NBA Accreditation and Teaching – Learning in Engineering (NATE)
Professor K. Rajanikanth
Retired Principal - MSRIT
Indian Institute of Science, Bengaluru
Lecture 04
Self Assessment Report

Greetings. Welcome to Module 1 Unit 4: Self Assessment Report.

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MIU4 Outcome

• Understand the key features of Self Assessment Report (SAR).

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In the earlier unit, we understood the origin of Outcome Based Education and the most important features of an outcome statement. We also had a very broad look at the OBE framework as required by the NBA.

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Recap

• Understood the origins of Outcome Based Education and the most important features of an outcome statement.

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In this unit, we will look at the Self Assessment Report that the department has to prepare while seeking accreditation. We will understand the key features of Self Assessment Report that is the outcome of this unit. This will be a very broad look at the different criteria of SAR. Each of these criteria will be discussed in depth in later units. In the present unit it is a bird's eye view of the SAR - the key features of SAR.

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SAR Criteria

Criteria No.	Criteria	Tier I Marks	Tier II Marks
	Program Level Criteria		
1.	Vision, Mission and Program Educational Objectives	50	60
2.	Program Curriculum and Teaching-Learning Processes	100	120
3.	Program Outcomes and Course Outcomes	175	120
4.	Students' Performance	100	150
5.	Faculty Information and Contributions	200	200
6.	Facilities and Technical Support	80	80
7.	Continuous Improvement	75	50
	Institute Level Criteria		
8.	First Year Academics	50	50
9.	Student Support Systems	50	50
10.	Governance, Institutional Support, and Financial Resources	120	120
	Total	1000	1000

We already saw in earlier unit that there are 10 criteria in SAR and the total marks are 1000 and this number is same for tier 1, as well as tier 2 institutes. However, the marks allocated to individual criteria obviously differ. For example, for criteria 1, vision, mission and PEO's a tier 1 institute has 50 marks.

There is a tier 2 has 60 marks. So, the marks allocated to individual criteria differ. Even when the marks are same, the sub criteria may differ from tier 1 institute to tier 2 institute. For example, if you see criterion 5, faculty information and contributions, the marks allocated are 200 both for tier 1, as well as for tier 2 institute.

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Tier I and Tier II Institutes

- 10 criteria and a total of 1000 marks for both Tier I and Tier II institutes.
- However, marks for individual criteria differ.
- Even when the marks for a particular criterion are same, the sub-criteria and associated marks may vary from Tier I institute to Tier II institute. Example:
  Criterion 5: Faculty Information and Contributions
  200 marks for both Tier I and Tier II institutes.
  However, there are 10 sub-criteria for Tier I institute while there are 9 sub-criteria for Tier II institute!
- Depending on whether the institute is Tier I or Tier II, the preparation of SAR and the focus areas change.

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However, the sub criteria for tier 1 institute and tier 2 institute are different for criterion 5. There are 10 sub criteria for tier 1 institute while there are only 9 sub criteria for tier 2 institute which means that basically depending on whether the institute is tier 1 or tier 2, the preparation of the SAR and the focus areas change. So, we learn to pay attention to the details of the SAR and prepare accordingly the report whether one is at tier 1 institute or tier 2 institute.

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Faculty

- NBA recognizes the critical role of teachers in facilitating the learning by students.
- Maximum weightage is given to the Criterion 5 :"Faculty Information and Contributions" - 200 out of the total of 1000 marks
- It considers several factors including Student-Faculty Ratio, Faculty Cadre Proportion, Faculty Qualification, Faculty Retention, Innovation by the Faculty in Teaching and Learning, Participation in Faculty Development Programs, Research and Development, Faculty Performance Appraisal and Development System, and Visiting Faculty.

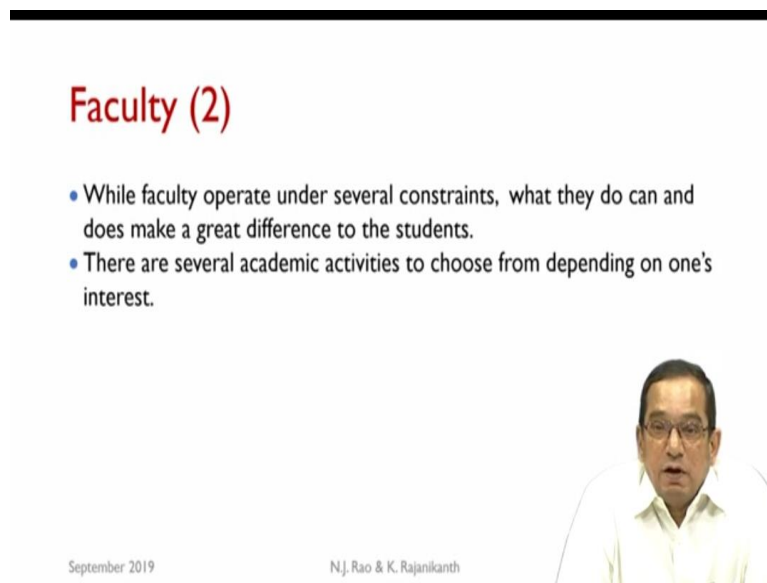September 2019   N.J. Rao & K. Rajanikanth   6

Now, one of the most important criteria is criterion 5 which is concerned with the faculty contributions. NBA recognizes the critical role of teachers in facilitating the learning by students. So, maximum weight is given to criterion 5. Among the 10 criteria, criterion 5

faculty information and contributions carries maximum marks - 200 out of a total of 1000 marks. In fact, there are additional constraints on the marks to be scored under this criterion for a program to get accredited whether for 3 years or 6 years. So, this is an extremely important criterion and NBA, in fact, recognizes the importance of faculty.

This criterion considers several factors including student faculty ratio, faculty cadre proportion, assistant professors, associate professors and professors. What is the proportion in which we have this cadre?

Faculty qualifications, faculty retention, innovations by the faculty in teaching and learning, participation in faculty development programs, research and development, faculty performance appraisal and development system, the provision for and the actual use of visiting faculty. These are all the factors which are included under criteria 5. As I mentioned earlier, the actual marks awarded for each subject area may differ from a tier 1 institute to a tier 2 institute.

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Faculty (2)

- While faculty operate under several constraints, what they do can and does make a great difference to the students.
- There are several academic activities to choose from depending on one's interest.

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While faculty operate under several constraints, it is accepted by all faculty operate under several constraints what they do can and does make great difference to the students. There are several academic activities to choose from depending upon one's interest. Faculty can focus more on research and development activities or projects apart from, of course, teaching learning activities.

Students are the reason why an institution exists obviously. So, criteria 4 is concerned with the performance of students. There are several sub criteria that address the quality of students admitted and their performance during the 4 years. How many students who appeared for examinations in first year have progressed to second year?

How many have progressed from second year to third year? How many from third year to fourth year and how many have graduated? How many have graduated within the stipulated period of 4 years without even one single failure? Parameters like this essentially provide an indication of the extent to which the students are able to attain and demonstrate the intended learning outcomes. The quality of their performance rate determines the attainment levels of outcomes.

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Students (2)

- Institute's performance in this area is measured through the enrolment ratios, success rates in all semesters, participation in professional activities, placements, enrolment for higher studies etc.
- Many sub-criteria deal with outputs also.
- 150 marks in the case of Tier II institutes and only 100 marks in the case of Tier I institutes!
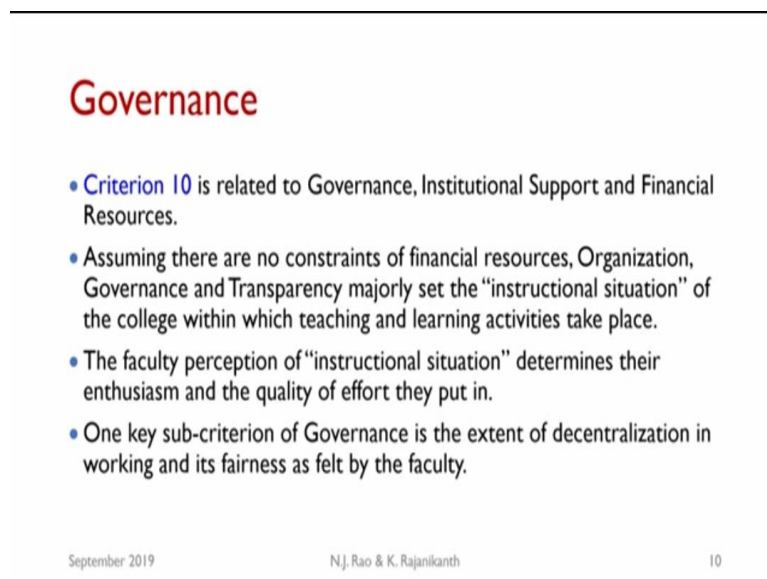
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The institute's performance in this area is measured through enrolment ratios, success rates in all semesters, participation in professional activities, placements, enrolment for higher studies. There are several such subject area within the criterion 4 which determine the marks that a particular program gets under this particular criteria.

Many sub criteria deal with outputs also. How many students have become entrepreneurs? How many students have actually gone abroad for higher studies or pursued higher studies in India? So, these are all the numbers which we need to provide and again the marks of them differ from tier 1 to tier 2. 150 marks in the case of tier 2 institutes and only 100 marks in the case of tier 1 institutes. We will look at these differences in greater detail in later units.

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Governance

- Criterion 10 is related to Governance, Institutional Support and Financial Resources.
- Assuming there are no constraints of financial resources, Organization, Governance and Transparency majorly set the "instructional situation" of the college within which teaching and learning activities take place.
- The faculty perception of "instructional situation" determines their enthusiasm and the quality of effort they put in.
- One key sub-criterion of Governance is the extent of decentralization in working and its fairness as felt by the faculty.

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Then criteria 10 is related to governance, institutional support and financial resources. Another key aspect. Assuming there are no constraints of financial resources, organization, governance and transparency majorly sets what may be called as the instructional situation of the college within which teaching and learning activities take place.

The faculty perception of such instructional situation to a large extent determines their enthusiasm and the quality of effort they put in. So, this is extremely important criterion. One key sub criterion of governance is the extent of decentralization in working and its fairness as felt by the faculty. So, this criterion is actually an institute level criterion.

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Then facilities and technical support and the student support systems. Criterion 6 is related to laboratory facilities and associated technical support. A fairly straightforward criterion. The key sub-criterion is related to facilities created beyond the curricular requirements to enhance students learning.

Criterion 9 is related to student support systems. They include mentoring system, facilities for self-learning, feedback from students. How it is collected? What use is made of such feedback and how the system rewards the students for providing feedback? These are all the issues concerned with the feedback from students. Support for career guidance, placement, entrepreneurship, co-curricular and extracurricular activities.

Quantitative Criteria

- Several criteria in SAR are based on defined formulae that use the quantitative data provided by the department in the SAR to compute the marks to be awarded.

Example: 5.3 Faculty Qualification – 25 Marks (Tier II Institutes)

- $FQ = 2.5 \times [(10X + 4Y)/F)]$ where
  X is no. of regular faculty with Ph.D.
  Y is no. of regular faculty with M.Tech.
  F is no. of regular faculty required to comply with Student faculty ratio of 20:1.
- The values of FQ are calculated for three consecutive academic years and the average is the score awarded under this criterion.
- The department itself can calculate this value unambiguously.

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Now, another way of looking at the criteria of SAR would be to see that some of them are quantitative in nature, while some of them are qualitative. Several criteria in SAR based on defined formulae that use the quantitative data provided by the department in the SAR to compute the marks to be awarded.

That means it is a very clear definite quantitative result that we get based on the data provided by the department itself. The quantitative data provided in the SAR is plugged into a formula and the output of the formula clearly indicates the marks to be awarded to the program. So, very strong quantitative criteria. There are several such criteria in SAR.

One example, criterion 5, sub criterion 5.3 on faculty qualification. For a tier 2 institute it is 25 marks. For tier 1 it is only 20. The faculty qualification is computed using a well-defined formula. 2.5 multiplied by 10 x plus 4 y, the whole thing divided by f, where x is the number of regular faculty with PhD, y is the number of regular faculty with M.Tech and f is the number of regular faculty required to comply with the student faculty ratio of 20 is to 1.

Now, this is all data. The program has to supply these numbers x, y and f and once we plug these numbers into the formula, we get the value of f q for one particular academic year. Now, the NBA calculates the values of fq for 3 consecutive academic years and the average is the score awarded under this criteria. Now, what is important to note here is that there is no ambiguity about the marks that the program gets. The department itself can calculate this value unambiguously.

So, there are criteria like this which are quantitative in nature. The data provided in the SAR immediately gives the marks that the program will get under that particular sub criterion. So, these are relatively straightforward and can be calculated by the department itself to see where it stands.

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Academic Processes

- There are several elements of SAR that need to be addressed following well defined processes.
- Some of these elements are Vision and Mission, PEOs, and PSOs.
- Criteria 1, 2, and 3 have several such academic processes.
- With each such process, we need a Process Document as well as an Implementation Record as evidence of proper implementation of the process.

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But there are other criteria which involve academic processes. There are several elements of SAR that need to be addressed following well-defined processes. Some of these elements are vision and mission of the department, PEOs and PSOs. Criteria 1, 2 and 3 have several such academic processes.

For example, there must be a process well documented through which the program educational objectives are established and this process must be implemented in its true spirit and following that the PEOs must be established.

With each such process we need 2 sets of documents actually. We need a process document as well as an implementation record as evidence of proper implementation of the process. With academic processes we need to specify how the process is going to be implemented. We also must show that we have implemented the process according to that process document.

So, process document will identify the members of the committee that takes the decisions. How frequently it needs to meet, the details of the process steps to be followed. So, we need to first create a document describing the process that the department is intending to follow. First, NBA itself gives certain guidelines on many of these processes, but the responsibility rests with the department to define the process clearly.

So, we need to create a process document. Then the minutes of the meeting of the committee needs to be formally recorded and should be made available to the visiting committee if they ask as evidence that the process is being implemented properly. Thus, we have a process document as well as an implementation record with academic processes.

Marks awarded will depend upon the visiting committee's qualitative evaluation of the appropriateness of the process and its implementation as against the quantitative criteria that we saw in the earlier slides. Here, the marks awarded will depend upon the visiting committee's qualitative evaluation of the appropriateness of the process and its implementation because the SAR gives clear guidelines on how the process must be designed and implemented.

What kind of exhibits must be shown to the visiting committee to show the process definition and its implementation but with all that still we must be able to convince the visiting committee of the quality of the process and appropriateness of the process and the faithful implementation of the process.

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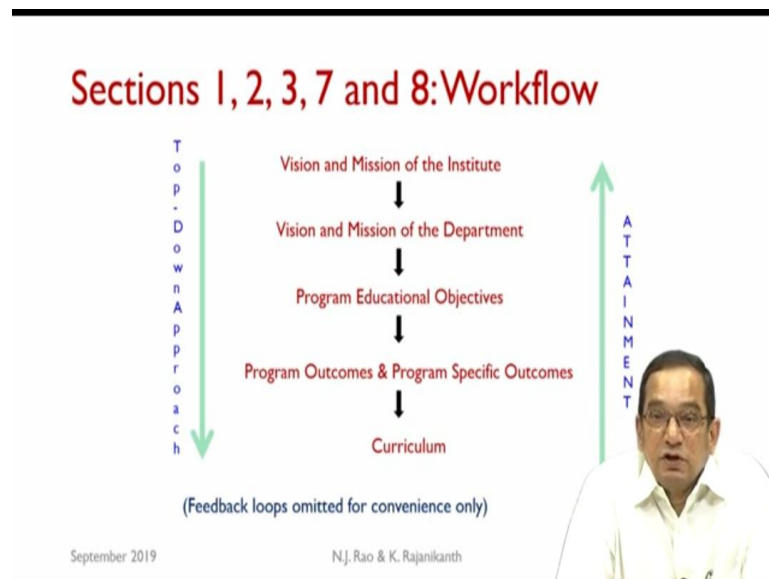
Now, sections 1, 2, 3, 7 and 8, the remaining sections that is 4, 5, 6, 9 and 10 we already have seen briefly what they are. The sections 1, 2, 3, 7 and 8, they have a workflow which is based on a process structure. As we saw in the last unit on the OBE framework, we start with the vision and mission of the institute.

With that as a basis, the vision and mission of the department are established. That provides the basis for establishing program educational objectives and from them we derive the program specific outcomes. The program outcomes are specified by NBA and then we have to design the curriculum which will help the students attain the PEOs and PSOs. So, from top to bottom if you see, it is the design that is demonstrated in this flow.

Starting with vision and mission of the institute, we end with detailed curriculum and the implementation moves in a bottom-up fashion. That is from the courses we determine the attainments of course outcomes. From the attainments of course outcomes we determine the attainments of PEOs and PSOs.

Ultimately that is supposed to determine the attainment of PEOs as well as the extent to which the department is able to realize its vision and the extent to which the mission is being implemented properly. So, from the implementation perspective, attainment perspective, it will be bottom up. So, very broadly this is the workflow. Of course, feedback loops exist but we have omitted that for convenience.

With all these process frameworks, we have a notion of closing the quality loop which plays a central role in the accreditation. All the academic processes associated with criteria 1, 2, 3, 7 and 8 required for accreditation need to have the step of closing the quality loop. Now the quality loop is something like the Deming's quality cycle. Plan, do, check, act.
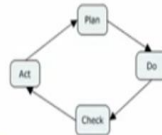
First, we plan the activity, then we actually implement the activity, do the activity, then measure the performance, how the activity is taking place, check, which is essentially measuring the performance. And then finally based on what was planned and what was achieved, initiate appropriate action commencing the next round of the quality cycle. That is act. This last step act is actually closing the quality loop. We plan, we do, then we measure and based on that, we initiate an appropriate action. That action is closing the quality loop.

Closing the Loop (2)

ACTION:

- If the attainment lags behind the planned target, we need to further analyze the reasons for the same and plan suitable corrective actions for the next round.
- If the achievement exceeds the planned target, we need to "raise the bar"! Further, we need to examine:
  - If the targets set were too easy; if so, we need to raise the bar in a realistic fashion
  - If the targets set were reasonable, then we need to set new targets suitably and plan for achieving the new target level.

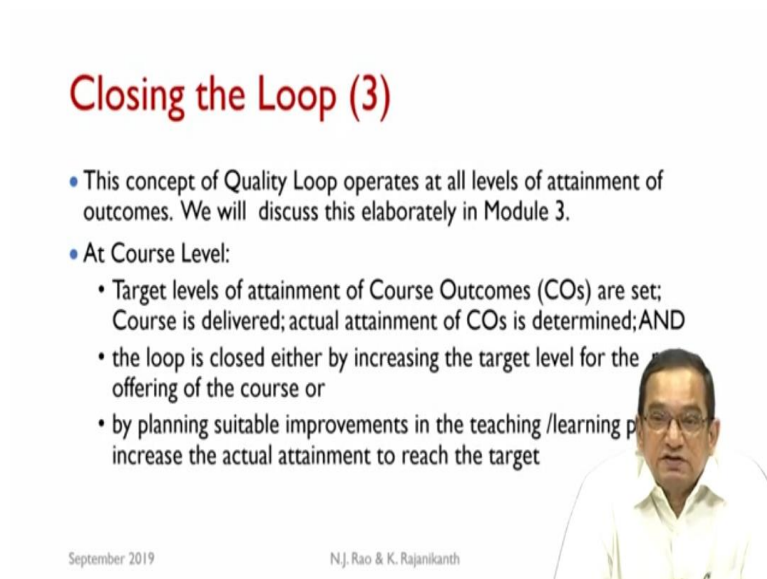September 2019   N.J. Rao & K. Rajanikanth   17

When we set a particular attainment target and we actually implement the course or the program and we measure the actual attainment as against the planter target. We may be lagging behind the set target or we may have achieved the set target. We will see the details of this in later units.

For example, for course outcomes, we specify certain levels which we hope to achieve at the end of the course. So, they become the planned or intended target levels. We actually deliver the course. The extent to which the students have attained these outcomes are measured and they become the actual attainment.

So, if the attainment lags behind the planned targets, we need to further analyze the reasons for the same and plan suitable corrective actions for the next round. On the other hand, if the achievement exceeds the planned target we need to raise the bar. In other words, we will become more ambitious.

We will set a higher level of target for the next round. Of course, we need to examine if the targets set were too easy. If so, we need to raise the bar in a realistic fashion. If the targets were reasonable then we need to set new targets suitably and plan for achieving the new target level.

As an example, the quality loop at the course level if we consider. Target levels of attainment of course outcomes are set. Maybe we will set 60 percent as the target level for all the course outcomes. The course is actually delivered. Actual attainment of the COs is determined. Now, the actual attainment maybe more than 60 percent or less than 60 percent.

So, the loop is closed either by increasing the target level for the next (())(21:55) of the course or by planning suitable improvements in the teaching-learning process to increase the actual attainment to reach the target. If the target is 60 percent but you have been able to achieve only 56 percent then we have to figure out why we have not been able to achieve the planned 60 percent, what kind of improvements in the teaching learning processes are required, if the attainment has to reach 60 percent next year when the course is offered.

On the other hand, if our actual attainment is more than 60 percent, say 65 percent, then we can increase our target for the next year. 65 percent or even higher depending upon what we hope to achieve. So, this is how the quality loop operates at the course level and this concept of quality loop operates at all levels of attainments of outcomes. This is just an example in the course level. We will explore this in great depth in module 3.

Closing the Loop (4)

- At PO, PSO Level:
  - POs and PSOs are achieved through formal courses and other co-curricular and extra-curricular activities
  - Target levels of attainment of POs and PSOs are set; Program is delivered; actual attainment of POs and PSOs is determined; AND the loop is closed either
    - by increasing the target level for the next cycle of the program or
    - by planning suitable improvements in all the relevant activities to increase the actual attainment
  - Criteria 7 and 8 ask for such specific plans for improving the attainments of POs and PSOs.

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This will operate at PO and PSO level also. POs and PSOs are achieved through formal courses and other co-curricular and extracurricular activities. Target levels of attainment of POs and PSOs are set. Program is delivered. Notice that now we are talking of the program. That means one particular batch going through 4 years of academic activity would constitute the completion of the program.

So for that batch, we set the targets for the attainment of POs and PSOs. The actual program is delivered. Then the actual attainment of POs and PSOs is determined based on the attainments of that batch of students over the 4 year period over which they have studied their B.Tech program and then the loop is closed.

This is again, either by increasing the target level for the next cycle of the program. That means for the next batch or by planning suitable improvements in all the relevant activities to increase the actual attainment. For a particular PO, if the attainment is lower than the intended target we may have many choices, many activities which are possible over a 4 year period to increase the attainment of that particular PO.

So, the department has to plan the relevant activities to increase the actual attainment of that PO. Criteria 7 and 8 of SAR actually ask for such specific plans for improving the attainment of POs and PSOs. In fact, they ask for these details with respect to each individual PO. For each PO we have to state what is the planned target, the achieved target and when there is a lag, what are the specific action plans that have been initiated by the department to increase the attainment level of that PO.

For each of the 12 POs, as well as PSOs, we need to state the action plans initiated by the department and implemented in subsequent years for improving the attainment levels of those POs and PSOs.

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Closing the Loop (5)

- "Closing the loop" can be carried out (but at present need not be), in a similar manner, at the level of PEOs also!
- This concept applies even at higher levels of Mission and Vision though the time frames involved are usually much larger!
- Thus Mission is revisited typically once in 5 to 6 years.
- It is much rarer to revisit the Vision in less than about 7 to 8 years!

This process view of Quality is implicitly central to Accreditation

We will examine SAR in detail in Module 3.

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So, this essentially is the quality loop. Closing the loop can be carried out in a similar manner at the level of PEOs also but NBA does not require it at present but the principle holds good at all levels. So, this concept applies even at higher levels of mission and vision though the timeframes involved are usually much larger. The mission is revisited typically once in 5 to 6 years and its much rarer to revisit the vision in less than about 7 to 8 years or even maybe a decade but the idea of a quality loop is central to all the activities of the accreditation.

In fact year on year, improvements in the performance of the program is the central feature of an institute which is on a growth trajectory. A program which is on a growth trajectory and that is a very important aspect of a quality program. This process view of quality is implicitly central to accreditation.

Even if we set initial targets at lower values, if we are able to demonstrate that the program is on a growth trajectory and year on year we are improving the attainment of the outcomes, then usually we present a very positive and favourable picture of the existing scenario.

So, we will examine SAR in detail in module 3 but the central theme of SAR is that the quantitative criteria are fairly straightforward based on the data we get the mark but when it comes to the process related criteria, we must ensure that the documents are all proper, the implementation is proper and we are able to demonstrate the growth of the program from

year to year. So, this is the central feature of the SAR and we will examine the SAR in detail in module 3.

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MIU5

- Reinterpret the familiar words "education", "learning", "assessment", "teaching", and "instruction" in the context of formal programs.
- Understand the centrality of assessment in facilitating good learning.

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So, in the next unit will re-interpret the familiar words education, learning, assessment, teaching and instruction in the context of formal programs. These are all words with which everyone is familiar but we will try to relook these words in the context of formal program. Also, we will understand the centrality of assessment in facilitating good learning. Thank you. We will meet again in the next unit. Thank you.