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**THE IMPACT OF ICT SUPPORT SERVICES IN QUALITY
EDUCATION ON STUDENTS' PERCEIVED PERFORMANCE: A CASE
OF CENTRE OF DIPLOMA STUDIES (PPD), SPACE UTM**

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MASTER OF SCIENCES (MANAGEMENT)

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OF CENTRE OF DIPLOMA STUDIES (PPD) SPACE UTM**

By

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**Thesis Submitted to
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(Management)**



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ABSTRACT

Nowadays the role of Information and Communication Technology (ICT), in the education sector plays an important role, especially in empowering the technology into the educational activities. Education sector can be the most effective sector to expect and eliminate the negative impact of ICT. Technology on another side can be the most effective way to increase the student's knowledge. Education is a socially oriented activity and quality education has traditionally associated with strong teachers having high degrees of personal contact with learners. Using ICT in education lends itself to more student-centred learning settings. But with the world moving rapidly into digital media and information, the role of ICT in education is becoming more and more important and this importance will continue to grow and develop. This study focused on the impact of ICT support services in quality education on student perceived performance and how it affects the student's learning quality to achieve good grades in the 3-years Diploma Programme at Centre of Diploma Studies (PPD) SPACE UTM. The questionnaire was used as the instrument in collecting data from the respondents. It consisted of three parts; part A (personal information of respondents), part B (the impact of ICT support services in quality education on student perceived performance) and part C (quality of work). There were 400 questionnaires distributed randomly to the respondents and 291 were returned to the researcher. Findings have shown that there is a significant relationship between teaching and learning with student perceived performance ($r = 0.618$), education quality and accessibility with student perceived performance ($r = 0.466$), environment of learning with student perceived performance ($r = 0.619$) and motivation of learning with student perceived performance ($r = 0.417$). Based on the results of the research, the results showed that all the factors studied had an impact of ICT support services in quality education on student perceived performance. Hence, ICT support services have become important activities that need to measure from time to time to ensure the advantages of ICT usage. Thus, this paper proposes the effective measurable approach for measuring the quality of ICT support services and the impact on the student performance. This study reviewed the current scope of ICT support services in the term of teaching and learning process, quality and accessibility of education, learning environment and learning motivation. The findings suggest ideas and awareness that ICT support services top managements, providers and users relating to the ICT support services scope.

Keywords – Student Performance, ICT, ICT Support Service, Quality Education

ABSTRAK

Pada masa kini peranan Teknologi Maklumat dan Komunikasi (ICT), dalam sektor pendidikan memainkan peranan penting, terutamanya dalam memperkasakan teknologi ke dalam aktiviti pendidikan. Sektor pendidikan boleh menjadi sektor yang paling berkesan untuk mengharapkan dan menghapuskan kesan negatif ICT. Teknologi di sisi lain boleh menjadi cara yang paling berkesan untuk meningkatkan pengetahuan pelajar. Pendidikan adalah aktiviti berorientasikan sosial dan pendidikan berkualiti secara tradisional dikaitkan dengan guru-guru yang kuat yang mempunyai hubungan peribadi dengan pelajar yang tinggi. Menggunakan ICT dalam pendidikan meminjamkan kepada lebih banyak penekanan pembelajaran berpusatkan pelajar. Tetapi dengan dunia bergerak dengan pesat ke dalam media digital dan maklumat, peranan ICT dalam pendidikan menjadi semakin penting dan kepentingan ini akan terus berkembang dan berkembang. Kajian ini memberi tumpuan kepada kesan perkhidmatan sokongan ICT dalam pendidikan berkualiti terhadap pencapaian pelajar dan bagaimana ia mempengaruhi kualiti pembelajaran pelajar untuk mencapai gred yang baik dalam Program Diploma 3 tahun di Pusat Pengajian Diploma (PPD) SPACE UTM. Soal selidik digunakan sebagai instrumen dalam mengumpul data daripada responden. Ia terdiri daripada dua bahagian; bahagian A (maklumat peribadi responden) dan bahagian B (kesan perkhidmatan sokongan ICT dalam pendidikan berkualiti terhadap prestasi pelajar yang dipersyaratkan). Terdapat 400 soal selidik yang diedarkan secara rawak kepada responden dan 291 telah dikembalikan kepada penyelidik. Hasil kajian menunjukkan terdapat hubungan yang signifikan di antara pengajaran dan pembelajaran dengan prestasi yang dirasakan oleh pelajar ($r = 0.618$), kualiti pendidikan dan kebolehcapaian dengan prestasi yang dirasakan oleh pelajar ($r = 0.466$), persekitaran pembelajaran dengan prestasi pelajar yang dirasakan ($r = 0.619$) motivasi pembelajaran dengan prestasi pelajar yang dirasakan ($r = 0.417$). Berdasarkan hasil penyelidikan, hasilnya menunjukkan bahawa semua faktor yang dikaji mempunyai kesan terhadap perkhidmatan sokongan ICT dalam pendidikan berkualiti terhadap pencapaian pelajar. Perkhidmatan sokongan ICT telah menjadi aktiviti penting yang perlu diukur dari semasa ke semasa untuk memastikan kelebihan penggunaan ICT. Oleh itu, kertas kerja ini mencadangkan pendekatan yang dapat diukur dengan berkesan untuk mengukur kualiti perkhidmatan sokongan ICT dan kesan kepada prestasi pelajar. Kajian ini mengkaji ruang lingkup semasa perkhidmatan sokongan ICT dalam proses pengajaran dan pembelajaran, kualiti dan aksesibiliti pendidikan, persekitaran pembelajaran dan motivasi pembelajaran. Penemuan ini mencadangkan idea dan kesedaran bahawa perkhidmatan sokongan ICT di atas pengurusan, penyedia dan pengguna yang berkaitan dengan skop perkhidmatan sokongan ICT.

Kata Kunci - Prestasi Pelajar, ICT, Perkhidmatan Sokongan ICT, Pendidikan Kualiti

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LIST OF ABBREVIATIONS

ICT	Information and Communication Technologies
PPD	Pusat Pengajian Diploma
UTM	Universiti Teknologi Malaysia
SPACE	School of Professional and Continuing Education
WWW	World Wide Web



CHAPTER 1

INTRODUCTION

1.1 Background of the Study

The technology was an essential component of our everyday life. In reality, in the current world, we need to equip ourselves with the expertise to survive. With this in mind, it is always important for education institution to provide the best education system to ensure that their students are capable to survive when they join the corporate world. To provide the best education it is important that education higher institution to invest in ICT, this is to ensure that their students get the best ICT facilities and ICT support service from the higher institution to provide the best environment in their campus life.

ICT and E-learning enhance the education through innovative ways by increasing the student's motivation, interest and engagement, by facilitating acquire skills and by enhancing the trainer coaching can improve the communication and exchange of knowledge (Pavel *et al.*, 2015). According to Fouji and Islam (2010), ICT has become a subject of discussion within the technological arena and its applications in several sectors and education. It recognizes Information and Communication Technologies (ICTs) as a contemporary instrumental instrument that allows instructors to transform learning methods, that they used to extend the achievement of the learners. Educational establishments around the world adopted ICT as a way of teaching and also as providing ICT-connected tutorial programs.

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APPENDIX A - QUESTIONNAIRE



UNIVERSITI UTARA MALAYSIA

Dear Respondents,

I am a postgraduate student of University Utara Malaysia and conducting a survey on the impact of ICT support services in quality education on student performance: a case study of Centre of Diploma Studies (PPD) UTM Space to fulfill the master's requirement of the university.

I understand recognize that your time is valuable and many demands are made upon it by your heavy workload. However, your participation in this survey, which will require only about 10-15 minutes of your time, is vital to the success of this study.

All information provided in this questionnaire will be confidential for the present study purposes. No information pertaining to individuals will be divulged to any third person or organization. In sum, the information obtained in this study will be used purely for academic purposes only.

Should you have any queries regarding this research please do not hesitate to contact me at aida.kl@utm.my or call me at 019-6421549. Thank you very much for your cooperation in responding to the questionnaire. Your participation in this study is greatly appreciated.

RAJA AIDA BINTI RAJA SHAHARUDDIN
MSc (Management)

**SURVEY OF THE IMPACT OF ICT SUPPORT SERVICES IN QUALITY EDUCATION
ON STUDENT PERFORMANCE: A CASE STUDY OF CENTER OF DIPLOMA
STUDIES (PPD) UTM SPACE**

Section A: Demographic Information

Please check (✓) in the appropriate box or fill in the blank, where appropriate.

1. Your gender:

- Male
- Female

2. Your age:

- 18-25 years
- 26-39 years
- 40 years and above

3. Race:

- Malay
- Chinese
- Indian
- Others, please specify: _____

4. Department (example: computer science):

5. Course of study (example: Dip comp science):

6. Reason joined this Diploma program:

- To obtain diploma
- To learn a job skill (i.e. for upgrade for promotion purpose)
- For personal satisfaction/knowledge

7. Study mode:

- Full time student
- Part time student

Section B: Factors that contribute to the impact of ICT support services in quality education on student performance: a case study of Center of Diploma Studies (PPD) UTM Space.

Factor: Teaching and Learning

Indicate your level of agreement with the following sentences from 1 (strongly disagree) to 5 (strongly agree). Choose the best answer according to the scale above.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1	2	3	4	5

1	My university's ICT facilities work well and can be used.	1	2	3	4	5
2	If educators are confronted with problems, technical support will be given.	1	2	3	4	5
3	ICT makes it possible for learners to be more imaginative and creative.	1	2	3	4	5
4	Using ICT enables learners explore associated teaching understanding and information.	1	2	3	4	5
5	ICT use enables learners to discover associated teaching understanding and knowledge.	1	2	3	4	5
6	With the help of ICT, teachers are provided the choice to design their own teaching.	1	2	3	4	5

Factor: Education Quality and Accessibility

Indicate your level of agreement with the following sentences from 1 (strongly disagree) to 5 (strongly agree). Choose the best answer according to the scale above.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1	2	3	4	5

1	Access to what I need anytime.	1	2	3	4	5
2	Access to remote resources I want anytime.	1	2	3	4	5
3	Improvement of teaching and learning by using quality data resources.	1	2	3	4	5
4	Improvement in educational quality.	1	2	3	4	5
5	Encourages collaborative and interactive learning	1	2	3	4	5

Factor: Environment of Learning

To what extent do you agree that ICT provides learners with a fresh learning to set? Choose the best answer according to the scale above.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1	2	3	4	5

1	Do you believe using ICT improves the level of knowledge of learners?	1	2	3	4	5
2	Do you believe using ICT will make learners enjoy their classes?	1	2	3	4	5
3	Do you think that not using ICT is old fashioned?	1	2	3	4	5
4	Can ICT be a tool to make students independent?	1	2	3	4	5
5	Does ICT facilitate students' needs?	1	2	3	4	5

Factor: Motivation of Learning (ML)

To what extent do you agree with ICT, by enhancing learner motivation and commitment, can you improve the quality of education in several ways? Choose the best answer according to the scale above.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1	2	3	4	5

1	ICT is an Innovative teaching method that are based on active and experimental learning and increases student engagement and performance.	1	2	3	4	5
2	ICT encourages and supports disadvantaged students in their learning, raises students' motivation to learn through giving the learner more control over the learning experience.	1	2	3	4	5
3	ICT offers different operations to test the development of student understanding and skills.	1	2	3	4	5
4	By assigning group projects where learners meet online, ICT offers possibilities for knowledge acquisition through cooperation, conversation, and negotiation.	1	2	3	4	5
5	ICT is used to support subject-specific learning, and have positive impact on attainment.	1	2	3	4	5

Factor: Student Perceived Performance

Indicate your level of agreement with the following sentences from 1 (strongly disagree) to 5 (strongly agree). Choose the best answer according to the scale above).

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1	2	3	4	5

1	This will assist me in my studies to get better outcomes.	1	2	3	4	5
2	It will assist me in comprehending more deeply the topic matter.	1	2	3	4	5
3	It will enhance my long-term career or job opportunities.	1	2	3	4	5
4	Technology interferes with my capacity to focus on topics I care about and believe profoundly.	1	2	3	4	5
5	I wish my college professors would use more technology and incorporate it into their learning.	1	2	3	4	5



UUM
END OF QUESTIONNAIRE
THANK YOU
Universiti Utara Malaysia

APPENDIX B – DEMOGRAPHIC ANALYSIS

Your gender:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	139	47.8	47.8	47.8
	Male	152	52.2	52.2	100.0
	Total	291	100.0	100.0	

Your age:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-25 years	150	51.5	51.5	51.5
	26-39 years	108	37.1	37.1	88.7
	40 and above	33	11.3	11.3	100.0
	Total	291	100.0	100.0	

Your race:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Cina	30	10.3	10.3	10.3
	India	31	10.7	10.7	21.0
	Malay	230	79.0	79.0	100.0
	Total	291	100.0	100.0	

Department (example: computer science):

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Department of Computer Sciences and Services	79	27.1	27.1	27.1
	Department of Engineering	67	23.0	23.0	50.2
	Department of Geomatic and Built Environment	64	22.0	22.0	72.2
	Department of Management	81	27.8	27.8	100.0
	Total	291	100.0	100.0	

Course of study (example: Dip comp science):

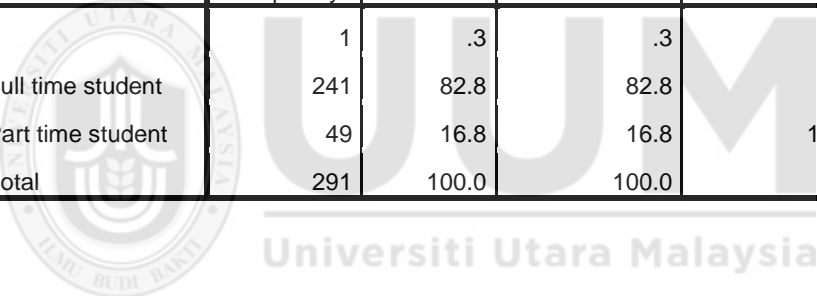
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Diploma in Architecture	17	5.8	5.8	5.8
	Diploma in Chemical Engineering	1	.3	.3	6.2
	Diploma in Civil Engineering	22	7.6	7.6	13.7
	Diploma in Computer Science (Information Technology)	60	20.6	20.6	34.4
	Diploma in Computer Science (Multimedia)	19	6.5	6.5	40.9
	Diploma in Electronic Engineering	4	1.4	1.4	42.3
	Diploma in Electronic Engineering (Mechatronic)	6	2.1	2.1	44.3
	Diploma in Electronic Engineering (Power)	3	1.0	1.0	45.4
	Diploma in Land Surveying	8	2.7	2.7	48.1
	Diploma in Mechanical Engineering	31	10.7	10.7	58.8
	Diploma in Property Management	20	6.9	6.9	65.6
	Diploma in Quantity Surveying	23	7.9	7.9	73.5
	Diploma in Technology Management	38	13.1	13.1	86.6
	Diploma in Technology Management (Accounting)	23	7.9	7.9	94.5
	Diploma in Urban and Regional Planning	16	5.5	5.5	100.0
	Total	291	100.0	100.0	

Reason joined this Diploma program:

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid for personal satisfaction/knowledge	50	17.2	17.2	17.2
For personal satisfaction/knowledge	30	10.3	10.3	27.5
To learn a job skill (i.e. for upgrade for promotion purpose)	106	36.4	36.4	63.9
To obtain diploma	105	36.1	36.1	100.0
Total	291	100.0	100.0	

Study mode:

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	.3	.3	.3
Full time student	241	82.8	82.8	83.2
Part time student	49	16.8	16.8	100.0
Total	291	100.0	100.0	



APPENDIX C – DESCRIPTIVE ANALYSIS

Dependent Variables

Descriptive Statistics												
	N	Range	Minimum	Maximum	Mean		Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
SP1	291	2.0	3.0	5.0	4.244	.0440	.7513	.564	-.434	.143	-1.117	.285
SP2	291	2.0	3.0	5.0	4.333	.0381	.6504	.423	-.460	.143	-.705	.285
SP3	291	2.0	3.0	5.0	4.113	.0343	.5850	.342	-.021	.143	-.151	.285
SP4	291	2.0	3.0	5.0	4.220	.0354	.6044	.365	-.141	.143	-.485	.285
SP5	291	1.0	4.0	5.0	4.770	.0247	.4217	.178	-1.288	.143	-.343	.285
Valid N (listwise)	291											

Independent Variables

Descriptive Statistics												
	N	Range	Minimum	Maximum	Mean		Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
TL1	291	3.0	2.0	5.0	3.749	.0425	.7256	.527	.259	.143	-.786	.285
TL2	291	2.0	3.0	5.0	3.918	.0330	.5633	.317	-.021	.143	.111	.285
TL3	291	2.0	1.0	3.0	2.481	.0328	.5591	.313	-.462	.143	-.825	.285
TL4	291	2.0	3.0	5.0	4.244	.0299	.5108	.261	.296	.143	-.248	.285
TL5	291	2.0	3.0	5.0	4.364	.0307	.5232	.274	.126	.143	-1.052	.285
TL6	291	2.0	3.0	5.0	4.227	.0409	.6974	.486	-.341	.143	-.918	.285
TL7	291	2.0	3.0	5.0	4.082	.0393	.6696	.448	-.096	.143	-.765	.285
QA1	291	2.0	3.0	5.0	4.237	.0384	.6556	.430	-.290	.143	-.737	.285
QA2	291	2.0	3.0	5.0	4.234	.0399	.6800	.462	-.328	.143	-.842	.285
QA3	291	2.0	3.0	5.0	4.093	.0405	.6911	.478	-.124	.143	-.898	.285
QA4	291	1.0	4.0	5.0	4.423	.0290	.4948	.245	.315	.143	-1.914	.285
QA5	291	2.0	3.0	5.0	4.237	.0293	.5005	.250	.373	.143	-.180	.285

EL1	291	2.0	3.0	5.0	4.302	.0283	.4821	.232	.583	.143	-.956	.285
EL2	291	2.0	3.0	5.0	4.540	.0305	.5196	.270	-.382	.143	-1.346	.285
EL3	291	2.0	3.0	5.0	4.110	.0240	.4089	.167	.793	.143	2.205	.285
EL4	291	2.0	3.0	5.0	4.124	.0370	.6312	.398	-.103	.143	-.525	.285
EL5	291	2.0	3.0	5.0	4.179	.0423	.7209	.520	-.282	.143	-1.042	.285
ML1	291	1.0	4.0	5.0	4.313	.0272	.4644	.216	.812	.143	-1.350	.285
ML2	291	3.0	2.0	5.0	3.959	.0360	.6145	.378	-.066	.143	-.065	.285
ML3	291	2.0	3.0	5.0	3.856	.0288	.4911	.241	-.318	.143	.653	.285
ML4	291	1.0	4.0	5.0	4.158	.0214	.3654	.134	1.884	.143	1.561	.285
ML5	291	2.0	3.0	5.0	4.065	.0292	.4974	.247	.137	.143	.987	.285
Valid N (listwise)	291											



APPENDIX D – RELIABILITY TEST

Teaching and Learning Process

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.733	.707	7

Item Statistics

	Mean	Std. Deviation	N
TL1	3.749	.7256	291
TL2	3.918	.5633	291
TL3	2.481	.5591	291
TL4	4.244	.5108	291
TL5	4.364	.5232	291
TL6	4.227	.6974	291
TL7	4.082	.6696	291

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	3.866	2.481	4.364	1.883	1.759	.417	7
Item Variances	.375	.261	.527	.266	2.018	.012	7

Quality and Accessibility of Education

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.873	.885	5

Item Statistics

	Mean	Std. Deviation	N
QA1	4.237	.6556	291
QA2	4.234	.6800	291
QA3	4.093	.6911	291
QA4	4.423	.4948	291
QA5	4.237	.5005	291

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	4.245	4.093	4.423	.330	1.081	.014	5
Item Variances	.373	.245	.478	.233	1.950	.013	5

Environment Learning

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.738	.733	5

Item Statistics

	Mean	Std. Deviation	N
EL1	4.302	.4821	291
EL2	4.540	.5196	291
EL3	4.110	.4089	291
EL4	4.124	.6312	291
EL5	4.179	.7209	291

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	4.251	4.110	4.540	.430	1.105	.032	5
Item Variances	.318	.167	.520	.353	3.109	.020	5

Motivation of Learning

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.860	.875	5

Item Statistics

	Mean	Std. Deviation	N
ML1	4.313	.4644	291
ML2	3.959	.6145	291
ML3	3.856	.4911	291
ML4	4.158	.3654	291
ML5	4.065	.4974	291

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	4.070	3.856	4.313	.457	1.119	.031	5
Item Variances	.243	.134	.378	.244	2.828	.008	5

Student Perceived Performance

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.814	.792	5

Item Statistics

	Mean	Std. Deviation	N
SP1	4.244	.7513	291
SP2	4.333	.6504	291
SP3	4.113	.5850	291
SP4	4.220	.6044	291
SP5	4.770	.4217	291

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	4.336	4.113	4.770	.656	1.160	.065	5
Item Variances	.375	.178	.564	.387	3.174	.020	5

APPENDIX E – FACTOR ANALYSIS TEST

Dependent Variable

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.598
Bartlett's Test of Sphericity	Approx. Chi-Square	923.910
	df	10
	Sig.	.000

Communalities

	Initial	Extraction
SP1	1.000	.856
SP2	1.000	.847
SP3	1.000	.420
SP4	1.000	.698
SP5	1.000	.096

Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.917	58.340	58.340	2.917	58.340	58.340
2	.948	18.957	77.298			
3	.685	13.695	90.993			
4	.397	7.937	98.930			
5	.054	1.070	100.000			

Extraction Method: Principal Component Analysis.

Component Matrix^a

	Component
	1
SP1	.925
SP2	.920
SP3	.648
SP4	.836
SP5	.310

Extraction Method:

Principal Component

Analysis.

a. 1 components

extracted.

Independent Variable**KMO and Bartlett's Test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.796
Bartlett's Test of Sphericity	Approx. Chi-Square	8707.666
	df	231
	Sig.	.000

Communalities

	Initial	Extraction
TL1	1.000	.810
TL2	1.000	.594
TL3	1.000	.602
TL4	1.000	.906
TL5	1.000	.709
TL6	1.000	.859
TL7	1.000	.882
QA1	1.000	.883
QA2	1.000	.812
QA3	1.000	.768
QA4	1.000	.931
QA5	1.000	.890
EL1	1.000	.756
EL2	1.000	.841
EL3	1.000	.818

EL4	1.000	.805
EL5	1.000	.727
ML1	1.000	.790
ML2	1.000	.882
ML3	1.000	.805
ML4	1.000	.878
ML5	1.000	.869

Extraction Method: Principal
Component Analysis.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	10.026	45.571	45.571	10.026	45.571	45.571
2	3.317	15.079	60.650	3.317	15.079	60.650
3	1.982	9.010	69.660	1.982	9.010	69.660
4	1.342	6.101	75.761	1.342	6.101	75.761
5	1.149	5.221	80.982	1.149	5.221	80.982
6	.850	3.863	84.845			
7	.800	3.638	88.483			
8	.605	2.750	91.233			
9	.357	1.621	92.854			
10	.317	1.440	94.295			
11	.285	1.294	95.589			
12	.222	1.008	96.597			
13	.172	.784	97.380			
14	.145	.660	98.040			
15	.119	.542	98.582			
16	.102	.463	99.045			
17	.069	.315	99.360			
18	.056	.257	99.617			
19	.041	.189	99.806			
20	.017	.079	99.885			
21	.016	.073	99.958			
22	.009	.042	100.000			

Extraction Method: Principal Component Analysis.

Component Matrix^a

	Component				
	1	2	3	4	5
TL1	.803	-.254	-.296	-.106	-.035
TL2	.668	.087	.096	.130	-.338
TL3	-.443	.219	.307	.362	.364
TL4	.356	.173	-.238	-.591	.586
TL5	.758	-.192	.106	-.215	-.201
TL6	.837	-.124	.203	-.283	-.149
TL7	.776	-.334	.371	.112	.137
QA1	.340	.873	-.031	-.032	-.060
QA2	.251	.815	.197	.093	-.192
QA3	.840	.218	.004	-.090	.076
QA4	.678	.658	.190	.030	.024
QA5	.823	.266	-.259	-.271	.041
EL1	.813	.151	-.229	.106	-.091
EL2	.690	.218	.535	-.153	-.086
EL3	.178	-.458	.689	-.310	-.076
EL4	.626	-.633	-.100	-.034	-.024
EL5	.606	-.382	.331	.318	-.056
ML1	.823	.173	-.247	.109	-.101
ML2	.675	-.402	-.505	.094	-.010
ML3	.654	-.049	.273	.079	.542
ML4	.799	-.070	-.274	.397	.032
ML5	.765	-.010	.051	.431	.311

Extraction Method: Principal Component Analysis.

a. 5 components extracted.

APPENDIX F – PEARSON CORRELATION ANALYSIS

Descriptive Statistics

	Mean	Std. Deviation	N
TL	3.8665	.37980	291
QA	4.2447	.49751	291
EL	4.2509	.39360	291
ML	4.0701	.39484	291
SP	4.3361	.46316	291

Correlations

		TL	QA	EL	ML	SP
TL	Pearson Correlation	1	.527**	.802**	.754**	.618**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	291	291	291	291	291
QA	Pearson Correlation	.527**	1	.362**	.520**	.466**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	291	291	291	291	291
EL	Pearson Correlation	.802**	.362**	1	.720**	.619**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	291	291	291	291	291
ML	Pearson Correlation	.754**	.520**	.720**	1	.417**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	291	291	291	291	291
SP	Pearson Correlation	.618**	.466**	.619**	.417**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	291	291	291	291	291

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

APPENDIX G – REGRESSION ANALYSIS

Descriptive Statistics

	Mean	Std. Deviation	N
SP	4.3361	.46316	291
TL	3.8665	.37980	291
QA	4.2447	.49751	291
EL	4.2509	.39360	291
ML	4.0701	.39484	291

Correlations

		SP	TL	QA	EL	ML
Pearson Correlation	SP	1.000	.618	.466	.619	.417
	TL	.618	1.000	.527	.802	.754
	QA	.466	.527	1.000	.362	.520
	EL	.619	.802	.362	1.000	.720
	ML	.417	.754	.520	.720	1.000
Sig. (1-tailed)	SP	.	.000	.000	.000	.000
	TL	.000	.	.000	.000	.000
	QA	.000	.000	.	.000	.000
	EL	.000	.000	.000	.	.000
	ML	.000	.000	.000	.000	.
N	SP	291	291	291	291	291
	TL	291	291	291	291	291
	QA	291	291	291	291	291
	EL	291	291	291	291	291
	ML	291	291	291	291	291

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	31.221	4	7.805	72.033	.000 ^b
	Residual	30.990	286	.108		
	Total	62.211	290			

a. Dependent Variable: SP

b. Predictors: (Constant), ML, QA, EL, TL

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
	B	Std. Error	Beta			
1	(Constant)	.783	.233		3.356	.001
	TL	.379	.099	.311	3.831	.000
	QA	.273	.048	.293	5.703	.000
	EL	.592	.088	.503	6.742	.000
	ML	-.389	.081	-.332	-4.811	.000

a. Dependent Variable: SP

Model Summary for R Values

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.708 ^a	.502	.495	.32918	.502	72.033	4	286	.000

a. Predictors: (Constant), ML, QA, EL, TL