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## Teaching Workload Analysis for Performance Contracting and Service Delivery in the Academic Setting of Kenya

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### **Abstract:**

*The study sought to analyze why there is a disconnect between the implementation of performance contracting as a management tool in Public Universities. Empirical evidence was collected from three public universities, with consideration being put to members of academic staff in three schools from each of the selected universities. The total staff who responded to the questionnaire were 142. The descriptive findings showed that a greater percentage of the academic members of staff were aware of performance contracting in the public universities and that they understood performance contracting in different versions and terminologies. The tests of between-subjects effects established at least at 90% confidence intervals that a strong relationship existed between the level of service delivery and the workload of the teaching members of staff of the universities selected in this study.*

### **1. Introduction**

Traditionally, universities have defined the role of academic staff to three domains of teaching, research, and service with primary emphasis placed upon the teaching and research aspects and secondary upon service or administration (Houston et al., 2006). University academic staff does the complex work in an increasingly demanding environment. Universities are the only organizations focused on dual core functions of knowledge creation and knowledge transmission through the processes of research and teaching (Romainville, 1996). The work life of university academic staff is predominantly framed and shaped by commitments and performance in these functions.

Jenkins (2004) noted existing evidence that commitments to teaching and research can be synergistic and complementary or antagonistic and competing. He argued that the relationship between research, teaching, broader work expectations, and rewards need to be defined and managed at the institutional, departmental, and individual levels to avoid potentially undesirable effects and counterproductive behaviors (Ibid). Harman (2001, 2002, 2003) investigated changes in academic staff roles in Australian universities across 20-year period based on survey data gathered in 1977 and again in 1997. Leslie (2002) found that salary and job satisfaction were uncorrelated and that faculty (who spent the majority of their time teaching) reported a preference for being rewarded for teaching effectiveness.

Kerr (1975) noted that "society hopes that (university) teachers will not neglect their teaching responsibilities, but rewards them almost entirely for research and publications, consequently it is rational for university teachers to concentrate on research, even to the detriment of teaching and at the expense of their students". McInnes (1999, 2000) found that level of commitment remains high with academic staff attributing this to intrinsic motivators rather than extrinsic factors such as salary and working conditions. Challenge, variety, and autonomy are key elements of the academic staff to engage in core activities such as critical thinking, reflection, and

collegial interactions in the context of disciplinary interests and expertise (Winter et al.,2000).Flexibility and autonomy are key factors in becoming and remaining an academic (Bellamy et al., 2003).

In New Zealand, tertiary reforms have sought to refine the role of higher education and define university linkages to enhance national economic development and to make universities more accountable to government, students as consumers, and the public generally (Patterson,1996),while subjecting them to more centralized control mechanism. Where pursuit of the knowledge society has resulted in increased pressures and performance expectations, workloads of academic staff have been affected directly. Coaldrake and Stedman (1999) noted that as academic work expanded to meet growing expectations, universities and individual academics have responded through ‘‘accumulation and accretion’’ rather than adaptation. McInnes (2000) highlighted the need to investigate workloads issues such as increased stress on staff, development of creative solutions to ameliorate problems, and ‘‘sustaining the primary sources of work satisfaction that best promote quality’’. Coaldrake and Stedman (1999) noted that ‘‘until recently the effect of change in academic work has been a blind spot in policy terms for many universities... and it remains so for most’’.

In the 1990’s, research reports commissioned by university staff unions raised concerns regarding workloads and levels of stress (Sullivan,1997).Chalmers (1998) found that staff were reporting increased stress associated with the academic work and more-work-related illness or injuries in comparison to previous years. Consequently, workload systems management has increasingly been a factor in recent contract negotiations and collective employment agreements.

The following sections present the methodology, key results of the study and their discussion, and a summary of the main findings and conclusion.

## 2. Methodology

### 2.1. Research Design and Sampling

#### 2.1.1. Research Design

The study adopted a descriptive design. Descriptive design helps to answer questions concerning the current status of the subjects under study (Mugenda and Mugenda, 2003).Descriptive studies are aimed at finding out ‘what is’. Descriptive research can include multiple variables for study(Borg and Gall,1996).Description emerges following creative exploration and serves to organize the findings in order to fit them with explanations and then test or validate these explanations (Krathwoh,1998). Kothari(2009) points out that descriptive research studies are concerned with specific predictions, narration of facts and characteristics concerning individuals, groups or situations.

#### 2.1.2. The Target Population

The target population comprised the seven (7) public universities. The category of staff focused on were the academic teaching staff members ranging from tutorial fellows to professors. The total number of lecturers in the seven public universities was five thousand six hundred and thirty(5630) (Table 1). The researcher targeted the teaching staff members since the main function of public universities is dissemination of knowledge, research and community work which is formulated, implemented and monitored by them.

UNIVERSITY	Year of inception	Staff Members No.
Nairobi	1964	1429
Kenyatta	1985	879
Moi	1984	1286
Egerton	1987	543
Maseno	1991	320
Jkuat	1994	633
Masindemuliro	2007	540
Total		5630

*Table 1: Universities’ Teaching Staff member’s schedule  
Source: Human Resource Information Management Systems (2012)*

#### 2.1.3. Sampling Strategy

The researcher used purposeful random sampling since the members involved were the academic teaching staff at the main campuses not satellite campuses, and the intention of the researcher was to find out whether performance contracting has had any positive effect in service delivery in the state-run universities. Table 2 presents the results of such a sampling strategy.

University	School	Total Pop.	Target (15%)	Actual number of Respondents
Kenyatta University	Humanities and Social Sciences	205	30.75	<b>66</b>
	Business	74	11.10	
	Education	151	22.65	
	<b>Sub-Total</b>	<b>430</b>	<b>64.50</b>	
Moi University	Arts and Social Sciences	121	18.15	<b>55</b>
	Business and Economics	72	10.80	
	Education	114	17.10	
	<b>Sub-Total</b>	<b>307</b>	<b>46.05</b>	
Maseno University	Humanities and Social Sciences	49	7.35	<b>21</b>
	Business and Economics	30	4.50	
	Education	32	4.80	
	<b>Sub-Total</b>	<b>111</b>	<b>16.65</b>	
<b>Total</b>		<b>848</b>	<b>127.2</b>	<b>142</b>

Table 2: Teaching academic staff schedule of selected universities

Source: Field Data (Researcher 2013)

Table 2 shows that the researcher purposefully picked three universities with a total population of two thousand four hundred and eighty five (2485) teaching academic members of staff. Kenyatta University the following was considered, schools (15) which make up 62 academic departments. In Moi University the following was considered, schools (14) consisting of 74 academic departments while in Maseno the following was considered ,schools (12) and one (1) faculty which make up 54 departments. The researcher chose the biggest schools and faculties in terms of student population as evidenced by the proposed Joint Admissions Board (JAB) admission of undergraduate students in the academic year 2012/2013. These schools were school of business and economics, school of education and school of arts and social sciences for Moi university, while in Kenyatta university it was school of business, school of education and school of humanities and social sciences and in Maseno it was school of business and economics, school of education and school of humanities and social sciences .In effect,a total of 142 respondents were realized from a total of 180 questionnaires issued to a total population of 848 academic staffers. This represented a proportion of 16.74%. The respondents to the questionnaire were picked using simple random sampling.

## 2.2. Data Collection

### 2.2.1. Procedures for Data Collection

A self-administered questionnaire was dropped to each respondent and picked later. The questionnaire consisted of both open ended and closed ended questions. Respondents to self-administered questionnaires are relatively unlikely to answer questions to please (Mark et al., 2003).The questionnaire was divided into three parts covering demographic variables, practices and expectations from performance contracting. And where additional information was required by the researcher, semi-structured interviews were conducted.

The researcher used both qualitative and quantitative data. Qualitative data was applicable since meanings were based on expressions through words and analysis was conducted through the use of conceptualization. Quantitative data was applicable since meanings were derived from numbers and analysis was conducted through the use of diagrams and statistics (Mark et al., 2003).This information was coded and analyzed with the help of statistical package for social sciences (SPSS) software package.

### 2.2.2. Validity of Research Instrument

The researcher employed construct validity as advocated by Cronbach(1955), in which it related the measuring instrument to the general theoretical framework so as to determine whether the instrument was tied to the concepts and the theoretical assumptions. Content validity was done to ascertain clarity and simplicity. The researcher used clear wording of the questions by using terms that are likely to be familiar to, and understood by the respondents. The researcher engaged experts and his supervisors to ascertain whether the content of the research instrument was up to standard, after which he administered it to the respondents.

### 2.2.3. Reliability of Research Instrument

According to Easterby-Smith et al.(2002), reliability can be assessed by posing the following questions: will the measures yield the same results on other occasions? Will similar observations be reached by other observers? And whether there is transparency in how sense was made from raw data? Tabachnick and Fidel (2001) states that reliability relates to the constancy with which a measuring instrument yields certain result, where the results of constructs measured demonstrate a high percentage of similar outcomes and is without bias. This analysis was conducted for all statements structured on a likert point scale using Cronbach alpha score test. Cronbach's alpha coefficient value for determining the internal consistency of the research instrument was defined by equation [3.1]:

$$\alpha = \frac{K}{K-1} \left( 1 - \frac{\sum_{i=1}^K \sigma^2 Y_i}{\sigma^2 X} \right) \quad [3.1]$$

Where K is the number of components (K-items or testlets),  $\sigma^2 X$  the variance of the observed total scores and  $\sigma^2 Y_i$ , the variance of the component I for the current sample of persons. This is normally described as follows: Excellent,  $\alpha \geq 0.9$ ; Good,  $0.9 > \alpha \geq 0.8$ ; Acceptable,  $0.8 > \alpha \geq 0.7$ ; Questionable,  $0.7 > \alpha \geq 0.6$ ; Poor,  $0.6 > \alpha \geq 0.5$ ; Unacceptable,  $\alpha < 0.5$ .

## 2.3. Data Analysis

### 2.3.1. Data Pre-processing and Processing

Under this section the following are examined: techniques of data analysis, issues of regression strength, problems of multicollinearity of predictors and homogeneity of variances between predictant and predictors, and the calibration of the regression model. Regression analysis tools were used so as to predict the results of the study. Results were interpreted and presented using descriptive and inferential statistical methods. The following sub-sections explain the type of model specification, calibration and estimation procedures involved in the study.

### 2.3.2. Model Specification

As an outcome of performance contracting, the quality of service delivery at university level is clearly assessed in terms of tangibles ( $y_1$ ), reliability of services ( $y_2$ ), responsiveness of employees ( $y_3$ ), assurance given by lecturers ( $y_4$ ) as well as their empathy ( $y_5$ ). These variables are impacted by several factors ranging from teaching workload (Objective 1) to working environment (Objective 4) via the administrative work systems (Objective 2) and employees participation in community service (Objective 3). All these variables and their relationships can be represented by equation [3.2]:

$$Y_i = \alpha_i + \beta_{1j}x_{1j} + \beta_{2j}x_{2j} + \beta_{3j}x_{3j} + \beta_{4j}x_{4j} + \varepsilon_i \quad [3.2]$$

Where,

$Y_i$  are factors related to the quality of service delivery

$X_{1j}$  = Teaching workload factors

$X_{2j}$  = Administrative work systems' factors

$X_{3j}$  = community service participation factors

$X_{4j}$  = the working environment factors

$\alpha_i$  = the intercept

$\beta_i$  = the regression coefficients of the independent variables.

$\varepsilon_i$  = the error term

The following sub-sections deals with some econometric problems encountered in the study that could lead to biased predictions. These encompass the testing of the multicollinearity among predictors and their homogeneity of variances with the dependent variables.

### 2.3.3. Testing Multicollinearity

The multicollinearity test enabled to minimize the number of parameters involved in the model in order to generate reliable predictions on the level of service delivery at university level within acceptable confidence limits. This model diagnostic was carried out to rule out the assumption of high correlation between explanatory variables of different types of factors (predictants) related to the quality of service delivered at university. Such an econometric problem was likely to lead to biased predictions of the performance of public universities in Kenya. Consequently, one of the variables found to be highly correlated to another was removed from the model. It shall be noted Cohen and Holiday (1998) declare that a multiple correlation coefficient is considered high when its value is equal to or above 0.7. That was the cutting point for this study.

### 2.3.4. Homogeneity of Variances

Though having conducted the test of multicollinearity, an independent test for equal variances between the predictant and its predictors would rule out any assumption of heterogeneity, which may possibly increase the presence of heteroskedasticity of errors in the error term. Such rejection of heterogeneity would justify the use of normal distributions, namely the F and t tests. This hypothetical homogeneity of variances was derived from an independent test of homogeneity of variances known as the Levene's test. The inferred hypothesis test later on led to clustering the observed variables using heuristic method.

### 2.3.5. Model Estimation

This stage of the study dealt with the identification of a specific model that could measure the level of service delivery at university level. Hence, five categories of factors related to the quality of service delivery at university were selected, and their corresponding causes (or variables) identified. The selected model can be represented by a system of equations defined by the algebraic description below [3.3]:

$$Y = A + BX \quad [3.3]$$

Where,

Y = vector of predictants related to the level of service delivery

X = Matrix of predictors of the level of service delivery

B = Matrix parameters of the relevant predictors

A = vector of the model intercepts

The full regression model of the level of service delivery may be written as follows [3.4]

$$\begin{bmatrix} y_1 \\ y_2 \\ y_3 \\ y_4 \\ y_5 \end{bmatrix} = \begin{bmatrix} a_1 \\ a_2 \\ a_3 \\ a_4 \\ a_5 \end{bmatrix} + \begin{bmatrix} b_{11} & b_{12} & b_{13} & b_{14} & b_{15} & b_{16} & b_{17} & b_{18} & \dots & b_{1n} \\ b_{21} & b_{22} & b_{23} & b_{24} & b_{25} & b_{26} & b_{27} & b_{28} & \dots & b_{2n} \\ b_{31} & b_{32} & b_{33} & b_{34} & b_{35} & b_{36} & b_{37} & b_{38} & \dots & b_{3n} \\ b_{41} & b_{42} & b_{43} & b_{44} & b_{45} & b_{46} & b_{47} & b_{48} & \dots & b_{4n} \\ b_{51} & b_{52} & b_{53} & b_{54} & b_{55} & b_{56} & b_{57} & b_{58} & \dots & b_{5n} \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \\ x_4 \\ x_5 \\ x_6 \\ x_7 \\ x_8 \\ \vdots \\ x_n \end{bmatrix} \quad [3.4]$$

Table 3 displays the actual variables used in the modeling to predict the performance of university staffers vis-à-vis their contractual academic duties.

Multiple logistic regressions (probit, logit or tobit) of these predictants by their relevant predictors were conducted to estimate the regression parameters for each category of dependent variables (predictants). The latter were embedded in the Multivariate Generalized Linear Model (GLM) procedure, which was run to that effect using the SPSS software package.

### 2.3.6. Model Evaluation and Validation

A diagnostic check-up was conducted to assess goodness of fit of the model and to rule out the presence of bias in the prediction. The study used Pearson's Rho test to establish the correlation of various variables. The coefficient of determination ( $R^2$ ), the Beta weight and the F and t statistics were also employed to get an appropriate set of parameters that determine the strength of ties between subjects within the variables input in order to measure in the regression strength.

## 3. Results and Discussion

### 3.1. Key Descriptive of the Sample

The researcher in this section explored different parameters ranging from innovativeness, recommended work load, whether the recommended workforce was more than recommended, the challenges faced in teaching more than recommended workload, how the respondents overcome the challenges, the aspects of teaching workload which are hindrance to service delivery, the most attractive aspect of the respondents work, the areas requiring innovativeness in the universities, whether the respondent has ever come up with an innovative idea and how the customer responded to the implemented idea, the extent to which the suggested measures are effective in custom satisfaction and whether the concept of performance contracting has improved effectiveness and efficiency in the respondents work. These findings are presented in the following pages figures and tables.

Predicant: Quality of service delivery at university measured by:		Predictors							
		Objective 1: Teaching workload		Objective 2: Administrative work systems		Objective 3: Community service		Objective 4: Working environment	
Empto WS 11	Tangibles	Increase in demand of courses offered	PerCTS 13	Employee recognition	Empto WS 1	Well paid employees	Empto CSS 1	Initiation of new academic programme	Contri 1
Empto WS 12	Reliability	Increase in student enrollment	PerCTS 14	Employee training	Empto WS 2	Continuous employee training	Empto CSS 2	Strengthening of academic processes	Contri 2
Empto WS 13	Responsiveness	Timely graduation	PerCTS 15	Development of employees	Empto WS 3	Rigorous employee development programme	Empto CSS 3	Enhancement of individual autonomy	Contri 3
Empto WS 14	Assurance	Effective and efficient teaching methodologies	PerCTS 16	Improved working facilities	Empto WS 4	Employee with better working facilities	Empto CSS 4	Greater automation of academic work	Contri 4
Empto WS 15	Empathy	Reduction in customer complaints	PerCTS 17	Competitive medical cover	Empto WS 5	Employee promoted for achieving targets	Empto CSS 5	Better utilization of academic resources	Contri 5
		Increase in customer compliments	PerCTS 18	Better employee working relations	Empto WS 6	Best worker awards	Empto CSS 6	Better customer service	Contri 6
		Increase in number of graduates	PerCTS 19	Working rules and regulations	Empto WS 7	Transferring of employees	Empto CSS 7	Focused and deliberate planning	Contri 7
		Timely examinations	PerCTS 20	Competitive take home package	Empto WS 8	A fully paid leave of absence	Empto CSS 8	Better unit cost management	Contri 8
		Timely release of results	PerCTS 21	Out-of-office team building activities	Empto WS 9	Award of scholarly titles for academic work	Empto CSS 9	Freedom to take and manage risks	Contri 9
				Assignment of other duties	Empto WS 10	Supporting dependants in educational programmes	Empto CSS 10		

Table 3: Specific variables retained for analyzing performance contracting at university level  
Source: Researcher, 2013

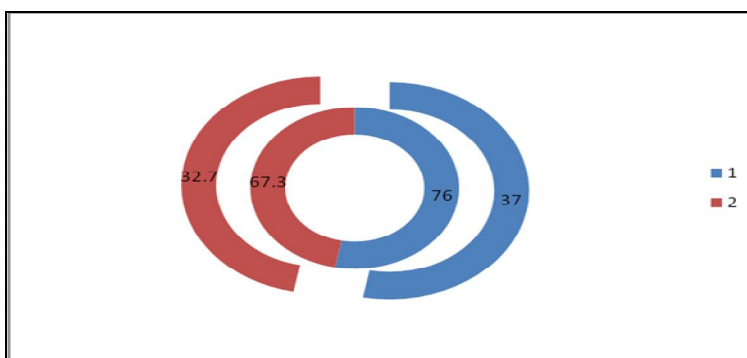


Figure 1: Management of public universities support of innovative teaching ideas  
Source: Field Data (Researcher 2013)

As reflected in Figure 1 above 67.3% of the respondents expressed the feeling that there was support of innovative teaching ideas by the management of public universities, while 32.7% felt there was no support.

Workload	Frequency	Percent	Valid Percent	Cumulative Percent
1	1	.7	.7	10.6
2	2	1.4	1.4	12.0
3	16	11.3	11.3	23.2
4	32	22.5	22.5	45.8
5	8	5.6	5.6	51.4
6	69	48.6	48.6	100.0
Missing	14	9.9	9.9	9.9
Total	142	100.0	100.0	

Table 4: Recommended teaching workload in the university per academic year  
Source: Field Data (Researcher 2013)

The information in the above table 4.24 reflects the responses in respect of the recommended teaching workload for each respondent in that year. The majority (48.6%) had 6 units, while 0.7% showed those who had only 1 unit, the disparity in this could be explained by the fact that some respondents could have been holding administrative positions either during the whole academic year or part thereof.

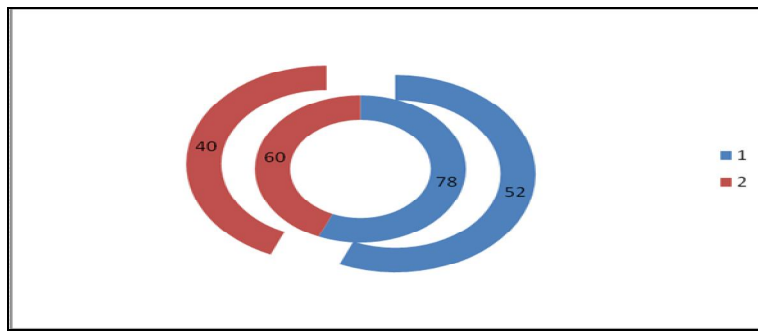


Figure 2: The teaching workload more than the recommended  
 Source: Field Data (Researcher 2013)

The researcher in Figure 4.32 wished to ascertain whether the respondents had taught more units than recommended by the university in that particular academic year, majority (60.0%) indicated that they had taught more, while 40.0% did not teach more than recommended. This expresses the concern then how one is able to handle the extra units within the specified time and what the university should then do. This also brings the question of whether this could be a contributing factor to the slow pace of PhD completion by some staff member in certain schools.

Status	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	66	46.5	73.3	73.3
No	24	16.9	26.7	100.0
Total	90	63.4	100.0	
Missing	52	36.6		
Total	142	100.0		

Table 5: Challenges of teaching more than the recommended workload  
 Source: Field Data (Researcher 2013)

Table 5 draws its observations from figure 4.32, and it points out that there are challenges associated with teaching more than recommended workforce with 73.3% stating that there are challenges and only 26.7% indicating that they did not find any challenges. It will be of great interest and research to explore this area and how universities are managing such extremes.

The researcher wished to find out the challenges associated with the recommended workload, how the challenges were overcome, the areas of teaching workload which are a hindrance to service delivery and which of the hindrances were more important, the aspects of the teaching workload which were considered as more attractive and the areas requiring innovativeness in the public universities. The researcher also sought to know whether the respondents had come up with any innovative idea during their period of service delivery and implemented the same and how the customers responded to the implemented idea. Figure 3 illustrates the findings in respect of the challenges associated with teaching recommended workload and 36.6% cited large classes, 16.2% long and late teaching hours, 4.2% loss of time due to clashing time table and travels, 2.1% limited time and short semesters, while 40.8% did not indicate.

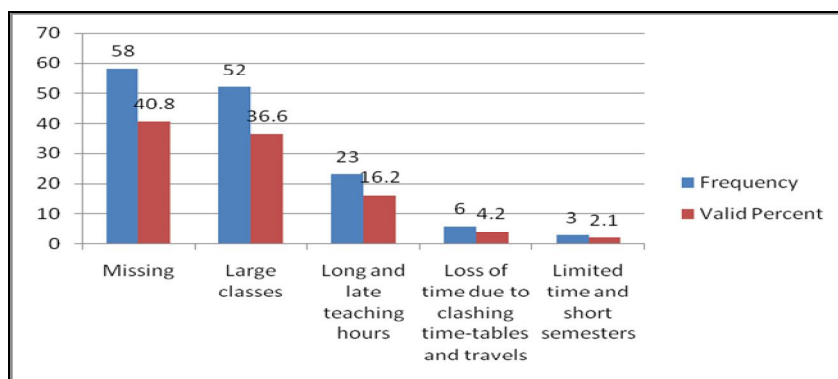


Figure 3: Challenges of teaching recommended workload  
 Source: Field Data (Researcher 2013)

Table 6 illustrates how the above cited challenges were overcome, 20.4% stated that they divided classes and group discussions, 20.4% stated flexible schedule and perseverance, 12.7% stated self-organization, 6.3% co-teaching and co-marking, while 40.1% did not indicate.

	Frequency	Percent	Valid Percent	Cumulative Percent
Missing	57	40.1	40.1	40.1
Divided classes and group discussions	29	20.4	20.4	60.6
Flexible schedule and perseverance	29	20.4	20.4	81.0
Self-organization	18	12.7	12.7	93.7
Co-teaching and co-marking	9	6.3	6.3	100.0
Total	142	100.0	100.0	

Table 6: How challenges of teaching more than recommended workload were overcome  
Source: Field Data (Researcher 2013)

Figure 4 illustrates the aspects of teaching workload which are considered a hindrance to service delivery and the findings were 43.0% cited inadequate teacher-student interaction, 11.3% large material contents, 17.6% compressed teaching content, 27.5% cited inappropriate marking of CATs and exams, while 0.7% did not indicate. Table 7 illustrates how the respondents ranked the responses in respect of aspect of teaching workload considered a hindrance to service delivery, and 43.0% ranked inadequate teacher-student interaction as most important, 11.3% ranked large material contents as most important, 17.6% ranked compressed teaching content as most important, 27.5% ranked inappropriate marking of CATs and examinations as most important, while 0.7% did not rank. In figure 5 the researcher presents the most attractive aspect of work and 26.1% stated that it was student-teacher interaction and prestige, 26.8% learning by doing and knowledge acquisition, 8.5% ICT and automation of services, 28.9% academic freedom for research and part-timing, 6.3% socio-economic incentives, while 3.5% did not indicate.

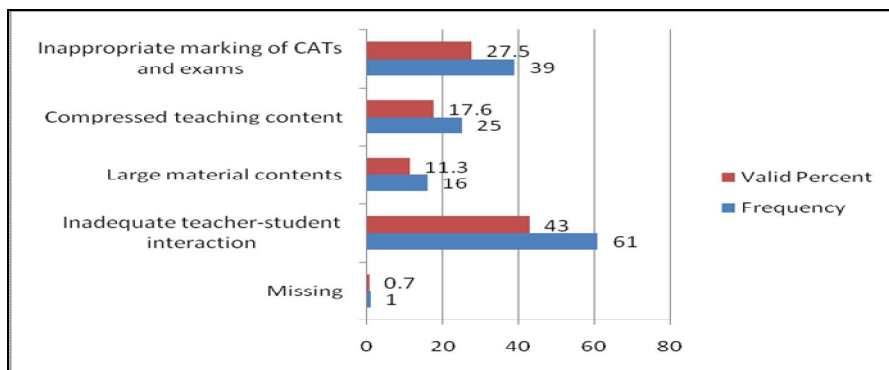


Figure 4: Aspect of teaching workload considered a hindrance to service delivery  
Source: Field Data (Researcher 2013)

Status	Frequency	Percent	Valid Percent	Cumulative Percent
Missing	1	.7	.7	.7
Inadequate teacher-student interaction	61	43.0	43.0	43.7
Large material contents	16	11.3	11.3	54.9
Compressed teaching content	25	17.6	17.6	72.5
Inappropriate marking of CATs and exams	39	27.5	27.5	100.0
Total	142	100.0	100.0	

Table 7: Aspects of teaching workload considered a hindrance to service delivery  
Source: Field Data (Researcher 2013)

In respect of an area requiring innovativeness for service delivery table 8 explains that 35.2% supported ICT and CCTV for exam surveillance, 51.4% suggested innovative methods for teaching and marking exams, 3.5% suggested staff specialization, 8.5% suggested research support, while 1.4% did not offer any suggestion.



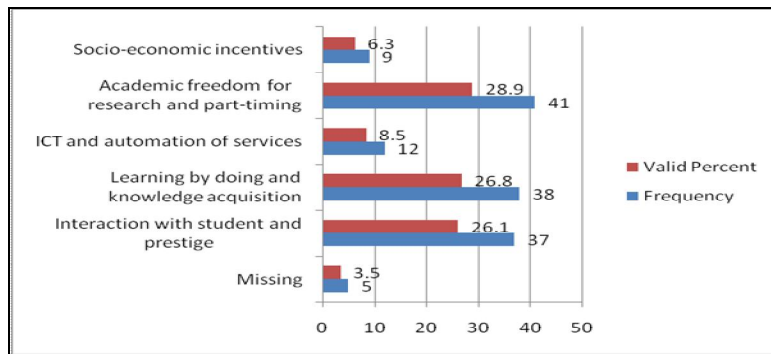


Figure 5: The most attractive aspect of work  
Source: Field Data (Researcher 2013)

Status	Frequency	Percent	Valid Percent	Cumulative Percent
Missing	2	1.4	1.4	1.4
ICT and CCTV for exam surveillance	50	35.2	35.2	36.6
Innovative methods for teaching and making exams	73	51.4	51.4	88.0
Staff specialization	5	3.5	3.5	91.5
Research support	12	8.5	8.5	100.0
Total	142	100.0	100.0	

Table 8: Type of innovativeness required at the university  
Source: Field Data (Researcher 2013)

In respect of coming up with an innovative idea, Table 9 explains that 54.2% had come, 39.4% had not while 6.3% did not indicate. In reference to response from customers about the implemented idea, the researcher in figure 6 established that 5.0% were not satisfied, 17.5% were satisfied, 28.8% fairly satisfied, 27.5% highly satisfied, and 21.3% excellently satisfied.

Status	Frequency	Percent	Valid Percent	Cumulative Percent
Missing	9	6.3	6.3	6.3
Yes	77	54.2	54.2	60.6
No	56	39.4	39.4	100.0
Total	142	100.0	100.0	

Table 9: Innovativeness followed by implementation at university level  
Source: Field Data (Researcher 2013)

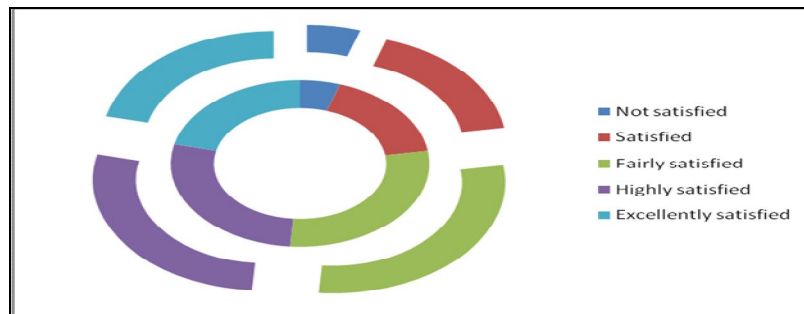


Figure 6: Degree of customers' response to implementation of innovated idea  
Source: Field Data (Researcher 2013)

3.2. Test of Multicollinearity between Predictors

Suspicion of multicollinearity is strong in a regression when the Pearson correlation is equal to or above 0.7. Based on the correlation matrix presented in Table 10, this statement was not confirmed. Pearson correlation test depicted a significant but moderate relationship between Increase in demand of courses offered (PerCTS 13), Timely graduation (PerCTS 15) and Increase in number of graduates (Per CTS 19) at 95% confidence interval. The relationship between all the other remaining variables was mostly significant

at 99% confidence interval but still weak or moderate. None of these correlations was beyond 0.69, thus providing an indication of independence between different predictors retained in the study. Hence, the significance of their relationships could only be explained by chance but not by collinearity. Consequently, the prediction of the quality of service delivery by workload effects could not expectedly be tainted by a problem of multicollinearity.

### 3.3. Test of Homogeneity of Variances

The Levene's test confirmed the assumption of equality of error variances between the quality of service delivery measured by the level of tangibles (EmploWS 11) and its corresponding predictors (Table 11). This test confirmed the existence of a strong relationship between them based on their homogeneity. However, this test nullified the hypothesis of homogeneity between all other dependent variables and their corresponding predictors. Therefore, the study confirmed the assumption that tangibles contribute to the quality of service delivery in public universities by easing employee's teaching workload.

Variable/Measure	PerCTS 13	PerCTS 14	PerCTS 15	PerCTS 16	PerCTS 17	PerCTS 18	PerCTS 19	PerCTS 20	PerCTS 21
Increased demand of courses offered (PerCTS 13)	1.000								
Increase in student enrollment (PerCTS 14)	0.148	1.000							
Timely graduation (PerCTS 15)	0.216**	0.458***	1.000						
Effective/ efficient teaching methods (PerCTS 16)	-0.014	0.312***	0.392***	1.000					
Reduction in customer complaints (PerCTS 17)	0.126	0.349***	0.420***	0.531***	1.000				
Increase in customer compliments (PerCTS 18)	0.077	0.365***	0.281***	0.315***	0.383***	1.000			
Increase in number of graduates (PerCTS 19)	0.229**	0.504***	0.490***	0.385***	0.417***	0.371***	1.000		
Timely graduation ceremonies (PerCTS 20)	0.037	0.227***	0.538***	0.500***	0.482***	0.292***	0.619***	1.000	
Timely release of results (PerCTS 21)	0.031	0.209**	0.363***	0.404***	0.401***	0.299***	0.281***	0.577***	1.000

Table 10: Correlation between independent variables for the teaching workload<sup>d</sup>

Source: Field Data (Researcher 2013)

#### Notes:

\*\*\*. Correlation is significant at the 0.01 level (2-tailed).

\*\* . Correlation is significant at the 0.05 level (2-tailed).

\* . Correlation is significant at the 0.1 level (2-tailed).

<sup>a</sup> Method: Pearson Correlation

Variable	F	df1	df2	Sig.	Conclusion
Tangibles contributes to quality of service offered at the university	0.987	120	13	0.556	Homogeneity
Reliability contributes to quality of service offered at the university	2.726	120	13	0.022	Heterogeneity
Responsiveness contributes to quality of service offered at the university	11.012	120	13	0.000	Heterogeneity
Assurance contributes to quality of service offered at the university	6.856	120	13	0.000	Heterogeneity
Empathy contributes to quality of service offered at the university	3.485	120	13	0.007	Heterogeneity

Table 11: Results of Levene's Test of Equality of Error Variances <sup>a,b</sup>

Source: Field Data (Researcher 2013)

#### Notes:

<sup>a</sup> Tests the null hypothesis that the error variance of the dependent variable is equal across groups

<sup>b</sup> Weighted Least Squares Regression - Weighted by Age

<sup>c</sup> Design: Intercept + PerTCS13 + PerTCS14 + PerTCS15 + PerTCS16 + PerTCS17 + PerTCS18 + PerTCS19 + PerTCS20 + PerTCS21

### 3.4. Model Estimation and Regression Strength Testing

#### 3.4.1. Model Estimation

Table 12 presents the correlation coefficients computed between the dependent variables for the quality of service delivery at university and the teaching workload factors (independent variables). Pearson Rho test established that the quality of service delivery as measured by the level of tangibles (EmploWS 11) was statistically related at 99% confidence interval to Reduction in customer complaints (PerCTS 17), Increase in customer compliments (PerCTS 18) and Increase in number of graduates(Per CTS 19).Tangibles were also linked to Increased students' enrollment(PerCTS 14) and Timely release of results(PerCTS 21) at 95% confidence interval; and Timely graduation (PerCTS 15) at 90% confidence interval. Similarly, Reliability (EmploWS 12) was strongly correlated to Reduction in customer complaints(Per CTS 17) at 99% confidence interval, to Increased students' enrollment(PerCTS 14), Increase in customer compliments (Per CTS 18),Increase in number of graduates(Per CTS 19) and Timely release of results(PerCTS 21) at 95% confidence interval; and to Timely graduation (PerCTS 15)at 90% confidence interval.

The correlation test also upheld the relationship between Responsiveness (EmploWS 13) and the Increase in number of graduates(Per CTS 19) at 99% confidence interval, EmploWS 13 and Timely graduation (PerCTS 15), Effective and efficient teaching methodologies (PerCTS 16),Reduction in customer complaints(Per CTS 17) and Increase in customer compliments (Per CTS 18) at 95% confidence interval; and (EmploWS 13) and Timely graduation ceremonies (PerCTS 20) and Timely release of results(PerCTS 21)at 90% confidence interval. Assurance (EmploWS 14) was said to be significantly related to efficient teaching methodologies (PerCTS 16),Increase in customer compliments (Per CTS 18) and Increase in number of graduates(Per CTS 19) at 90% confidence interval, while Empathy (Emplo WS 15) was strongly correlated to Timely graduation(Per CTS 15) and Increase in number of graduates(Per CTS 19) at 90% confidence interval. Hence, a strong relationship could be expected between the quality of service delivery and the teaching workload effects.

The tests of between-subjects effects established at 90% confidence intervals that there existed a strong relationship between the level of service delivery and the workload of the teaching members of staff of the universities selected in this study. The F test therefore failed to reject the hypothesis stating: "there is a positive relationship between employees' teaching workload and the level of service delivery in public universities in Kenya".

Variable	PerCTS 13	PerCTS 14	PerCTS 15	PerCTS 16	PerCTS 17	PerCTS 18	PerCTS 19	PerCTS 20	PerCTS 21
EmploWS 11	-0.091	0.226**	0.173*	0.145	0.281***	0.354***	0.242***	0.133	0.208**
EmploWS 12	0.060	0.202**	0.171*	0.148	0.338***	0.232**	0.229**	0.161	0.230**
EmploWS 13	0.165	0.156	0.216**	0.206**	0.211**	0.229**	0.257***	0.190*	0.185*
EmploWS 14	0.109	0.061	0.066	0.191*	0.085	0.172*	0.189*	0.120	0.071
EmploWS 15	-0.147	0.120	0.171*	0.129	0.146	0.082	0.175*	0.163	0.108

Table 12: Correlation between the quality of service delivery and the teaching workload factors

Source: Field Data (Researcher 2013)

#### Notes:

\*\*\*. Correlation is significant at the 0.01 level (2-tailed).

\*\* . Correlation is significant at the 0.05 level (2-tailed).

\*. Correlation is significant at the 0.1 level (2-tailed).

#### 3.4.2. Regression Strength

Table 13 shows that "tangibles", including physical facilities, equipment and staff appearance, significantly contributed to the quality of service delivery at the university ( $R^2 = 0.623$ ; Adjusted  $R^2 = 0.465$ ;  $F = 3.955$ ;  $Sig. = 0.000$ ). This was explained by increased demand for courses offered at selected universities ( $F = 2.406$ ;  $Sig. = 0.043$ ), timely graduations ceremonies ( $F = 2.295$ ;  $Sig. = 0.065$ ), increased customer compliments ( $F = 4.472$ ;  $Sig. = 0.002$ ) and increased number of graduates ( $F = 4.111$ ;  $Sig. = 0.004$ ). Secondly, "reliability", that is the ability to perform service dependably and accurately, significantly contributed to level of service delivery at these universities of Kenya ( $R^2 = 0.657$ ; Adjusted  $R^2 = 0.514$ ;  $F = 4.59$ ;  $Sig. = 0.000$ ) by means of timely graduation ceremonies ( $F = 2.96$ ;  $Sig. = 0.024$ ), reduction in customer complaints ( $F = 2.134$ ;  $Sig. = 0.083$ ) and increase in customer compliments ( $F = 9.143$ ;  $Sig. = 0.000$ ). Also is notable the contribution of "responsiveness" or willingness to help and respond to customer needs ( $R^2 = 0.563$ ; Adjusted  $R^2 = 0.380$ ;  $F = 3.079$ ;  $Sig. = 0.000$ ) by means of effective and efficient teaching methods ( $F = 2.038$ ;  $Sig. = 0.096$ ), increase in customer compliments ( $F = 8.766$ ;  $Sig. = 0.000$ ) and timely release of results ( $F = 2.092$ ;  $Sig. = 0.088$ ).

Regarding "assurance", in other words the ability to inspire confidence ( $R^2 = 0.534$ ; Adjusted  $R^2 = 0.339$ ;  $F = 2.741$ ;  $Sig. = 0.000$ ), its contribution to level of service delivery at the university was largely explained by novel teaching methods ( $F = 4.33$ ;  $Sig. = 0.003$ ), reduction in customer complaints ( $F = 2.546$ ;  $Sig. = 0.045$ ) and increase in customer compliments ( $F = 6.154$ ;  $Sig. = 0.000$ ). Finally, "empathy" or the extent to which individualized service is given ( $R^2 = 0.486$ ; Adjusted  $R^2 = 0.272$ ;  $F = 2.268$ ;  $Sig. = 0.001$ ) determined the level of service delivery at the university via reduction in customer complaints ( $F = 3.422$ ;  $Sig. = 0.012$ ), increase in customer

compliments ( $F=2.36$ ;  $Sig.= 0.059$ ) and timely release of results ( $F=2.879$ ;  $Sig.= 0.027$ ). It shall however be noted that the increase in customer compliments was the key explanatory variable predicting the level of service offered at the university. It was significantly linked to tangibles, reliability, responsiveness, assurance and empathy. The remaining factors explained one or a few of the above outcomes.

Parameter	Tangibles <sup>a</sup>		Reliability <sup>b</sup>		Responsiveness <sup>c</sup>		Assurance <sup>d</sup>		Empathy <sup>e</sup>	
	F	Sig.	F	Sig.	F	Sig.	F	Sig.	F	Sig.
Demand of courses	2.406**	0.043	0.482	0.789	0.684	0.637	1.207	0.312	1.61	0.165
Student enrolment	1.115	0.354	1.508	0.207	1.31	0.272	1.004	0.41	1.345	0.26
Graduations	2.295*	0.065	2.96**	0.024	1.275	0.286	0.841	0.503	1.881	0.12
Teaching methods	0.317	0.866	1.447	0.225	2.038*	0.096	4.33***	0.003	0.55	0.7
Complaints	1.037	0.393	2.134*	0.083	1.551	0.194	2.546**	0.045	3.422**	0.012
Compliments	4.472	0.002	9.143***	0.000	8.766***	0.000	6.154***	0.000	2.36*	0.059
Number of graduates	4.111***	0.004	1.422	0.233	0.25	0.909	0.316	0.866	0.427	0.789
Examinations	1.145	0.341	1.684	0.161	0.474	0.755	1.132	0.347	0.491	0.742
Results	1.653	0.168	1.791	0.137	2.092*	0.088*	1.573	0.188	2.879**	0.027
Corrected Model	3.955***	0.000	4.59***	0.000	3.079***	0.000	2.741***	0.000	2.268***	0.001

Table 13: Tests of between-subjects effects of teaching workload on the quality of service delivery

Source: Field Data (Researcher 2013)

a. R Squared = .623 (Adjusted R Squared = .465)	*Significance at 10%; Confidence intervals of 90%
b. R Squared = .657 (Adjusted R Squared = .514)	**Significance at 5%; Confidence intervals of 95%
c. R Squared = .563 (Adjusted R Squared = .380)	***Significance at 1%; Confidence intervals of 99%
d. R Squared = .534 (Adjusted R Squared = .339)	
e. R Squared = .486 (Adjusted R Squared = .272)	

Table 14 presents results of the most significant parameters among different categories within a variable. The *t*test mostly pointed out to increase in demand of courses being offered as moderately important, important and very important, timely graduation ceremonies as being important, increase in customer compliments as being both moderately important and very important, while timely release of results was very important. Reduction in customer complaints was also explained as being moderately important while increase in the number of graduates was not important. These categories were able to explain almost all the aspects of the level of service offered at the university.

### 3.5. Discussion on Workload Analysis

In the literature review it is pointed out that universities have defined the role of academic staff to three domains of teaching, research, and service and that university academic staff do complex work in an increasingly demanding environment. It is farther pointed out that universities are the only organizations focused on dual core functions of knowledge creation and knowledge transmission, and that academic staff members who spent the majority of their time teaching reported a preference for being rewarded for teaching effectiveness. It is also noted that challenge, variety, and autonomy are key elements of the academic staff to engage in core activities such as critical thinking, reflection, and collegial interactions in the context of disciplinary interests and expertise. Reforms have sought to make universities more accountable to government, students as consumers, and the public generally. It is emphasized that workload systems management has increasingly been a factor in recent contract negotiations and collective employment agreements and therefore the need to investigate workloads issues such as increased stress on staff, development of creative solutions to ameliorate problems, and “sustaining the primary sources of work satisfaction that best promote quality”.

It is the wish of each and every student to be admitted in a competitive course in a public university, more so the number of students joining these universities has in the recent past increased due to the introduction of various degree programmes and the expansion of teaching programmes through self-sponsorship, open and distance learning and evening classes in most of the major urban centres. This number has also grown due to the opening up of satellite campuses and the recent uplifting of middle level colleges to fully fledged universities.

Parameter	Tangibles		Reliability		Responsiveness		Assurance		Empathy	
	t	Sig.	t	Sig.	t	Sig.	t	Sig.	t	Sig.
Demand of courses [=1]	3.045***	0.003	0.524	0.602	-1.034	0.304	-1.366	0.175	1.936*	0.056
Demand of courses [=2]	2.298**	0.024	0.41	0.683	-1.183	0.24	-1.835*	0.07	1.714*	0.09
Demand of courses [=3]	2.51**	0.014	0.356	0.723	-1.173	0.244	-1.931*	0.057	2.099**	0.039
Demand of courses [=4]	2.747***	0.007	0.282	0.778	-0.819	0.415	-1.957*	0.053	1.977*	0.051
Demand of courses [=5]	2.671***	0.009	0.014	0.989	-0.968	0.335	-2.204**	0.03	1.586	0.116
Graduations [=1]	-0.242	0.809	1.411	0.162	0.636	0.526	0.67	0.505	-1.462	0.147
Graduations [=2]	-0.651	0.517	-1.106	0.272	-0.146	0.884	0.29	0.772	0.357	0.722
Graduations [=3]	-2.921***	0.004	-2.709***	0.008	-2.009**	0.047	0.761	0.449	-1.193	0.236
Graduations [=4]	-1.719*	0.089	-1.091	0.278	-0.83	0.408	-1.163	0.248	-2.139**	0.035
Teaching methods [=1]	-0.813	0.419	-1.99**	0.05	-0.608	0.545	-0.232	0.817	-0.144	0.886
Teaching methods [=2]	0.491	0.625	0.801	0.425	1.463	0.147	-0.253	0.801	-0.228	0.82
Teaching methods [=3]	-0.166	0.869	-0.979	0.33	-1.807*	0.074	-3.56***	0.001	-1.422	0.158
Teaching methods [=4]	0.531	0.597	0.065	0.948	0.244	0.808	0.566	0.572	-0.194	0.846
Complaints [=1]	-0.357	0.722	0.863	0.39	-0.121	0.904	-0.57	0.57	0.041	0.968
Complaints [=2]	-1.499	0.137	-1.886*	0.062	-1.057	0.293	0.122	0.903	-2.058**	0.042
Complaints [=3]	-0.161	0.873	-0.294	0.769	1.488	0.14	2.387**	0.019	1.735	0.086

Table 14: The most significant teaching workload parameters explaining the level of service delivery  
Source: Field Data (Researcher 2013)

Parameter	Tangibles		Reliability		Responsiveness		Assurance		Empathy	
	t	Sig.	t	Sig.	t	Sig.	t	Sig.	t	Sig.
Complaints [=4]	-1.478	0.143	-1.597	0.114	-0.618	0.538	-0.843	0.401	-1.028	0.307
Compliments [=1]	-2.32**	0.023	0.092	0.927	0.268	0.789	-1.013	0.314	-1.119	0.266
Compliments [=2]	-3.601***	0.001	-4.735***	0.000	-5.056***	0.000	-4.716***	0.000	-2.782***	0.007
Compliments [=3]	-1.148	0.254	-0.469	0.64	-1.17	0.245	-1.29	0.2	-0.676	0.501
Compliments [=4]	-2.239**	0.028	-2.792***	0.006	-2.604**	0.011	-1.784	0.078	-1.333	0.186
Number of Graduates [=1]	-2.641***	0.01	-2.264**	0.026	0.207	0.836	0.332	0.74	0.756	0.451
Number of Graduates [=2]	-0.083	0.934	-0.55	0.584	-0.524	0.601	-0.813	0.418	0.881	0.381
Number of Graduates [=3]	-0.731	0.466	-0.168	0.867	-0.271	0.787	-0.63	0.53	0.112	0.911
Number of Graduates [=4]	-2.693***	0.008	0.04	0.968	-0.803	0.424	-0.838	0.404	0.018	0.986
Results [=1]	-0.269	0.789	-0.43	0.668	0.643	0.522	0.2	0.842	0.301	0.764
Results [=2]	-2.366**	0.02	-1.204	0.232	-0.916	0.362	-0.143	0.886	-0.681	0.498
Results [=3]	-0.31	0.757	-0.349	0.728	-0.492	0.624	-1.047	0.298	-1.182	0.24
Results [=4]	0.369	0.713	1.936*	0.056	2.252**	0.027	1.914	0.059	2.604**	0.011

Table 15: The most significant teaching workload parameters... (Cont'd)  
Source: Field Data (Researcher 2013)

**Notes:**

- \*Significance at 10%; Confidence intervals of 90%
- \*\*Significance at 5%; Confidence intervals of 95%
- \*\*\*Significance at 1%; Confidence intervals of 99%

The increase of the student has had to push the universities to innovate more effective means of satisfying them. This has led to increased efficiency and effectiveness in various parameters in respect of student enrolment, timely graduation ceremonies so as to join the labor market, teaching methodologies, timely examinations and timely release of examination results. Once all this is addressed adequately then the universities would have to experience reduction in customer complaints, increase in customer compliments and ultimately increase in the number of students enrolled.

#### 4. Summary and Conclusion

That the level of service delivery in respect of the teaching workload and in consideration of the various variables used to measure the level of service delivery was majorly determined by increased demand for courses offered at selected universities, timely graduation ceremonies, increased customer compliments, increased number of graduates, reduction in customer complaints, effective and efficient teaching methods, timely release of results and novel teaching methods. In view of these observations the universities should try as much as possible to link the performance contracting practices to these variables, sustain them and equip its staff with the necessary tools and skills besides giving feedback to its customers and also linking the courses offered to the industry. It is worth noting that increase in student enrollment and timely examinations in regard to teaching workload was not considered as affecting the level of service and this can be explained by the presence of many modules and programmes which have been introduced to take care of the various needs of the customers, and that universities also continuously assess the students through various types of examinations which include class presentations, discussion groups, take away assignments and continuous assessment tests besides the final semester examinations and supplementary examinations.

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