Investigations on Computation of CGPA for Higher Education Institutes Assessment & Accreditation by NAAC

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Abstract

The focus of NAAC is on improving the quality parameter of education, unlike the traditional educational system, NAAC aims to improve the overall development of students by helping them inculcate skills & knowledge via their education. This paper deals with the development of the computational program which is to integrate different educational assessments into a unified evaluation report that provides a plan for continues improvements in order to determining the weakness and strength of education delivery process. The developed computational program enables HEI to streamline their work processes & manage institutional data to help them get ready for NAAC accreditation. In addition to this, the HEI software also helps in generating error-free compliance Self Study Reports with gaps and suggestions for improvement provides an opportunity to HEI to manage entire data seamlessly and most significantly with the improvement input details in the reports, HEI get an opportunity to equip themselves with state-of-the-art facilities. Program is capable of taking inputs as per NAAC templates as per the data provided. Validation of the provided data through applications of riders applied depending the metrics have been implied. Early and quick view of current strength and areas of improvement can be reported without complete data. Even if the institution is not having a complete data but is interested to know its score, the utility does not stop the user to make quick use of it without waiting for complete data.

Keywords: CGPA, *IQAC, NAAC accreditation, HEI*

I. INTRODUCTION

The University Grant Commission (UGC) has issued a decree stipulating that every institution must get certification by the council called NAAC (National Assessment and Accreditation Council) which is a measure to evaluate and then guarantee a standard of education provided in higher institutions across the nation. The focus of NAAC is on improving the quality parameter of education, unlike the traditional educational system, NAAC aims to improve the overall development of students by helping them inculcate skills & knowledge via their education. The institutions that aim to maximize the student learning outcomes by ensuring the best practices must try to attain NAAC accreditation. The Assessment & Accreditation process of NAAC is very rigorous and involves both qualitative metrics and quantitative metrics. There are several benefits of accreditation for students and HEIs like SWOT Analysis & Continuous Evaluation: NAAC accreditation process helps the institution identify its weaknesses, strengths, opportunities, and threats using a continuous evaluation process. The SWOT analysis further enables the institutions to understand the need for planning in the internal areas and allocating resources. The NAAC accreditation journey introduces institutions to modern and innovative educational methods. In the long run, it elevates the institution's image and offers a new direction of success. The A&A process Improves Internal Processes & Communication, In order to ensure seamless internal processes during the NAAC accreditation; HEIs focus on inter-and-intra institutional communication and thus eliminates the communication gap between faculty & students. The NAAC journey provides the institutions with consistent details about the quality of courses offered so that the colleges can adopt the best practices. An organization prefers to recruit candidates with better knowledge & skills so it not only enhances the skill of the students but also increases chances of their placement for suitable jobs. In a higher educational institute, enhancing the educational process and achieving a high quality of education will help decision makers in a better management of resources of the educational institutes. The Indian HEIs applied for national and international higher education accreditation, whose one of evaluation criteria depends on students' performance and course delivery process. Quality of course delivery process is considered one of the main objectives in the educational field. Currently, all the HEIs collect, process, and store huge amount of educational data. The collected data in educational systems include teaching learning, curriculum enrichments, extracurricular activities, research and development works, NSS, NCC, Rover scout works, best practices and many more. The absence of knowledge for using the collected data in improving the courses delivery process and the process of coordinating and assessing the quality of extracting knowledge is a time consuming. Assistance of every decision-maker in higher educational institute is required to enhance the educational process and achieve high quality in the educational field. In addition, the data collected from exams, assignments, and quizzes will take time to be analyzed and evaluated without an automated system. In this paper, a computation model has been designed, developed and demonstrated with respect to few quantitative metrics. The developed method evaluates and enhances the educational process, can convert the collected data in the usable format of NAAC accreditation process and also provides learning outcomes, Program outcomes (PO), Program specific outcomes (PSO), Course outcomes (CO) and also the SWOT analysis (1-5). The purpose and future of the computational program is to integrate different educational assessments into a unified evaluation report that provides a plan for continues improvements in order to determining the weakness and strength of education delivery process, however in this paper a simple computational model have been reported to calculate the grade point of HEI.

II. METHODOLOGY

The accreditation process for higher education institutions (HEIs) is based on five points scales i.e. 0-4 CGPA and being accessed by an autonomous body NAAC. The complete process is based on the basis of points / marks in, *criteria - key indicators - qualitative and quantitative metrics.* Three types of grade points are to be calculated i.e. Key Aspect-wise Weighted Grade Point (KAWGP), Criterion-wise Weighted Grade Point (CrWGP) and Criterion-wise Grade Point Average (CGPA). This involves use of the pre-determined Weightages (W) and the grade points assigned by the peer team for the various key aspects covering the seven criteria.

The complete process have been done by two different ways first by manual calculation as per suggested formula by NAAC and second by computing the required values in the program designed. In the cases the value of KAGP has been used arbitrarily.

II.1 Method First Manual Calculation – This is performed in three different steps

II.1.1 Calculation of KAWGP

The Key Aspect-wise Weighted Grade Point (KAWGP) is calculated by multiplying the predetermined Weightage (W) of a Key Aspect with respective Key Aspect-wise Grade Points (KAGP). The value of KAGP is a whole number lies from 0 to 4 and it is assigned by the peer team after physical verification. The formula used for the purpose is –

$$\text{KAWGPi} = \text{KAGPi} \times \text{Wi}$$

II.1.2 Calculation of CrGPA

Criterion-wise Grade Point Average CrGPA can be calculate by two different ways

(a) First, by dividing the sum of the Key Aspect-wise Weighted Grade Points (KAWGP) of a Criterion by sum of the Weightages of the Key Aspects of that Criterion.

$$\textbf{CrGPAi} = \frac{\sum_{i=1}^{n}(\boldsymbol{KAWGP})\boldsymbol{i}}{\sum_{i=1}^{n}\boldsymbol{Wi}}$$

(b) Second, by dividing the Criterion-wise Weighted Grade Point (CrWGP) by the total weightage of that Criterion.

$$\textbf{CrGPAi} = \frac{(\boldsymbol{CrWGP})\boldsymbol{i}}{\boldsymbol{Wi}}$$

'i' – key aspects

'j' – criteria

'n' – number of Key Aspects in that Criterion

$\sum_{i=1}^{n}(KAWGP)i$ = sum of the assigned Key Aspect-wise Weighted Grade Points of that Criterion

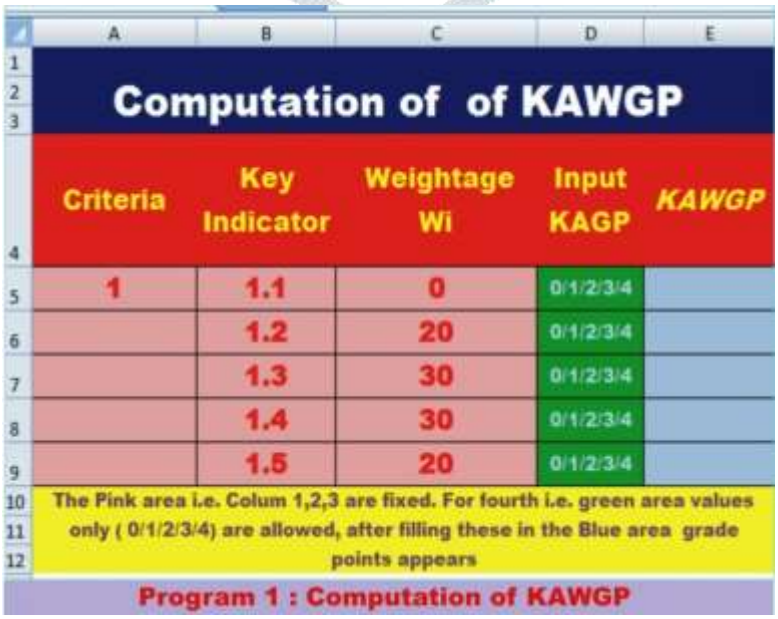
$\sum_{i=1}^{n} Wi$ = sum of the predetermined Weightages of the Key Aspects of that Criterion

II.1.3 Calculation of CGPA

Cumulative Grade Point Average (CGPA) is also considered as the final grade of the institution on that basis letter grade i.e. A++, A+, A, B++, B+, B, C or D is decided. It is calculated by the formula

$$\textbf{Institutional CGPA} = \frac{\sum_{j=1}^{7}(\boldsymbol{CrWGP})\boldsymbol{j}}{\sum_{j=1}^{7}\boldsymbol{Wj}}$$

II.2 Method Second Using VB Excel Program – In this method a program have been designed developed and tested by using MS EXCEL and Visual Basics (6,7). In the designed program three different sets have been developed computing the above formula in the form of a Basic Spreadsheet Design and Procedures – overall procedure have been represented in Program 1, 2 and 3.



	A	B	C	D	E
1					
2		Computation of of KAWGP			
3					
4	Criteria	Key Indicator	Weightage Wi	Input KAGP	KAWGP
5	1	1.1	0	0/1/2/3/4	
6		1.2	20	0/1/2/3/4	
7		1.3	30	0/1/2/3/4	
8		1.4	30	0/1/2/3/4	
9		1.5	20	0/1/2/3/4	
10	The Pink area i.e. Colum 1,2,3 are fixed. For fourth i.e. green area values				
11	only (0/1/2/3/4) are allowed, after filling these in the Blue area grade				
12	points appears				

Program 1 : Computation of KAWGP

	A	B	C	D
1				
2		Computation of of CrGPA		
3				
4	Criteria	CrWGP	Wi	CrGPA
5	1		100	
6	2		350	
7	3		120	
8	4		100	
9	5		130	
10	6		100	
11	7		100	
12	The Pink area i.e. Colum 1 and 4 are fixed. For second i.e. green			
13	area values will arrive from first stage of computation and it			
14	turns for blue area			

Program 2 : Computation of CrGPA

	A	B	C	D
1				
2		Computation of of Institutional CGPA		
3				
4	Criteria	CrWGP	Wi	CGPA
5	1		100	
6	2		350	
7	3		120	
8	4		100	
9	5		130	
10	6		100	
11	7		100	
12	Total	CrGPA	1000	
13				
14	The Final CGPA arrives at Gree Zone			

Program 3 : Computation of C GPA

III DISCUSSIONS

The developed computational program enables HEI to streamline their work processes & manage institutional data to help them get ready for NAAC accreditation. In addition to this, the HEI software also helps in generating error-free compliance Self Study Reports (SSR reports) with gaps and suggestions for improvement, provides an opportunity to HEI to manage entire data seamlessly and most significantly with the improvement input details in the reports, HEI get an opportunity to equip themselves with state-of-the-art facilities. The computation program and or software not only helpful in the process of learning, the techniques to promote conformity with accreditation quality, classification but it also imparts an opportunity easier administration of academics, administration and library management system. Following are the inferences from the results –

1. The computation results obtained by using this program have been checked and compared with manual calculations have been found in good agreement, further it has been verified with the Institutional Assessment and Accreditation grade sheet of few recently accredited HEI and the results were with hundred percent accuracy (Table 1) which enables the importance and utilization of the programs.
2. The program is capable of taking inputs as per NAAC templates as per the data provided.
3. The Validation of the provided data through applications of riders applied depending the metrics have been implied.
4. An early and quick view of current strength and areas of improvement can be reported without complete data. Even if the institution is not having a complete data but is interested to know its score, the utility does not stop the user to make quick use of it without waiting for complete data.
5. The program have been applied on

6. The collected data can be reused for Self-Assessment and Scoring.

Future scope – The program is very much primitive but provides easy computation with a limitation of data arriving system only. The next generation programs have also been designed and planned to provide the analysis of the data and results which is to be associated with AI, in order to develop such a program which also provide suggestive measure for A&A procedures.

Table 1 Calculation of arbitrary data using VB Excel program

Criteria	**Weightage (W_i)**	**Criterion-wise weighted Grade Point ($CrWGP_i$)**	**Criterion- wise Grade Point Averages ($CrWGP_i/W_i$)**
1	85	300	3.52
2	340	1150	3.38
3	110	330	3.00
4	96	300	3.12
5	125	300	2.40
6	94	310	3.29
7	100	310	3.1
Total	950	3000	3.15

IV CONCLUSIONS

The purpose and future of the computational program is to integrate different educational assessments into a unified evaluation report that provides a plan for continues improvements in order to determining the weakness and strength of education delivery process, however in this paper a simple computational model have been reported to calculate the grade point of HEI. Validation of the provided data through applications of riders applied depending the metrics have been implied.

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