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# The Impact Of The Requirements For Applying The Six Sigma Methodology In Improving The Quality Of University Education

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**Abstract**

One of the main issues in education today is the improvement of the quality of education. It has led those who are interested in competition to increase the demand for quality. In the past, Six Sigma has been used successfully to improve products and services in companies, but the concept has not been trusted in higher education. The current research aims to identify the impact of the requirements for applying the Six Sigma methodology in improving the quality of university education. The research used the analytical method using a questionnaire and applying it to a sample of university professors. A structural model was formulated and tested using a set of advanced statistical methods such as correlation, regression, factor analysis, and structural modeling, the research reached a set of conclusions, the most important of which is that there is a positive impact of the Six Sigma methodology in improving the quality of university education, as it is possible, by applying the Six Sigma methodology, to improve the quality of educational outcomes by reducing error rates and problems in educational programs, and ensuring that educational outcomes meet the needs of the market.

**Keywords**: Six Sigma, management support, relationship with customers, infrastructure, training and efficiency, continuous improvement, quality of university education.

## Introduction

The issue of modernizing and reforming higher education institutions has become one of the basic foundations for developing the education system to adopt its various elements, including educational programs, academic and administrative staff members, buildings, equipment...etc. This created a need for modern administrative methods in higher education institutions, in order to qualitatively develop their outputs and achieve alignment between them and development requirements. However, applying such administrative methods in higher education institutions is not an easy matter, as they are service institutions that have their own characteristics. Educational services have no known borders, so higher education institutions must have an in-depth vision of the requirements for applying modern management methods and try to adapt them to their own needs to achieve their desired goals, especially quality.

Among the most important modern management methods that are widely used in business organizations is the Six Sigma method (Housseyn et al., 2021). Companies are in a lot of competition for market position on a global scale. To stay in business for a long time, they need to improve how they make things and run their businesses. This makes a lot of demands on everyone involved with these groups. Higher education institutions (HEIs) are also affected by these demands because they train professionals with the skills needed in today's globalized world, including those who work in manufacturing and service-related fields.

In Iraq, higher education institutions have to deal with the country's economic problems, as well as the needs of the social and productive sectors regarding how important education is. The costs are going up, and the budgets given by government institutions are barely enough to cover their costs and annual operating expense needs (Velázquez, 2014). Additionally, students, parents, and

employers in higher education institutions see the quality of teaching as a key factor in how competitive a person is in the job market. To this end, it is necessary to incorporate tools that enhance the quality of teaching, research, service, management, technology, and support processes (Ramasubramanian, 2012).The educational institution becomes free of defects, and therefore the Six Sigma methodology depends on linking the highest quality with the lowest costs of the educational process (Morsi, 2022) . As a result, some universities around the world have now succeeded in incorporating quality strategies to improve their operations (Pandi et al., 2016) , some universities have applied the Six Sigma methodology as a strategy to improve quality in their operations, for example, in the Kingdom of Saudi Arabia, King Abdullah University of Science and technology,In the United States of America, the University at Buffalo (Jankowski, 2013), Valdosta State University and Gordon State College, in the United Kingdom, Newcastle University, in South Korea, and Sungkyunkwan University, in Iran, Regional Information Center for Science and Technology (Biranvand y Akbar, 2013), on For example (Gastelum et al., 2018). With regard to Iraq, the literature on improvement projects in higher education institutions is scarce, which raises the need to analyze the process improvement strategies currently followed by these institutions. In addition, no previous evidence was found from studies on the feasibility of applying Six Sigma in the context of higher education institutions in Iraq.

Therefore, the aim of this work is to identify the impact of the Six Sigma methodology in improving the quality of university education in Iraq.

## Literature Review

### Six Sigma Methodology

The term Six Sigma is derived from statistics and focuses on measuring product or process defects. The symbol sigma is a Greek letter that represents a measure

of deviations through the shape of the distribution or spread around the mean or average value of any process or procedure in industrial, engineering, service operations, or commercial transactions in general. Achieving the Six Sigma level is equivalent to a performance that is almost free of errors and defects, as this process aims to ensure that the defects, deviations, or errors arising from the various processes do not exceed (3-4 errors or defects per million events) (Donald, 2006).

Researchers have addressed the concept of Six Sigma as a set of structured processes that aim to achieve a specific performance level with a degree very close to perfection when implementing operations (William Truscott, 2016). It is a way to make business better and more profitable by cutting down on waste, lowering the cost of poor quality, and making all of the company's production processes more efficient and effective. (Lazurus & Wendy, 2014).

In general, Six Sigma is defined as a set of systematic and statistical processes that aim to prevent errors in performance and achieve consumer satisfaction. This methodology aims to reduce deviation by following a set of analytical processes that may show that there is a length in the time cycle for the process performance and/or there is a high Cost and/or poor output. By following this methodology in doing business, it is possible to achieve a quality level that reaches more than . 99.99% (Halqan ,2021).

**The Importance Of Six Sigma**

The Six Sigma approach has some benefits and advantages, the most important of which are the following (Masri,2014):

1. Focus on the final effects of its application, as this approach is not accepted unless its final results are determined, which makes it have a significant impact on the presence of effective administrative leadership.

2. It uses a comprehensive, interconnected methodology for improvement, as this methodology has proven its effectiveness in raising the level of performance of all the processes to which it has been applied.
3. An approach that seeks to integrate the improvement of an organization's operations and its human resources.
4. It includes forming a work team that has personal experience and skills from the administrative, technical and statistical aspects.
5. It ensures reducing the cost of poor quality (defects in production), and the problems that result from it, such as delay in the delivery date, dissatisfaction from beneficiaries, and the loss of a number of beneficiaries.
6. The ability to reduce worthless processes and focus on processes with critical quality characteristics (Pandya, 2022).
7. Increase awareness and understanding of ways to solve problems, and ways to use tools and techniques, which affects increased employee satisfaction.

Anthony pointed out several benefits of using this methodology, including:

1. Improving the organization as a whole by developing work teams.
2. Changing the organizational culture from a pattern of combating errors to a pattern of preventing errors.
3. Increase employee morale.
4. Eliminate steps that are considered unnecessary in operations.
5. Reducing the cost of poor quality.
6. Satisfying employees by spreading increased awareness of tools and the use of techniques in solving problems.
7. Relying on data and facts for effective management decisions instead of personal opinions (Antony, 2014).[5]

## Six Sigma Dimensions

There are five main dimensions of Six Sigma that constitute one of the key techniques used to improve any process (Cherrafi et al. 2016). Six Sigma consists of five parts: define, measure, analyze, improve, and control. This method is an organizational improvement method that focuses on process outcomes that matter to customers to find and eliminate the causes of errors or defects in business processes (Hazen et al. 2014). The behavioral dimensions of the Six SCMA methodology that include support from management, customer relationship, infrastructure, training and efficiency, and continuous improvement will be used for this study as it shown in Figure 1.

## Management Support

Management support is an umbrella term for ideas or systems used to help managers do their jobs. The first study to look at how to change the Six Sigma system to support management was (Cherraf, 2016). It indicates that any manufacturing company that uses Six Sigma was able to obtain good management because the Six Sigma tool makes it easy to find all databases, which speeds up the management of the production process. Six Sigma is a complete and adaptable tool that will help the organization manage itself better, which will have a positive impact on total quality management and performance in general.

## Relationship With Customers

Establishing a relationship with a customer means listening to and responding to any complaint or compliment they offer. Swink and Bryan (2012), in their research paper titled “Customer Focus and Quality Management,” point out that Six Sigma has helped most companies improve their work and pay more attention to their customers. Because of the use of the Six Sigma tool, companies focused on a lot of customer complaints. The goal of the Six Sigma

method is to obtain and maintain the six standard deviations between the mean and the closest to the specification.

**Infrastructure**

infrastructure refers to the physical or organizational structures that an industry needs to operate. In his 2016 study on Six Sigma and Infrastructure in Industries, (Cherraf )noted and provided a detailed description of how Six Sigma and Infrastructure are used in the study of structure and modeling. In this area, they pointed out how Six Sigma helps the organization's work as a whole. Moreover, it shows how similar and different the benefits that organizations obtain from using the Six Sigma methodology are. In addition, they point out that the analysis done in industries can also be used in other industries, although it would cost a lot to prepare.

**Training And Efficiency**

Training and efficiency means developing the skills and knowledge you need to do specific tasks (Ekkelenkamp, 2016). efficiency means that someone has been trained and can do the task assigned to them. In their 2016 study on the effects of Six Sigma on training and efficiency, Kwak and Frank argue that all industries became more technically advanced because Six Sigma helped them build their human capital in a real way. Six Sigma is a platform that any organization can use to improve its training facilities and hire people with the right skills for today's job market.

**Continuous Improvement**

Improvement is the process or continuous work to improve a product or service (Besant et al., 2015). (Bhuiyan et al., 2015) refer to the history of Six Sigma and the history of industries in terms of their stability and income. They refer to that things started going well for companies once they started using the Six Sigma statistical tool. Starting in 2000, any company using Six Sigma saw a significant

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rise in profits (Sreedharan & Raju, 2016). In their study, Bhuiyan and Baghel found that fewer defects led to more sales, which in turn led to a larger market share.

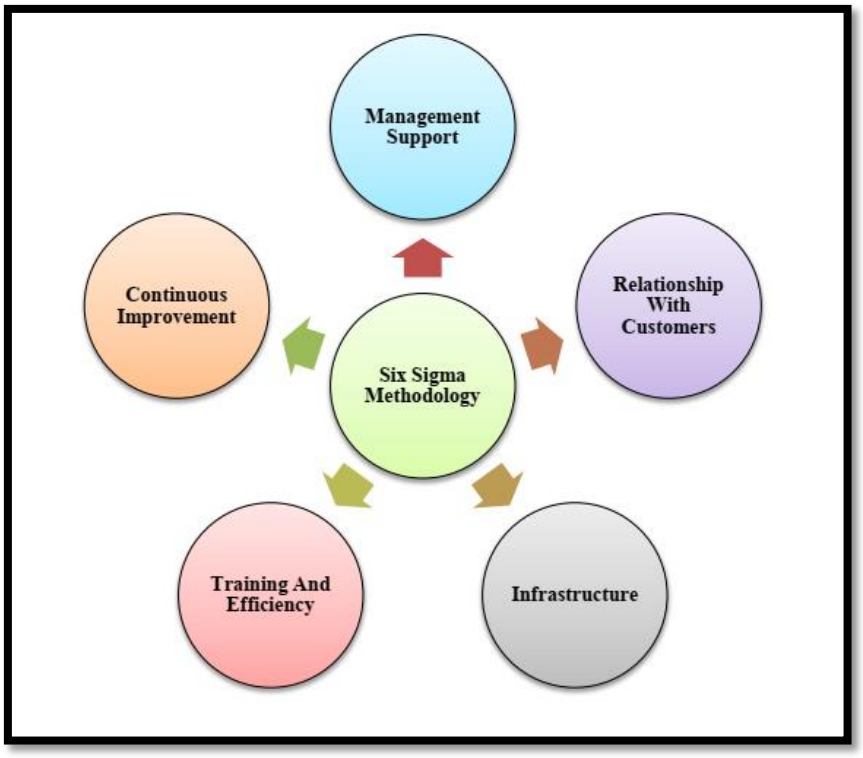


Figure 1: Six Sigma Dimensions

**Quality Of University Education**

Interest in the quality of education has increased in educational institutions in general and universities in particular. This has been demonstrated by the conduct of many academic studies and research on the subject of quality in the educational field, the beginnings of which were launched in the four famous studies published in the Harvard Educational Review in In 1996, under the title: (We work together for reform), in addition to holding many international research seminars and discussions on quality in its multiple dimensions, and in the various stages and types of education, such as the one held at the University of Oxford in England in the period 7-12. March 1999) on the topic: (Ensuring

quality and standards in higher education).The term quality in university education refers to the overall efforts made by faculty members, scientific leaders, and administrators in the educational institution to direct resources and processes to raise the level of educational outcomes commensurate with the requirements of society. The concept of quality is considered one of the main pillars of competition in the past two decades (Noaman, 2017). Therefore, quality has become the main focus of university management in the future, as the quality of educational service has become a necessity whose importance increases as its ability to achieve the full desires of students increases, by meeting their stated and undeclared requirements, needs, and expectations (Thareja,2017).Juran says that achieving quality in higher education is an administrative approach and process that aims to make higher education adequate and create the right academic environment for students to get a university degree. (Faruq, 2023). From Adams' point of view, quality in university education means the quality of the learners, the university environment, education processes, and the outcomes that include knowledge, skills, and attitudes that reflect positively on community service. The quality of university education depends entirely on the quality of the teaching staff and the quality of the student support system. In simple words, quality is the purity of knowledge (100%) acquired from faculty members and the standards set by the higher education institution to transform the current state of knowledge of the student community to face the upcoming challenges effectively and efficiently, as seen by (Joshi,2018). This means that quality in university education is not determined by the quality of a specific element of educational science nor by the data of its environment only, but rather describes the state of integration and interaction between the various elements and the outcome of the resulting outcomes, which are supposed to achieve an effective response to the needs and

expectations of the beneficiaries (stakeholders), and this makes The concept of quality is a relative concept that is difficult to generalize or define by a standard (Bazhenov et al., 2015).

**Methodology**

The study used the descriptive analytical method using a questionnaire as the main tool for collecting data. The questionnaire consisted of two types of variables, the independent variable (requirements of the six requirements) and includes (management support, relationship with customers, infrastructure, training and efficiency, and continuous improvement).The dependent variable is the quality of university education. The questionnaire was distributed to a sample of (81) university professors, and the analysis aims to identify the relationships within the model in Figure 2 , and test the following hypotheses:

Hypothesis (H1) There is a significant correlation between Six Sigma and the quality of university education, and sub- hypotheses

Hypothesis (H2): There is a significant effect between six levels and the quality of university education, and sub- hypotheses.

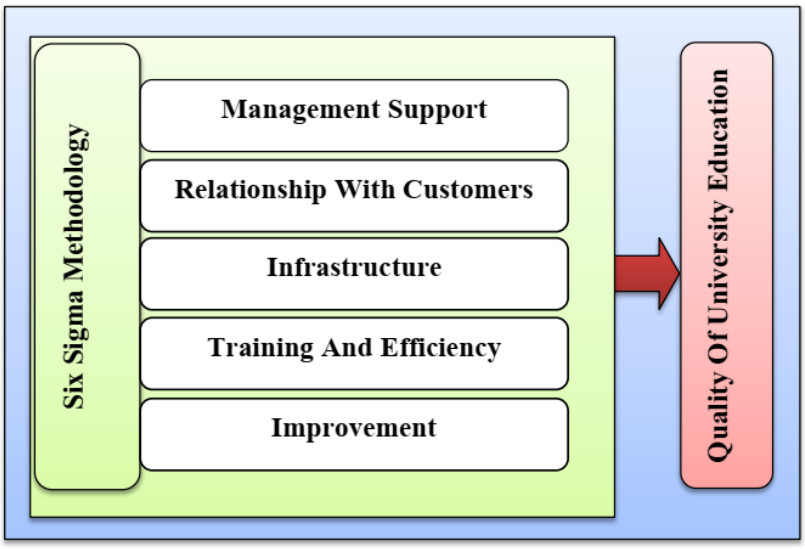


Figure 2: Study Model

**Normal Distribution**



To know the nature of the data and whether it follows a normal distribution or

not, we resort to performing a test by identifying the values of kurtosis and skewness, which are required to be between (+1.96) and (-1.96), Table 1 indicates that the data of the variables follow a normal distribution.

Table 1: Normality Test

| Variable | Skew | Kurtosis |
|---|---|---|
| q25 | -.199 | -.663 |
| q24 | -.848 | .418 |
| q23 | -.493 | -.374 |
| q22 | -.433 | -.352 |
| q21 | -.588 | .241 |
| q20 | -.493 | .527 |
| q19 | -.452 | -.436 |
| q18 | -.672 | -.131 |
| q17 | -.917 | 1.335 |
| q16 | -.783 | 1.048 |
| q15 | -.414 | -.280 |
| q14 | -.953 | .715 |
| q13 | -.512 | -.652 |
| q12 | -.451 | -.403 |
| q11 | -.587 | .163 |
| q10 | -.013 | -.504 |
| q9 | -.941 | 1.988 |
| q8 | -.489 | -.675 |
| q7 | -.725 | .656 |
| q6 | -.247 | -.876 |
| q5 | -.344 | -.457 |
| q4 | -.846 | .403 |
| q3 | -.438 | -.364 |
| q2 | -.454 | -.372 |
| q1 | -.456 | .122 |
| Multivariate | | 716.864 |
| z10 | -.008 | -.641 |
| z9 | -.918 | 1.470 |
| z8 | -.541 | -.526 |
| z7 | -.657 | .599 |
| z6 | -.327 | -.771 |
| z5 | -.533 | .113 |

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| | | |
|---|---|---|
| z4 | -.809 | .362 |
| z3 | -.516 | -.295 |
| z2 | -.654 | .241 |
| z1 | -.766 | .952 |
| Multivariate | | 28.689 |

## Linearity Test

The linearity test is used for the data in order to identify the linearity of the data, which contributes to estimating the relationship well, within its assumptions that the data must be spread around the scattering line, and a slight deviation does not affect the results. In order to test the linearity of the data, the (outlier) test will be adopted, which indicates Directly to the possibility of direct visualization through the spread of data around the scattering line, and it is clear from Figure 3 that the data is characterized by linearity.

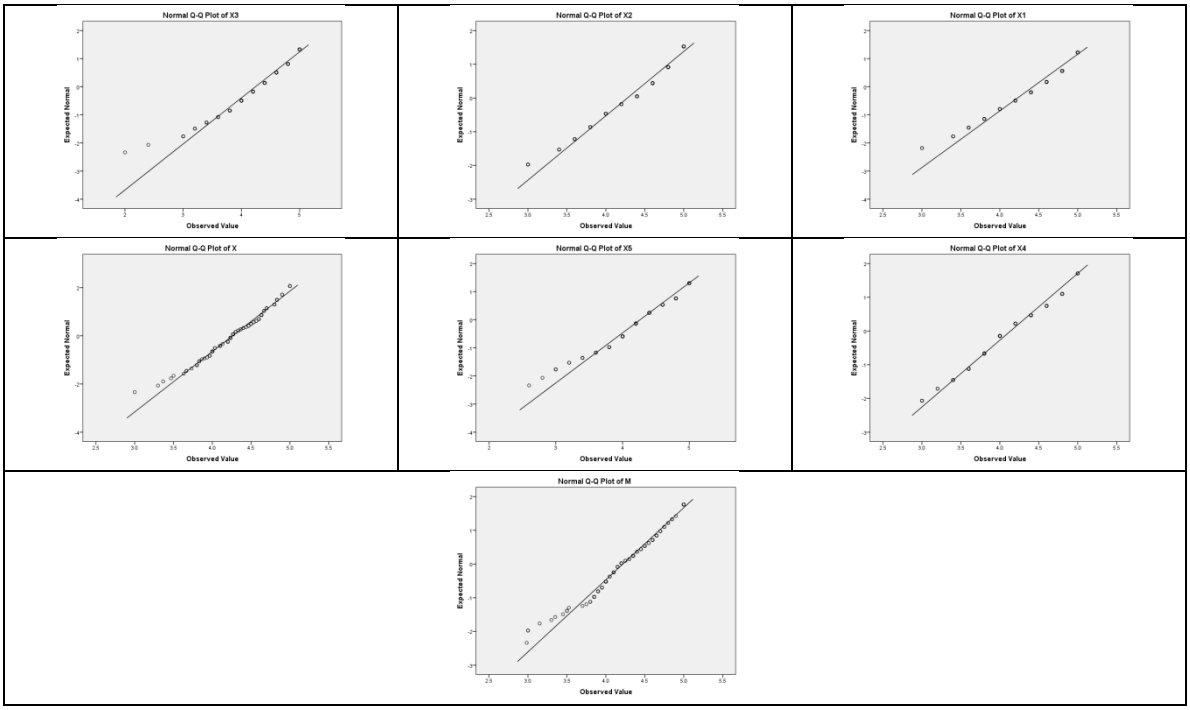


Figure 3 : Linearity Test

## Results

## Factor Analysis And Modeling

Confirmatory factor analysis was used to measure the construct validity of the study scale. It depends on factor analysis of the underlying structures between

variables. Hence, it is considered one of the important methods used in the case of multiple models and gives the possibility of identifying the suitability of the data.

Table 2 and Figures (4, 5) indicate that the results of the factor analysis of the study variables are acceptable values, as the value of confirmatory factor analysis requires that the values be greater than (0.50) and that the level of significance is smaller than (0.05).

Table 2: Factor Analysis

| Path | Original Sample (O) | Sample Mean (M) | Standard Deviation (STDEV) | T Statistics (\|O/STDEV\|) | P Values |
|---|---|---|---|---|---|
| q1 <- IV1 | 0.791 | 0.788 | 0.048 | 16.327 | 0.000 |
| q2 <- IV1 | 0.775 | 0.775 | 0.05 | 15.375 | 0.000 |
| q3 <- IV1 | 0.716 | 0.718 | 0.052 | 13.876 | 0.000 |
| q4 <- IV1 | 0.702 | 0.707 | 0.052 | 13.503 | 0.000 |
| q5 <- IV1 | 0.783 | 0.783 | 0.034 | 23.355 | 0.000 |
| q6 <- IV2 | 0.755 | 0.754 | 0.043 | 17.476 | 0.000 |
| q7 <- IV2 | 0.798 | 0.798 | 0.036 | 22.03 | 0.000 |
| q8 <- IV2 | 0.826 | 0.829 | 0.032 | 26.187 | 0.000 |
| q9 <- IV2 | 0.826 | 0.825 | 0.034 | 24.448 | 0.000 |
| q10 <- IV2 | 0.777 | 0.775 | 0.045 | 17.278 | 0.000 |
| q11 <- IV3 | 0.834 | 0.834 | 0.031 | 26.709 | 0.000 |
| q12 <- IV3 | 0.733 | 0.735 | 0.052 | 13.998 | 0.000 |
| q13 <- IV3 | 0.767 | 0.769 | 0.047 | 16.483 | 0.000 |
| q14 <- IV3 | 0.73 | 0.735 | 0.047 | 15.592 | 0.000 |
| q15 <- IV3 | 0.78 | 0.781 | 0.036 | 21.94 | 0.000 |
| q16 <- IV4 | 0.817 | 0.814 | 0.043 | 18.861 | 0.000 |
| q17 <- IV4 | 0.82 | 0.818 | 0.042 | 19.385 | 0.000 |
| q18 <- IV4 | 0.837 | 0.839 | 0.031 | 26.692 | 0.000 |
| q19 <- IV4 | 0.839 | 0.835 | 0.044 | 19.144 | 0.000 |
| q20 <- IV4 | 0.806 | 0.803 | 0.042 | 19.266 | 0.000 |
| q21 <- IV5 | 0.829 | 0.83 | 0.033 | 24.936 | 0.000 |
| q22 <- IV5 | 0.75 | 0.753 | 0.056 | 13.508 | 0.000 |
| q23 <- IV5 | 0.729 | 0.732 | 0.051 | 14.261 | 0.000 |
| q24 <- IV5 | 0.732 | 0.735 | 0.047 | 15.638 | 0.000 |
| q25 <- IV5 | 0.758 | 0.757 | 0.039 | 19.349 | 0.000 |
| z1 <- DV | 0.721 | 0.72 | 0.051 | 14.206 | 0.000 |
| z2 <- DV | 0.726 | 0.72 | 0.05 | 14.579 | 0.000 |
| z3 <- DV | 0.692 | 0.698 | 0.057 | 12.073 | 0.000 |
| z4 <- DV | 0.689 | 0.692 | 0.052 | 13.236 | 0.000 |

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| | | | | | |
|---|---|---|---|---|---|
| z5 <- DV | 0.761 | 0.762 | 0.034 | 22.489 | 0.000 |
| z6 <- DV | 0.711 | 0.71 | 0.05 | 14.316 | 0.000 |
| z7 <- DV | 0.723 | 0.721 | 0.048 | 15.113 | 0.000 |
| z8 <- DV | 0.762 | 0.759 | 0.047 | 16.293 | 0.000 |
| z9 <- DV | 0.731 | 0.73 | 0.049 | 14.857 | 0.000 |
| z10 <- DV | 0.726 | 0.725 | 0.046 | 15.953 | 0.000 |

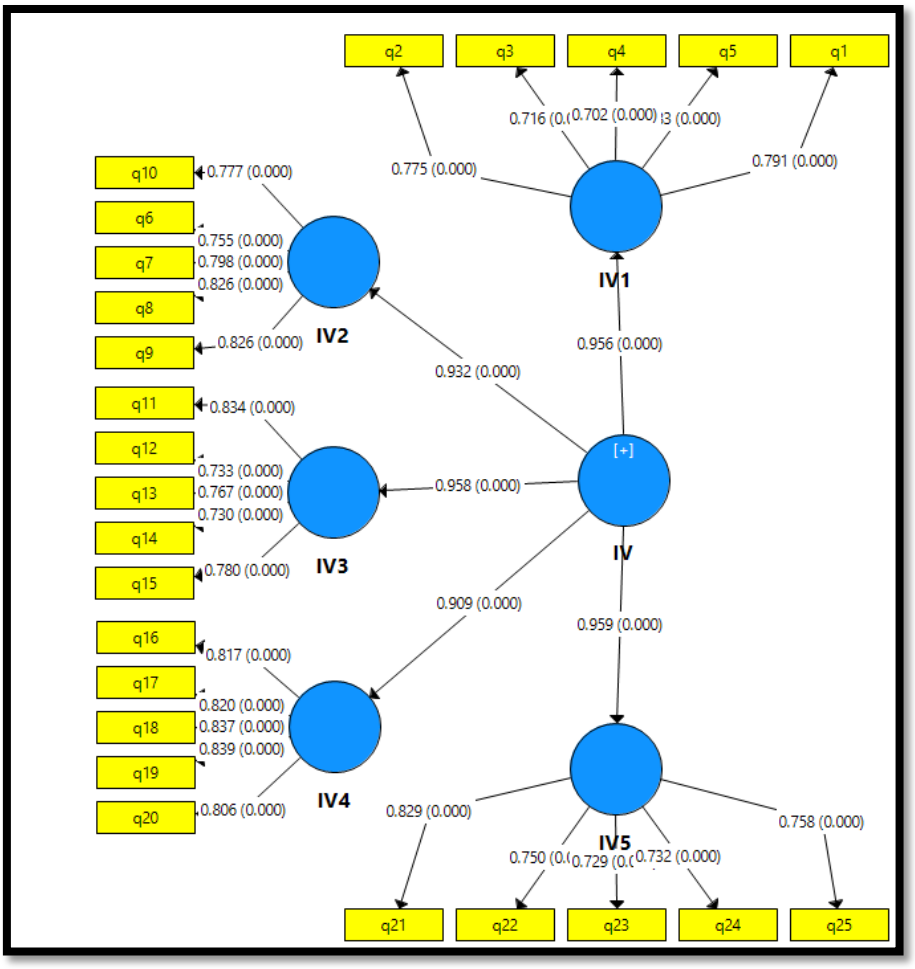


Figure 4: IV Modeling

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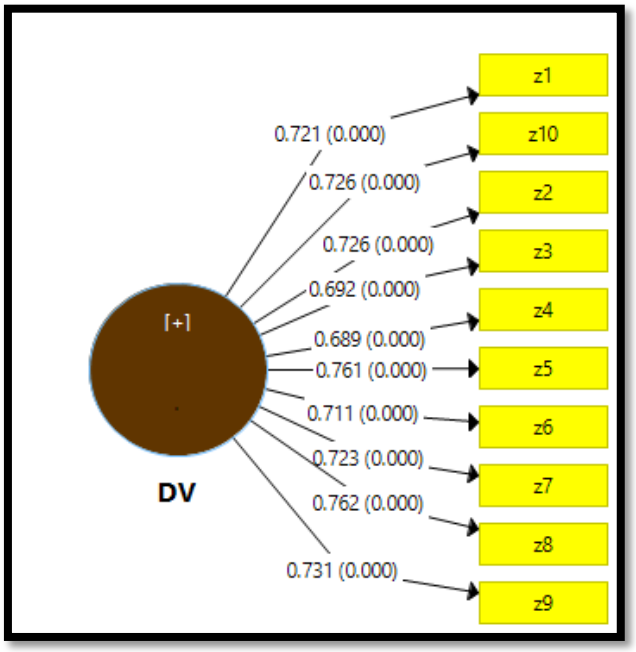


Figure 5: DV Modeling

**Hypothesis (H1)**

Table 3 indicates that the relationship between (IV) and (DV) is (0.894**), and it is significant (<0.05), and (T) test is acceptable and greater than the table value , which refer to accept (H1). Regarding the sub-hypotheses, the results refer to the relationship between (IV 1) and (DV) is (0.817**), and it is significant (<0.05), and (T) test is acceptable and greater than the table value , which refer to accept (H1-1). and the relationship between (IV 2) and (DV) is (0.816**), and it is significant (<0.05), and (T) test is acceptable and greater than the table value , which refer to accept (H1-2), In addition, there is a positive relationship between (IV 3) and (DV) which is (0.806 **) and it is significant (<0.05), and (T) test is acceptable and greater than the table value , which refer to accept (H1-3). There is also a positive correlation between (IV 4) and (DV) which is (0.819 **) and it is significant (<0.05), and (T) test is acceptable and greater than the table value , which refer to accept (H1-4). And there is also a positive correlation between (IV 5) and (DV) which is (0.771 **) and it is significant (<0.05), and (T) test is acceptable and greater than the table value ,

which refer to accept (H1-5).

Table 3: Correlation Matrix

| Var. | | IV1 | IV2 | IV3 | IV4 | IV5 | IV | DV |
|---|---|---|---|---|---|---|---|---|
| IV1 | r | 1 | .772** | .738** | .898** | .811** | .937** | .817** |
| | Sig. | | | | | | | .000 |
| | T | | | | | | | 15.330 |
| IV2 | r | .772** | 1 | .768** | .730** | .813** | .906** | .816** |
| | Sig. | | | | | | | .000 |
| | T | | | | | | | 15.271 |
| IV3 | r | .738** | .768** | 1 | .694** | .686** | .859** | .806** |
| | Sig. | | | | | | | .000 |
| | T | | | | | | | 14.747 |
| IV4 | r | .898** | .730** | .694** | 1 | .726** | .898** | .819** |
| | Sig. | | | | | | | .000 |
| | T | | | | | | | 15.448 |
| IV5 | r | .811** | .813** | .686** | .726** | 1 | .902** | .771** |
| | Sig. | | | | | | | .000 |
| | T | | | | | | | 13.105 |
| IV | r | .937** | .906** | .859** | .898** | .902** | 1 | .894** |
| | Sig. | | | | | | | .000 |
| | T | | | | | | | 21.587 |
| **. Correlation is significant at the 0.01 level (2-tailed). | | | | | | | | |

**Hypothesis (H2)**

Table 4 indicates that there is a positive effect of (IV) on (DV), as the value of the alpha constant is (0.594), the regression slope value is (0.859), and the interpretation factor is (79.9%).

This relationship is significant (Sig . <0.05), and (F) test is acceptable and greater than the table value , which refer to accept (H2). And related to the sub-hypotheses

There is a positive effect of (IV 1) on (DV), as the value of the constant alpha is (1.113), the value of the regression slope is (0.725), and the interpretation factor is (66.8%). This relationship is significant (Sig . <0.05), and (F) test is acceptable and greater than the table value , which refer to accept (H2-1).

There is also a positive effect of (IV 2) on (DV), as the value of the constant alpha is (1.045), the value of the regression slope is (0.742), and the interpretation factor is (66.6%). This relationship is significant (Sig . <0.05),

and (F) test is acceptable and greater than the table value , which refer to accept (H2-2). There is also a positive effect of (IV 3) on (DV), as the value of the alpha constant is (1.017), the regression slope value is (0.730), and the interpretation factor is (65%). This relationship is significant (Sig . <0.05), and (F) test is acceptable and greater than the table value , which refer to accept (H2-3).

In addition, there is a positive effect of (IV 4) on (DV), as the value of the constant alpha is (1.178), the value of the regression slope is (0.711), and the interpretation factor is (87.1%). This relationship is significant (Sig . <0.05), and (F) test is acceptable and greater than the table value , which refer to accept (H2-4).

Finally, there is a positive effect of (IV 5) on (DV), as the value of the constant alpha is (1.654), the value of the regression slope is (0.597), and the interpretation factor is (59.5%). This relationship is significant (Sig . <0.05), and (F) test is acceptable and greater than the table value , which refer to accept (H2-5).

Table 4 :Structural Effect

| Var. | a | B | R2 | F | P Values |
|---|---|---|---|---|---|
| IV1 | 1.113 | 0.725 | 0.668 | 235.654 | 0.000 |
| IV2 | 1.045 | 0.742 | 0.666 | 233.114 | 0.000 |
| IV3 | 1.017 | 0.730 | 0.650 | 217.168 | 0.000 |
| IV4 | 1.178 | 0.711 | 0.871 | 238.166 | 0.000 |
| IV5 | 1.654 | 0.597 | 0.595 | 171.740 | 0.000 |
| IV | 0.594 | 0.859 | 0.799 | 465.369 | 0.000 |

Regarding the effect at the factor level, the model in Table 5 and Figure 6 indicates that the highest effect value is (IV 2) on (DV), which is (0.832),

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followed by the effect of (IV 1) on (DV), which is (0.778).Then the effect of (IV 4) on (DV) is (0.774) Fourthly, the effect of (IV 3) on (DV), which is (0.396). Finally, there is a weak effect of (IV 5) on (DV), which is (0.362).

Table 5 :Structural Effect

| Path | Original Sample (O) | Sample Mean (M) | Standard Deviation (STDEV) | T Statistics (\|O/STDEV\|) | P Values |
|---|---|---|---|---|---|
| IV1 -> DV | 0.778 | 0.777 | 0.039 | 19.917 | 0.000 |
| IV2 -> DV | 0.832 | 0.830 | 0.034 | 24.478 | 0.000 |
| IV3 -> DV | 0.396 | 0.376 | 0.169 | 2.352 | 0.019 |
| IV4 -> DV | 0.774 | 0.777 | 0.042 | 18.511 | 0.000 |
| IV5 -> DV | 0.362 | 0.344 | 0.154 | 2.342 | 0.020 |

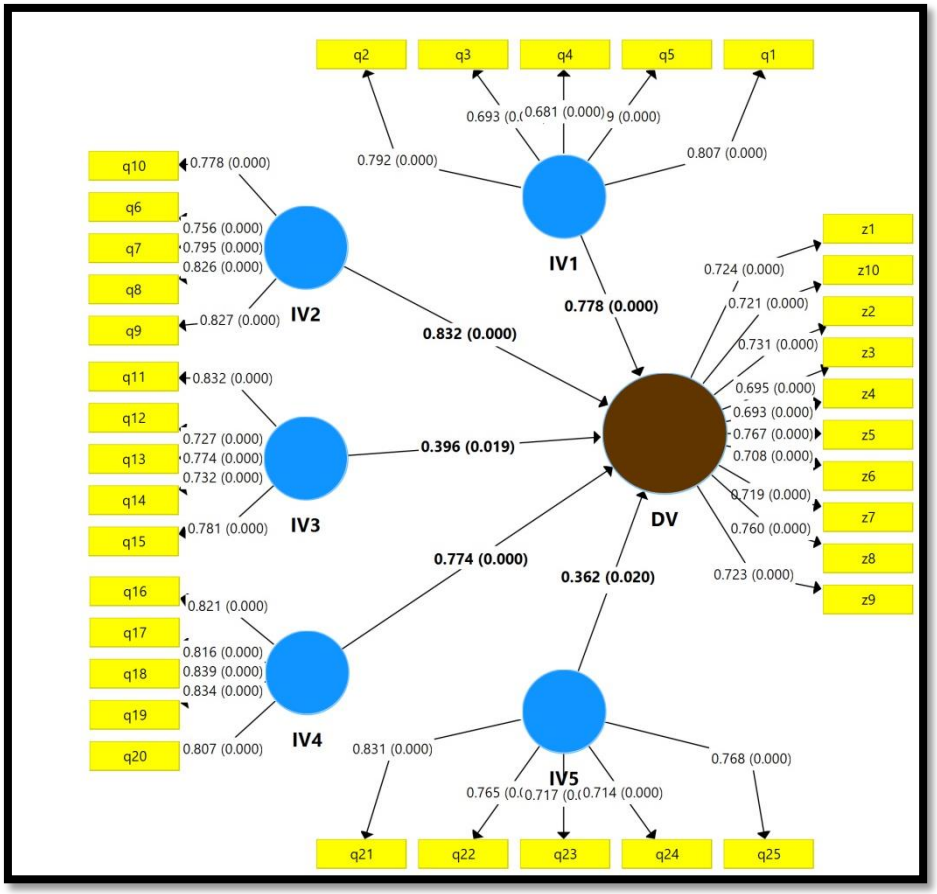


Figure 6 :Structural Effect

## Discussion And Conclusions

The research aims to identify the impact of the requirements for applying the Six Sigma methodology in improving the quality of university education.

The results proved that there is a positive impact of the Six Sigma methodology in improving the quality of university education. By applying the Six Sigma methodology, it is possible to improve the quality of educational outcomes by reducing error rates and problems in educational programs, and ensuring that educational outcomes meet the needs of the labor market. Six Sigma focuses on analyzing and improving processes so that they are more efficient and effective. By applying this methodology in universities, educational and administrative processes that need improvement can be identified and comprehensively analyzed to reduce defects and improve performance. The results also demonstrated that there is a positive effect of administration support in improving the quality of university education. The administration has a pivotal role in providing the appropriate environment and resources necessary for full university education.

There is also a positive impact of the relationship with customers in improving the quality of university education. When the relationship between the university and customers is strong and responsive, it contributes to increased customer satisfaction. Students and parents feel confident in the university, its educational programs and the services provided, and this strengthens their connection to the university and motivates them to stay and graduate from it. Infrastructure contributes to improving the quality of university education. Providing the necessary material and technical resources to improve the infrastructure in universities, such as modernizing laboratories and improving educational and technical means, contributes to improving the quality of university education. There is also a positive impact of training and efficiency in improving the

quality of university education. Providing training opportunities for faculty members to enhance their educational skills and improve teaching and evaluation methods reflects positively on university performance . Continuous improvement also reflects positively on the quality of university education. It aims to identify the strong and weak points in the educational system and take action to improve them continuously. Through continuous improvement, educational performance is monitored and evaluated and specific quality standards are met.

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