TALE - 2 Course Design and Instruction of Engineering Courses

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Lecture - 14
Evaluate Phase

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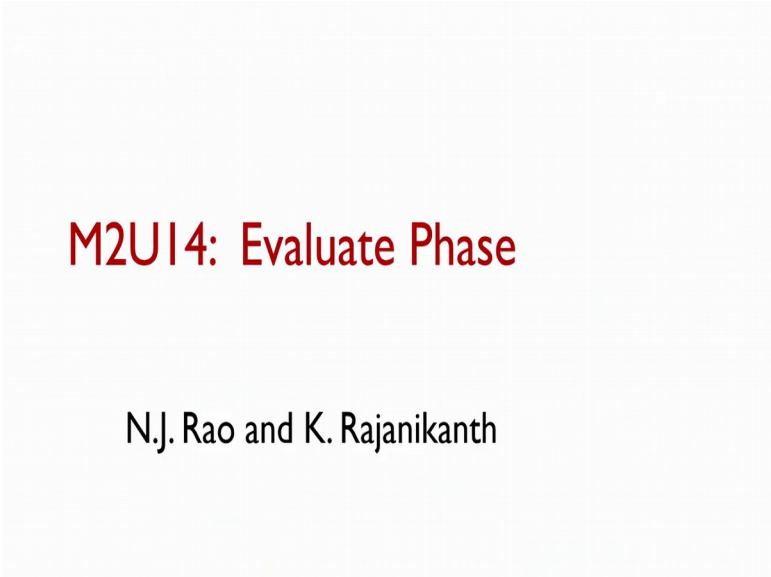

Greetings. Welcome to Module 2, Unit 14 on Evaluate Phase.

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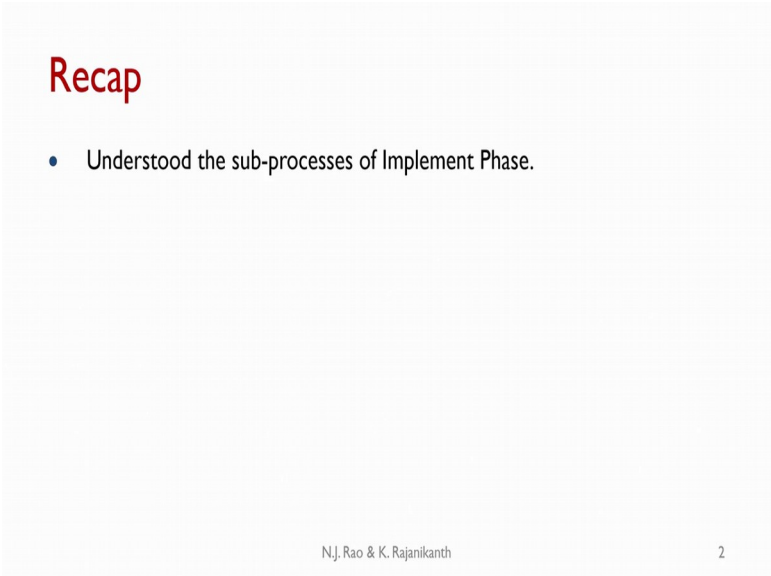

In the last unit, we understood the sub-processes of implement phase.

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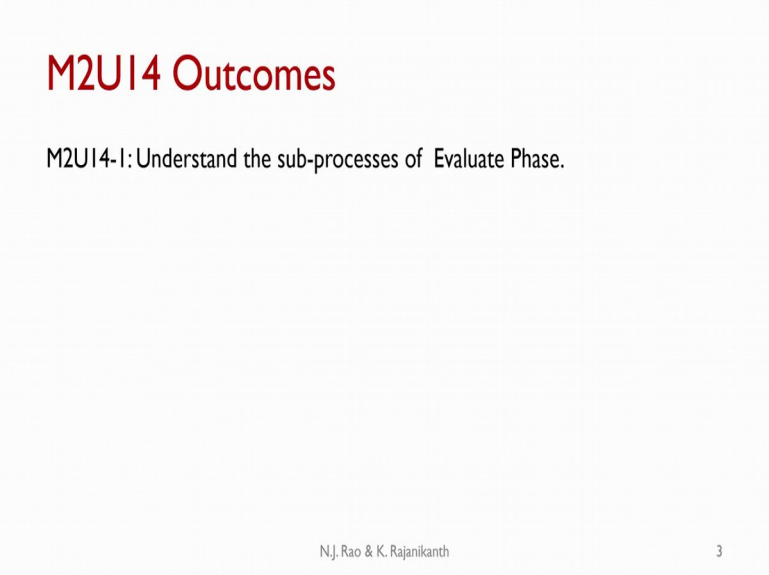

The outcome for this unit would be: understand the sub-processes of Evaluate Phase.

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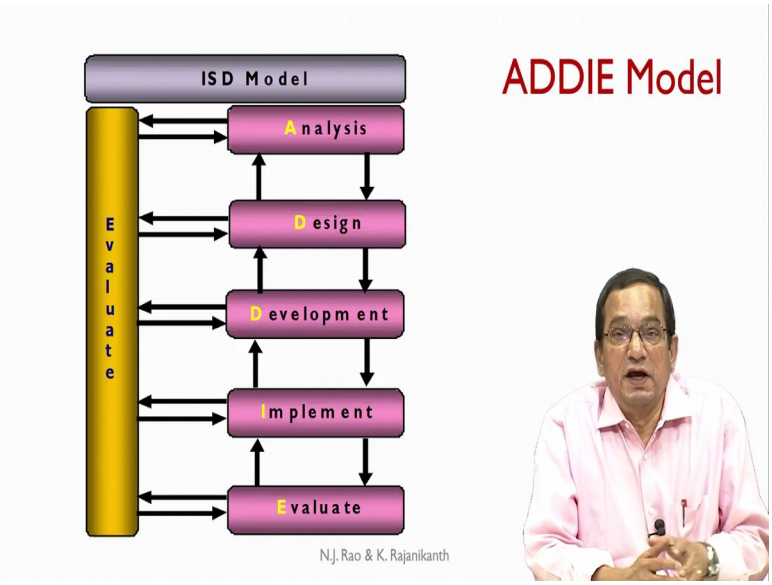

In the ADDIE model that we have been using for the course design, evaluate phase is the last phase and it is summative phase. However, when we look into this diagram we see that evaluate occurs in two different contexts. There is an “evaluate” which is summative phase at the very end; Analysis, Design, Development, Implement, then Evaluate. But there is also an “evaluate” which is connected to every phase. If you see the horizontal

rows, Analysis Phase, Design Phase, Development Phase as well as Implement Phase - they are all linked to Evaluate.

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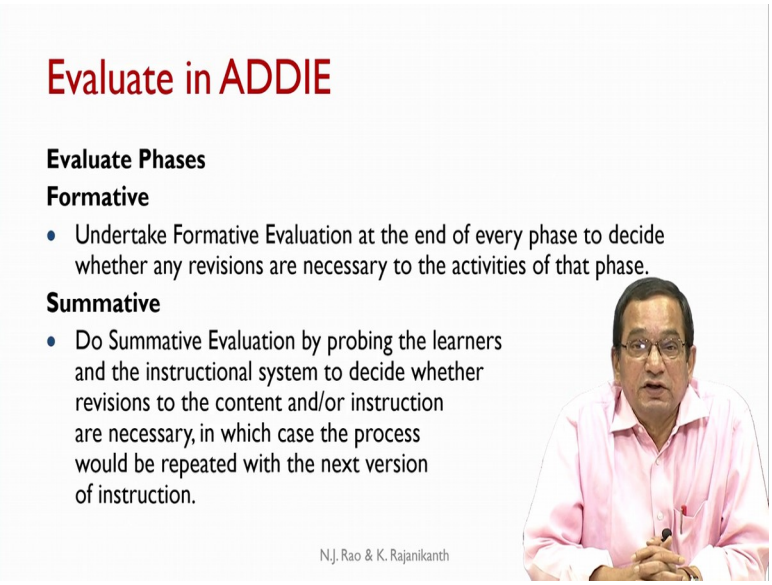

That means, in its formative mode, the Evaluate Phase is connected to every other phase. So, the formative evaluation is taken up at the end of every phase to decide whether any revisions are necessary to the activities of that phase. In the literature on the ADDIE model, we find some authors using and treating ADDIE model as a strictly sequential model with no feedback loops whatsoever and then, on that basis criticize the model as being too rigid. Whereas, ADDIE model, at least in the presently accepted standard form, has feedbacks at every stage.

After every phase, it goes through an evaluate and if the evaluate phase indicates that a revision is necessary, then the activities in that phase are revisited. At the end of every phase, we do have an evaluate process taking place. But in this unit, we are looking at the Evaluate Phase as the summative final phase of the ADDIE model. In this phase, we probe the learners and the instruction system to decide whether revision to the content and our instruction are necessary in which case the process would be repeated with the next version of the instruction.

The evaluate occurs in two modes: (1) at the end of every phase to determine if any activities of that phase are to be revisited; (2) at the end of the 4 phases as the final summative phase to determine the overall model's effectiveness in terms of the course

design, delivery and its implementation and whether there should be any changes the next time the course is offered; that is the summative role.

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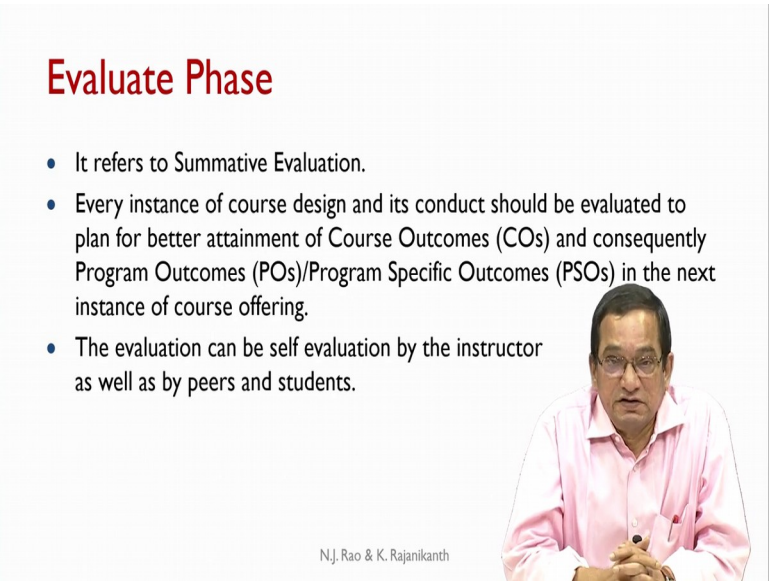

Evaluate Phase (summative): Every instance of course design and its conduct should be evaluated because each delivery is a unique instance. Though, we have the analysis, design and develop phases, each implementation is a unique instance. So, that should be evaluated to plan for better attainment of course outcomes and via the better attainment of course outcomes we should able to get better attainment of program outcomes as well as program specific outcomes in the next instance of course offering.

This improvement work occurs at two levels: (1) at the course level - we are closing the quality loop by ensuring that the attainment levels of the course outcomes are better next time and (2) at the program level - we are ensuring that the attainment levels of program outcomes and program specific outcomes are also improved in the next time. The evaluation can be self evaluation by the instructor as well as by peers and students. In fact, it is desirable to have the evaluation by students definitely and if possible by peers and this feedback that we get would be the basis for development of the course delivery the next time.

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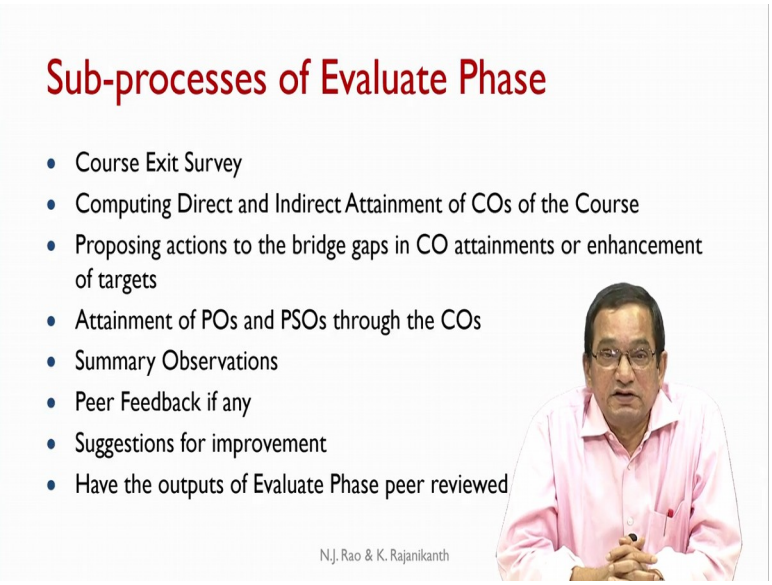

There are several sub-processes of evaluate phase. We have course exit survey. (We will discuss this in greater detail in the next unit.) Computing direct and indirect attainment of COs of the course; note that we already have set the target levels to be attained for the COs earlier in the design phase. During the design phase, we have set certain target levels for the attainment of the COs and in the evaluate phase, we are actually computing the direct and indirect attainment of COs.

Then, based on the target levels and the actual attainment levels, proposing actions to bridge the gaps in the CO attainments; in case the attainment level has not reached the target levels or if the attainment levels have reached the target levels, we could think of enhancing the target levels. Then, via attainment of the COs, we need to compute the attainment of POs and PSOs also. During the implement phase we would have made observations after every instructional unit. The instructor would have recorded the observations after every instructional unit.

Based on all these we can make summary observations regarding the “implement” of the course. Peer feedback if any is available; suggestions for improvement; we could also get feedback from other sources if they are available; have the outputs of evaluate phase peer reviewed. Note that even the evaluate phase itself actually is connected to the vertical evaluate block which essentially means that even this phase needs to be evaluated. So obviously in this model there is an input - output relationship, in the sense that the output

of one phase becomes input to the next phase. But there is also a parallel evaluate phase at the end of every phase; we need to evaluate.

At the end of evaluate phase also the documents that we produce (improvement plans and other plans) - they all must be peer reviewed in order to ensure that what we have is a valid information.

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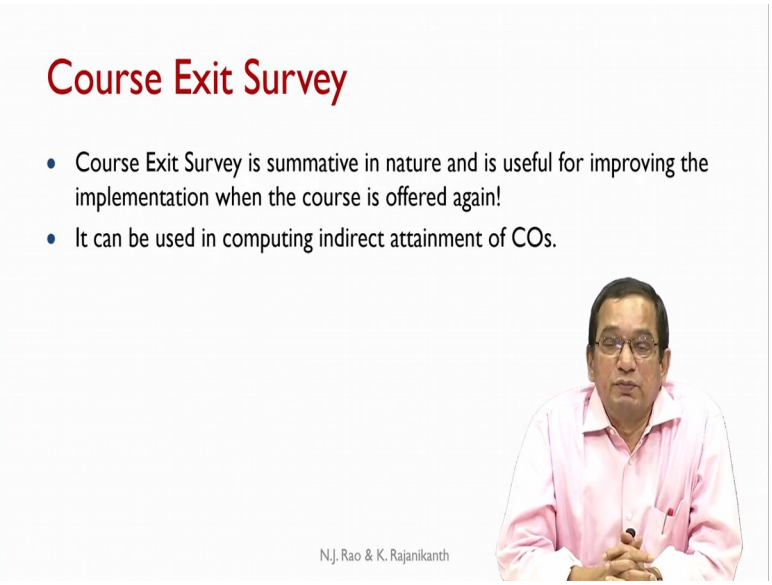

One of the important things is course exit survey. (We will discuss this in greater detail in the next unit.) This is summative in nature and is quite useful for improving the implementation, when the course is offered again. The students provide this data and this can be used in computing indirect attainment of COs also. Thus, the data from course exit survey provides inputs for improving the implementation as well as it provides the data for computation indirect attainment of COs.

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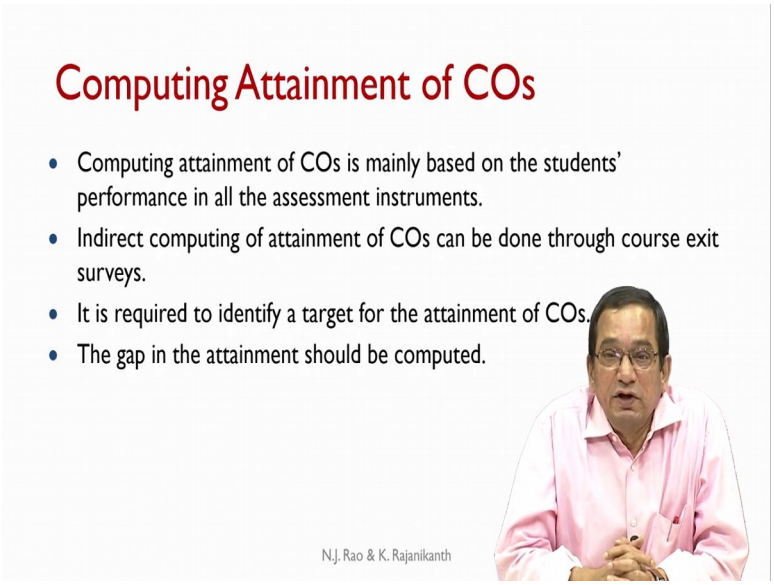

Primarily, (we have seen earlier in the earlier module also that) computing the attainment of COs is based on students' performance in all the assessment instruments, internal tests, quizzes, assignments, semester and examinations.

However, we can also compute the attainment in an indirect way through course exit survey. (How to do that? We will see this in the next unit.) It is required to identify a target for the attainment of COs and this we have seen is done typically in the design phase. Then, the gap in the attainment should also be computed.

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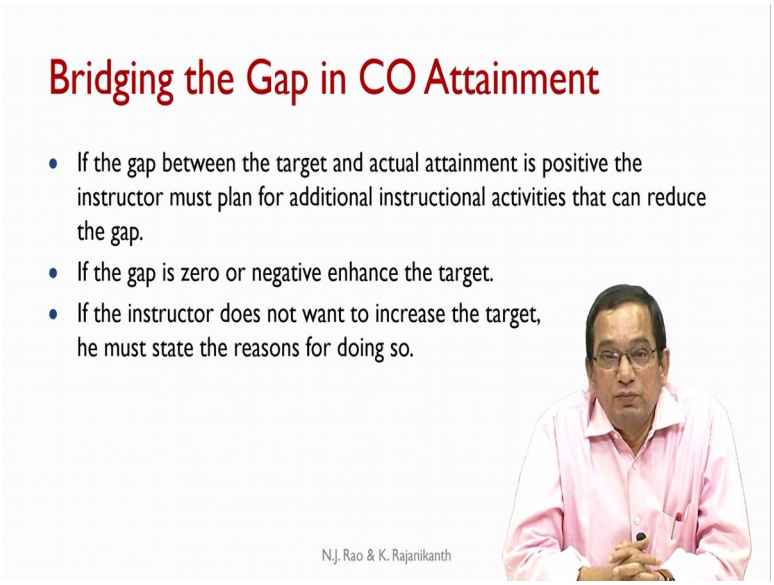

If the gap between the target and actual attainment is positive, then the instructor must plan for additional instruction activities that can reduce the gap; in the sense that if the attainment level is less than the target level, we must plan for improvements next time the course is delivered so that the gap is reduced.

On the other hand, if the attainment level is equal to the target level or is greater than the target level - that means, if the gap is 0 or negative - we could enhance the target. It is also possible that the instructor may wish to keep the target as the same even when it is achieved and if that is the case the instructor has to state the reasons for doing so! Maybe that for this batch, we have attained it. But we are not very sure whether the instructional delivery is fine for the next batch also. Hence, you would like to see for one more batch and if you are able to attain the set targets even for the second batch, then we would like to enhance target.

It is possible that the instructor has some reasoning like this for retaining the same target level; but if that is so, the instructor must state those reasons. Either we plan improvements in order to raise the attainment levels to reduce the gap, when the targets have not been attained or retain the same target when the target has been attained or increase the target when the target has been attained. So, one of these actions we need to do and that is part of the evaluate phase.

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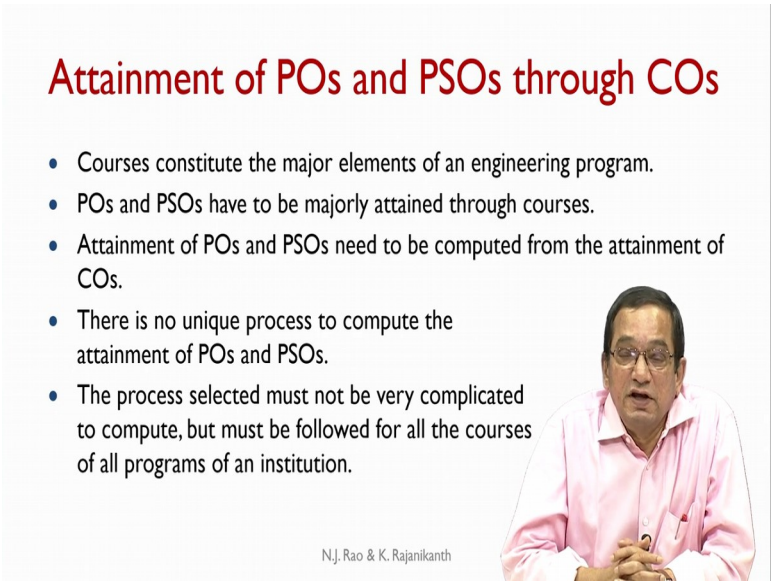

Based on the attainments of the course outcomes, we need also to compute the attainment of POs and PSOs. Courses constitute major elements of an engineering program particularly the core courses and POs and PSOs have to be majorly attained through courses. There are co-curricular, extracurricular activities and other activities probably which contribute towards the attainment of POs and PSOs. But by and large, the POs and PSOs have to be attained through courses.

Attainment of the POs and PSOs need to be computed from the attainment of COs. Obviously, every CO addresses a subset of the POs and PSOs and every CO is related to those addressed POs and PSOs to varying strengths of correlation. We have seen in the earlier units that the correlation strength can be low, moderate or high. Depending upon the correlation strength and the actual level of attainment of the COs, the attainment levels of the POs and PSOs need to be computed.

There is no unique process to compute the attainment of POs and PSOs. But in the earlier module, we have given one simple process by which the attainment levels of POs and PSOs can be computed. That would depend both on the correlation strength as well as the actual attainment level of the related COs. Whatever process we select, that must be reasonably simple to implement because we need to implement it across all the courses and it must be followed for all the courses of all programs of an institution.

So, it is a necessary to have one common process across the institute, across the programs, across all the courses. One simple process which we have discussed earlier could be adopted; if any other process or variations of that process are desired, even that is fine as long as it is common across the institute.

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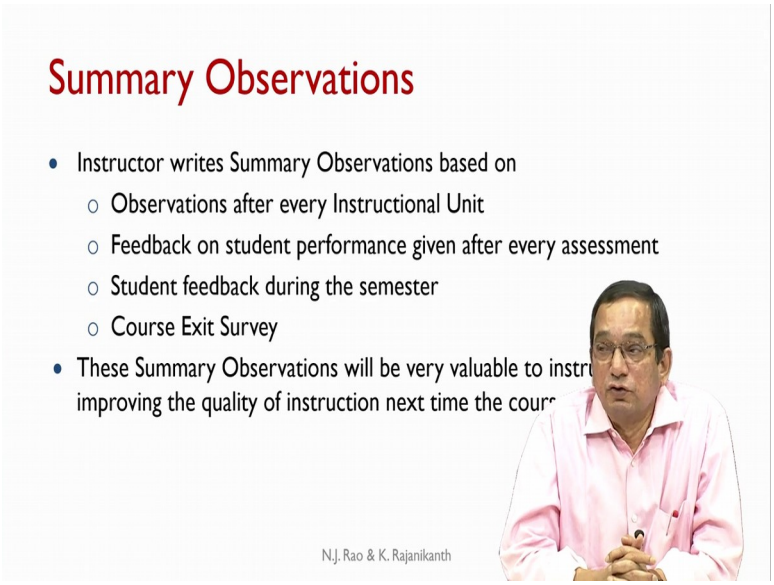

We also saw that during the implement phase, after every instructional unit, the instructor makes observations. These observations are given after every instructional unit. We also have the feedback on the student performance provided to the students. After every assessment, after every quiz or after every test or after the submission of every assignment, feedback is given to the students on their performance.

The feedback that is collected from the students in a mid-course survey is available. The feedback that would be obtained from the students at the end of the course, a course exit survey is available. We have observations after every instructional unit, feedback after every assessment, feedback during mid-course surveys (one or more), and the course exit survey data. Based on all these, the instructor must write the summary observations. These summary observations will be very valuable to the instructor in improving the quality of instruction next time the course is offered.

These summary observations would include items like what are the areas in which there are difficulties in covering the material in the planed number of hours; what are the sticky points - the problems that the students face; what are the issues with respect to the prerequisite knowledge that is required; what are the COs which are proving to be particularly difficult. All these kinds of issues can be derived from these summary observations and that can form the basis for planning the improvements in the quality of instruction next time the course is delivered.

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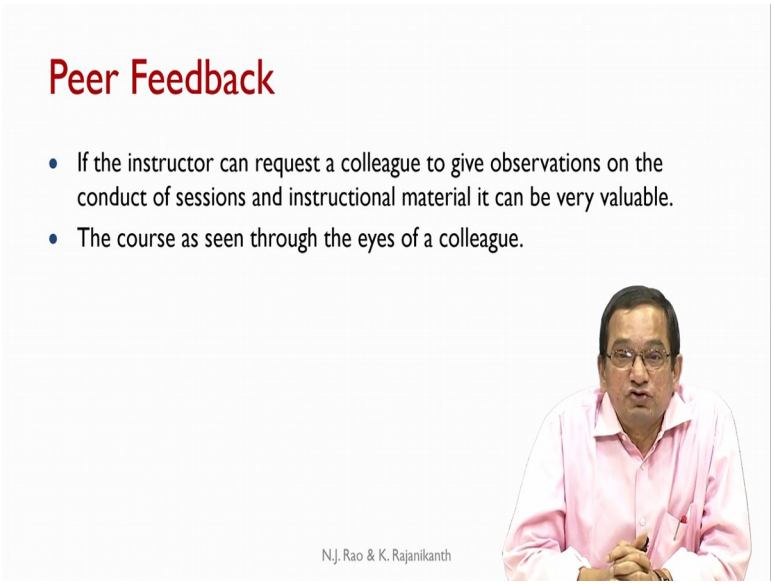

If the instructor can request a colleague to give observations on the conduct of the sessions and instructional material, it can be very valuable. Because the implementation of this would require considerable cooperative environment, where the feedback that is given is used only for the purpose of evaluation and it is not really considered as any kind of personal feedback or a personal affront.

There must exist an environment which is conducive to corporation and if that is available, then the instructor can request the colleague to give observations on the conduct of the sessions and instructional material. Also, we have seen that typically every institute has a mechanism for checking the quality of the assessment instruments - the quality of the assessment instruments with respect to the language, clarity, coverage of the COs, the cognitive levels at which the questions are posed and the cognitive levels of the corresponding COs.

With respect to all these issues usually a scrutiny process exists, where the assessment instruments are reviewed. The feedback given by this committee (basically the committee consists of colleagues,) would also be helpful in trying to plan for improvement of the course next time it is delivered. Apart from that, we can request the colleagues to look at the teaching material, the learning material, the actual conduct of the sessions and provide the feedback.

This allows us to see the course as seen through the eye of a colleague and this information can also be used to plan the improvements for the course. So, there are multiple sources from which we should get information and this information is all pooled together to plan the improvements for the course the next time it is delivered. Notice that in some of the institutes it is quite possible that the instructor may not be offering the course next time; either because the instructor leaves this institute or there is a different course which is assigned to this instructor. Still, it is important to note that all these observations which are recorded in a kind of a course file would be very helpful for the instructor who is planning to teach the course the next time. In that sense this information should be cumulative in nature and it should become an asset of the department (maintained at the department level). It should be considered as a repository; (maintained at the department level) and thus an instructor should look at it as a contribution to the department. Even if the same instructor is not planning to deliver the course the next time, this information must be recorded diligently and all the data that goes into the planning process must also be available. It is also possible that in a subsequent delivery there could be minor variations in the actual content of the course.

Though with respect to core courses, it is less common to have changes occurring every year, but in principle it is possible for a Tier I institute to make minor changes in the course content even for core courses. And when it comes to elective courses, substantial changes may also occur. But, even when such changes occur in the course, part of the information that we have collected may not be very much relevant; but a substantial part of the feedback collected, a substantial part of the plans for improving the course - they will remain relevant.

Thus, even in situations where there are likely to be some changes in the course contents, the process should be followed diligently and all the data required is collected and recorded. This kind of plan for improving the course the next time it is delivered is an essential aspect of the closure of the quality loop. We have seen that this is also important in terms of computing the POs and PSOs and if there is an improvement in the attainment level of the COs, the attainment levels of the POs and PSOs also will improve and this kind of closure of the quality loop at the course level and at the program level is essential. So, that is how we should be looking at the evaluate phase.

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The suggestions for improvements: Improvement (as just now we saw) are worked out based on Summary observations, which themselves are based on observations after every instructional unit, the actual levels of attainment of the COs vis-a-vis targets which have been set during the design phase and whether the attainment levels have reached the target levels or if they have failed to reach, by how much margin they have field to reach and if they have exceeded the target levels, by how much margin they have exceeded the target levels. Feedback from the peers on all aspects of the course - the teaching material, the learning material, the assessment instruments used, the quality of each individual assessment instrument, the entire assessment plan. Also student feedback obtained through mid-course surveys as well as course exit survey.

So, based on all these we make the suggestions for improvement and as mentioned, these must be recorded and made available to the department. These are necessary even if the same instructor is not going to offer the course the next time. Of course, if the same instructor is offering it is all the more great; the instructor can definitely implement, incorporate all these improvement plans, and achieve higher levels of CO attainment. So, that is the important aspect of the evaluate phase.

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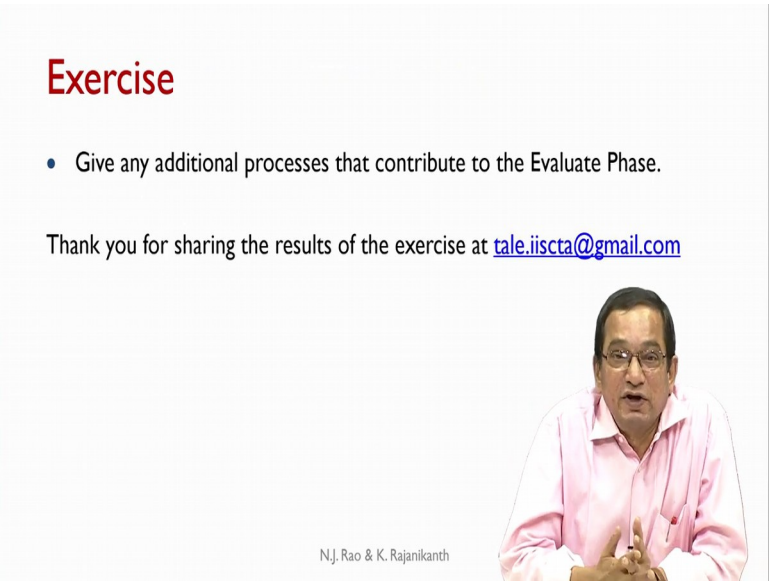

Exercise: Give any additional processes that contribute to the evaluate phase. Thank you for sharing the results of the exercise at tale.iiscta@gmail.com.

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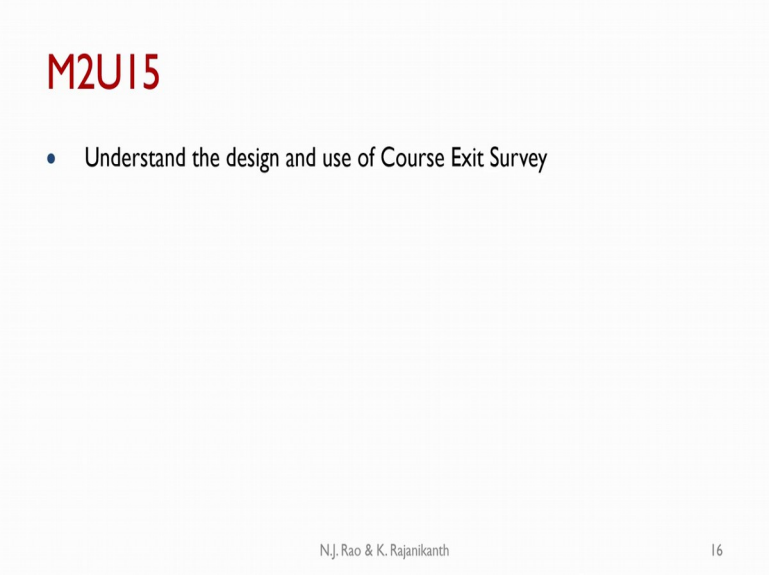

In the next unit, we will understand the design and use of course exit survey. As already noted the course exit survey is an extremely important component to obtain feedback from the students regarding all aspects of the course. The design of the course exit survey as well as the use of data from the course exit survey would form an important component in improvement plans of the course.

Thank you and bye.