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The Reality of Applying Six Sigma in Kuwaiti Higher Education Institutions from the Point of View of Its Faculty Members

Dr. Ghadeer Abdallah Hussain Jasem
Kuwait

Abstract
This study aimed at identifying the reality of applying six sigma in Kuwaiti higher education institutions from the point of view of its faculty members, The study population consisted of all faculty members in Kuwaiti universities, and a random sample consisted of (121) member was selected from Kuwait University and the Public Authority for Applied Education and Training university. The study findings showed that the arithmetic averages of applying Six Sigma in Kuwaiti higher education institutions from the point of view of its faculty members for the tool as a whole was medium, and the dimensions came in descending order as follows: (Management Support and commitment, Measurement and feedback, Improvement tools and techniques, Systems and processes, Resources, Education and training). And findings showed that there aren't statistically significant differences in the degree of applying Six Sigma in Kuwaiti higher education institutions attributed to gender, university or college variables.

1. Introduction

The environment of Higher Education and of society in general is going through very important changes today. The international quality rankings are an expression of the new competitive context of the universities. The searching for organizational excellence has as its base the development and updating of management within the processes, to be more efficient and competitive while decreasing the costs. Using cycles of continuous improvement and business management philosophies in order to achieve these objectives, visualizing education with a business approach where students, professors and administrative and service personnel are visualized as clients.

Quality is the most important factor of management, and Six Sigma is not only a new subject to discuss quality, but also a direct method of management to use statistic data (Chen, Farn & Tsai, 2009). Six Sigma is a quality management process for achieving, sustaining and maximizing business success. The premise of Six Sigma is that companies need consistently higher levels of quality and lower levels of cost and that a disciplined, organized approach will root out the variance, waste and errors that plague operations. A close understanding of customer needs, rigorous measurement and statistical analysis drives the process. Six Sigma improves quality and cuts costs throughout an enterprise, from manufacturing to sales and customer service. It provides a measure of quality that allows comparisons to be made between radically different business activities (Jones, 2004). Six Sigma is a metric refers to 3.4 defects per million opportunities (DPMO), where Sigma is a statistical term representing the variation around the process mean (George, 2002). The marching trend of the new economic order has generated a new capsule of SIX SIGMA as a unified approach to process excellence. The tests reveal that it has transformed some of the most successful companies in the world like Motorola, GE etc. It is activated as an approach to aiming at the target by changing the culture of a company, involving everyone in the company, not just the Black Belts and Green Belts (Mehrotra, 2007).

Applying Six Sigma tools and methodologies can be used to manage the practical challenges of improving, provide real-world direction for this new improvement agenda with targeted rapid deployment, achieve high impact results, return on investment, and growth in global market share (Burton, 2011). Higher education institutions interest in six sigma, as there are ten key reasons: (to create excellence in process delivery; to reduce defects; to increase efficiency; to create a quality focused mindset; to benefit from best practice; to bring clarity to the processes of HR; to use a structured scientific approach; to speak the same language and improve communication; to gain control over your processes; and to strengthen your business case) (Albeanu, Radford & Hunter, 2010).

The core principles underlying the approach are decreasing variability or unreliability in organizational work processes in higher education institutions, eliminate waste or activity that does not add value to desired outcomes, identify defects and decrease their incidence, reduce the cost of work processes, and improve beneficiary/client satisfaction levels (LeMahieu, Nordstrum & Cudney, 2017). The power that Six Sigma holds to accelerate innovation in higher education institutions is through its inherent focus on continuous improvement. By a disciplined approach to innovative Six Sigma methodologies, efforts can be focused on identifying the hands-on activities that require a small time investment but deliver high learning effect. Projects can then be prioritized for maximum employee workload reduction. Utilizing Six Sigma methodologies, organizations have the potential of reducing employee frustration while simultaneously increasing the employee energy available to focus on innovation (Elbadawi, Aichouni & Messaoudene, 2016).

Institutions for higher educations including universities and four year colleges in Kuwait have been

continuously striving for higher quality under the continuous pressure of public scrutinizes, budget crunch and cut in private, state and government funding. While demand for higher quality and productivity in higher education has been continuously growing the nations institutions of higher education are still run like seasonal business with escalating cost and low productivity. And according to the importance of concept and applications of six sigma method in solving problems and improving operations, and the benefits of sigma methods which help higher education institutions leaders to solve a wide range of problems in their operation, this research came to investigate the reality of applying six sigma in Kuwaiti higher education institutions from the point of view of its faculty members.

2. Problem and questions of the study

In the business world, especially in manufacturing or quality management, the term Six Sigma usually refers to a set of tools and methodologies developed by Motorola to improve processes by eliminating defects, and this is very important. Six Sigma is a discipline that has revolutionized many corporations, It has literally transformed them from a state of loss to one of profitability, It can be used to improve any process whether one used for tangible products or services. While universities are not typically viewed as "profit and loss" institutions, but their leaders have to be concerned with improving quality, reducing costs, and meeting customer and other stakeholder requirements. Higher education institutions have to raise quality and effectiveness in order to face global competitiveness. And in the light of the Kuwaiti government's growing interest in quality management and excellence, and in the light of the tremendous educational development and the absence of clear foundations for quality management in Kuwaiti higher education institutions. And according to the results of many previous studies Whose results showed a lack of implementation of the Six Sigma in institutions of higher education, such as Dodin and Masadeh (2014), and according to a few studies aimed at identifying aimed to identify the degree of applying Six Sigma in Kuwaiti higher education institutions from the point of view of its faculty members, this study came to answer the following questions:

1. What is the degree of applying Six Sigma in Kuwaiti higher education institutions from the point of view of its faculty members?

2. Are there statistically significant differences at the level of significance ($\alpha \leq 0.05$) in the degree of applying Six Sigma in Kuwaiti higher education institutions from the point of view of its faculty members attributed to (gender, college, university) variables?

3. The importance of the study

The importance of this study came from the urgent need to identify the degree of applying Six Sigma in Kuwaiti higher education institutions from the point of view of its faculty members because of the rapid educational developments in higher education institutions in Kuwait, and the importance of this study can be shown as follow:

Theoretical importance:

- Enrich the theoretical aspect regarded "Six Sigma in Kuwaiti higher education institutions", as the researcher hopes that this study contributes in enriching the Arab library in this field.
- This study is regarded as a guide for conducting new studies in "Six Sigma in higher education institutions".

Applied practical aspect:

- Providing a feedback about the degree of applying Six Sigma in Kuwaiti higher education institutions from the point of view of its faculty members to university management.
- the researchers and those interested in Six Sigma may benefit from the findings and recommendations of this study.
- Decision-makers in the Ministry of Education in Kuwait ay benefit from the findings and recommendations of this study, to help them making appropriate decisions to improve the educational process.

4. Terminology

The study adopting identifying the following term:

Six Sigma: "Six Sigma is a statistical quality control method of reducing variation and limiting defects within a process" (Fuqua, 2009, p.4), and it is identified in this study a quality control method that consists of Resources, Improvement tools and techniques, Measurement and feedback, Management Support and commitment, Systems and processes, Education and training.

5. Study limitations

The results of this study are determined by:

- The sample: it is limited to the Faculty Members in Kuwait University and in the Public Authority for Applied Education and Training University.
- The temporal boundary: it is limited to the academic year 2017-2018.

- Objective limit: it is limited in identifying the degree of applying Six Sigma in Kuwait University and in the Public Authority for Applied Education and Training University, from the point of view of its faculty members.

6. Variables

Independent variables:

The study includes three independent variables, namely:

Gender: male and female.

University: Kuwait University and the Public Authority for Applied Education and Training University.

College: scientific colleges and humanitarian Colleges.

7. Research previous studies

Lu, Laux & Antony (2017) conducted a study aimed at evaluate whether a Lean Six Sigma (LSS) leadership model could be effectively utilized to resolve efficiency and effective issues like rising costs, quality of education, graduation and retention rates encountered in higher education institutions (HEIs) in the modern era. Design/ methodology/ approach, the authors systematically reviewed the literature on key concepts of LSS and leadership in HEIs in to develop a theoretical model using an inductive theory-building approach in accordance with the exploratory nature of the study. Findings of the study proposed a conceptual LSS leadership framework, which provides a basis for testing of LSS leadership representations in HEIs. The results suggest that LSS leadership has advantages for HEI to overcome currents issues and challenges. LSS leadership model has its practical meaning in providing a fundamental base for HEIs to overcome challenges, fulfill missions, and sustain improvements.

Isa & Usmen (2015) conducted a study aimed to present a case study on the use of Lean Six Sigma principles and tools to study the improvement in design and construction services at a university. Findings -- It was found that non-value-added general improvement review form (GIRF) process steps involving revisions and rework for the design and construction result in time delays, cost increases and quality deficiencies and render cost estimates unreliable; these are unnecessary and should be minimized or eliminated. It was additionally noted that administrative reviews and approvals embedded in GIRF processes slow down work flow, leading to similar problems.

Dodin and Masadeh (2014) conducted a study aimed at identifying the applying of Six Sigma in Jordanian public and private universities, to achieve the objective of the study, the researcher used the descriptive approach, and to collect data, a questionnaire was used. The study population consisted of all 6613 Faculty Members of Jordanian Universities. A random sample of (269) members was selected, The results showed that the degree of applying Six Sigma in Jordanian universities was medium. And the applying of Six Sigma concepts in these Jordanian universities still new, and the absence of a clear model of Six Sigma that can be adopted by them, in addition to the weakness of qualified human resources, and the weakness of the financial resources necessary for applying six sigma and there are no statically significant differences attributed to gender or university variable.

Antony, Krshan, Cullen & Kumar (2012), conducted a study aimed at evaluating whether Lean Six Sigma (LSS) can be a powerful business improvement methodology for improving the efficiency and effectiveness of higher education institutions (HEIs). The authors use secondary data from literature to justify the need for this powerful approach and the benefits of adopting this business process improvement strategy within the HEIs. the findings showed that LSS can be a useful and systematic approach to tackle operational and strategic issues within the HE industry. And adopted the integrated LSS approach by higher education institutions (HEIs) leads to superior performance and enhanced student satisfaction.

Chen, Farn & Tsai (2009) conducted a study aimed at analyzing effectiveness of school education management Focus on Invested resources to private universities' students with Six Sigma. The Department of Higher Education of Ministry of Education has administered an academic evaluation for universities and colleges in 2004~2005. This study adopts the quantification data of 29 private universities and colleges, and tries to analyze the effectiveness of school education management in 2003. The findings showed that there is a positive influence on the effectiveness of school education management. The universities and colleges invest in resources to run a school facing students or teachers keep 1.2~2.1 sigma at present.

Dols, L. & Knight, E. (2009) conducted a study aimed at investigating the success of the University of Arizona Library in implementing six sigma, In 2004, the University of Arizona Library Document Delivery Team embarked on a strategic project to assess the service quality and cost of filling interlibrary loan journal article borrowing requests. The Document Delivery Team utilized a Six Sigma Define, Measure, Analyze, Improve, and Control process improvement method. Improvements that were implemented as a result of this study led to increased satisfaction, decreased turnaround time, and lower cost per delivered article.

Kumi & Morrow (2006) conducted a study aimed to increase self-issue levels using six sigma methodology in Newcastle University Library, the six-month long project is outlined and gives an insight into the process

improvement methodology called six sigma. Findings: Outlines the long and short term measures which were needed to improve the self-issue service. The findings showed that six sigma improved the self-issue service in a systematic way in Newcastle University Library.

8. Method and procedures

8.1 Methodology

This study aimed at investigating the degree of applying Six Sigma in Kuwaiti higher education institutions from the point of view of its faculty members, so the study used the descriptive method which is regarded suitable to answer the aims of this research.

The study population consisted of all faculty members in Kuwaiti universities, and a random sample consisted of (121) member was selected from Kuwait University and the Public Authority for Applied Education and Training university, and table (1) shows that.

Table (1): the Distribution of respondents according to study variables

variables	Variable level	number	Total
gender	male	92	121
	female	29	
university	Kuwait University	86	121
	The Public Authority for Applied Education and Training university	35	
College	Scientific Colleges	38	121
	Humanitarian Colleges	83	

8.2. The Study tool

To investigate the degree of applying Six Sigma in Kuwaiti higher education institutions from the point of view of its faculty members, a questionnaire was developed by the researcher**,** referring to the previous studied in this field such as the study of Salah Aldin (2009),

8.3. Validity of the study tool

To ascertain the validity of the study tool, content validity was used by viewing the questionnaire to (13) arbitrators of the faculty members who specialize in educational administration, so as to take their opinions on the content of the questionnaire, the adequacy of paragraphs, the need to modify or delete any paragraph, and any comment they think it is necessary, and according to the observations of the arbitrators, some items were modified, but no item deleted, and the researcher found that the paragraphs were correlated to their dimensions, as the agreement degree between the arbitrators reached (94%), and this percentage is regarded suitable for the purposes of this study.

8.4. Reliability of the study tool

Research tool reliability was assured by using (Test- retest), and by applying it on (20) member from outside the research sample, and Pearson correlation coefficient was calculated, and the value of reliability coefficient was (0.90), and this is an acceptable value for the purposes of the research.

The degree of applying Six Sigma in Kuwaiti higher education institutions was determined by dividing the degrees to three levels (high, medium, low) based on the following equation:

The highest value – the lowest value / number of levels = (5-1) / 3 = 4/3 = 1.33.

Thus it was adopted the following Criterion to determine the degree of applying Six Sigma in Kuwaiti higher education institutions:

- Low degree: between (1- 2.33).

Medium degree: between (2.34- 3.67).

.(High degree: between (3.68- 5.00).

8.5. Statistical treatment

To answer the questions of the study the appropriate statistical methods were used as follow:

- To answer the first question, the arithmetic averages and standard deviations were used.
- To answer the second question the independent samples t- test was used.

9. Study results and discussion

The results of the study are organized and discussed, as follows:

9.1. First question: "**what is the degree of applying Six Sigma in Kuwaiti higher education institutions from the point of view of its faculty members**?" This question was answered as follows:

The arithmetic averages and the standard deviations of applying Six Sigma in Kuwaiti higher education institutions from the point of view of its faculty members for the tool as a whole and for each of its dimensions were calculated, and table (2) shows that.

Table (2): The arithmetic averages and the standard deviations of applying Six Sigma in Kuwaiti higher education institutions from the point of view of its faculty members for the tool as a whole and for each of its dimensions

no.	The dimension	arithmetic average	standard deviation	rank	degree
4	Management Support and commitment	2.71	0.38	1	medium
3	Measurement and feedback	3.56	0.33	2	medium
2	Improvement tools and techniques	3.55	0.41	3	medium
5	Systems and processes	2.87	0.61	4	medium
1	Resources	3.12	0.33	5	medium
6	Education and training	3.57	0.39	6	
	The whole degree	3.22	0.24	medium	

It can be seen from Table (2) that the arithmetic averages of applying Six Sigma in Kuwaiti higher education institutions from the point of view of its faculty members for the tool as a whole was medium, and the arithmetic average was (3.12) with a standard deviation (0.24), and all the dimensions came in medium degree, this finding means that there are some weakness in the applying Six Sigma in Kuwaiti higher education institutions from the point of view of its faculty members, and this result may be attributed to the lack of clear understanding of six sigma, the insufficient physical and human resources, and expecting not to be successful, as well as the inability of the organization to cover the costs of trainees, experts and trainers, beside the great effort needed to build the information system, and the need to change the organizational culture of the university in order to meet the requirements of the Six Sigma, in addition to the lack of qualified human resources in this field, and the lack of an effective communication and feedback system. The results of this study agree with the results of Dodin and Masadeh (2014), showed that the degree of applying Six Sigma in Jordanian universities was medium.

9.2. Management Support and commitment

The researcher calculated the arithmetic averages and the standard deviations for this dimension: 'management support and commitment", and table (3) shows that.

Table (3): The arithmetic averages and the standard deviations for the dimension: 'management support and commitment".

no.	The dimension	arithmetic average	standard deviation	rank	degree
9	University management supports six sigma implementation.	**3.25**	**0.85**	**1**	medium
11	University management builds a control quality culture.	**3.06**	**0.74**	**2**	medium
7	The task of quality control is assigned to a particular department.	**2.61**	**0.65**	**3**	medium
12	University management promotes quality control implementation.	**2.55**	**0.68**	**4**	medium
10	University management interests in the quality of service. provided to customers	**2.41**	**0.61**	**5**	medium
8	Quality control and continuous improvement are clear objectives in management strategy	**2.40**	**0.81**	**6**	medium
	The whole degree	**2.71**	**0.38**	**medium**	

It can be seen from table (3) that the degree of "**Management Support and commitment**" dimension as a whole, came medium, and the arithmetic average was (2.71) with a standard deviation (0.38), and all the items came in medium degree, these findings mean that there is some weaknesses in university Support and commitment, probably this finding may be attributed to the weaknesses in the desire of university management to apply Six Sigma, the ability to link methodology to strategy, reliance on facts and data in the decision-making process, defining responsibilities and tasks in the organization, building a review system and a control quality culture, and persuading lower level employees of the importance of implementing the Six Sigma Performance of the Organization. The presence of these weak points weakened the level of "support and commitment" which came in the medium degree.

9.3. Measurement and feedback

The researcher calculated the arithmetic averages and the standard deviations for this dimension: "Measurement and feedback", and table (4) shows that.

Table (4): The arithmetic averages and the standard deviations for the dimension: 'management support and commitment".

no.	The dimension	arithmetic average	standard deviation	rank	degree
14	Customer satisfaction levels are measured and monitored.	**3.95**	**0.75**	1	high
16	A system to feedback customer concerns is established.	**3.77**	**0.95**	2	high
17	Internal measures (such as quality costs, no. of rejects). collected to monitor quality improvement.	**3.69**	**0.85**	3	high
13	Employees' views are listened to and acted upon.	**3.58**	**0.74**	4	medium
15	Critical processes are identified for improvement.	**2.80**	**0.84**	5	medium
	The whole degree	**3.56**	**0.33**	medium	

It can be seen from table (4) that the degree of " **Measurement and feedback**" dimension as a whole, came medium, and the arithmetic average was (3.56) with a standard deviation (0.33), and the items range between medium and high degree, these findings mean that there are some weaknesses in "Measurement and feedback" despite the interest of the university management in the satisfaction of service recipients, and in receiving feedback about, there are some weaknesses in "Measurement and feedback", probably this finding may be attributed to the weaknesses in establishing process performance baselines as the basis for improvement, so there's a weak in identifying creative solutions to eliminate the key root causes in order to fix and prevent process problems, so there is a weakness in the chance of improvement. And maybe the presence of these weak points weakened the level of "**Measurement and feedback**" which came in the medium degree.

9.4. Improvement tools and techniques

The researcher calculated the arithmetic averages and the standard deviations for this dimension: "Improvement tools and techniques", and table (5) shows that.

Table (5): The arithmetic averages and the standard deviations for the dimension: "Improvement tools and techniques".

no.	The dimension	arithmetic average	standard deviation	rank	degree
21	Statistical techniques used in design processes.	**3.81**	**1.00**	1	high
22	Statistical techniques used in production processes.	**3.68**	**0.99**	2	high
18	Training on tools and techniques provided.	**3.69**	**0.91**	3	medium
20	Non-production related functions such as marketing and sales use quality tools for improvement activities.	**3.56**	**1.06**	4	medium
19	Appropriate techniques are implemented when necessary.	**3.01**	**0.77**	5	medium
	The whole degree	3.55	0.41	medium	

It can be seen from table (5) that the degree of "**Improvement tools and techniques**" dimension as a whole, came medium, and the arithmetic average was (3.55) with a standard deviation (0.41), and the items range between medium and high degree, these findings mean that there are some weaknesses in proving the improvement tools and techniques needed for applying sigma six, and these findings may be attributed to some weaknesses in using the Appropriate techniques to improve communication between different administrative levels, and between management and employees. There is also a weakness in using the appropriate improvement tools to improve the information system that meets and enhances the needs of the organization, and there is a weakness in technical support supported by university management which reflects the nature of responsibility that must be present to ensure the success of applying sigma six.

9.5. Systems and processes

The researcher calculated the arithmetic averages and the standard deviations for this dimension: "Systems and processes", and table (6) shows that.

Table (6): The arithmetic averages and the standard deviations for the dimension: "Systems and processes".

no.	The dimension	arithmetic average	standard deviation	rank	degree
23	Systems and procedures for quality assurance are implemented.	3.17	0.90	1	medium
26	Information and data collection system established to monitor improvement activities.	3.01	0.72	2	medium
27	Relevant training system in place.	2.86	0.96	3	medium
24	Key educational processes identified, improved and monitored.	2.81	1.00	4	medium
25	Key educational processes focused on meeting the needs of customers.	2.48	0.81	5	medium
	The whole degree	2.87	0.61	medium	

It can be seen from table (6) that the degree of "**Systems and processes**" dimension as a whole, came medium, and the arithmetic average was (2.87) with a standard deviation (0.61), and all its items came in medium degree, these findings mean that there are some weaknesses in identifying, improving and monitoring Systems, procedures and processes to apply sigma six in Kuwaiti educational institutions successfully. And these findings may be attributed to some weaknesses in using the appropriate system and possess to improve the quality of the output of a process by removing the causes of defects and minimizing variability in educational processes. And these findings may be attributed to some weaknesses in using quality management methods, mainly empirical, statistical methods to create a special infrastructure of people within the university who are experts in these Systems and processes.

9.6. Resources

The researcher calculated the arithmetic averages and the standard deviations for this dimension: "Resources" and table (7) shows that.

Table (6): The arithmetic averages and the standard deviations for the dimension: "Resources".

no.	The items	arithmetic average	standard deviation	rank	degree
31	Sufficient financial resources provided to support improvement activities.	3.84	0.71	1	high
28	Human resource availability considered in improvement activities.	3.41	0.71	2	medium
29	Investment decisions based on sound resources consideration.	2.89	0.92	3	medium
30	Technical resources (e.g. software, equipment) are provided.	2.35	0.68	4	medium
	The whole degree	3.12	0.33	medium	

It can be seen from table (7) that the degree of "**resources**" dimension as a whole, came medium, and the arithmetic average was (3.12) with a standard deviation (0.33), and all its items came in medium degree, these findings may be attributed to some weaknesses in the programs of developing human resources by providing them with the necessary data, expertise, technological tools, modern systems, in addition to motive them materially and morally, which leads to the failure of data transfer and the failure of receiving feedback from employees, coupled with poor communication between management and students, these negatives weakened the Six Sigma's success.

9.7. Education and training

The researcher calculated the arithmetic averages and the standard deviations for this dimension: "Education and training" and table (8) shows that.

Table (8): The arithmetic averages and the standard deviations for the dimension: "Education and training".

no.	The items	arithmetic average	standard deviation	rank	degree
35	Employees are trained in job-specific skills.	4.01	0.72	1	high
32	2. Employees are trained in quality-specific tools and techniques.	3.81	0.79	2	high
33	3. Employees are trained on total quality concepts.	3.61	0.72	3	medium
34	4. Training time is provided for employees.	3.41			medium
36	5. Regular training is provided by quality management team.	3.01	0.65	4	medium
	The whole degree	3.57	0.39	medium	

It can be seen from table (8) that the degree of "**Education and training**" dimension as a whole, came medium, and the arithmetic average was (3.57) with a standard deviation (0.39), and all its items came in medium degree, these findings may be attributed to the lack of qualified and specialized expertise in the training of the Six Sigma Quality Entrance Approach, because of the lack of qualified Six Sigma trainers who are able to transfer their experiences to employee in university. And the lack of appropriate opportunities for employees in the university to be trained to apply the Six Sigma, in addition to the weakness in convincing employees to train on applying the six sigma approach to achieve the objectives of the university, and repair defects. Beside the weakness of the incentive system for trainers and trainees, this leads to fear of Six Sigma applying.

10. The findings and discussion of the second question: Are there statistically significant differences at the level of significance ($\alpha \leq 0.05$) in the degree of applying Six Sigma in Kuwaiti higher education institutions from the point of view of its faculty members attributed to (gender, college, university) variables?

To investigate if there are **statistically significant differences at the level of significance ($\alpha \leq 0.05$) in the degree of applying Six Sigma in Kuwaiti higher education institutions from the point of view of its faculty members attributed to (gender, college, university) variables**, the researcher calculates averages, standard deviations, and independent samples (t- test), and Table (8) shows that.

Table (8):The (t- test) findings for the differences between the averages of the research sample responses attributed to (gender, college, university) variables

Variable	Variable levels	No.	arithmetic averages	Standard deviation	Degree of freedom	The value of T	The level of significance
gender	male	92	3.26	0.42	119	2.201	0.107
	female	29	3.09	0.38			
university	Kuwait University	86	3.21	0.47	119	2.145	.361
	The Public Authority for Applied Education and Training university	35	3.25	0.34			
College	Scientific Colleges	38	3.16	0.32	119	.624	.247
	Humanitarian Colleges	83	3.25	0.84			

- It can be seen from Table (8) that there aren't statistically significant differences at the level of significance ($\alpha \leq 0.05$) in the degree of applying Six Sigma in Kuwaiti higher education institutions attributed to (gender) variable, as the value of (T) was (2.201), at level of significance (0.107), which isn't a statistically significant value, Perhaps this finding attributed to educational system in Kuwaiti universities, which offers the same opportunities for professional development for males and females, And thus they acquire similar experiences, which in turn reduced the differences between their views.

- It can be seen from Table (8) that there aren't statistically significant differences at the level of significance ($\alpha \leq 0.05$) in the degree of applying Six Sigma in Kuwaiti higher education institutions attributed to (university) variable, as the value of (T) was (3.13), at level of significance (0.34), which isn't a statistically significant value, Perhaps this finding attributed to the fact that all of the faculty members in Kuwaiti universities have the same opportunity in learning and trained, and in using the same technological tools, and both of the two category are in a direct contact with students affairs and problems, which reduced the differences between their point of view.

- It can be seen from Table (8) that there aren't statistically significant differences at the level of significance (α

≤ 0.05) in the degree of applying Six Sigma in Kuwaiti higher education institutions attributed to (college) variable, as the value of (T) was (0.624), at level of significance (0.247), which isn't a statistically significant value, Perhaps this finding attributed to the fact that both types of colleges (Scientific College and Humanitarian College) Subject to the same instructions and regulations. And the faculty members in both types of colleges (Scientific College and Humanitarian College) are taken the same qualifying courses and the same training programs, which reduced the differences between their point of view. The findings of this study agree with the findings with findings of Dodin and Masadeh (2014) which showed that there are no statically significant differences attributed to gender or university variable.

11. Recommendations and suggestions

The researcher recommends the following:

-Adopting training employee on Six Sigma programs by the university management.

-Adopting proving human and material resources necessary for applying of Six Sigma by the university management.

- identifying key educational processes by the university management to focus on meeting the needs of customers.

- identifying critical processes by the university management to focus on improvement.

- identifying quality control and continuous improvement by the university management to be clear objectives in management strategy.

-Conducting Further studies, and comparing their findings with the findings of the this research.

References

Albeanu, M., Radford, J. & Hunter, I. (2011), **Six Sigma in HR Transformation : Achieving Excellence in Service Delivery**, Ebesco, 389097.

Antony, J., Krshan, N., Cullen, N. & Kumar, M. (2012), Lean Six Sigma for higher education institutions (HEIs)Challenges, barriers, success factors, tools/techniques. I**nternational Journal of Productivity & Performance Management**. 61(8), p940-948.

Burton, T. (2011), **Accelerating Lean Six Sigma Results : How to Achieve Improvement Excellence in the New Economy**, Ebesco, 593300258.

Chen, W., Farn, S. & Tsai, H. (2009), Analyzing Effectiveness of School Education Management Focus on Invested Resources to Private Universities' Students with Six Sigma, **international Journal of Learning**. 16(5), p539-547.

Dodin and Masadeh (2014), "The Extent of Using Six Sigma Concepts in Jordanian Public and Private Universities." **Arab Journal for Quality Assurance of Higher Education,** p. 16 (1), p. 162-184.

Elbadawi, E., Aichouni, N. & Messaoudene, A. (2016), Developing an Innovative and Creative Hands-on Lean Six Sigma Manufacturing Experiments for Engineering Education, **Engineering, Technology & Applied Science Research**, 6(6), 1297-1302.

Fuqua, D. (2009), No Belts Required, the Advantages and Limitations of Statistical Quality Control, **Army Logistician**, 41(4), P.54.

George, M. (2002), **Lean Six Sigma: Combining Six Sigma Quality with Lean Speed**, McGraw-Hill, New York, NY.

Isa, M. & Usmen, M. (2015), Improving university facilities services using Lean Six Sigma: a case study. **Journal of Facilities Management**. 13(1), 13 Issue 1, p70-84.

Kumi, S. & Morrow, J. (2006), Improving Self Service the Six Sigma Way at Newcastle University Library, Program, **Electronic Library and Information Systems**, (40), 2 p123-136.

L. & Knight, E. (2009), Interlibrary Loan Meets Six Sigma: The University of Arizona Library's Success Applying Process Improvement, **Journal of Interlibrary Loan, Document Delivery & Electronic Reserves.** 19(1), p75-94.

LeMahieu, G., Nordstrum, E. & Cudney A. (2017), Six Sigma in Education, Quality Assurance in Education: **An International Perspective**, 25(1), p91-108.

Lu, J,. Laux, C. & Antony, J. (2017), Lean Six Sigma leadership in higher education institutions, **International Journal of Productivity & Performance Management**. 66(5), p638-650.

Mehrotra, D. (2007), Need of Six Sigma in Education, Journal of Dols, Educational Technology, 4(3), p13-18.

Salah aldin, S. (2009), Six Sigma Practices in the Banking Sector in Qatar, Global Business and Management Research: **An International Journal**, 1(1), 23- 35.