



وقائع المؤتمر العلمي الدولي لكلية الإدارة والاقتصاد
(الثورة الرقمية كأداة للتنمية المستدامة وأداة للتخطيط الاقتصادي والإداري في العراق)
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Assessment Report with Academic Accreditation Standards (ABET) in Engineering Faculties Staff (Faculty of Engineering College - Mustansiriya University as a Model)

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Abstract:

Quality in higher education, as he stressed the need to achieve the ministerial program, is one of the most important means by which universities compete and show their strength and distinction, given the clear answers they provide for the university's vision and the goals it seeks to achieve, as well as the means it provides. The raise the level of the university's performance and how the local university becomes the level of international universities, and because it provides criteria for measuring the success of the university through evaluation systems that are tools for measuring productivity. For all these considerations, it has been studied academic staff was taken in the self-assessment report submitted by the College of Engineering Department of Mechanical Engineering in accordance with international standards to obtain accreditation ABET and then took the strengths and weaknesses and SWOT analysis of those points

1. Introduction

The scientific development of any university will be reflected in the development of society, which is a criterion for the progress of the university and society together. Therefore, Iraqi universities felt the need to develop their programs by activating quality assurance and academic accreditation in order to graduate qualified cadres capable of meeting the needs of the beneficiaries, as well as for scientific research and the educational project.

Iraqi universities have sought to achieve the international standards for obtaining ABET accreditation and accreditation programs within the eleven axes of vision, mission, goals, leadership, resources, faculty members, student affairs, student services, academic programs, and teaching methods, as well as scientific research, community service, evaluation and ethics undergraduate.

Quality in higher education, as he stressed the need to achieve the ministerial program, is one of the most important means by which universities compete and show their strength and distinction, given the clear answers they provide for the university's vision and the goals it seeks to achieve, as well as the means it provides to raise the level of performance The university and how the local university becomes at the level of international universities, because it provides criteria for measuring the success of the university through evaluation systems that are tools for measuring productivity.

Commitment to applying quality standards is one of the priorities for improvement and development in the current stage, and according to what was agreed upon at the



UNESCO Education Conference (Paris, 1998). All educational functions and activities, such as school curricula, should be included in higher education quality requirements. Educational, scientific research, students, buildings, facilities, tools, community service, and internal self-education are all covered by Walp software also require comparison with the quality of internationally recognized institutions.

Improving the performance of higher education institutions to provide the best services to beneficiaries is done by adopting an inexpensive approach and tool that enables teachers to strengthen the institutions to which they belong through self-assessment and analysis procedures, preparation and follow-up of action plans to implement the goals.

The goal of the educational institution is basically to lay solid foundations for the sustainability of the institution's development activities in all fields by setting the institutional development curriculum in a specific period of time to follow up on the institution's activities to upgrade it to excellence. As well as working on the application of the institutional development methodology through the adoption of tools for self-assessment, planning and follow-up on the implementation of action plans.

This research aims to focus on the teaching staff in the Department of Mechanical Engineering / College of Engineering / Mustansiriyah University. The Department of Mechanical Engineering endeavors to provide the labor market with engineering competencies armed with scientific and practical techniques, principles and sound values.

In this research, the focus of the academic staff was taken in the self-assessment report submitted by the College of Engineering Department of Mechanical Engineering in accordance with international standards to obtain accreditation ABET and then took the strengths and weaknesses and SWOT analysis of those points

2. The American Academic Accreditation Authority for Engineering and Technology (ABET)

The Accreditation Board for Engineering and Technology, Inc., or ABET, is a non-profit organization that accredits post-secondary education programs in applied and natural science, computing, engineering, and engineering technology.

The American Board for Engineering and Technology (ABET) accredits college and university programs in applied sciences, computing, engineering, and technology in the United States. Workshops, consultations, memorandums of understanding, and mutual recognition agreements, such as the Washington Agreement, are all ways that ABET provides international leadership. Since 1997, the Accreditation Council for Higher Education Institutions (CHIA) has recognized ABET.

ABET is a world-renowned, not-for-profit organization owned and operated by more than 25 scientific and engineering professional societies in the USA, involving more than 1,500 academic and industry professionals. ABET has been setting and developing high-quality standards for engineering education for 75 years.

All certified engineering programs must meet these requirements. Furthermore, these criteria are designed to encourage a systematic pursuit of quality improvement in



engineering education that meets the needs of its constituents in a dynamic and competitive context. It is the school seeking accreditation for an engineering program's responsibility to demonstrate that the program fits the following standards.

2.1 Academic accreditation for engineering and technology

Accreditation it is an evaluation process that requires scientific departments to carry out a comprehensive periodic evaluation of all academic activities. In the process of evaluating engineering programs and specializations, ABET forms work teams consisting of highly experienced scientists, specialists and experts from industry, academic, governmental and private bodies. In the evaluation process, the work team focuses on the curricula, the efficiency of the faculty members, the level of students, the material and human capabilities, the support provided by the university to the scientific department and the college, and many other elements that concern the quality and efficiency of the educational process. Continuous development of the quality of education is one of the most important elements of ABET accreditation, and to achieve this, the scientific department sets specific and measurable goals, which students and graduates must achieve.

2.2 Criteria for bachelor programs

All programs wishing to be accredited by ABET's Engineering Accreditation Commission must demonstrate that they meet all of the General Criteria for Baccalaureate Level Programs.

- Criterion 1: Students
- Criterion 2: Program Educational Objectives
- Criterion 3: Student Outcomes
- Criterion 4: Continuous Improvement
- Criterion 5: Curriculum
- Criterion 6: Faculty
- Criterion 7: Facilities
- Criterion 8: Institutional Support

Faculty was explored in this study.

3. Criterion of Faculty

The program must demonstrate that there are enough faculty members and that they are qualified to cover all of the program's curricular areas. In order to allow suitable levels of student-faculty contact, student advising and counseling, university service activities, professional development, and interactions with industrial and professional practitioners, as well as student employers, there must be enough professors.

The program faculty must have the necessary credentials and authority to ensure the program's right direction, as well as to establish and implement mechanisms for the program's evaluation, assessment, and continuous development. Education, diversity



of backgrounds, engineering experience, teaching effectiveness and experience, ability to communicate, enthusiasm for developing more effective programs, level of scholarship, participation in professional societies, and licensure as Professional Engineers can all be used to assess the faculty's overall competence.

3.1 Responsibilities of academic staff.

The total number of the academic staff is (60) as shown in table 1.

Certificate				The scientific title								Sum	
Msc		Ph.D		Prof		Asst.Prof		Lecture		Asst. Lecture		Male	Fe male
Male	Fe male	Male	Fe male	Male	F emale	Male	Fe male	Male	Fe male	Male	Fe male		
15	5	30	10	3	--	12	4	25	8	5	3	45	15
Sum		Sum		Sum		Sum		Sum		Sum		Sum	
20		40		3		16		33		8		60	

In addition to their main job of teaching, the academic staff is also work in different kind of responsibilities such as (head of department, members of multi committee ...etc).

Average area of research laboratory for each lecturer is 60 m² with 14 laboratories are available in the department.

Average area of each classroom in the department is shown in table 1.

Table 1 Average area of each classroom in the department

Total			4 th Year			3 rd Year			2 nd Year			1 st Yrae			Classroom Area m ²
Standard Average capacity of each class room	Average No. of students in each classroom	No. of classroom	Standard Average capacity of each class room	Average No. of students in each classroom	No. of classroom	Standard Average capacity of each class room	Average No. of students in each classroom	No. of classroom	Standard capacity of each classroom	Average No. of student in each classroom	No. of classroom	Standard Average capacity of each class room	Average No. of students in each classroom	No. of classroom	
40	50	12	40	40	3	40	40	3	40	40	3	40	50	3	50

3.2 The qualification and experience of the academic staff.



The large percent of the academic staff have a wide experience in the academic field. The staff holds high degrees (M.Sc & Ph.D) from Iraqi universities and others from foreign universities (USA, UKetc).

3.3 Developing the skills of Academic Staff

By pushing and support the academic staff to participate in the local and international conferences and join different level of training course which organized by continuous education unit. Most of the staff depends on their own efforts to improve their skill. The main source of information, which helps the staff, is the internet.

3.4 Ratio of students to lecturer under different scientific grade and qualification

The ratio of students to lecturer is 7:1.

3.5 Scientific research and it is Outcomes

There is a scientific research plan which approved by the scientific committee of the department at the beginning of each year. The plan contains the title of the research projects and its requirements. There are many projects completed during the academic year and published in different types of journals and conferences. The department got a thanks full certificate for publishing three papers in international journals with high impact factor.

Our academic staff supervises many M.Sc and Ph.D projects in other Iraqi universities. In addition, many scientific seminars held in the department for postgraduate student. The purpose for these M.Sc & Ph.D seminars is to know the level of project achievements and help them to solve the problem.

3.6 Evaluate the present number of Human recourses

Regarding to the table of the number of lecturers and their scientific grade which shows before, it is necessary to engorge some of lecturers with M.Sc degree to continue their higher degree towered Ph.D and also encourage them to transfer to the higher scientific grade.

3.7 Available Resources in the college

The available resources are enough from the point of quantity but it needs to developed by nominate them to participate in the different kind of training courses and let them participate in the international conferences.

3.8 Means of Developing the Academic staff

1. Offer the finical support to participate in the international conferences and give them a chance to see the others colleges in the same field and exchange the views with them.
2. Send the academic in an advance-training course inside and outside Iraq to notice the latest technology in education and curriculums.
3. Organize a scientific seminars and conferences inside Iraq and invite the experts from high quality universities around the world to give lectures and exchange the ideas and views with them.
4. Give the lecturers a chance to work as consultant for both the public and private sectors.



3.9 The roles of Academic staff in curriculum Design

The academic staff plays major roles for designing the curriculums. They are presenting their syllabus at the beginning of each year of (30 weeks) which prove it by the scientific committee of the department.

3.10 The roles of college's Dean and university authorities in curriculum design.

There is a central committee in the college which it is main job to coordinate between scientific departments and evaluate the presented curriculum. The college held a big meeting, which attends, by the experts to evaluate and assess the curriculum and then send it to the dean of engineering committee to prove it and send it again to the MOHE to finale prove.

4. Analysis

4.1 Strength points:

- 1- Send number of lecturers outside Iraq for training and see the experience of the others in their field.
- 2- Percent of lecture/student within the standardization.
- 3- Apply all the instructions and rules of the MOHE by encourage the Asst. lecturer to get higher scientific grade.
- 4- There is a big chance to them to continue their higher degree (Ph.D) either inside or outside Iraq.
- 5- Plan to get the Accreditation through the re assess of the curriculum and other requirements.
- 6- Forms committees within the department and the college to follow and check the efforts, which try to develop the quality, and quantity of the curriculums.

4.2 Weakness Points

- 1- Force the academic staff to do some kind of works such to be a member of committees which is not related to his main job.
- 2- There is no enough participation of the lecturer in the conferences or training courses.
- 3- There is no enough finical support to manufacture and a build a scientific research devices .Also a poor financial support for participating in the conferences or publishing papers in international journals.
- 4- There is no advance scientific laboratories which can stand with the advance scientific researches.

4.3 Deficiencies, Weaknesses Documented and the Actions taken to Address them

This section provides the documented shortcomings and threats, as well as the department's important activities taken or intended to address the weaknesses and hazards related with the educational process.



Faculty		
Weaknesses	Threats	Actions Made & Proposed to be Made
<ul style="list-style-type: none"> - Due to insufficient development programs, an increasing number of new faculty members have little or no teaching experience. - A large number of professors have little or no industrial or research experience. - Faculty members' rehabilitation programs are inadequate. - Relationships with international research institutes and academic institutions are strained. - Faculty development is not adequately funded. 	<ul style="list-style-type: none"> - There is a competition (local, regional and global). <ul style="list-style-type: none"> a. Local and regional private colleges that are just being started. b. Iraqi branches of private institutions in neighboring countries. c. Weaknesses in society's overall degree of scientific awareness. - Interest in engineering is dwindling. - Reduced financial support for professors as scientific researchers, resulting in a drop in research quality, where publishing in worldwide scientific journals is the foundation for improving the college's and university's reputations to the level of foreign universities. 	<ol style="list-style-type: none"> 1. Make faculty development suggestions to the Ministry of Higher Education. 2. The Continuous Education Center is now operational. 3. Initiate fieldwork relationships. 4. Recognizing, caring for, and retaining exceptional educators and staff. 5. Use continual assessment to improve teaching and learning. 6. Encourage research and consultation that addresses the society's present and long-term requirements. 7. Establish a solid relationship with society, particularly industry, in order to work together to promote the country's economy. 8. Continue to build and maintain a sufficient infrastructure. 9. Increasing the number of faculty training programs. 5. Five faculty members enrolled in Ph.D. programs in Iraq. 11. Three faculty members enrolled in Ph.D. programs outside of Iraq.

5. The improvement planning in Mechanical Department for Teaching Staff

A plan to improve the self-assessment report has been prepared for the Department of Mechanical Engineering, and the professors' axis procedures will be reviewed to enhance strengths and address weaknesses to advance the educational process.



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	Achievement Indicators	The Duration		The Responsible side	Activities	The Outputs	The Goals	Notes
		from	to					
1-	To develop the teaching staff	2011	continuous	*Presidency & the Council of the Dpt. * Scientific Committee	*To train instructors in specialized courses *Making workshops to know about the new methods in teaching	Trained teachers on modern scientific and academic techniques	Developing the teaching staff	
2-	A plan to Raise the level of scientific research and its output	2011	continuous	*Presidency of the Dpt. * Scientific Committee	* Activation of conducting joint research with universities in the world * Publication of teachers' research in good international journals * Participation in global conferences * Prepare an annual research plan	good scientific research	Making researchers on the local and global levels and developing their ability research	
3-	A Plan to develop the teaching staff capabilities and contribute to global conferences	2016	2020	*Presidency of the Dpt. * Scientific Committee *Quality Assurance Committee	*Providing financial support for teachers to participate in global conferences *nominating teachers in development courses inside and outside Iraq holding * Seminars and scientific conferences	Teaching staff with high capability in the service of the community	* Teaching staff capacity development * Strengthening the scientific reputation locally and globally	



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		from	to					
4-	A plan to Activate the role of teachers in curriculum development	1/09/2016	1/07/2020	*Scientific Committee *teaching staff	*making curriculum vocabularies *to make study plan to complete the curriculum within definite duration* develop the curriculum	New strong vocabularies curriculum and their coding according to global context	New strong vocabularies curriculum and their coding	Helping in solving government problems through scientific researches for high study students
5-	A plan to use new technology & techniques in teaching	1/09/2016	continuuos	*Scientific Committee *teaching staff	Holding workshops to make knowledge of new technology	Raise the level of technology proficiency for teaching staff	Raise the technology proficiency for teachers	
6-	A plan to develop the technical abilities for engineers	1/09/2016	continuuos	*Continual learning unit *Scientific Committee	*Nominate engineers for continual learning courses inside & outside the College * Activate the participation in performance test and IC3 & TOEFL	To make engineers can run labs technically	Develop the engineering staff	



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	Achievement Indicators	The Duration		The Responsible side	Activities	The Outputs	The Goals	Notes
		from	to					
7-	A plan to develop the labs	1/09/2016	1/07/2020	* Presidency of the Dpt. *Scientific Committee *officials of labs	*evaluate the reality of the labs devices * Determine the validity and novelty devices and labs equipment * Determine the Dpt. need of the lab and research services * Determine the possibility of introducing specialized lab	Study the nature & reality of the labs devices and the ability to develop them	Develop the Dpt. Labs according to the global context	The developing plan is continuous
8-	A plan to buy the newest labs	1/09/2016	1/07/2020	* Presidency of the Dpt. *Scientific Committee *labs committee *central committee of labs	*Determine the Dpt. need to buy required devices of lab *Check and matching technical specifications of the received devices * preparing of a specialized technical staff for the use of modern devices	Buying new labs devices according to the scientific descriptions and the need of the Dpt.	Availability of labs with developed researching descriptions	The work is continuous according to the plan
9-	A plan to develop labs for higher studies students	1/09/2016	continuous	* Scientific Committee *labs committee *central committee of labs	Preparing rooms for higher studies labs Providing them with newest devices and tools	Developing labs to fulfill developed scientific research	To fulfill the developed researching projects	



6. Conclusions

- 1- From the foregoing, we conclude that obtaining ABET reliability requires a period of time ranging from it takes 4 to 5 years, so this process requires a continuous improvement plan for the faculties that have blinded with this experience.
- 2- The teaching, learning and research need an enough budget and a clear vision in order to spend it in the right way as done in other countries.
- 3- The quality of furniture in the classroom is good but the labs need more research and experimental equipment.
- 4- Administrative responsibilities give the teacher experience in dealing with real life, through Committees in which the teacher is assigned.
- 5- 3- The number of students at the present time is commensurate with the number of teachers.
- 6- The presence of curricula development committees within the same department would continuously develop curricula.
- 7- The number of delegations for teaching abroad does not match their number.
- 8- Curriculum change rate of only 11% negatively affects the development of curricula, because there are curricula
- 9- You need more than that, and there is a slow response to changing curricula, such as adding a new subject or Delete an item.
- 10- The lack of laboratories and infrastructure weakens the research.



7. Recommendations

- 1- Cooperate with others departments in other universities.
- 2- Develop the research laboratories to do high quality scientific researches.
- 3- Help the lecturers to do their research work with comfortable environment.
- 4- Activate the positive scientific relationship with others enterprise (public & private).
- 5- Continue the higher degree courses (M.Sc) in the department and expand towered a Ph.D degree.
- 6- Organize seminars in the college to present the latest technology of education.
- 7- Invite the experts from a scientific international institutes and universities to give a lecture in this field.
- 8- Invite the Iraqi lecturers who work abroad.
- 9- Individual efforts of our staff by exchange the ideas and views with others through the internet network.
- 10- Provide the finical support for the scientific researches projects.
- 11- Activating a mechanism of cooperation or twinning with international universities.

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