



Portrait of XYZ University Learning Process Output Quality Performance through Operational Management Approach Period 2022/2023

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Abstract. This research analyses the performance of learning process output at XYZ University for the period 2022/2023 with an operational management approach. The main focus of the research is to evaluate performance using key performance indicators, such as Grade Point Average (GPA), length of study, and student efficiency. Data was collected from graduation books, with quantitative analysis methods to determine performance variations between faculties. Results showed that Faculty XYZ11 had the highest average GPA (3.82), reflecting superior teaching quality and effective resource support. Faculty XYZ10 also demonstrated the best efficiency, with the shortest length of study and low frequency of Single Tuition Fee (UKT) payments. In contrast, Faculties XYZ4 and XYZ9 faced challenges in longer lengths of study, suggesting the need for evaluation of factors that slow down study completion. Although some faculties show high productivity, the ratio of academic output to cost input remains important to consider. The findings highlight the importance of academic support and time management in improving students' learning experience. This research provides recommendations for continuous improvement in the learning process, in order to produce graduates who are competitive and ready to face challenges in the world of work effectively.

Keywords: Performance, Higher Education, Quality Control, Improvement

1 Introduction

In recent years, improving the quality of education has become the main focus of the Indonesian government, covering all levels of education, from early childhood education to higher education[1]. This policy aims to improve the quality of education in order to produce graduates who are competent and ready to compete at the global level. In this context, higher education has an important role as one of the pillars of developing quality human resources.

To achieve this goal, the government has implemented a series of strategic policies that include accreditation of study programmes and institutions by the National Accreditation Board[2]. This accreditation provides assurance that study programs meet certain quality standards, with assessment referring to several criteria, such as curriculum quality, facilities, and student learning outcomes. In addition, international accreditation is also implemented, involving accreditation agencies such

as AUN-QA and ABEST 21, which provide global recognition of the quality of education provided[3].

The implementation of the ISO 9001:2015 quality assurance system is an important step in creating a culture of continuous improvement in higher education. Through this system, the university is expected to conduct better evaluation and quality control, so as to improve student learning experience and stakeholder satisfaction.

The Key Performance Indicators (KPIs) set by the Ministry of Research, Technology and Higher Education (Kemenristekdikti) are also a reference in measuring university performance[4]. These KPIs include eight indicators, such as graduate work readiness, student participation in off-campus activities, and lecturer quality. Through systematic measurement, it is expected to realise a quality education process that is relevant to the needs of industry and society.

XYZ University, as one of the leading higher education institutions in Indonesia, has committed to implementing all these policies. Data shows that the university has obtained a number of national and international accreditations, and implemented an effective quality assurance system. However, although the results obtained show good performance, further research needs to be done to evaluate in depth the learning process and ensure that the achievements are in accordance with the expectations of the community and the needs of the world of work[5].

This research aims to analysis the output performance of the learning process at XYZ University during the 2022/2023 semester period, with an operational management approach. It is expected that the results of this research can provide useful recommendations for the improvement and development of education quality in the future.

2 Literature Review

2.1 Adaptation of SIPOC Framework in Education

The SIPOC (Suppliers, Inputs, Process, Outputs, Customers) framework is a management tool used to describe the relationship between elements in a system. In an educational context, the adaptation of SIPOC can help identify and analyse the elements involved in the learning process. Suppliers include faculty, teaching staff, and external resources that contribute to providing materials and facilities. Inputs consist of the resources required for the learning process, including curriculum, teaching materials, and technology[6].

The learning process involves the interaction between lecturers and students, as well as the teaching methods applied. Output quality is measured through indicators such as Grade Point Average (GPA) and student satisfaction levels. Customers in the context of education include students, parents, and industries that expect work-ready graduates. The use of the SIPOC framework allows educational institutions to identify strengths and weaknesses in the learning process and make continuous improvements.

In quality management, the customer's position is very strong because it depends on his assessment of the output so that at the output level the requirement is also an outcome[7]. Furthermore, a good process must determine quality inputs to

create a good process so that the term IR (Input Requirement) appears, each element of SIRPORC will then form a supply chain that requires precise and objective measurements to achieve high effectiveness and efficiency so that it requires the OM (Objective Measure) element[8]. In supply chain management, it can be abbreviated with the acronym (SIRPORC)[9].

2.2 Quality Management Model in Higher Education

A number of quality management models have been developed to improve effectiveness and efficiency in higher education institutions. Such as follow[10,11,12,13]:

- Total Quality Management (TQM) is a management approach that emphasises continuous improvement and the involvement of all employees. In education, TQM encourages the involvement of all stakeholders to improve the quality of education through data and facts in decision-making.
- The ISO 9001:2015 quality management system is an international standard that provides a framework for organisations to ensure quality in products and services. The implementation of ISO 9001 in education helps institutions formulate clear procedures and promote a culture of quality.
- The Malcolm Baldrige National Quality Award (MNBQA) recognises organisations that demonstrate outstanding achievement in quality management. In higher education, the application of MNBQA criteria helps institutions identify strengths and areas for improvement.
- Six Sigma is a methodology that aims to reduce defects and variation in processes. In education, Six Sigma can improve the quality of the learning process through data analysis and performance measurement.
- Lean Production Systems focuses on eliminating waste and increasing value for customers. Lean principles can be applied to streamline administrative processes and improve the student learning experience.
- Lean Six Sigma combines Lean and Six Sigma principles to achieve higher efficiency and quality. In education, this model helps institutions streamline processes while ensuring high academic standards.
- Quality assurance agency models, such as the National Accreditation Board, play an important role in assessing and assuring the quality of higher education. In this case, the accreditation process not only measures institutional performance, but also provides useful feedback for improvement.

Using the SIPOC framework and various quality management models, higher education institutions can improve the quality of the learning process, which in turn will improve performance, relevance and customer satisfaction. The application of these principles is crucial in producing globally competitive graduates.

3 Methods

3.1 Research Design

This research uses a quantitative approach with descriptive analysis methods. The data used comes from the graduation book of XYZ University students for the 2022/2023 period. The focus of this research is to analyse the performance of the learning process based on predetermined performance indicators.

3.2 Population and Sample

The population of this research is all graduates from study programmes at XYZ University during the specified period. The research sample is taken purposively from the average value of each graduation in each faculty, by selecting graduates who meet the following criteria who have complete data on Grade Point Average (GPA), length of study (Delivery), Time-Based Achievement Index, frequency of payment of Single Tuition Fees (UKT), productivity and efficiency.

3.3 Data Collection

Data collected from graduation books that contain information about:

- a. GPA, Grade Point Average of each student.
- b. Delivery, Length of study in months until graduation.
- c. Cost, Frequency of UKT payment for 7 to 14 semesters.
- d. Output, the number of students who graduated in that period and the performance of the learning process consisting of GPA, Length of Study, IPB, Pay Frequency, Productivity and Efficiency.

The collected data will then be processed to produce performance indicators, namely:

1. Grade Point Average by Length of Study (IPB)

$$\frac{48}{\text{length of study} \times \text{GPA}} \quad (1)$$

2. Productivity

$$\frac{\text{Output}}{\text{Input}} = \frac{144}{\text{Pay Frequences}} \quad (2)$$

3. Efficiency

$$\frac{\text{Length of study}}{48} \quad (3)$$

3.4 Data Analysis

After data collection, the analysis steps to be performed are as follows: (Add sigma level)

1. Calculated the range of each indicator to determine the variation in performance among graduates.
2. Calculating DPMO (Defects Per Million Opportunities) to measure defects or problems in the learning process. DPMO can be calculated with the formula:

$$\text{DPMO} = 1000000 - \frac{(\text{NORMSDIST}((\text{USL}-\text{X})/\text{S}) \times 1000000) + (\text{NORMSDIST}((\text{LSL}-\text{X})/\text{S}) \times 1000000))}{2} \quad (4)$$

Description:

- USL = Upper specification limit with value 4
- LSL = Lower specification limit with a value of 2
- X = Average value
- S = Standard Deviation

3. Calculate the sigma level with the formula

$$\text{SIGMA LEVEL} = \text{NORMSINV}((1000000 - \text{DPMO}) / 1000000) + 1.5 \quad (5)$$

4. Calculate the average of each performance indicator (GPA, Delivery, IPB, Cost, Productivity, and Efficiency) to get an overview of the performance of the graduate learning process.
5. Using the results of the average calculation to rank the faculties based on performance. The faculty with the highest average will be placed at the top of the ranking.

4 Result

4.1 GPA Distribution Data

Table 1. Data Process of GPA Distribution

No.	XYZ	X1	X2	X3	X4	X5	X6	X7	X8	Total	RANK	Average (XBAR)	Range	S	DPMO	SIGMA LEVEL
1	XYZ1	3.62	3.65	3.73	3.71	3.74	3.70	3.77	3.74	29.66	4	3.71	0.2	0.05	0	6.00
2	XYZ2	3.78	3.75	3.77	3.70	3.66	3.80	3.83	3.78	30.07	2	3.76	0.2	0.06	27	6.00
3	XYZ3	3.37	3.43	3.18	3.37	3.60	3.50	3.42	3.48	27.35	12	3.42	0.4	0.15	41	5.44
4	XYZ4	3.48	3.46	3.51	3.55	3.51	3.52	3.50	3.56	28.09	8	3.51	0.1	0.04	0	6.00
5	XYZ5	3.77	3.72	3.71	3.73	3.79	3.76	3.77	3.78	30.03	3	3.75	0.1	0.03	0	6.00
6	XYZ6	3.58	3.64	3.74	3.72	3.64	3.71	3.66	3.66	29.35	5	3.67	0.2	0.06	0	6.00
7	XYZ7	3.70	3.63	3.62	3.69	3.57	3.61	3.64	3.69	29.15	6	3.64	0.1	0.05	0	6.00
8	XYZ8	3.45	3.47	3.40	3.48	3.48	3.52	3.52	3.59	27.91	9	3.49	0.2	0.07	0	6.00
9	XYZ9	3.61	3.50	3.53	3.38	3.37	0.00	3.37	3.67	24.43	13	3.05	3.7	1.29	438,295	6.00
10	XYZ10	0.00	0.00	3.29	3.48	3.33	0.00	3.48	3.15	16.73	14	3.35	3.5	1.22	431,723	1.67
11	XYZ11	3.83	3.82	3.80	3.82	3.77	3.82	3.81	3.85	30.52	1	3.82	0.1	0.03	0	6.00
12	XYZ12	3.52	3.45	3.39	3.56	3.55	3.55	3.59	3.57	28.18	7	3.52	0.2	0.07	0	6.00
13	XYZ13	3.36	3.40	3.41	3.49	3.40	3.44	3.45	3.48	27.43	11	3.43	0.1	0.05	0	6.00
14	XYZ14	3.48	3.34	3.22	3.30	3.54	3.53	3.43	3.45	27.29	13	3.41	0.3	0.11	0	6.00
15	XYZ15	3.60	3.46	3.44	3.51	3.37	3.46	3.51	3.54	27.89	10	3.49	0.2	0.08	0	6.00
Average Process												3.53	0.63	0.22	58,006	3.07

Source: Data processed 2024

The results of data processing showed that XYZ11 faculty ranked the highest with an average GPA of 3.82, reflecting excellent academic performance and the effectiveness of the learning process. This figure shows that the faculty's students are able to achieve excellent academic outcomes, almost close to the maximum score, which is evidence of the quality of teaching, resource support, and learning methods that are successfully implemented. It also indicates high student competence, which can contribute to student success in the workforce and enhance the faculty's reputation.

When viewed from table 1 above, it can be said that the faculty is superior because the highest GPA is flawless with a high level of six sigma.

4.2 Length of study distribution data

Table 2. Data processing of Length of study

No.	XYZ	X1	X2	X3	X4	X5	X6	X7	X8	Total	AVERAGE (XBAR)	RANK	Range	S	DPMO	SIGMA LEVEL
1	XYZ1	59.00	57.00	55.00	56.00	53.00	55.00	49.00	50.00	434.00	54.25	8	10.00	3.51	37,589	3.28
2	XYZ2	53.00	56.00	55.00	60.00	65.00	53.00	50.00	55.00	447.00	55.88	11	15.00	5.27	67,500	2.99
3	XYZ3	53.00	53.00	51.00	54.00	44.00	54.00	46.00	53.00	408.00	51.00	3	10.00	3.51	196,525	2.35
4	XYZ4	68.00	64.00	60.00	59.00	60.00	59.00	62.00	60.00	492.00	61.50	15	9.00	3.16	10	5.77
5	XYZ5	52.00	57.00	57.00	54.00	49.00	53.00	53.00	53.00	428.00	53.50	7	8.00	2.81	25,155	3.46
6	XYZ6	56.00	59.00	55.00	54.00	62.00	55.00	60.00	60.00	461.00	57.63	13	8.00	2.81	307	4.93
7	XYZ7	53.00	58.00	56.00	54.00	60.00	58.00	58.00	54.00	451.00	56.38	12	7.00	2.46	329	4.91
8	XYZ8	53.00	57.00	59.00	57.00	56.00	55.00	56.00	53.00	446.00	55.75	8	6.00	2.11	118	5.18
9	XYZ9	53.00	60.00	53.00	59.00	64.00	0.00	64.00	64.00	417.00	52.13	4	64.00	22.48	505,308	1.49
10	XYZ10	0.00	0.00	36.00	39.00	42.00	0.00	42.00	45.00	204.00	40.80	1	45.00	15.81	678,769	1.04
11	XYZ11	51.00	53.00	51.00	53.00	56.00	54.00	54.00	49.00	421.00	52.63	5	7.00	2.46	29,982	3.38
12	XYZ12	54.00	59.00	64.00	54.00	54.00	55.00	52.00	54.00	446.00	55.75	9	12.00	4.21	32,981	3.34
13	XYZ13	60.00	58.00	58.00	54.00	57.00	62.00	57.00	60.00	466.00	58.25	14	8.00	2.81	132	5.15
14	XYZ14	48.00	50.00	50.00	54.00	51.00	46.00	49.00	51.00	399.00	49.88	2	8.00	2.81	252,301	2.17
15	XYZ15	52.00	37.00	50.00	48.00	58.00	62.00	58.00	56.00	421.00	52.63	6	25.00	8.78	299,379	2.03
Average process											52.48		16.13	5.67	141,789	2.57

Source: Data processed 2024

Based on the length of study data, XYZ10 faculty ranks first, which means that students in this faculty have the shortest length of study compared to other faculties. This may indicate efficiency in the learning process and completion of studies, where students are able to complete educational programmes in a faster time, perhaps due to a well-structured curriculum, appropriate academic guidance, or relatively lower level of course difficulty. In contrast, faculty XYZ4 ranks 15th, indicating that students in this faculty tend to complete their studies in a longer time. Factors influencing longer lengths of study could include higher academic difficulty, challenges in final project completion, or non-optimisation in learning management, which need to be further identified for improvement. This analysis shows variations in study management effectiveness between faculties.

DPMO and sigma values have no significance for the performance status in the rankings.

4.3 IPB Distribution Data

Table 3. Data Processing of IPB

No.	XYZ	X1	X2	X3	X4	X5	X6	X7	X8	Total	RANK	Average (XBAR)	Range	S	DPMO	SIGMA LEVEL
1	XYZ1	2.95	3.07	3.26	3.18	3.39	3.23	3.69	3.59	26.35	4	3.29	0.75	0.26	1	6.00
2	XYZ2	3.42	3.21	3.29	2.96	2.70	3.44	3.68	3.30	26.01	7	3.25	0.97	0.34	58	5.36
3	XYZ3	3.05	3.11	2.99	3.00	3.93	3.11	3.57	3.15	25.91	8	3.24	0.93	0.33	25	5.56
4	XYZ4	2.46	2.60	2.81	2.89	2.81	2.86	2.71	2.85	21.98	14	2.75	0.43	0.15	0	6.00
5	XYZ5	3.48	3.13	3.12	3.32	3.71	3.41	3.41	3.42	27.01	3	3.38	0.59	0.21	0	6.00
6	XYZ6	3.07	2.96	3.26	3.31	2.82	3.24	2.93	2.93	24.51	10	3.06	0.49	0.17	0	6.00
7	XYZ7	3.35	3.00	3.10	3.28	2.86	2.99	3.01	3.28	24.87	9	3.11	0.49	0.17	0	6.00
8	XYZ8	3.12	2.92	2.77	2.93	2.98	3.07	3.02	3.25	24.07	12	3.01	0.49	0.17	0	6.00
9	XYZ9	3.27	2.80	3.20	2.75	2.53	0.00	2.53	2.75	19.82	15	2.48	3.27	1.15	156,743	2.51
10	XYZ10	0.00	0.00	4.39	4.28	3.81	0.00	3.98	3.36	19.81	1	3.96	4.39	1.54	380,220	1.80
11	XYZ11	3.60	3.46	3.58	3.46	3.23	3.40	3.39	3.77	27.89	2	3.49	0.54	0.19	0	6.00
12	XYZ12	3.13	2.81	2.54	3.16	3.16	3.10	3.31	3.17	24.38	11	3.05	0.77	0.27	0	6.00
13	XYZ13	2.69	2.81	2.82	3.10	2.86	2.66	2.91	2.78	22.64	13	2.83	0.44	0.15	0	6.00
14	XYZ14	3.48	3.21	3.09	2.93	3.33	3.68	3.36	3.25	26.33	5	3.29	0.75	0.26	1	6.35
15	XYZ15	3.32	4.49	3.30	3.51	2.79	2.68	2.90	3.03	26.03	6	3.25	1.81	0.64	19,663	6.00
Average Process												3.16	1.14	0.40	37,114	3.29

Source: Data processed 2024

Based on the Index of Achievement by Length of Study (IPB) data, Faculty XYZ10 is in the first position, indicating that students in this faculty not only have a high GPA, but also complete their studies in a relatively fast time. IPB, which is calculated from GPA divided by length of study, gives an idea of students' academic efficiency, indicating how well they can achieve high academic performance in a shorter study time.

In contrast, Faculty XYZ9 in 15th place and Faculty XYZ4 in 14th place show that although students may have obtained a fairly good GPA, their length of study is longer, which causes their GPA to be relatively lower. This could indicate potential obstacles in the completion of longer studies, such as challenges in curriculum, academic guidance, or non-academic factors that affect graduation time. Thus, these faculties need to conduct an evaluation of the factors that prolong the length of study to improve students' IPB and academic efficiency.

DPMO and sigma values are not meaningful in the rankings

4.4 Pay Frequency distribution data

Table 4. Data Processing of Pay Frequency

No.	XYZ	X1	X2	X3	X4	X5	X6	X7	X8	Total	RANK	Average (XBAR)	Range	S	DPMO	SIGMA LEVEL
1	XYZ1	10.00	10.00	9.00	9.00	9.00	9.00	8.00	8.00	72.00	7	9.00	2.00	0.70	2,207	4.35
2	XYZ2	9.00	10.00	9.00	10.00	11.00	9.00	8.00	9.00	75.00	9	9.38	3.00	1.05	12,108	3.75
3	XYZ3	9.00	9.00	9.00	9.00	7.00	9.00	8.00	9.00	69.00	3	8.63	2.00	0.70	10,356	3.81
4	XYZ4	11.00	11.00	10.00	10.00	10.00	10.00	10.00	10.00	82.00	15	10.25	1.00	0.35	0	6.00
5	XYZ5	9.00	10.00	10.00	9.00	8.00	9.00	9.00	9.00	73.00	8	9.13	2.00	0.70	1,243	4.52
6	XYZ6	9.00	10.00	9.00	9.00	10.00	9.00	10.00	10.00	76.00	13	9.50	1.00	0.35	0	6.00
7	XYZ7	9.00	10.00	9.00	9.00	10.00	10.00	9.00	9.00	75.00	9	9.38	1.00	0.35	0	6.00
8	XYZ8	9.00	10.00	10.00	10.00	9.00	9.00	9.00	9.00	75.00	9	9.38	1.00	0.35	0	6.00
9	XYZ9	9.00	10.00	9.00	10.00	11.00	0.00	10.00	11.00	70.00	5	8.75	11.00	3.88	412,405	1.72
10	XYZ10	0.00	0.00	6.00	7.00	7.00	0.00	7.00	8.00	35.00	1	7.00	8.00	2.81	506,367	1.48
11	XYZ11	9.00	9.00	9.00	9.00	9.00	9.00	9.00	8.00	71.00	6	8.88	1.00	0.35	0	6.00
12	XYZ12	9.00	10.00	11.00	9.00	9.00	9.00	9.00	9.00	75.00	9	9.38	2.00	0.70	361	4.88
13	XYZ13	10.00	10.00	10.00	9.00	10.00	10.00	9.00	10.00	78.00	14	9.75	1.00	0.35	0	6.00
14	XYZ14	8.00	9.00	8.00	9.00	9.00	8.00	8.00	9.00	68.00	2	8.50	1.00	0.35	10	5.77
15	XYZ15	9.00	6.00	8.00	8.00	10.00	10.00	9.00	9.00	69.00	4	8.63	4.00	1.40	123,784	2.66
Average Process												9.03	2.73	0.96	71,256	2.97

Source: Data processed, 2024

The frequency of UKT (Single Tuition Fee) payments illustrates the efficiency of students in completing their academic programme. Faculty XYZ10 came in first with an average of only 7 payments, indicating that students in this faculty are generally more efficient in completing their studies. Students manage to graduate in a shorter time, with an average of only 7 semesters out of the maximum 14 semesters allowed. This means that they not only complete their studies faster, but also significantly reduce the cost of education, as they pay less UKT. This efficiency reflects good study planning and students' ability to complete courses on time, without having to experience delays or repeat semesters.

DPMO and sigma values have no meaningful meaning in the ranking.

4.5 Productivity Distribution Data

Table 5. Data Processing of productivity

No.	XYZ	X1	X2	X3	X4	X5	X6	X7	X8	Total	RANK	Average (XBAR)	Range	S	DPMO	SIGMA LEVEL
1	XYZ1	14.40	14.40	16.00	16.00	16.00	16.00	18.00	18.00	128.80	5	16.10	3.60	1.26	136	5.14
2	XYZ2	16.00	14.40	16.00	14.40	13.09	16.00	18.00	16.00	123.89	7	15.49	4.91	1.72	2,700	4.28
3	XYZ3	16.00	16.00	16.00	16.00	20.57	16.00	18.00	16.00	134.57	3	16.82	4.57	1.61	7,752	3.92
4	XYZ4	13.09	13.09	14.40	14.40	14.40	14.40	14.40	14.40	112.58	13	14.07	1.31	0.46	0	6.00
5	XYZ5	16.00	14.40	14.40	16.00	18.00	16.00	16.00	16.00	126.80	6	15.85	3.60	1.26	68	5.32
6	XYZ6	16.00	14.40	16.00	16.00	14.40	16.00	14.40	14.40	121.60	11	15.20	1.60	0.56	0	6.00
7	XYZ7	16.00	14.40	16.00	16.00	14.40	14.40	16.00	16.00	123.20	9	15.40	1.60	0.56	0	6.00
8	XYZ8	16.00	14.40	14.40	14.40	16.00	16.00	16.00	16.00	123.20	10	15.40	1.60	0.56	0	6.00
9	XYZ9	16.00	14.40	16.00	14.40	13.09	0.00	14.40	13.09	101.38	15	12.67	16.00	5.62	416,685	1.71
10	XYZ10	0.00	0.00	24.00	20.57	20.57	0.00	20.57	18.00	103.71	1	20.74	24.00	8.43	610,592	1.22
11	XYZ11	16.00	16.00	16.00	16.00	16.00	16.00	16.00	18.00	130.00	4	16.25	2.00	0.70	0	6.00
12	XYZ12	16.00	14.40	13.09	16.00	16.00	16.00	16.00	16.00	123.49	8	15.44	2.91	1.02	0	6.00
13	XYZ13	14.40	14.40	14.40	16.00	14.40	14.40	16.00	14.40	118.40	12	14.80	1.60	0.56	0	6.00
14	XYZ14	18.00	16.00	18.00	16.00	16.00	18.00	18.00	16.00	136.00	3	17.00	2.00	0.70	0	6.00
15	XYZ15	16.00	24.00	18.00	18.00	14.40	14.40	16.00	16.00	136.80	2	17.10	9.60	3.37	164,990	2.47
Average Process												15.89	5.39	1.89	80,195	2.90

Source: Data processed, 2024

In the data, the total faculty value reflects the ratio between outputs (such as academic performance, GPA, and length of study) and inputs (UKT fees paid). This value is used to assess faculty productivity. A faculty with a high total score such as XYZ10 indicates that the outputs produced are large relative to the inputs used, although this does not necessarily mean it is productive if students take a long time to graduate. Conversely, XYZ9 with the lowest total value may be considered more wasteful in terms of costs, but if the output is a longer length of study or a large number of inactive students, then the productivity of this faculty could be considered low.

Again, DPMO and sigma values are not meaningful to the rankings.

4.6 Efficiency Distribution Data

Table 6. Data processing of efficiency

No.	XYZ	X1	X2	X3	X4	X5	X6	X7	X8	Total	RANK	Average (XBAR)	Range	S	DPMO	SIGMA LEVEL
1	XYZ1	1.23	1.19	1.15	1.29	1.10	1.15	1.02	1.04	9.17	8	1.15	0.27	0.10	2,207	4.35
2	XYZ2	1.10	1.17	1.15	1.10	1.35	1.10	1.04	1.15	9.17	7	1.15	0.31	0.11	6,805	3.97
3	XYZ3	1.10	1.10	1.06	1.19	0.92	1.13	0.96	1.10	8.56	3	1.07	0.27	0.10	20,030	3.55
4	XYZ4	1.42	1.33	1.25	1.21	1.25	1.23	1.29	1.25	10.23	15	1.28	0.21	0.07	0	6.00
5	XYZ5	1.08	1.19	1.19	1.35	1.02	1.10	1.10	1.10	9.15	6	1.14	0.33	0.12	10,983	3.79
6	XYZ6	1.17	1.23	1.15	1.13	1.29	1.15	1.25	1.25	9.60	13	1.20	0.17	0.06	0	6.00
7	XYZ7	1.10	1.21	1.17	1.13	1.25	1.21	1.21	1.13	9.40	12	1.17	0.15	0.05	0	6.00
8	XYZ8	1.10	1.19	1.23	1.15	1.17	1.15	1.17	1.10	9.25	10	1.16	0.13	0.04	0	6.00
9	XYZ9	1.10	1.25	1.10	1.46	1.33	0.00	1.33	1.33	8.92	4	1.11	1.46	0.51	427,391	1.68
10	XYZ10	0.00	0.00	0.75	1.06	0.88	0.00	0.88	0.94	4.50	1	0.90	1.06	0.37	484,671	1.54
11	XYZ11	1.06	1.10	1.06	1.46	1.17	1.13	1.13	1.02	9.13	5	1.14	0.44	0.15	41,983	3.23
12	XYZ12	1.13	1.23	1.33	1.10	1.13	1.15	1.08	1.13	9.27	11	1.16	0.25	0.09	613	4.73
13	XYZ13	1.25	1.21	1.21	1.19	1.19	1.29	1.19	1.25	9.77	14	1.22	0.10	0.04	0	6.00
14	XYZ14	1.00	1.04	1.04	1.10	1.06	0.96	1.02	1.06	8.29	2	1.04	0.15	0.05	811	4.65
15	XYZ15	1.08	0.77	1.04	1.42	1.21	1.29	1.21	1.17	9.19	9	1.15	0.65	0.23	118,030	2.68
Average process												1.14	0.40	0.14	74,285	2.94

Source: Data processed, 2024

Faculty efficiency rankings are used to measure how quickly students complete their studies compared to the set maximum study period (48 months). Faculty XYZ10 took the top spot, indicating that its students graduate more efficiently, reflecting good time management and academic support. In contrast, faculty XYZ4 ranked last, indicating that its students take longer to complete their studies, hence the lowest efficiency.

This efficiency rating is important because it shows the faculty's performance in helping students graduate on time. A more efficient faculty not only reduces the length of study, but also saves educational costs and resources, which ultimately contributes to improving the quality of education and students' academic experience.

5 Result and Discussion

Conclusions from the analysis of faculty data showed significantly varied results in academic performance, length of study, and student efficiency across different faculties. Faculty XYZ11 stood out with an average GPA of 3.82, reflecting high teaching quality and effective support for students. In contrast, faculty XYZ10 has the shortest length of study and the highest rank in the Grade Point Average by Length of Study (GPA), indicating efficiency in the learning process and completion of studies. On the other hand, faculties XYZ4 and XYZ9 experience challenges in terms of longer length of study and lower IPB, indicating the need for evaluation of factors that may slow down students' study completion.

Although XYZ15 has a high total score, this does not necessarily mean good productivity, given the importance of the ratio between academic outputs and cost inputs. Overall, the faculty efficiency ranking reflects the faculty's ability to support students to complete their studies on time, which in turn results in reduced costs and an improved academic experience. A thorough evaluation of the factors affecting learning effectiveness will assist the faculty in improving students' academic performance and study efficiency in the future by focusing on improving the learning process[14].

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