

Quality Education Assessment of colleges through ICT Model

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Abstract— How to provide quality education to large numbers at affordable costs is the primary concern of developing countries. In this context quality and excellence should be the vision of every higher education institution. Acquisition of quality and excellence is the great challenge faced by all higher education institutions. The UGC with its statutory powers is expected to maintain quality in Indian higher education institutions. The UGC has been continuously developing mechanisms to monitor quality in colleges and universities directly or indirectly. The NAAC is advocating the best practices benchmarking approach for quality enhancement in higher education. The purpose of the study is to investigate and develop ICT model for NAAC that can be used in assessment of quality education in colleges affiliated by University. A model if implemented will effectively help to achieve a good quality assessment of any institution.

Keywords- ICT model; NAAC; SSR; Criteria; Key Aspect

I. INTRODUCTION

In this paper we present the ICT model for quality education assessment of colleges. Basically the objective is to design and develop a tool for NAAC review team. The tool is in the form of software which deals with evaluation criteria and colleges performance.

The paper covers initially accreditation frame work for NAAC. Then the description of ICT model in the form of web based application. It is used to calculate GPA which will help NAAC peer team for quality evaluation of the colleges or institutes.

Higher education is becoming a major driver of economic competitiveness in an increasingly knowledge-driven global economy. The imperative for countries to improve employment skills calls for quality teaching within educational institutions. How to provide quality education to large numbers at affordable costs is the primary concern of developing countries. Quality makes education as much socially relevant as it is personally indispensable to the individual. In this sense quality becomes the defining element of education. In this context quality and excellence should be the vision of every higher education institution. Acquisition of quality and excellence is the great challenge faced by all higher education institutions. The overall

scenario of higher education in India does not match with the global Quality standards. Hence, there is enough justification for an increased assessment of the Quality of the country's educational institutions. Traditionally, these institutions assumed that Quality could be determined by their internal resources, viz., faculty with an impressive set of degrees and experience detailed at the end of the institute's admission brochure, number of books and journals in the library, an ultra-modern campus, and size of the endowment, etc., or by its definable and assessable outputs, viz., efficient use of resources, producing uniquely educated, highly satisfied and employable graduates. This view of determining Quality in higher education, popularly termed as the "value-addition" approach, does not measure the competencies students develop through the courses offered.

The University Grants Commission (UGC) with its statutory powers is expected to maintain quality in Indian higher education institutions. The UGC has been continuously developing mechanisms to monitor quality in colleges and universities directly or indirectly. In order to improve quality, it has established national research facilities, and Academic Staff Colleges to re-orient teachers and provide refresher courses in subject areas. The UGC also conducts the National Eligibility Test (NET) for setting high standards of teaching. As a part of its responsibility for the maintenance and promotion of standards of education, the UGC took the initiative to establish an Accreditation and Assessment Council as an autonomous body. After eight years of continuous and serious deliberations, the UGC established NAAC at Bangalore as a registered autonomous body in 1994.

II. NAAC AND QUALITY EDUCATIONS

"Quality of education in our universities is obviously an area in which our higher education system lags behind. It is quite disheartening that none of the Indian universities finds a place in the top 200 universities in the world," the governor of Odisha SC Jamir said, while addressing the 88th All-India Vice-chancellors' Conference at KIIT University (TOI news Dt. 26 Feb 2014).

The National Assessment and Accreditation Council (NAAC) is advocating the best practices benchmarking

approach for quality enhancement in higher education. The NAAC uses the best practice benchmarking in the form of criterion statements to assess the level of performance of higher education institutions. NAAC has identified seven criteria to serve as the basis for the assessment of higher education institutions in the country. It follows a four-phase process of assessment of a unit (Institution or Programme/Department) covering:

- Nationally evolved criteria for assessment
- Self-study by the institution
- Peer team visit
- Final decision by Executive Committee of NAAC

The accreditation framework of NAAC is based on five core values:

- Contributing to National Development
- Fostering Global Competencies among Students
- Inculcating a Value System among Students
- Promoting the Use of Technology
- Quest for Excellence

(i) Contributing to National Development

Most of the HEIs have a remarkable capacity to adapt to changes, and at the same time pursue the goals and objectives that they have set forth for themselves. Contributing to National Development has always been an implicit goal of Indian HEIs. The HEIs have a significant role in human resource development and capacity building of individuals, to cater to the needs of the economy, society and the country as a whole, thereby contributing to the development of the Nation. Serving the cause of social justice, ensuring equity, and increasing access to higher education are a few ways by which HEIs can contribute to the National Development. It is therefore appropriate that the Assessment and Accreditation (A&A) process of the NAAC looks into the ways HEIs have been responding to and contributing towards National Development.

(ii) Fostering Global Competencies among Students

The spiraling developments at the global level also warrant that the NAAC includes in its scope of assessment, skill development of students, on par with their counterparts elsewhere. With liberalization and globalization of economic activities, the need to develop skilled human resources of a high caliber is imperative. Consequently, the demand for internationally acceptable standards in higher education is evident. Therefore, the accreditation process of NAAC needs to examine the role of HEIs in preparing the students to achieve core competencies, to face the global requirements successfully. This requires that the HEIs be innovative, creative and entrepreneurial in their approach, to ensure skill development amongst the students. Towards achieving this, HEIs may establish collaborations with industries, network with the neighborhood agencies/bodies and foster a closer relationship between the “world of skilled work” and the “world of competent-learning”.

(iii) Inculcating a Value System among Students

Although skill development is crucial to the success of students in the job market, skills are of less value in the

absence of appropriate value systems. HEIs have to shoulder the responsibility of inculcating the desirable value systems amongst the students. In a country like India, with cultural pluralities and diversities, it is essential that students imbibe the appropriate values commensurate with social, cultural, economic and environmental realities, at the local, national and universal levels. Whatever be the pluralities and diversities that exist in the country, there is ample scope for debate about inculcating the core universal values like truth and righteousness apart from other values emphasized in the various policy documents of the country. The seeds of values sown in the early stages of education, mostly aimed at cooperation and mutual understanding, have to be reiterated and re-emphasized at the higher educational institutions, through appropriate learning experiences and opportunities. The NAAC assessment therefore examines how these essential and desirable values are being inculcated in the students, by the HEIs.

(iv) Promoting the Use of Technology

Most of the significant developments that one can observe today can be attributed to the impact of Science and Technology. While the advantages of using modern tools and technological innovations in the day-to-day-life are well recognized, the corresponding changes in the use of new technologies, for teaching – learning and governance of HEIs, leaves much to be desired. Technological advancement and innovations in educational transactions have to be undertaken by all HEIs, to make a visible impact on academic development as well as administration. At a time when our educational institutions are expected to perform as good as their global partners, significant technological innovations have to be adopted. Traditional methods of delivering higher education have become less motivating to the large number of students. To keep pace with the developments in other spheres of human endeavor, HEIs have to enrich the learning experiences of their students by providing them with State-of-the-Art educational technologies. The campus community must be adequately prepared to make use of Information and Communication Technology (ICT) optimally. Conscious effort is also needed to invest in hardware, and to orient the faculty suitably.

In addition to using technology as learning resources, managing the activities of the institution in a technology-enabled way will ensure effective institutional functioning. For example, documentation and data management in the HEIs are areas where the process of assessment by NAAC has made a significant impact.

Moving towards electronic data management and having institutional website to provide ready and relevant information to stakeholders are desirable steps in this direction. In other words, effective use of ICT in HEIs will be able to provide ICT literacy to the campus community, using ICT for resource sharing and networking, as well as adopting ICT-enabled administrative processes. Therefore, NAAC accreditation would look at how the HEIs have put in place their electronic data management systems and

electronic resources and their access to internal and external stakeholders particularly the student community.

(v) Quest for Excellence

Contributing to nation-building and skills development of students, institutions should demonstrate a drive to develop themselves into centre's of excellence. Excellence in all that they do, will contribute to the overall development of the system of higher education of the country as a whole. This 'Quest for Excellence' could start with the assessment or even earlier, by the establishment of the Steering Committee for the preparation of the Self-Study Report (SSR) of an institution. Another step in this direction could be the identification of the strengths and weaknesses in the teaching and learning processes as carried out by the institution.

The five core values as outlined above form the foundation for assessment of institutions that volunteer for accreditation by NAAC. In conformity with the goals and mission of the institution, the HEIs may also add to these their own core values.

III. ICT MODEL

ICT is an instrument, a base upon which to operate, a means which, if properly understood and handled, can help us to improve the processes and the results of our academic undertakings. Guaranteeing quality in higher education today, in the 21st century society of knowledge, must consider the appropriate use of ICT. Information and communication technologies also allow us to deal with transversality in training programs, another important element in quality assessment in universities.

To fulfill the students demand for quality education it becomes very necessary to have assessment of quality of teaching on regular basis. A well designed assessment method should be implemented. Carefully designed assessment method can control the quality of the institution. Being the latest technology in computers, ICT can be a very powerful tool in the assessment of quality in Higher Education. Thus a model can be developed and implemented by using this robust and new technology which can be used in assessment of quality in higher education.

The purpose of the study is to investigate and develop ICT model for NAAC that can be used in assessment of quality education in colleges affiliated by University with a pedagogical approach. A model if implemented will effectively help to achieve a good quality assessment of any institution.

IV. FRAME WORK FOR WEB BASED ICT MODEL

There are four major components of the ICT model

1. Registering Institution
2. Feeding of SSR by the Institution
3. Feeding of Assessment report by peer team
4. Calculating Grade of Institution

Institution Registration: The working of this Software begins with College registration which creates a college Login and password, by using which the college can login

and feed the SSR. The admin user can only register a college and assign login ID and password. This login and password will be unique for every college.

Feeding of SSR by the Institution-The first and most important step in the process of assessment is the submission of the self-study report (SSR) to NAAC. NAAC believes that an institution that really understands itself- its strengths and weaknesses, its potentials and limitations. Self- study is thus envisaged as the backbone of the process of assessment. If a college gets a login and password, using this college can login and enter the SSR report, by creating College profile and then criteria wise inputs. The college profile contains around 35 questions to be answered. A criterion wise input is divided into 7 criteria, each criteria is further divided into key Aspects having several questions to be answered by the college.

Feeding of Assessment report by peer team-After receiving SSR from college, a peer team of NAAC visits the college for assessment. They make the assessment as per the SSR report submitted by the college. To validate the self-study report, the team looks for evidences through interactions with the various constituents and stakeholders of the institution, checking documents and visiting the various units of the institution. For feeding SSR report online, the peer team can login through their user Id and password and submit the report to NAAC.

Calculating Grade of Institution: After accepting assessment report from peer team, NAAC calculate grade of accreditation for that institution. The Executive Committee (EC) of the NAAC will review the peer team report, the criterion-wise Grade Point Averages (Cr.GPA), the final Institutional Cumulative Grade Point Average (CGPA), the Institutional Grade recommended by the Peer Team and the feedback received from the institution and the Peer team and takes the final decision on the accreditation status and the institutional grade.

V. OUR WORK

We have developed an ICT model which is in the form of online website. Using this proposed model, the institution will be able to submit the SSR (Self Study Report) online. The NAAC peer team who visits college for assessment can now validate the claims made by the institution in its SSR by logging in this website, as the SSR report submitted by the institution is available to peer team through peer login, and collect relevant documentary evidences. Peer team can now feed the PTR (Peer Team Report) from the college itself instead of carrying the hard copies of the entire document with them to NAAC. Due to this online submission facility, the NAAC accreditation process will be fast.

The website is developed using .NET technology. ASP .NET is used as front end and Microsoft SQL server is used to maintain database on the server in back end. The website can be accessed on computers by any browser from anywhere.

Following are few screen shots of the proposed ICT based model for NAAC.



Fig. 1: Admin Login

If the user logs in with correct Administrator user name and password the main screen will appear, as shown in the above screen shot. Administrator can perform various tasks as per the requirement. If the admin wants to register a new college/institute or want to see a list of colleges he/she can go to the Organization option. To activate a college for Accreditation user can go to Accreditation option. The Assessment option can be used for managing Criteria, Key Aspects and Questions. Graph Option is used for generating graphs of the available information of various colleges.

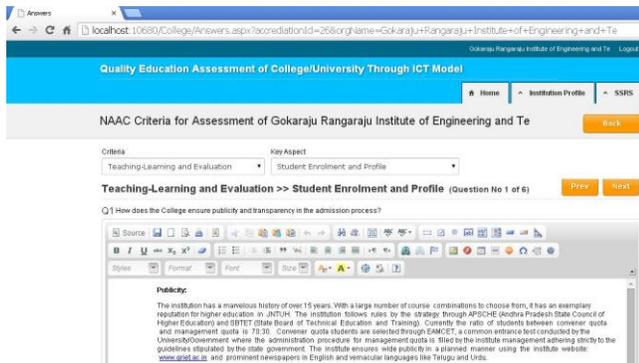


Fig. 2: Institution Login

The above screen will appear in the college login for submitting SSR report online, where the user can select the criteria and its Key Aspect. The first question for the selected Key Aspect will be asked. User can type the answer for the asked question in the text box and click on Save/Edit button. In this way all the questions for that particular Key Aspect will be asked one by one and can be answered by clicking on Next button. After answering all the questions of one Key Aspect, user can select next Key Aspect from the list till all the Key Aspects are answered. When we finished all the Key Aspects of one criterion, we can select next criteria from the criteria list and so on.

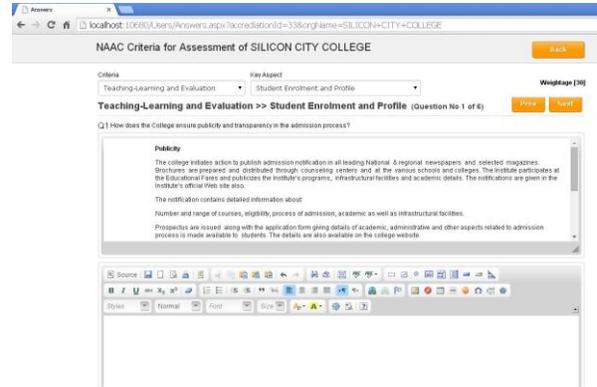


Fig. 3: Peer Team Login

At the time of peer team's visit to the institution, the peer user can login by the allotted user name and password and can verify the answers given by the college for every question of all 7 criteria and their respective Key Aspects. The peer user screen will be displayed as above, where user will have to select the criteria from the criteria list. As soon as user selects required criteria from the list, automatically all the Key Aspect of the selected criteria will be listed in Key Aspect list.

When the user selects the Key Aspect, the first question for the selected Key Aspect will be asked. There will 2 text boxes displayed in this screen. The first text box shows the answer that was given by the college for that particular question. Peer user can verify the answer given by the college and type the answer for the asked question in the second text box and click on Save/Edit button. In this way all the questions for that particular Key Aspect will be asked one by one and can be answered by clicking on Next button. After answering all the questions of one Key Aspect, user can select next Key Aspect from the list till all the Key Aspects are answered. When we finished all the Key Aspects of one criteria, user can select next criteria from the criteria list and so on.

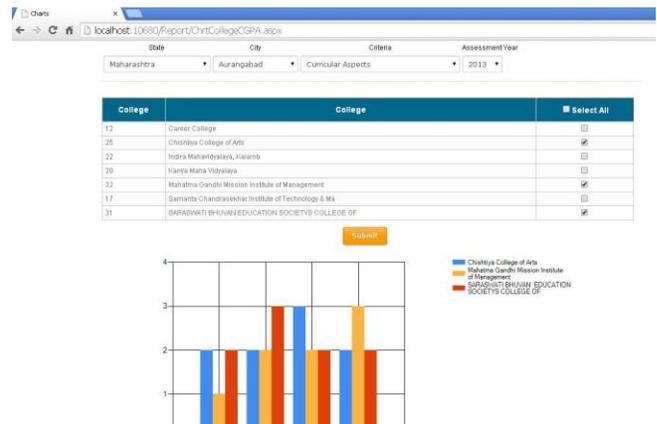


Fig. 4: Generating Graph.

To generate graph of the information of various colleges we can go to Graph menu. As shown in the above Screen, we can generate the graph by Selecting State, City of the colleges. After that we can select the colleges for which graph is to be generated or can click on Select All option to generate graph for all the colleges of that state and city. Then select the criteria and Key Aspect for which graph is to be generated, a graph of that type for the specified colleges will be generated and displayed.

VI. ADVANTAGES OF TOOL

The main advantage of this ICT tool will be the work which is being done manually will be done online by this tool which will save time. Institution will now be able to feed SSR online. The peer team will not have to carry the hard copy of reports physically with them as they are doing presently. After assessment, the team member will feed the information online from the institute itself. The information given by the institution in SSR will be displayed, referring which the team member can verify and feed Peer Team Report (PTR). On the basis of the PTR feed by peer team, the criterion-wise Grade Point Averages (Cr.GPA), the final Institutional Cumulative Grade Point Average (CGPA), can be calculated automatically by this tool, which will help in declaring the accreditation grade for the institution very fast. The final decision on the accreditation status and the institutional grade will be taken by Executive Committee of NAAC.

VII. FEATURES OF TOOL

It accepts data for following 7 institution evaluation criteria

1. Curricular Aspects
2. Teaching-Learning and Evaluation
3. Research, Consultancy and Extension
4. Infrastructure and Learning Resources
5. Student Support and Progression
6. Governance Leadership and Management
7. Innovations and Best Practices

The tool will be used to compute GPA which will help NAAC peer team for quality evaluation of the institution.

VIII. CALCULATION OF INSTITUTIONAL GPA

Arriving at Institutional CGPA includes calculation of the Key Aspect-wise Weighted Grade Point (KAWGP), the Criterion-wise Weighted Grade Point (CrWGP) and the Criterion-wise Grade Point Average (CrGPA). This involves use of the pre-determined Weightages (W) and the grade points assigned by the peer team for the 32 key aspects covering the seven criteria. The details for arriving at the KAWGP, CrGPA and CGPA are given below:

1. Calculation of KAWGP

NAAC has assigned predetermined weightages to each of 32 key aspects under seven criteria. To help the peer team in arriving at KAGP, NAAC provides suggestive guiding indicators. Using the guiding indicators and based on their observations and assessment of the institution (onsite visit and the validation of SSR), the peer team is expected to

assign appropriate grade point to each of the key aspect by using five point scale (0-4). These grade points are assigned as 0/1/2/3/4 without using decimal points and are referred to as the Key Aspect-wise Grade Points (KAGP).

The Key Aspect-wise Weighted Grade Point (KAWGP) is arrived at by multiplying the predetermined Weightage (W) of a Key Aspect with respective KAGP assigned by the peer team.

$$\text{i.e., KAWGP}_i = (\text{KAGP}_i) \times (W_i)$$

Where, 'i' - represents the Key Aspects

2. Calculation of CrGPA

Summation of Key Aspect-wise Weighted Grade Points (KAWGP) of a criterion is referred to as Criterion-wise Weighted Grade Point (CrWGP) of that criterion and the summation of the predetermined weightages of the key aspects of a criterion is referred to as Weightage (W_j) of that criterion.

Criterion-wise Grade Point Average (CrGPA) is calculated by dividing the Criterion-wise Weighted Grade Point (CrWGP) by the Weightage of that Criterion (W_j)

$$\text{CrGPA}_j = \frac{(\text{CrWGP})_j}{W_j}$$

Where,

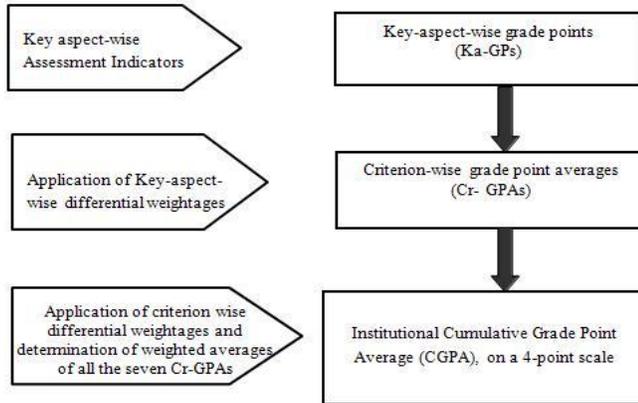
'j' - represents the Criterion

3. Calculation of CGPA

The sum of seven CrW GP divided by sum of the pre assigned Weightages of the seven Criteria will result in Cumulative Grade Point Average (CGPA) of the Institution. The institutional CGPA will be the deciding factor for accreditation status of the institution and its grade.

$$\text{Institutional CGPA} = \frac{\sum_{i=1}^7 (\text{CrWGP})_j}{\sum_{j=1}^7 W_j}$$

A Cumulative Grade Point Average (CGPA) is arrived at, which reflects the quality status of the institution. The serial methodology of determining the institutional CGPA on a four-point scale is illustrated below



A significant outcome of the Assessment is the final Institutional grading. After Assessment, the Cumulative Grade Point Average (CGPA) of an Institution is computed and the institution is assigned appropriate grade on a four point scale as detailed below:

Range of institutional Cumulative Grade Point Average (CGPA)	Letter Grade	Performance Descriptor
3.01-4.00	A	Very Good (Accredited)
2.01-3.00	B	Good (Accredited)
1.51-2.00	C	Satisfactory (Accredited)
< 1.50	D	Unsatisfactory (Not Accredited)

Institutions which secure a CGPA equal to or less than 1.50 are notionally categorized under the letter grade “D”

(Performance Descriptor: Unsatisfactory; Status: Not Accredited). Such unqualified institutions will also be intimated and notified by NAAC as “Assessed and Found not qualified for Accreditation”.

IX. CONCLUSION

The paper represents the original contribution in enhancing the quality assessment process. The objective was to generate a tool to improve the quality aspects in existing colleges and institutes. Thus the paper projects detail insight in designing and developing an ICT model. The ICT is IT + other media. Being the latest technology in computers, ICT can be a very powerful tool in the assessment of quality in Higher Education. Thus the model developed, if implemented by using this robust and new technology can be very helpful in assessment of quality in higher education..

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