

Table 6. Pearson correlation coefficients between SERVQUAL factors and educational issues

	Tangibles	Reliability	Responsiveness	Assurance	Empathy	SERVQUAL
Scientific adequacy and teaching capability of the staff ^a	.163(**)	.098	.125(*)	.298(**)	.222(**)	.230(**)
Behavior of the staff and capability for collaboration ^a	.137(*)	.244(**)	.253(**)	.350(**)	.305(**)	.341(**)
Textbooks, notes and educational material quality ^a	.261(**)	.167(**)	.143(**)	.217(**)	.214(**)	.256(**)
Infrastructure of the establishment and laboratories equipment ^a	.368(**)	.151(**)	.169(**)	.222(**)	.174(**)	.272(**)
Infrastructure in teaching rooms ^a	.266(**)	.064	.038	.150(**)	.081	.158(**)
Administration services ^a	.167(**)	.197(**)	.225(**)	.271(**)	.213(**)	.250(**)
Student dining facilities and services ^a	.075	.082	.035	.117(*)	.128(*)	.116(*)
Library ^a	.105	.079	.108	.101	.124(*)	.125(*)
Sports facilities ^a	.115(*)	.027	.013	.051	.054	.065
Career office ^a	.061	.059	.072	.070	.087	.101
Cultural activities ^a	.154(**)	.127(*)	.127(*)	.159(**)	.139(*)	.183(**)
The institute in general ^a	.200(**)	.126(*)	.165(**)	.267(**)	.171(**)	.226(**)
The city ^a	-.002	-.063	-.065	.028	-.044	-.032

(a "Are you satisfied with...", 1 "not at all", .., 5 "very much")

(** Correlation is significant at the 0.01 level)

(* Correlation is significant at the 0.05 level)

Table 7. Regression models of education issues vs SERVQUAL dimensions. Stepwise method used.

	B	Std. Error
Scientific adequacy and teaching capability of the staff	(Constant) 3.566	0.065
	Assurance 0.253	0.055
	Empathy 0.111	0.056
Behavior of the staff and capability for collaboration	(Constant) 3.519	0.059
	Assurance 0.261	0.038
Textbooks, notes and educational material quality	(Constant) 2.868	0.067
	Tangibles 0.217	0.045
Infrastructure of the establishment and laboratories equipment	(Constant) 3.086	0.067
	Tangibles 0.317	0.045
Infrastructure in teaching rooms.	(Constant) 2.962	0.076
	Tangibles 0.288	0.053
Administration services	(Constant) 2.875	0.097
	Assurance 0.319	0.063
Student dinning facilities and services	(Constant) 2.723	0.091
	Empathy 0.132	0.058
Library	(Constant) 4.130	0.066
	Empathy 0.092	0.042
Sports facilities	(Constant) 3.230	0.070
	Tangibles 0.096	0.047
Cultural activities	(Constant) 3.062	0.086
	Assurance 0.159	0.056
The institute in general	(Constant) 3.576	0.069
	Assurance 0.224	0.045

The impact of student characteristics on SERVQUAL scores

Regarding the debate currently taking place about quality of Higher Education Institutes in Greece, it is interesting to observe whether there are any differences among different student characteristics. For example, do the younger students who have more recently attended higher education, encounter different levels of offered education quality than their oldest colleagues? Spearman correlation coefficients are used to record whether student characteristics have an impact on SERVQUAL factors and the total score (Table 8). Spearman correlation coefficient is a non parametric statistic which offers a convenient way of describing the associations among both

continuous and discrete variables.

Sex has a minimum impact on factor scores. Female students rank Assurance higher than male students. Year of birth and especially Semester have a considerable impact on the scores. For Year of Birth and Semester most of the correlation coefficients are statistically significant. Though their absolute value are not high, the significances however demonstrate that the younger students present higher scores in Assurance, Responsiveness and Tangibles while students of smaller semesters present higher levels in all the SERVQUAL factors and the total score. Students who entered higher education more recently are more satisfied. This might be linked to the continuous efforts made by the higher education institutes and the state to provide better services.

Table 8. Spearman correlation coefficients.

	Sex ^a	Year of birth	Semester
Assurance	0.117*	0.130*	-0.165*
Responsiveness	0.045	0.117*	-0.125*
Empathy	-0.009	0.100	-0.163**
Reliability	0.070	0.100	-0.167**
Tangibles	0.023	0.107*	-0.195**
SERVQUAL	0.076	0.091	-0.189**

(a 1 'male' 2 'female')

(*: p<0.05)

(**.: p<0.01)

CONCLUSION AND FURTHER WORK

SERVQUAL is most valuable when it is used periodically to track service quality trends and when it is used in conjunction with other forms of service quality measurement (Parasuraman et al. 1988). In this study SERVQUAL was used together with some items, which investigate education quality. Their association provided some indications that SERVQUAL can be effectively used to record education service quality. This should acquire attention since this attempt is one of the first regarding education issues in Greece.

However, SERVQUAL was originally constructed to measure consumers' views about quality. Although it is roughly suitable for a wide range of service quality studies, neither previous other scholars work, nor our experience during this study, suggest only SERVQUAL as it is, can be used to provide a complete and global picture regarding education quality. Further feature work is needed.

The authors have already fielded a SERVQUAL instrument to record faculty's views about education quality. In this way the possible gaps between students and faculty views could be explored.

It is our view that an instrument should be constructed specifically for measuring education service quality, taking into account the special needs and circumstances of the case it will be applied to. This instrument should be constructed from scratch, following the pioneer work of Parasuraman et al. (1985) using both qualitative and quantitative research.

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