

Build Criteria to Evaluate the Quality of Technical Institutes Performance

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ABSTRACT: Improving the performance of technical institutes is a global concern, and building the criteria produces indicators or measures that are able to support the facts, and facilitate their description, and help to guide the decision.

This paper came to build criteria by which digital indicators or measures can be found that reduce the margin of diligence in a manner that increases accuracy and fairness in the evaluation and what distinguishes these criteria as they remain effective in the case of changing the degrees of hubs or adding new hubs, and that the proposed evaluation model includes of nine main hubs, whose grades are divided on each hub according to its relative importance, as the total score is (100) degrees, and the paper also included the evaluation mechanism. Meanwhile, the paper results a set of conclusions and recommendations, the most important of which are:

1. Raising the efficiency of the performance of technical institutes by creating a positive competition between the institutions and that the use of indicators makes the decision more correct and away or reduce the margin of diligence.
2. Can benefits from the feedback for the purpose of the amendment in a way that is compatible with the latest changes by applying proposed model.

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INTRODUCTION

The implementation of any process of developing and evaluating any activity or manage it, cannot be carried out in the absence of effective measures. Therefore, measurement has an effective role in all activities. And the creation of statistical criteria and indicators, produces highly significant measures that are able to support facts, facilitate their description, and help to guide our decision by developing a sense of what we evaluate. In addition, the concept of education quality lies in focusing on the goals of the program and the relevance of the outputs to the goals as well, the ways to achieve them, and how close they are to the approved quality criteria. {[2], [5], [1], [14]}.

The evaluation is a process of measuring what has been accomplished from activities and tasks to know the weaknesses to address them and strengths to support them, and that the main purpose of the evaluation is to measure the results achieved by the various activities within the framework of the plan set, to identify whether the application has been optimized or if there are shortcomings that led to low achievement, in addition to knowing the positives that contributed to success. Besides, the evaluation is a continuous and comprehensive process, and it is not a goal in itself, but rather a means of improvement, and it is an objective process that uses measurement and measures as its basis. Where the measures are quantitative indicators that enable us to express things and their properties, meaningful numbers or symbols that enable us to feel them. On the other hand, measurement is the process of deriving a number or symbols accompanying the properties of real things to facilitate their explanation according to clear criteria. {[3], [6], [7]}

Measurement and measures are the mainstays of scientific researches and helps in controlling and directing any process, measures contribute directly and efficiently to saving effort and costs. On the other side, the measurement helps in choosing the best alternative and the right decision. Whilst, the quantitative measures help in unifying the decision, thus obtaining the satisfaction of the beneficiary, which is considered one of the most important measures of quality that various institutions, including educational ones, strive to achieve. {[8], [11]}

In this paper, a mechanism for evaluating technical institutes will be proposed by building quantitative indicators or measures by which the quality of educational institutions' performance can be accurately measured, by defining the evaluation hubs and the components that each hub consists of, and what distinguishes these (proposed) indicators is their flexibility and the possibility of adapting them to a form that serves their users. {[12], [3], [9]}

EVALUATION HUBS

For the purpose of improving and developing the educational process, there is a need for periodic review and continuous evaluation as the basis for improvement and development, and for developing measure indicators that help educational institutions' reassurance at the level of implementing their programs in order to ensure the proper fulfillment of the evaluation hubs, it has been suggested hubs, components, and evaluation degrees of technical diploma programs in technical institutes affiliated with technical universities in Iraq, as in the following table.

No	Evaluation hubs	degree	components
1	Teaching aids	15	Laboratories, workshops, and places of drawing equipment, Audio-visual aids, Library, and Computer networks.
2	Syllabus	15	Study plan, educational plan, subjects development, exam questions
3	The teaching staff	15	scientific degrees, weekly hours and coverage, teaching and

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	and their assistants		development courses, researches, authorship, patents, teacher to student, technician to student, scientific promotions.
4	Infrastructure	10	Administration buildings, faculty offices and their assistants, halls, laboratories, workshops, restrooms, stadiums, students restaurants, website, internet availability.
5	Students	10	Existence of administrative orders with warnings and dismissal, complaints and suggestions box, management meetings with students, circulating and announcing instructions, contacted with graduates, having an electronic system for student activities (absences books, exam committees, documents and certificates) describing the employees' work in student affairs, students residences, student activities
6	Community Service	10	Investment, productive business, public seminars and lectures, contribution to general activities, news and published articles, site activity, voluntary initiatives and campaigns, and having a plan.
7	Plans and committees	10	The documented plan, the number of institute councils meetings, departmental councils, formed committees, administrative orders, and services provided to workers
8	The graduates	10	Systematic training, business market, self-reports of achievements, summer training, management follow-up in finding job opportunities
9	Vision, mission and objectives	5	Existed, published, available to affiliates
	Total	100	

By looking at the evaluation hubs and its components, can notice that the activities that will be covered by the proposed criteria are divided into three main sections:

- Activities directly related to program planning and implementation for instance, the suitability of the targeted educational outcomes for students and the quality of the evaluation process in its programs.
- Institutionalized activities that have no impact on the programs for example, non-class activities, how beautiful and attractive the educational institution location and its facilities.
- General Institutionalized activities with an impact on programs, this indicator relates to the availability of teaching staff, their assistants and technical staff, in addition to the availability of references in the library. Thus, these activities contribute directly and significantly to the institution's ability to implement its programs. {[16], [15], [13], [9], [10], [4]}

Evaluation Technique

- For the purpose of establishing a clear and measured evaluation mechanism, we include below the evaluation mechanisms for each of the above hubs: {[4], [11], [13], [2], [3]}

First Hub: Teaching Aids Hub

Indicators for this hub are calculated as follows:

places of drawing indicator = (number of drawing boards * weekly working days * available daily hours) / (number of students benefiting * Average of working hours per a week).

Workshop indicator = (available devices for each workshop * weekly working days * available daily hours) / (number of students benefiting * Average of working hours per a week).

Computer labs indicator = (number of computers * weekly working days * available daily hours) / (number of students benefiting * Average of working hours per a week).

Library indicator = (library size (student) * weekly working days * available daily hours) / (number of students benefiting * Average of working hours per a week).

With assumption that the average number of weekly hours' use is (8) hours and is calculated on the basis of (4) working days per student, on average, he spends daily (2) hours per a day at library.

A score of (2) is given in the case of existence an internet network for students and employees of the institute.

As for the calculating mechanism, it will be given (3) scores for the places of drawing indicator if the indicator value is ≥ 1 and the score will be (indicator value * 3) if the indicator value is < 1 and in the same way the workshop indicator, library and computer labs (computer indicator score) is (4).

It is worth to noting that the above indicators (places of drawing, workshops, computer labs, and the library) can be adopted as sufficient indicators. For example, when we want to know the adequacy of the computer lab, we use the same indicator and Make it equal to (1), and the unknown is the number of students. Thus, we can know the adequacy of computer labs to having the students and the same thing for the indicators of places of drawing, workshops and the library.

Second Hub: Syllabus Hub

Hours Implementation indicator = Hours actually implemented / Hours within the plan.

It is calculated for each subject and then the weighted average is calculated for the percentage of hours' implementation for each scientific department, then for all the departments within the institute and the score will be (5) if the indicator value is $\geq (1)$, And if the value of the indicator is $< (1)$, then the score will be $(5 * \text{the value of the indicator})$.

A score of (2) is given in the case of a generalized and publicized calendar for students and staff.

A score of (3) is given in the case of integrated study plans for the scientific departments, including the vocabulary of the syllabus.

A score of (2) is given if there are documented studies to develop the syllabus.

A score of (3) is given by examining samples of the exam questions and the extent of their conformity.

Third Hub: The Teaching Staff and Their Assistants Hub

The following indicators are calculated:

Ratio of completed research = number of completed research / number of teachers.

Ratio of authored and translated books = (number of authored and translated books * 10) / the number of teachers who are ranked (professor and assistant professor).

Teacher to student ratio = number of teachers / number of students.

Technician to student ratio = number of technicians / number of students.

Ratio of academic ranks = the number of teachers with the rank of professor and assistant professor * (2) / total number of teachers.

Weekly hours = the number of hours actually covered by teachers per week / The number of teachers hours per week.

Training and development courses indicator = the number of teachers in the development courses * (20) / the total number of teachers.

As for the distribution of degrees of this hub which is (15) degrees, it is distributed as follows:

Completed research: (3) scores are given if the value of the indicator is $\geq (1)$, and if it is $< (1)$, the score will be $(\text{the value of the indicator} * 3)$.

Authored and translated books: (1) score is given if the value of the indicator is $\geq (1)$ and if it is $< (1)$, the score will be $(1 * \text{the value of the indicator})$.

Registered patents: (3) scores are awarded for each registered patent.

The teacher to student ratio will take a full degree which is (2), if there is a teacher for every (20) students for medical, engineering, and information technology specialties, and there is a teacher for every (30) students for administrative specialties.

The technician to student ratio (1) score is given if the ratio equal (1 to 40).

The academic ranks ratio, the indicator will take full score which are (3) if the indicator value $\geq (1)$, and $(3 * \text{the value of the indicator})$ if its value is $< (1)$.

Weekly hours, will take (3) if the value of the indicator is $\geq (1)$ and if it is $< (1)$ takes $(3 * \text{the value of the indicator})$.

Training and development courses indicator takes the full score (2), if the value of the indicator is $\geq (1)$, and the score $(\text{indicator value} * 2)$ is given if the value is $< (1)$.

Fourth Hub: The Infrastructure Hub

For this hub, its indicators are as follows:

Classroom indicator = (capacity of classrooms (student) * number of weekly working hours * number of daily available hours) / (number of students * average of weekly use hours (theory)).

Student restaurants indicator = (the number of students absorbed by the restaurant * number of weekly working days * number of daily available hours) / total number of students * the average number of hours a student spends in the restaurants per week (6).

Note: It has been assumed that the average number of weekly hours spent by the student in the restaurant is (6) hours, calculated on the basis that the average time of the student is (4) days per week and is spent at a rate of (1.5) hours per day.

Green Areas indicator = total area of green spaces / (number of students * 5).

Indicator of faculty members' offices = total area allocated to faculty members' offices / number of faculty members * (7.5).

Faculty members parking indicator = total area for faculty members parking / number of faculty members * (12).

Bathrooms indicator = (number of bathrooms * number of daily working hours * 12) / number of students.

As for the distribution of the degrees of this hub, they are as follows:

Classroom indicator (3) scores, restaurant and club indicator (2) scores, green areas indicator (2) scores, faculty members' offices indicator (1) score, faculty members' parking indicator (1) score, bathrooms indicator (1) score.

Where, the full score of the indicator is given if the value of the indicator is $\geq (1)$, and the score will be (the indicator value * the degree assigned to it) in the event that the value of the indicator is $< (1)$.

Fifth Hub: Students' Hub

The degree of this hub, which is (10) degrees, is divided as follows:

A score of (3) in the case that there are administrative orders for warnings and dismissal announced to students in the boards of scientific departments according to the official mechanism for issuing them. And (2) scores in the case of complaints and suggestions box exist and follow-up according to official documented records, in addition to having documented meetings for the Deanship and heads of departments. Finally, score of (5) in case there is an electronic system for student activities that includes registration, absences, exam committees, documents and certificates.

Sixth Hub: Community Service Hub

The degrees of this hub, amounting to (10) degrees, are distributed as follows: (3) score for consulting indicator = number of consulting during the year / 2, if the result is $\geq (1)$ will take full score. Nevertheless, if the result $< (1)$ it will take (3 * indicator value).

A score of (4) for the productive works, that will be according to the following indicator:

Productive works = the number of productive works / (3), if the result $\geq (1)$ it will take full score and if the result $< (1)$ the score will be (4 * indicator value).

The other three degrees will be given to the following activities (general seminars, general lectures, contribution to general activities, news and published articles, site activity, voluntary initiatives and campaigns).

Seventh Hub: Plans And Committees' Hub

The degrees of this hub, amounting to (10) degrees, are distributed as follows (4) degrees for the plan, (3) degrees for councils, (3) degrees for committees, and the mechanism for calculating them will be as follows:

About the plan, its mean the annual work plan prepared by the institute by collecting and unifying the plans of scientific departments, which ensured that there is a central plan at the department level and institute level, as for the councils and committees indicators they are calculated as follows:

Councils indicator = total meetings of the councils of the scientific departments and the scientific council of the Institute during the year / (number of scientific departments * 10) + 8.

If the indicator value is $\geq (1)$ takes full score, and if the value of the indicator $< (1)$ it will take (3 * the value of the indicator), for example, if the following information given for an institute:

The number of Institute Board Meetings (10), number of scientific departments (5), its number of meetings during the year are respectively (8, 11, 10, 12, 9).

The indicator value will be: $(10 + 8 + 11 + 10 + 12 + 9) / (5 * 10) + 8 = 60 / 58 > (1)$ that's mean it will take (3).
Committees indicator = the number of committees actually formed / number of committees to be formed.

If the value of the indicator $\geq (1)$ will take (3), and if the indicator value $< (1)$ the score will be (3 * the value of the indicator).

Eighth Hub: The Graduates' Hub

The degree of this hub, which are (10) degrees, is distributed among samples of reports, systematic training records, relationship with the job market, summer training orders records, graduate follow-up mechanism, finding job opportunities, self-reports of achievements and samples of graduation projects.

Ninth Hub: The Vision, Mission And Objectives Hub

total degrees of this hub are (5) degrees, if the vision, mission and objectives are existed takes (2) scores, and if published takes (1) score, as well as, takes (2) scores if it is available for employed.

That is, this degree is given in full if the vision, mission and objectives are exist, published and available to employed and the weight for each of them is:

$$1/3 (2/5 + 1/5 + 2/5) = 1/3$$

As for the degree of this hub, it will be the sum of the three degrees. For example, if the vision is existed, unpublished and not available to the employed, its degree will be:

$$1/3 * (2/5 + 0/5 + 0/5) = 2/15$$

And if the mission is existed, published and available to the employed, its degree will be:

$$1/3 * (2/5 + 1/5 + 2/5) = 1/3 * 5/5 = 1/3$$

If the objectives are existed, published and not available to the employed, its degree will be:

$$1/3 * (2/5 + 1/5 + 0/5) = 1/3 * 3/5 = 1/5$$

The final indicator value will be:

$$2/15 + 1/3 + 1/5 = 10/15 = 2/3$$

And the final degree of this hub in the evaluation is equal to:

$5 * 2/3 = 10/3 = 3.3$

Which means, the degree of evaluation for this hub is (3.3) from (5).

Evaluation procedures:

The evaluation is carried out in two ways, the first is external through the university presidency and the second is internal, meaning that the institute evaluates itself and extracts the indicators and the degree of evaluation.

As for the evaluation levels, it may suggest the following:

(80 – 100) Excellent
(70 - less than 80) Good
(60- less than 70) Middle

Thus, the allowable point that any institute must pass in order to obtain success is (60) degrees.

A detailed report is presented to each institute showing the most prominent strengths and weaknesses on the basis of the evaluation hubs, because the institute that does not achieve the allowable point, for example, does not necessarily have to be distinguished in one of the hub.

Conclusions and Recommendations

After reviewing the evaluation hubs and indicators and its implications for the evaluation, quality, evaluation procedures and mechanism, we include the most important conclusions and recommendations.

- 1- The existence of a model for evaluating the performance of technical institutes helps them to check on the level of implementation of their programs and contributes to improving the educational process and developing them.
- 2- The proposed model and its results can be used during the evaluation years to find comparative criteria such as the index numbers to know the current development, positively or negatively for each component of the evaluation.
- 3- Raising the efficiency of the performance of technical institutes by creating a positive competition between the institutions
- 4- The use of the indicators makes the decision more correct and away or reduce the margin of diligence.
- 5- Can benefits from the feedback for the purpose of the amendment in a way that is compatible with the latest changes by applying proposed model.

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