

Course on Outcome based Pedagogic Principles for Effective Teaching
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Module 3
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Assessment and Evolution

Ok, so let us talk about that assessment and evaluation, so before I go into this topic I just ask one questions, why we require assessment and evaluation. If you say that in a technical education that while we take a lecture and at the end there is a end semester exam, mid semester exam why this examination system is there. In the beginning I have asked these questions that evaluation and assessment is not only for providing the grade to the students. I compare with that suppose some doctors prescribe you a pathological examination, examination itself is not the treatment.

Once the based on the examination the doctor prescribe the medicine, then the treatment is completed, so the assessment and evaluation if I say only to provide the grade to the students then it is a open ended there is no close end of that loop that means the assessment and evaluation only for grade assign a grade or to assign a marks to the student is not the purpose. Purpose is that assessment and evolution is also applicable to final the lacuna and loop holes of our teaching learning process and intended outcome what we have fixed for this course.

So what I meaning, the suppose I taught a course X, a course has a goal that means outcome of the course lets A, B, C, D are the outcome of the course. If I say student add the purpose of the assessment and evaluation is that to check whether each and individual learner has attend that goal or not. Whether each and individual learner has achieved or reached that goal or not or other hand to test whether the learner has acquired the skill what I intended to be, whether they have or not.

Once I done it, then let us after examination I found most of the learner cannot attend the goal seeks, then as a teacher I have to find out why the learner is not able to attend the goal seek. If the goal seeks, which I have defined is not achievable is the goal seeks which I have define is not specific. The goal which I have defined is not scattered the teaching-learning process I have adopted. May be the teaching-learning process I have followed which not scattered to the capability building of the goal seeks.

So once I analyze that things and take it to consideration in my to modify the teaching-learning process then I say the examination system that teaching-learning or assessment and evaluation is reinforce by teaching-learning process. So purpose of the assessment and evaluation process is not to provide not only to provide the grade or marks to the student but also reinforce the teaching-learning process or as a teacher the correct, the teaching-learning process, which I have adopted or to correct the outcome of the courses.

Now I give you some practical example. Many of us in lets in engineering education give question paper like that write a short note on this, describe this, and explain this. Now if you see the intended outcome for the 4 year graduate students is the in higher cognitive level. They should able to design, they should able to analyze, they should able to evaluate, they should able to design experiment, and they should able to use modern tools.

Now at the end semester I design a question paper write a short note on X, write a short note on Y, describe this, explain this, see that this cannot be a B.Tech or four year graduate question paper, this may be a ITI question paper. ITI engineer suppose to know how the system is work, how the different block diagram is work that things but not for the graduate engineer. Any question paper if you find many of us are scattered to that part only, which is totally wrong perception actually we are decreasing the student engagement, we are responsible for decreasing the student responsible. Student know that within the effort of seven days before the semester I can clear this subject, so I do not have to engage throughout the semesters, so this is the problem in assessment and evaluation system present system.

So how should I design my assessment and evaluation process such that it should reinforce the teaching-learning at an increase the student engagement ok that is the one part of the design and assessment and evaluation system. When your boss says what should be the pass mark, let I say that a university has created a pass mark on 35% and your question paper is designed like that out of 8 answer any 5. Once you do that out of 8 answer any 5, students has only knowing the 70% of the syllabus or 70% of the skill set which have defined the that this is the minimum skill set required to be expertise on that subject, 70% of the expertization give me the 100% evaluation marks that means that it is 35 I know the subject with 100% even if I only cover the 70% of the syllabus that means that total motion that out of 8 answer any 5 is totally wrong.

Yes it is possible I can give out of 8 answer any 5, if it is possible that any five students has attempt to answer is covered the 100% of the syllabus. So as a question paper setter, I should

able to say that any 5 the student will attempt he or she has to know the 100% of the syllabus. If I able to do that, then I say yes the question paper is correct then present scenario see that out of 70% knowing I can get 100% marks, 35% marks is the pass marks, so 35% 3 into 7 so only knowing the 21% of the syllabus roughly 21% of the syllabus I get promoted in the next class.

Think about the situation in the technical education let us I say, the somebody getting 20% knowledge in analogue electronics promoted to the course on VLSI what will happen to that student? 21% knowledge on analogue electronics promoted to as class on VLSI design, am I said that that student will capable taking the subject on VLSI design. So totally it is a wrong that we are not (()) (09:26) it is not that problem of the teachers. Teachers give them pass marks, it is not the problem of the teachers, it is a problem of the learner without getting confidence in one subject he or she has promoted to the next subject and with a difficulty is that he does not know the first subject how you acquire the second subject.

So it is the problem of the learner it is not hampering the teachers, so it is hampering the students itself, so what kind of assessment and evaluation system we should promote so that we have guaranteed that while the student is promoted in the next course or next level of the course, he has acquired or acquired the skill set which is desired for the course 1 and then he goes to course 2 if we able to do that then assessment and evaluation system is 100% correct. Think about why I should I should say that this is 4 years study in the particular university becomes a graduate engineer. I have initially said that if I am claim that I am a graduate engineer of this discipline then I should able to know that what are the skill I have acquired which does not have by the common man so that myself is different from the common man that I am a graduate engineer, it is not differentiate by the certificate.

So think about the near future will come and somebody can say that yes I can become a graduate engineer at the age of 60, no problem you define those are the skill set is required to become to declare myself as a graduate engineer. If the skill set are defined and if I acquire that skill set in anyhow, lets come MOOC let us see open online courses I acquire those skill set. Once I acquire those skill set let us there is exist a free and fair evaluation system where somebody will judge me whether I have that skill or not. Once somebody certify me with a free and fair evaluation system that yes I have those skills then I am able to declare myself that I am a graduate engineer. So that means the purpose of the evaluation system is to test

whether the student has the minimum skill set which require to declare in a pass or you can say the promote in the next grade of that course.

So how do you do that? So it is essential it is a criteria based evaluation system, our assessment and evaluation system for the course is a nothing but a criteria base assessment and evaluation system. So I will talk about the criteria based and non-reference based evaluation and assessment system. So it is a criteria based assessment and evolution system, so if I criteria is known to me, then I can do it. Now not as a present are you thinking the present grade co-relate with the student knowledge of the subject. Student might get excellent grade X Grade that means more than 90% marks in a subject that is mean you ask anything after the examination of three or five months he cannot say anything that is possible why because the assessment and evaluation system is not test the student skill set is only test the student surface knowledge, which make him a surface learner and he just passed that exam.

Many of many of experience with that things students whose CGPA above 9, if you ask any first year subject on him, he will say I just forget it because if you ask any student why you are not studying throughout the semester exam he said sir if I (()) (13:43) the last 2 or 3 year question paper, I am very sure that I can guaranteed 75% marks of that course by guessing the question paper 75% cases I will succeed that I will guess the question paper I just read it and give the exam, nothing else, so the purpose of the examination system is totally exploited. So, that means as a teacher I should know what is the correct assessment and evaluation system, what is the correct process of assessment evaluation which re-enforce the teaching and learning of that subject.

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1. ASSESSMENT & EVALUATION – Inter relationship

1.1 Assessment

- Process of gathering data to measure degree of attainment of course goals.
- Assessment techniques may vary with goals

Ex: Class test, quiz, assignment, viva, term paper, oral presentation, case studies, lab report, port folios, practical & theory exams.

1.2 Evaluation

- Assessment data quantified for each student for all relevant assessments.
- If necessary, data normalized for different tests / assessment methods.
- Value judgment made based on Criteria / Norm (proficiency / relative position amongst peers)

1.3 Conclusion

- Evaluation is the end
- Assessments are the means

So let us come here what is assessment, assessment is a process of gathering data to measure degree of attainment of a course goal. Course goal means course outcome, if I say those are the course outcome, so I have to gather the data whether the student or learner has received or have achieved the outcome or not of acquired that outcome skills or not that may be a class test, may be a quiz, may be a assignment, (()) (15:03), presentation, mini project many-many is the process those are the process of gathering data whether a student has acquired the intended skill or not. So assessment is a process for gathering the data. So what is evaluation? Assessment data quantify for each student for relevant assessment.

If I say I am assessing I evaluating a students for whether a students have can be qualify for going to the next level of semester exam, so second whether he able to clear that analogue electronics subject or not that that should be criteria based. So assessment has two evaluation is a 2 type either it can be criteria based or either they can be (()) (16:00). Why it is criteria based? Most of the cases in our class exam or our university level exam are criteria based because we have pre-defined criteria that if a student said I am passing in analogue electronics, he is suppose to have this skill A, B, C, D.

My question paper will test whether the student has skill A, B, C, D or not, if that all skills are present I give him excellent marks and promote to the next class. If none of the skill has present I cannot pass the students I can say the students to better to repeat this course acquire the skill and then go to the next level ok and that is called criteria based assessment system and always a non-reference that is not necessary for our teaching learning (()) (16:53) but it

is required for when I have to say I have to rank my all class 1, 2, 3, 4 then I have to go for the non-reference.

When I teaching a course my intension that every student should acquire the every goal, so in that case assessment and evaluation is criteria reference. Now, if somebody said that yes I want to take your past 10 students can you rank them, so maybe in my assessment may be there is a 20 student who acquire the all the course goal so everybody got ex. All course goal is acquired by the 20 students, but I have to rank them 1 to 20 then I have to take a assessment I have to take a examination which is non-reference that means criteria is that I have to select I have to arrange them 1 to 20 like that our JEE exam.

It is a non-reference because let us 300 marks question paper if I design how many students I can rank, 300 students. Or I can take a physics, chemistry, mathematics (()) (18:12) that section and get a permutation, combination, and then also it is not possible to scatter 5 lakhs students ok. So same marks can be obtained by the several students then my question paper should follow a long reference that that means elimination process that should be some question paper whose discrimination index is very high.

Few students can attempt that question paper, so I can arrange them so that is a non-reference and criteria based. Most of the our assessment in as a teacher in the class room assessment all are criteria based ok. In conclusion, evaluation is the aim and assessment are the means, it is not that semester examination only test the students skill.

Suppose I design a course and write a skill which require the use of modern tools , if you are a NBA guideline and Washington guideline, it is said that students must be exposed or must be know or must be have a skill on modern tools uses and they should know the limitations of that tools also. So at the end semester examination it is impossible to me to test whether know (()) (19:40) tools or not, so assessment one part of the assessment may be on that so I can give an mini project to the students using that tools whether they have completed that mini project or not that can be assessment for that objective. So for every objective I should plan what kind of assessment I should take to test whether every learner has reached that skill or not that is the teachers plan, then I can assess the students then I can evaluate the results of the assessment data and provide them the competence certificate whether they have a skill or not whether they have a skill or not whether they have a skill or not ok, so that is the purpose of the assessment and evaluation.

I already shown this block diagram so this is the block diagram, where I have said once the criteria that course outcome is known, if the criteria is known then based on the criteria I test the different assessment but different assessment process I test whether the student has attend the expected criteria or not once they have yes then I assign grade or rank or certify the competence. If they do not, then I have to evaluate the effectiveness of the teaching-learning process as well as the course outcome, so there will be one arrow should be pointing to here also ok. So both of them I have to modify so that next time they have attend this criteria, so that that is the flow diagram, how the examination system is real course the teaching-learning.

Now think about it, today we are talking about the great transfer, transfer of grade from one institute to another institute that depends on the quality of the institute but nobody, suppose some students has completed the course on thermodynamics on some X university, now X university want to transfer the grade to university Y and university Y is not willing to take that grade because that university ranking is not below to the. So it depends on the institute ranking, it does not depend what kind of thermodynamics taught in institute X and so that grade can be transferred.

So suppose some MD Doctor prescribe and that guaranteed that medicine is very good it not it may not be, so it may not be, some others may be give prescribe very good medicine so that means I should know the institute X thermodynamics, what is the skill set they should taught that is the criteria. Once I know the criteria that a thermodynamics for B.Tech level should have these these these skill sets on the students.

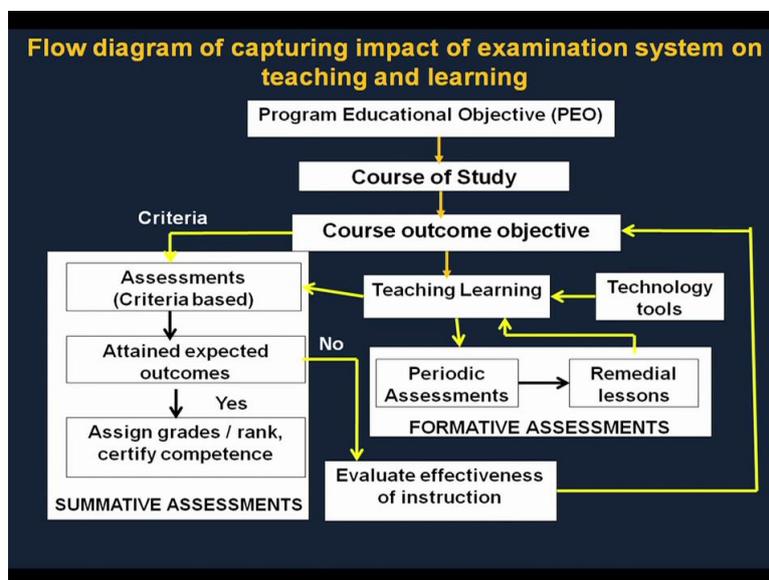
So develop these these skill set and let us take that there is an assessment system is valid and fair and they are tested on that skill set and assign a grade, now institute B said yes my criteria my criteria for thermodynamics that means compatibility criteria that that skill what X is develop University X is developed is also required for the skill for my university, then grade can be directly transfer without any hesitation. But somebody said that the yes some institute X has very good ranking and he developed the thermodynamics course on some students as grade A, my institute does not match with that thermodynamics knowledge because the skill set required by institute A is different the skill sets require by institute B.

It is not guaranteed that if I follow the IIT syllabus I will become the very good institute it cannot be. My intention of producing the different kinds of skills students which will be cater to the different purpose not the intention of the IIT. Suppose IIT said my students will go into

the high and research as a institute X outside the country or is a low resource institute, I cannot say that my students will have the capability to go into the high and research. I should produce the student to supply the manpower for certain industry. So the course taught on that institute X is may not be suitable for me, so I cannot say grade assign by the IIT will compatible with me I cannot say that, but if I say I certify that the course X are looking for those are the skill and I am certifying the students has those skill, then as a institute Y I can say yes I can take you take these students grade because I also looking for same skill, so grade transfer is very easy.

Unless it is curriculum is designed in outcome based curriculum and transfer of grade is totally unscientific. I cannot say the institute X is very good institute so you can take the grade of institute A, maybe that skill does not match with my institute skill. So that is the purpose so the basic question on the grade transfer lie on that what kind of skill you are certify by the grade among the students. Today, I cannot say that grade reflected the student skill, somebody getting a X grade that grade is not valid at all because he does not know the subject at all but grade X, so that means the purpose of the evaluation system is not designed correctly.

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Now I come to the again scientific aspect of assessment and evaluation. If you say assessment and evolution, the issue I should raise some issue I am raising how can we reliably measure grade and certify outcome at different domains and levels of planning. How can I design an assessment system that will certify outcome at different domain and level of planning? Assessment what kind of assessment, while I should take the assessment, how much

assessment I should take, how I take the assessment, how can use the results of assessment to evaluate the students, so all scientific aspect of this also has to be discussed. What are the different functions of assessment, how can we ensure the validity and reliability of the assessment and evaluation.

If I can say suppose I design a question paper today for basic electronics on the circuit theory of the students and I have guaranteed the student has these these skill, then after the exam after one month if I test the cell setup of student again can I guaranteed that the grade will be co-relate? Cannot guarantee that the grade can be co-related, if it is not guaranteed that means my assessment is not correct, my assessment is not reliable not valid, then what are the kinds of interpretation can we make.

If I say my grade is reflected the students skill then I can make interpret but if it is not what kind of interpretation what I take. How can I make good assessment plan throughout the semester how can I make a good assessment plan, what are the important statistical tools which I can use for the assessment planning the assessment like that item analysis all kind of scientific aspect of assessment and evaluation item analysis, question paper design all kind of things.

What is the current status in R&D in this field, I will not going to the R&D part because there is a computer based assessment , computer based question paper all kinds of things can be discuss, but as per this course I have not going to the computer risk assessment ok. So next class I will talk about the assessment and evaluation different aspect of assessment and evaluation ok Thank you.