

Teaching and Learning in Engineering (TALE)
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Lecture - 02
Education and Teaching

Welcome to the unit 2 of module 1 of TALE. The unit is we are trying to look at the words education and teaching.

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Recap

- The College/Department needs to design and conduct its UG programs to meet several stated Outcomes to meet the accreditation criteria.
- There are many important characteristics a good engineer should have besides “sound knowledge of engineering sciences and technologies”

And what we have done in the first unit, we stated very clearly that the college or the department offering the program needs to design and conduct its programs to meet several stated outcomes to meet the accreditation criteria. So it is no longer designing a course purely based on a particular discipline or a subject. It is much more than that. That is it has to plan and conduct its activities to meet several stated outcomes. That is what we stated.

We will continue to reinforce this particular requirement. And we also realized that there are many important characteristics of a good engineer, besides having sound knowledge of engineering sciences and technologies. The other requirements we may broadly classify them as professional requirements and whereas the sound knowledge of engineering sciences and technology is the disciplinary requirements.

So both disciplinary and professional requirements are important for a graduating engineer.

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MIU2: Outcomes

MIU2-1: Get reintroduced to the familiar words “Education” and “Teaching”.



Now coming to this particular unit 2, the outcome is get reintroduced to the familiar words “education” and “teaching”. As we mentioned in the first unit, “education” and “teaching” are 2 familiar words to especially teachers because that is their profession. But, it is necessary to formally get reintroduced to those words and that will be the major goal of this particular unit.

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Education

- Education, in its broad sense, refers to any act or experience that has formative effect on the mind, character or physical ability of an individual.
- Education in this sense never ends; we truly learn from experiences all through our lives.

In its broad sense, education refers to any kind of experience or any activity an individual does which has impact on the person’s thinking, character, or physical ability. Anything like that is considered education. And education in this sense never ends, we are continuously interacting with outside world, we are acting on events outside and we are observing and all of them will

have these experiences, will have some influence on us. To this extent education never really ever ends and it runs throughout our lives.

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Education

- Education, in its technical sense, is the process by which society deliberately transmits its cultural heritage – its accumulated knowledge, values and skills – from one generation to another.
- Education, in this context, is concerned with intentional learning like in schools, colleges and universities.
- To educate people wisely we must know what we educate them to become.

Whereas education in its technical sense, is the process by which society deliberately transmits its “cultural heritage”. “Cultural heritage” refers to its accumulated knowledge, values and skills from one generation to the other. Here education in this context is concerned with what you call intentional learning, and intentional learning happens in schools, colleges and universities. That means whenever you enter a school or a college or enter into a specific program, there is whoever has designed the program will say these are the things that the learner has to learn. So to that extent it is intentional learning that happens in formal educational institutions.

Now here comes the bigger question. So if you want to educate people wisely, we must know what we educate them to become. Who decides what is it that the students should learn? And in this process of decision making you come across a whole bunch of questions and what we call it as “philosophy of education”.

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Philosophy of Education

- To know what to educate it is necessary to ask what can be the purpose of life and what sort of life it should be.
- This leads to the necessity to consider education philosophically.
- Educational philosophy involves the application of formal philosophy to education.



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So to know what to educate, it becomes necessary to ask what can be the purpose of life and what sort of life it should be? This becomes necessary to consider education philosophically. And educational philosophy particularly which is a subject by itself involves with the application of formal philosophy to education. The same questions that formal philosophy asks; educational philosophy asks the same question specifically with respect to the education.

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Philosophy of Education (2)

- One convenient classification of philosophies is
 - Idealism
 - Realism
 - Pragmatism
 - Existentialism
 - Analysis

Now we are not going to deal with philosophy of education in detail. All that is necessary is that implicitly we may be operating in under some umbrella of some education philosophy which we may or may not be aware of. Broadly, the philosophies can be classified under, again this classification is not the universal classification. People may disagree with that. So I call it one

convenient classification of philosophy is idealism, realism, pragmatism, existentialism, and analysis.

We are not going to go through the details of each except to give an example of one and that sample we call it “pragmatism”.

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Sample: Pragmatism

- It is a practical and utilitarian philosophy.
- There are no established systems of ideas which will be true for all times.
- Pragmatists want education according to aptitudes and abilities of the individual.
- Individual must be respected and education planned to cater to his inclinations and capacities.
- It makes activity the basis of all teaching and learning.



What does pragmatism is one school of philosophy. So under that how is, under that how does the education philosophy look like? First of all, pragmatism, it is a practical and utilitarian philosophy. There is no established system of ideas which will be true for all times. This is an assumption that is made by pragmatism, with which I am sure many Indian schools of philosophy will not agree. Pragmatists want education according to aptitudes and abilities of the individual; individual must be respected and education planned to cater to his inclinations and capacities.

It makes the activity as the basis of all teaching and learning. If you are operating in the school of pragmatism, activity is the basis of all teaching and learning. That means both teachers and student should be or should be involved in activities and not one activity like only listening or speaking.

So this is one school of philosophy or it is for you to decide whether you agree or whether you would like to operate under a particular school of philosophy.

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Higher Education

- Aims of higher education cannot be and are not that universal.
- Universities/Colleges offering the programs will identify the aims, called Program Outcomes.
- In case of professional courses the national level Accrediting agencies identify the Program Outcomes with some freedom given to the Department offering the program.



Coming to higher education, we are, the aims of higher education cannot be and are not that universal like the way it happens in school education. Because the educational philosophy is you have wide range of schools when it comes to school education. What kind of person you want to train for. And the at higher education level the aims are not that universal. They start becoming very specific.

Universities, colleges offering the programs, will identify the “aims” and we are going to call them as “program outcomes”. And in our case, some outcomes are defined by National Board of Accreditation; some outcomes are the universities or colleges offering the program will have to decide. In the case of professional courses, the national level accrediting agencies identify the program outcomes with some freedom given to the department offering the programs.

In case of NAAC, when you are looking at other than professional degrees, like what we call as general programs, NAAC really does not identify what should be the program outcomes. It is for the university or the college offering the program will have to identify its own program outcomes. That is the kind of freedom given under NAAC for to institutions offering the, offering what we call as general programs, like a 3-year degree programs in sciences, humanities, social sciences and so on.

So, at higher education level, the philosophical questions are I would not call less important but they in some sense they are already addressed and get translated into a set of program outcomes defined by accrediting agency.

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Teaching

- Teaching is the process of helping others to acquire knowledge, skills and values.
- Teaching is the process of attending to people's needs, experiences and feelings, and **intervening** so that they learn particular things. (Mark K Smith).
- Interventions commonly take the form of questioning, listening, giving information, explaining some phenomenon, demonstrating a skill or process, testing understanding and capacity, and facilitating learning activities (such as note taking, discussion, assignment writing, simulations)

Coming to next word “teaching”, teaching is a process of helping others to acquire knowledge, skills and values. What knowledge, skills and values to be imparted or decided by or determined by the particular school of philosophy of education limited or by the accrediting agency which is overseeing the particular technical or the programs. Now teaching is a process of helping others to acquire whatever identified knowledge, skills and values.

And further teaching is a process of attending to people's needs, experiences and feelings. First attending to people's needs, experiences and feelings and then intervening so that they learn particular things, whatever that are identified as stated by one Mr. Smith. Now what are these interventions, what does a teacher does the teaching, what do the interventions take place? What kind of interventions?

The interventions commonly take the form of questioning, listening, giving information or what we call transferring information and explaining some phenomenon, demonstrating a skill or a process, testing, understanding and capacity and facilitating learning activities such as, there is a

whole bunch of them. A few examples are note taking, discussion, assignment, writing, and simulations.

So the interventions consist of this and the teacher chooses a subset of these to kind of transfer or rather to facilitate students to acquire knowledge, skills and values. That is what teaching is all.

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Models of Teaching

Teaching models

- may help teachers to create conducive environment for learning
- may help teachers to plan learning centered educational experiences
- may stimulate development of new and better forms and opportunities for education

Now there are what we call models of teaching. Teaching models may help teachers to create conducive environment for learning and they may help teachers to plan learning centered educational experiences, may stimulate development of new and better forms and opportunities for education. Because, even a choice of how a teacher wants to intervene with the students in a particular context you again there are some assumptions involved in that.

So those assumptions lead to different models of teaching. Once again we are not going to get into the details of models of teaching. That itself become a separate course or two.

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Families of Teaching Models

- Information processing family
- Personal family
- Social family
- Behavioural system family



There are families of teaching models, what we call information processing family. Why do we want to call it family? Under each family again there are maybe 5, 6 sometimes 8 teaching models available and all of them have been experimented, this subject being fairly teaching model subject of teaching models is fairly old, there is a whole lot of literature on this. And you have information processing family, a personal family, social family, and behavioral system family.

So you have a bunch of teaching models and maybe different these choice of this particular teaching model will become important more at school level. So we are not going to get into the details of the models under each family.

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Glasser Model of Teaching

William Glasser (1962)

1. Instructional objectives stated in behavioural terms.
2. Entering behaviour of students.
3. Instructional procedures
4. Performance assessments

The success of this model depends upon the competency and ability of the teacher in terms of skills like the formulation of objectives, use of proper strategies, and techniques of evaluation.

But if you consider what you may call was generic model though people classify William Glasser's Model under behavioral family model but why we chose Glasser's model of teaching is, it comes pretty close to what we are going to when we talk about course design, we are talking of ADDIE Model and this comes pretty close to that. So we present the features of Glasser Model of Teaching.

Now it consists of 4 stages. Instructional objectives stated in behavioral terms. What are these behavioral terms? That means what should the student be able to do at the end of a learning unit? So that is what how you should behave. What are the things you should be able to do? So instructional objectives are learning objectives if you want to call so are stated in terms of behavioral terms.

And then you must be very clear about what is the entering behavior of students. I cannot teach my course on digital electronics to a necessarily to a student of let us say 4th standard. When I teach something, I am expecting the student entering into my course to know something, to have the required background or required prerequisites as we call it. There is no point in stating your outcomes in a manner which are not compatible with entering behavior of students.

And sometimes the entering behavior may be such that your course may become trivial for the, because they already know most of it, or there may be such a gap between the instructional

objectives that you have chosen and the entering level of the students. So both are unacceptable. So it should be very clear in planning for a course what are the entering behavior of the students. Then from the entering behavior you want your students to attain the stated objectives and you now identify instruction procedures that facilitate them to go towards the stated objectives.

And then having done that, that means these what you may call as the interventions of the by the teacher or by the instructor. And then having done that you want to measure to what extent they have been attained, the instructional objectives have been attained. If you have no way of finding out to what extent they have been achieved or attained, we just do not know whether whatever you have done in the classroom makes any sense or in the end student knows anything.

So there is a performance of the, there are performance assessment, that means I should be able to assess to what extent the student has attained the stated objectives, okay. That is broadly the 4 stages. We will see these 4 stages in some maybe using different terminology will keep appearing when we are designing actually the course. For example Module 1 will dominantly focus on how to write Instructional Objectives in behavioral terms.

However, the success of this model depends on the competency and ability of the teacher in terms of skills like the formulation of objectives, use of proper strategies and techniques of evaluation. This is where what happens is all teachers are not the same. Based on their background, they have their own preferences and all teachers are not teaching the same subject.

So there is some features of the subject that determine what kind of instructional procedures and what kind of objectives that you can achieve. It will also depend on the context what kind of resources that you have that are required to ensure that the instructional objectives can be attained. So broadly I feel the Glasser's model of teaching comes pretty close to what we are talking about the other one called instructional model, instructional system design model what we call ADDIE.

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Assignments

These assignments are only to sensitize to the many features of education and teaching, and not really to master them at this stage.

- Give your reasons why you should be concerned with philosophy of higher education.
- Select a model of teaching that you consider will help you to plan your teaching the subject you are presently concerned with. Write a justification for your choice (maximum of 250 words)

There is huge amount of literature on the Internet.

Now coming to the assignments of this particular unit, these assignments are planned only to sensitize to the many features of educational teaching not really to master them at this stage. That is not our intention in talking about these two words education and teaching. We will also be talking about three other words that we normally use in the next module.

But regarding these two words it will be desirable if the learner spends some amount of time exploring the literature on that so that these two words mean something specific to you. So the assignment is give your reasons why you should be concerned with philosophy of higher education, okay? Give your own reasons. It could be a few statements, few sentences that are all required and then select a model of teaching that you consider will help you to plan your teaching the subject that you are presently concerned with.

Which model of teaching out of the many that are available, that are practiced around the world which is the model that you would like to rather at the first stage of your interaction with this which is the one that you would prefer. Write a justification for your choice, maximum of 250 words. And there is a huge amount of literature on the internet, so searching for literature is not an issue.

Some material will be made available to you when you are going through this course which will give you the kind of internet links that you can explore.

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MIU3

Get reintroduced to the familiar words “Learning”, “Assessment” and “Instruction”.

Understand the centrality of assessment in facilitating good learning



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Going to the next unit, next unit will like the present unit will reintroduce the familiar words learning, assessment, and instruction. And we also particularly emphasize the centrality of assessment in facilitating good learning, okay? We explore these words and this concept in the following module. Thank you very much for your attention.