Application of quality assurance standards for scientific research in Algerian universities: An effectiveness study based on Adrar University

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Abstract

The concept of quality has recently received great attention from various organizations and higher education institutions have been interested in this topic around the world. The objective of our study is to analyze the mechanisms of the success of the quality assurance system (QAS) adopted by Algerian higher education. First, we focused on the recent reforms of higher education during the rapid development of globalization, then the quality assurance strategy, its stages, and practices. Finally, the way Algeria's higher education policy can promote quality enhancement mechanisms in universities is discussed.

Keywords: Quality assurance system, Algerian higher education, scientific research, Adrar university.

تطبيق معايير ضمان الجودة للبحث العلمي في الجامعات الجزائرية: دراسة فاعلية على أساس جامعة أدرار

ملخص

يلقى مفهوم الجودة في الآونة الأخيرة اهتماما كبيرا من مختلف المنظمات واهتمت مؤسسات التعليم العالي بهذا الموضوع حول العالم. الهدف من دراستنا هو تحليل آليات نجاح نظام ضمان الجودة الذي اعتمده التعليم العالي الجزائري. أولا، ركزنا على الإصلاحات الحديثة للتعليم العالي أثناء التطور السريع للعولمة، ثم إستراتيجية ضمان الجودة ، ومراحلها وممارساتها. أخيرًا، كيف يمكن لسياسة التعليم العالي الجزائرية أن تعزز آليات تحسين الجودة في جامعاتها.

الكلمات المفاتيح: نظام ضمان الجودة، تعليم عالي جزائري، بحث علمي، جامعة أدرار.

Application des normes d'assurance qualité pour la recherche scientifique dans les universités algériennes: Une étude d'efficacité basée sur l'Université d'Adrar

Résumé

Durant les récentes années, le concept de qualité a retenu une grande attention de la part de diverses organisations et établissements de l'enseignement supérieur dans le monde entier. L'objectif de notre étude est d'analyser les mécanismes de réussite du système d'assurance qualité adopté par le système de l'enseignement supérieur algérien. Tout d'abord, nous nous sommes intéressés aux récentes réformes durant le développement rapide de la mondialisation, puis à la stratégie d'assurance qualité, ses étapes et ses pratiques. Enfin, la manière dont la politique algérienne de l'enseignement supérieur peut promouvoir des mécanismes d'amélioration de la qualité dans les universités est discutée.

Mots-clés: Système d'assurance qualité, enseignement supérieur algérien, recherche scientifique, université d'adrar.

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Introduction:

Quality assurance (QA) in higher education institutions is the basis of the educational process because the quality is one of the priorities of the development plans and the requirements for improving the outputs of higher education. Higher education in Algeria has undergone many stages in which it has encountered many difficulties and problems that prevent the active role of the university in cultural, economic and social life. The degradation of the quality of the higher education is one of the biggest problems those reflect the difficult conditions in the Algerian university system (AUS).

Despite the efforts exerted to ensure quality, there is a delay, particularly in the field of scientific research. The Algerian educational system recognized the necessity of implementing the quality assurance system (QAS) in higher education. It established the so-called National Council for Evaluation in 2008. The Ministry of Higher Education organized an international conference on quality assurance. On May 31, 2010, the National Committee for the Application of Quality Assurance in Higher Education and Scientific Research (CIAQES) was established.

Research Problem, Objectives and methodology:

In this article we will try to answer the following questions: (1) What is quality and QA in higher education? (2) What are the stages of establishing a QAS in Algerian higher education institutions? (3) How to improve the quality of scientific research according to the new internal QA reference in Algerian higher education institutions?

The Hypotheses of the study are as follows: -Algeria's national QA have succeeded in spreading a culture of quality; -The National Quality Assurance Authority (NQAA) was able to measure the quality of scientific research at Adrar University; and -The establishment of the committees in the National Reference for Scientific Research at the Adrar University allowed the improvement of quality practices.

Research objectives aim at analyzing the stages of establishing the QAS in Algerian higher education through reading the components of the national reference of quality assurance, analyzing the results of the self evaluation process in the scientific research domain of one of the university and highlighting the means of advancement in Algerian universities.

The Research Methodology adopted is based on the analytical descriptive approach by describing the stages of establishing the QAS in Algerian higher education and analyzing the results of the evaluation of the scientific research to come up with recommendations to improve its quality. To answer these questions, we split this work into three parts: 1. Quality and QAS, 2. The higher education system in Algeria: Recent policy updates and major reforms and, 3. QA strategy in Algerian higher education

Review of previous studies:

The study presented by *Naouel Abdellatif* (2011) is titled "The Importance of Quality Assurance in Realising and Maintaining a successful LMD system in the Algerian University". It attempted to solve the problem of securing the quality of higher education and its evaluation methods in Algerian universities. It aims first to provide basic information regarding the status of QA in Algerian higher education, then to propose effective strategies that will contribute to the success of the new reforms in the field of higher education in Algeria. The study concluded that QASs (plural) will face continuing challenges in the next decade, not only in terms of their procedural decisions, but also on the key educational issues to be addressed. Complex questions about how to measure educational quality in Algerian universities are of urgent importance, so there are still many problems to be asked in other studies[1].

The study presented by *Meriem Youcef and Naima Yahiaoui* (2017) is entitled "Inductive Study of Foreign Experiences in the Application of Total Quality Management in Higher Education (Conclusion of a Model Suggested for the case of Algeria)". The objective is to clarify the concept of total quality management (TQM) in higher education and study a number of foreign experiences in its application to come up with a proposal to allow the

improvement and development of higher education institutions in Algeria through the approach of TQM. The study concluded that despite deficiencies in the performance of higher education institutions, they do not agree on the need to change or reconsider their methods in performance of higher education institutions, but they agree on the need to change or reconsider their methods of doing business with a desire for rapid solutions. TQM requires a certain period of time in order to collect related data and analyze the results[2].

The third study reviewed here is presented by *Bouchiki Fatima and Barka Zine* (2017) and it is titled "Higher Education in Algeria: Achievements And Challenges - 1963 To 2017". This paper aims to examine the situation of the higher education sector in Algeria, under the pressure of change, where the sector is witnessing rapid growth and a significant contribution to economic growth. The Algerian government also faces the problem of allocating resources to the sector, which has been a top priority in public policies since independence. The higher education sector in Algeria has been characterized by several political reforms since its independence, the most important of which was the adoption of the LMD system. The implementation of amplification policies in Algeria has also led to a preference for quantity over quality, The study concluded that the main challenge currently facing Algerian universities is how to reconcile the needs of democratic access to higher education with the need for higher quality of formation in a changing world characterized by the emergence of a knowledge and information society and economic globalization. Furthermore, one of the strategic challenges is to train the large numbers of teachers needed to care for the student at a high level[3].

Quality and Quality Assurance System:

1- History of Quality Movement: The origin of quality as a concept is due to the period of business and industry in the 20th century. However, people have always been aware of quality and QA in various areas of life, but with the emergence of mechanization increased attention to quality and quality control. There are many scholars who have contributed significantly to what we know today in the field of 'quality'. Some of them are W. Edwards Deming, Joseph Juran, B. Crosby. So, it is important to look at the evolution of the concepts in quality:

Table 1: Chronology of quality movement

Pre -1900	Quality as an integral element of craftsmanship
1900-1920	Quality control by foreman
1920-1940	Inspection-based quality control
1940-1960	Statistical process control
1960-1980	Quality assurance/total quality control(the quality department)
1980-1990	Total quality management
1990-Present	TQM, the culture of continuous improvement, organization-wide quality

Source: Sanjaya Mishra, Quality Assurance in Higher Education: An Introduction, NAAC, 2006, p 16

2- Defining Quality: The meaning of quality may vary depending on the field of activity. The British Standard Institution (BSI) defines quality as "the totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs. Despite the efforts exerted to ensure quality, there is a delay, particularly in the field of scientific research. The Algerian educational system recognized the necessity of implementing the QAS in higher education. It established the so-called National Council for Evaluation in 2008. The Ministry of Higher Education organized an international conference on quality assurance. On May 31, 2010, the CIAQES (National Committee for the Application of Quality Assurance in Higher Education and Scientific Research) was established. In education system, a wide spectrum of definitions of academic quality has been used[4]:

- Quality as excellence: a traditional, élitist academic view, according to which only the best standards of excellence (usually meaning a high level of difficulty and of complexity of a programme, the seriousness of the student testing procedures, etc.) are understood as revealing true academic quality.
- Quality as fitness for purpose: a concept that stresses the need to meet or conform to generally accepted standards such as those defined by an accreditation or QA committee, the focus being on the efficiency of the processes at work in the institution or programme in fulfilling the stated, given objectives and mission.
- Quality as enhancement or improvement: focusing on the continuous search for permanent improvement, stressing the responsibility of the higher education institution to make the best use of its institutional autonomy and freedom. Achieving quality is central to the academic ethos and to the idea that academics themselves know best what quality is.

3- Quality assurance: The higher education system is more concerned with the concept of quality which is based on the principle of continuous evaluation throughout the life cycle of the system. The concept of QA has been addressed in many studies, the most important of which are: "Quality Assurance (QA) is generally defined as the advancement and evaluation of the various dimensions of a project/service/institution in order to determine if quality standards are met"[5]. However, there is not a clear definition of QA for higher education institutions. Besides, QA is concerned with instruction, research, publication, academic achievement, project development and all processes used in other operations by higher education institutions[6].

We can also define QA as: an all-embracing term referring to an ongoing, continuous process of evaluating (assessing, monitoring, guaranteeing, maintaining, and improving) the quality of a higher education system, institutions, or programmes. As a regulatory mechanism, QA focuses on both accountability and improvement, providing information and judgments through an agreed upon and consistent process with well-established criteria [7].

3- Why QA is important in higher education?

As teachers, students, principals, planners and policy makers in higher education, everyone should be conscious of why we should worry about quality of our teaching, programmes and institutions. Some of the reasons are[8]:

- **Competition:** With globalization and the new technology of information, the educational environment will be seized by increased competition. In order to survive in such a situation, higher educational institutions need to worry about their quality.
- **Customer satisfaction:** Students, parents or Stakeholders as customers of the higher educational institutions are now highly conscious of their rights. They are now demanding good quality teaching.
- **Maintaining standards:** the higher educational institutions are always concerned about setting our own standard and maintaining it continuously year after year. In order to maintain the standard, we should consciously make efforts to improve quality of the educational transactions as well as the educational provisions and facilities.
- **Accountability**: Concern for quality will ensure accountability of the funds utilised and inform the stakeholders about taking appropriate decisions. Thus, QA can be considered as a monitoring mechanism.

The higher education system in Algeria:

1- Development of higher education in Algeria: The Algerian education system at independence was directed only to train the French colonial elite. But With the establishment of the Ministry of Education, the process of building a new educational system has begun, with a focus on a number of objectives, including the Arabization of curricula and the modernization of teaching methods and skills.Higher education, in Algeria has witnessed many challenges since poste-independence. From 3 university establishments in 1962, with only 2000 students and less than 200 teachers, the sector grew in 2016 to 107 HE

establishments, and more than one and a half million students, of which 60% are female, and 54,000 teachers[9].

2- Characteristics of Algerian higher education: The rapid development and expansion of higher education in Algeria have had many implications for the performance of Algerian universities. The main characteristics of higher education policy are [10]:

- Rapid expansion of higher education in Algeria;
- Centralization of decisions and interference of Politics in higher education;
- Free education for all students and high expenses of the state on Higher Education;
- Accommodation, transport and meals for symbolic prices;
-Academic autonomy: universities determine the teaching programmes for the subjects within their sphere of competence;
- Scholarships are provided for the majority of students.

3- Recent policy updates and major reforms in Algerian higher education: Many reforms in Algerian higher education were carried out, in order to adapt to different challenges; and also to deal with various educational and organizational problems, and recently it was the LMD reform that started in 2004.

3-1- LMD reform: The LMD system started to be applied in the flow of the present academic year (2004/2005). It is similar in structure to the reforms being undertaken in Europe through the Bologna Process:

- The licence, corresponding to three years of study beyond the baccalaureate (bac+3);
- The master, corresponding to two years further study beyond the licence (bac+5);
- The doctorate, corresponding to three years of research beyond the master (BAC+8).

The advantages of this reform will allow the professors to design their own courses and degrees. Later, they can propose it for accreditation to the specialized groups at the Ministry of Higher Education. In terms of education, the LMD system is characterized by [11]:

- New education architecture;
- Reorganization of the teachings;
- Evaluation and accreditation of education programs and;
- Contents of innovative educational programs.

3-2- Recent policy updates (projects and programs):

a) Tempus Program (2002- 2013): Algerian Higher Education Institutions has submitted projects proposals through the different call for proposals and have benefited of a total of 56 projects in the calls of proposals: 24 projects in Tempus III and 32 in Tempus IV. Tempus III records 16 Joint Projects and 8 Structural Measures projects. As for Tempus IV it consisted of 26 Joint Projects and 6 Structural Measures projects [12].

Tempus projects have served to promote the following activities:

➢ participation in the development of international cooperation between national higher education institutions, those of the European Union (EU) countries and those of the southern Mediterranean region[13].

➢ training of administrative staff to assist with the management of the system of Bachelor, Master and doctoral degrees[14];

➢ establishment of university-enterprise partnerships;

➢ Establishment of an interface for university libraries in the central region; this network is currently being extended to cover all of Algeria's university libraries;

➢ Establishment of distance-learning platforms and training of teaching staff in the delivery of distance education.

b) Capacity Building in Higher Education (CBHE) Erasmus projects + program: Capacity Building projects focus on building capacities and modernizing Higher Education Institutions in Partner Countries to establish structural and a long-lasting impact. Algerian Higher Education Institutions partake as partners.

In 2016, Algerian Higher Education Institutions have participated in[15]:

➢ PROEMED: Boosting Environment Protection and Energy Efficient Buildings in Mediterranean Region;

➢ AFREQEN: Quality in higher education for renewable energies in North & West Africa;

➢ MERIC-Net: Mediterranean Network of National Information Centres on the Recognition of Qualifications;

➢ INSTART: Euro-African Network of excellence for entrepreneurship and innovation;

➢ SATELIT: Academic Solutions for the Euro-Mediterranean Territory Leader in Innovation and Technological Transfer of Excellence;

➢ DIRE-MED: Intercultural Dialogue, Networks and Mobility in the Mediterranean.

Quality Assurance Strategy in Algerian Higher Education:

With the start of the Bologna project in the 2004-2005 academic year, higher education has identified many challenges, the most important of which is adapting to the new system. So it was necessary to introduce the QAS as a key element in the LMD reform [16]. The QA system in higher education has emerged since 2008. The Ministry has organized an international conference on Quality Assurance. The QAS is the most important part of the Ministry's strategic plan to be implemented until 2030.

1- Establishment of QAS in Algeria: In Algerian higher education, the QAS has been established by the following stages:

• In 2008, the Ministry of Higher Education organized an international conference on quality assurance, which was based on the study of the possibility of applying QA in Algerian universities [17].

• In 2010: birth of two key organs :

- CNE (National Evaluation Committee): Its creation was provided for in the law 08-05 of 23-02-2008[18], and the setting of its mission was well explained in the executive decree number 10-36 of the 21-01 -2010 which is the monitoring and evaluation in the field of Quality assurance;

- CIAQES: the creation and designation of its members was by the decree of 31-05-2010 [19]. Its missions are to help implement and develop QA mechanisms, carry out QA activities evaluation and to carry out self-evaluation of programs and institutions in order to prepare for its accreditation national and/or international level [20];

• In 2012-2013: Formation of QA officials

Following the establishment of QA cells, the Ministry has devoted its efforts to training QA officials and members of the CIAQES [21];

• Establish a national reference of QA includes norms and criteria in accordance with international standards. The first reference was developed by the QA managers in January 2014, which covers all the criteria contained in the basic domains of formation, scientific research, university infrastructure, governance and life at the university, focusing on two other fields, given their importance in the national context: the university's relationship with the economic and social environment and cooperation with the economic and social environment.

Table 2: Components of the National Quality Assurance Reference

Domain	Fields	References	Criteria	Proofs
Formation	7	23	49	108
Scientific Research	3	17	32	55
Governance	5	27	53	181
Life at the University	4	14	25	71
Infrastructure	5	17	19	38
Relationship with the Economic and Social Environment	3	11	19	40
Cooperation with the Economic and Social Environment	4	14	22	70
Total	31	123	219	563

Source: MHESR (MESRS), CIAQES, CNE, Algeria:2016, http://www.ciaqes-mesrs.dz, (9/7/2019).

In reviewing the contents of the National Quality Assurance Reference in Higher Education Institutions, we note that the Ministry has given great importance to the domain of governance to ensure the participation of different parties in the decision-making of the institution. It also gave self-evaluation priority as a key factor for QA[22].

• Organise operations of self-evaluation of universities (2017).

In the next part, we will analyze the results of the self-assessment process in the domain of scientific research to highlight their contribution to quality improvement.

2- Case study: self-evaluation process of scientific research, Adrar University

In this section, we will present the diagnosis of scientific research at Adrar University, which was carried out by the QA Cell of the establishment according to SWOT and to the national reference of QA.

a. SWOT Analysis of Research:

The table below summarizes the strengths, weaknesses, opportunities, and threats of research:

Table 3: SWOT analysis for research

Strengths	*Weaknesses*
A. Human resources (note: 4)	*A. Organization and management (note: 5)*
- *Number of researchers (teachers and/or Ph.D. students)*	*- Lack of planning of research activities*
- Teacher-researchers from various schools (horizons).	*- The absence of a strategy to diversify the sources of financing of the laboratories*
B. Material resources (note: 3)	*B. Human Resources (note: 4)*
- An abundance of documentary resources	*- Lack of training for new researchers*
- Quality scientific equipment	*- No affiliation of the teacher-researchers to the laboratories*
- Presence of 40 labs. And research unit	*- Insufficient involvement of researchers in their research projects*
- Existence Infrastructures dedicated to research	*C. Means (note: 3)*
C. Strategy (note: 3)	*- locals unsuitable for research*
- The existence of a strategic vision for development	*- Inexistence of technological platforms.*
from research to university	*- Language of research*
- Growing demand for the opening of doctoral training.	*D. research Results (note: 3)*
D. Thematic and research axes (note: 2)	*- Lack of visibility of research results*
- Disciplines very favorable to research	*- The absence of applied research*
- Developed topics related to reality.	*- Lack of publications for the laboratories*
Opportunities	*Threats*
A. Environment (note: 5)	*A. Human Resources (note: 4)*
- Favorable socio-economic environment	*- Retirement of confirmed researchers*
- The emergence of a demand for research and development	*B. Environment (note: 4)*
B. Means (note: 4)	*- Lack of local, regional and national collaboration.*
- Internships, fellowships, and research projects	*- Social marginalization of the university.*
- Big budgets allocated to research	*- Social culture of the assistantship.*
- The existence of TIC resources	*C. Means (note: 3)*
c. Regulatory Framework (note: 3)	*- Exhaustion of public funding*
- Favorable regulatory text.	*D. Ethics (note: 2)*
	- Plagiarism

Source: *Developed by ourselves according to the 2017-2019 action plan, QA cell of Adrar University.*

b. Analysis of Scientific Research According to the National Reference of Quality Assurance (NRQA)

The following table summarizes the calculated scores of the references (4 categories) and the number of criteria and proofs not applied for each reference. It informs us about the urgency and the priority of the actions to be undertaken according to the references.

Table 4: Identification of priority activities of scientific research

Domain	Field	Calculated points for references				Nbr of unapplied criteria	Nbr of unapplied proofs
		Cp=<1	1<cp=<2	2<cp=<3	3<cp=<4		
research	R1	6	1	2	0	7	10
		%67	11%	22%	0%		
	R2	3	0	0	1	2	4
		75%	0%	0%	25%		
	R3	4	0	0	0	4	7
		100%	0%	0%	0%		
Total	3	13	1	2	1	13	21
		81%	4%	7%	8%	0%	0%

Source: Developed by ourselves according to the 2018-2019 action plan (Scientific Research), QA cell of Adrar University.

The result of the evaluation shows that the number of criteria not applied in the domain of Research is 13 of 32 the total number of criteria, and 21 unapplied proofs of 55 proofs. According to the national QA reference:

R1: *The organization, structuring, and development of Scientific Research;*
R2: *Relationships and Scientific Research partners;*
R3: *The valorization of Scientific Research.*

This representation informs us about the state of scientific research at the university. In fact, many activities should be launched in the future to ensure that its quality is improved.

3- What are the fundamental factors to successful QA System in Algeria?

In Algerian higher education, some efforts have been made to improve quality, but there is a long way to go for the successful system of QA. In this part, we will propose the fundamental factors for this strategy. The main results can be summarized as follows:

• The National Institutions for QA in Higher Education in Algeria have been able to spread the quality culture in university institutions,

• The application of the National Quality Reference Standards allowed the measurement of the quality of scientific research at the Adrar University,

• The establishment of committees in the National Reference for Quality in the domain of scientific research at the Adrar University allowed the improvement of quality practices,

• The self-assessment process proved that there was no improvement in the 2019 assessment compared to 2018 through the evaluation of the domain of Scientific Research. In 2019, it was estimated at 1.47% compared to the 2018 valuation of 1.59%, an estimated decrease of 7.54%.

Figure 1: The Radar representation of the calculated scores for the references
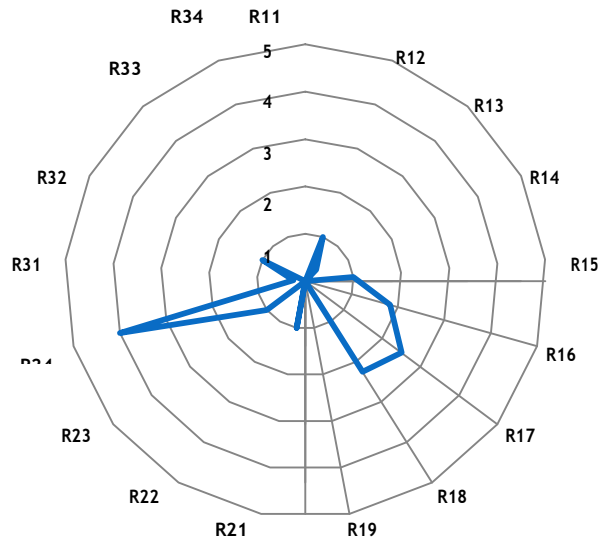
Source: Developed by QA cell of Adrar University.

- The evaluation found that the evidence not applied in the 2018 assessment is (21) proof of (55) evidence in scientific research by 38.18% and in the 2019 assessment there was a slight change and the number of non-applied evidence was (20) out of (55) proof by 36.36% Down by 1.82% which is a positive indicator.

Figure 2: Conditions for successful of QA
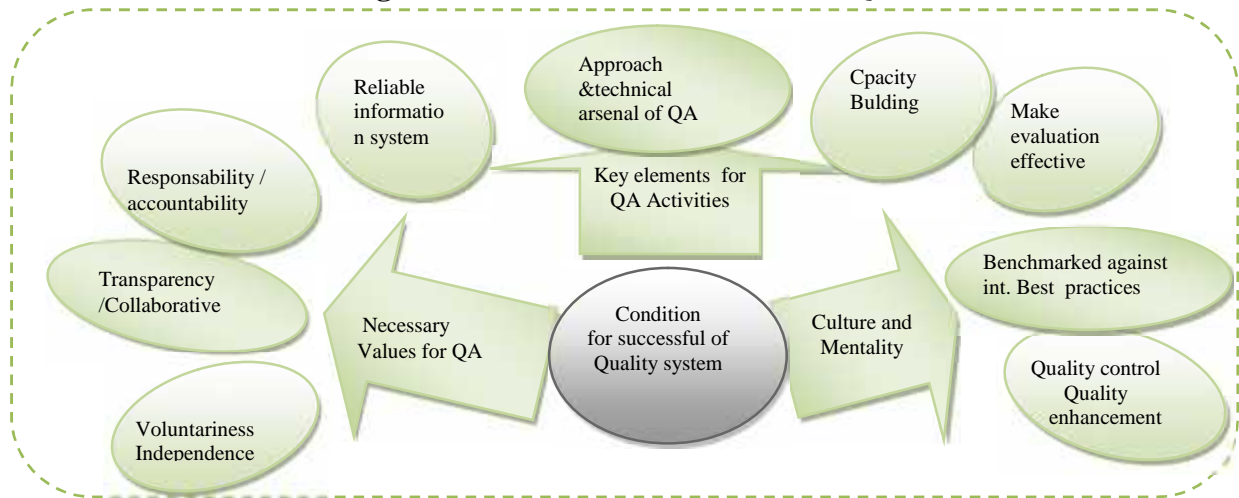
Source: developed by ourselves as seen it in fig. 1. The success of the QAS depends on the existence of specific mechanisms: quality improvement, quality control and evaluation, and TQM supported by a high quality culture.

Conclusion and suggestions:

　　The attention to QA in Algeria since 2008 has helped to create a dynamic culture of rigour effectiveness, and that was beneficial to Algerian higher education. But we should not forget that the whole process of building a congruent system of Quality will take some time before it will be visible and fully functional. To solve the real problems and constraints of Quality in Algerian Higher Education, more efforts are needed, and financial means are required, to face the complex challenges of globalization, in order to have effective universities, to match the performances of rising economies as Algeria aspires to be. It is suggested that more conformity, standardization and harmonization Universities to ensure minimum level of

quality in institutions which should get appropriate infrastructure support for facilities and technology. Also, it is needed to measure the quality of education, training of students, prestige of the faculty members and their research quality and increase quality culture level. The instauration of a collaborative network between QA committees is highly recommended.

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