Psychology of Learning

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Lecture – 34

Learning and Instruction (Contd.)

Hello viewers. So, welcome back to this NPTEL course on Psychology of Learning. In the last class we were discussing about the ADDIE model, Instructional System Design of ADDIE model. Now to continue with that only. So, ADDIE model as you as you see there is a framework to produce the effective learning training and development program.

It is a acronym of this analyze design development and these are actually the phases and these different phases and in different phases what are supposed to be done. So, this ADDIE methodology actually it offers a system based iterative learning incorporating the feedback, review, improve it is a complete package it is a kind of package the course strategic course mentioned for different kinds of training and development programs. So, this is the model as you can see analysis setting the goals, researching the target audience who is the target audience sort of their requirements. Design is the finding out the learning solutions and focusing on the content to be developed objective.

Development is actually the real development of the course content technology and software whatever it is required. Implementation is that the execution of or actual delivery of this whole thing and in the in terms of demonstration, in terms of delivery program then thereafter the evaluation this is the basic structure of the ADDIE model.

So, and let us see how this these all these phases all these stages are progressive in nature sequential in nature and moves on step by step. For example, for example, the first phase is that analysis phase. Analysis phase we need to ask the trainers whenever they design the programs design the training programs learning programs they need to ask certain things need to ask certain things.

So, primarily the analysis phase is based on certain questions to be addressed. For example, for whom we are designing. So, who are the audience and what are their characteristics. So, that our target group is that professional IT professionals, doctors, engineers or the management trainees who are the audience, who are the target audience and what are their characteristics ok. Then identify the new behavioral outcome.

New behavioral outcome like suppose if they are the management trainees or the IT professionals what they are going to learn after this course, what they are going to learn out of this course that what would be their new or expected behavioral outcome. May be something related to you know sustainability practices, something related to technology, something related to communication skill, something related to soft skill whatever what is the new behavioral outcome that we are proposed to plan. Then what type of learning constraints exist. Suppose we want to give them some training on something technology, technology development, technological technical skill. So, is there we have to analyze what type of

constraints learning constraints actually constraint exist like for example, may be that we do not have that much of infrastructure, may be that we do not have the financial resources to spend it, we do not have the technology, we do not have the software.

So, we have to analyze what actually what are the available resources infrastructure and what are the constraints to achieve it. Then what are the delivery options. So, how to give them, how to provide them, whether to give it the give them in the physical environment to the lab experiments to the online to the offline or in which mode in which context how we are going to deliver it. What are the online pedagogical construction considerations also if it has any online pedagogical implications or not that is we have to explore. What is the timeline for the project whether it is 7 days program, 10 days program, 15 days program that is analyzing all these things.

So, before planning before chalking out the plan we have to analyze all these things. Who will be the target audience, what are the what the skills we want to develop among them, can it be deliverable, can we really deliver it or do you have sufficient infrastructure and what would be the tenure all kinds of detailed analysis. Here also at these stage also at this stage this analysis stage also when we analyze the audience of the target group. So, there actually there we have to do all kinds of analysis like the need analysis. What the what is the existing knowledge and skills of the trainees already the professionals and what do they need for the future.

So, their existing need analysis also we have to do, financial analysis also we have to do, the situational analysis, the contextual analysis in terms of in terms of infrastructure, in terms of resources, in terms of any problems, any constraints that we have to do it. Then we have to also explore we have to analyze the pedagogical analysis in the sense of what kind of pedagogy we can use it, we can prepare, we can use it, we can therefore, delivering the thing. What kind of again time analysis, time analysis and in case of you know infrastructure analysis all kinds of analysis we have to do it at this stage. Then at actually then designing the phase. Now, in the design phase then we have to formulate the learning objectives, the training objectives or instructional objectives.

So, instructional objective what should be the assessment, instrument should be there, what are the exercises, what are the content, what the where from we can get the subject matter, where from we can get the experts, the lesson planning, the media selection all this thing everything that is systematic and has to be designed in a systematic way in a specific way. Therefore, these steps are involved in the design phase like documentation of the complete design blueprint of what we are going to deliver. It is a sketch blue sketch print or the blueprint of what we are going to do. So, documentation of the projects instructional, visual, technical, design strategy, instructional objectives, instructional strategies, instructional strategies including all these cognitive, affective, psychomotor thing. Then the how to create the story boards, how to present it different you know approaches pedagogical approaches that means, suppose case studies and what are the cases that we are going to analyze it, what are the software through which we can give the hands on experiences.

Design the user interface and user experience aspects also like the user interface what would the user interface for experiencing the whole thing user experiences and prototype creation if it is a technical thing, how to demonstrate that prototype, how to design the visual graphics, the graphics charts etcetera. So, all the aspects are to be detailed out or to be narrated or to be explained detailed out in the design phase. Then development is actually development stage is

that whatever we have designed then we have to develop it, we have to create it, we have to get it ready. Get it ready that means, create and assemble the content assets, then the what are the required technologies that they are to be integrated, how to develop or even procure the technology. So, then revise the thing according to the feedback given.

So, our feedback given are organize the whole thing starting from the pedagogical approach to the even the routine timetable schedule experts to be called invited, how the lecture schedule to be design module, course, content, technology and then all these then technology practical hands on visits everything I have to get besides that besides the curricular things then the what are the co curricular other kinds of a hospitality is there, hospitality then fooding all kind of a hospitality then travel also is there. So, many things are there. So, other related tertiary factors, tertiary issues. These are also to be developed that get ready get ready during the development phase when actually preparing getting ready with the content with the schedule with the structure with the facilities. Then implementation phase is that here implementation means actually we are delivering it. So, procedure for the training the you know starting from the even in the development stage also starting from the venue to the schedule to the hospitality to the travel to the certification to the accreditation all the official processes, then implementation then the actual execution of those development programs.

So, procedures for the training that is the training the facilitators who are the experts, how the learners, who are the experts, how the learning takes place and in between the feedback mechanism and as per the you know as per the upcoming demands or the you know feedback from the from the learner side like they are keen to learn new things and we can also modify and regulate and change certain things or add something new. So, facilitators training should cover course curriculum learning outcome methods of delivery testing procedure tools and also in between intermittently accommodate the feedbacks both software hardware experts to deliver the things then the learning tools and materials then software technology all these things hands on equipments software website all the things whatever it is there to get ready and to deliver it through deliver either online or offline in the how much delivery content through PPTs how much through labs how much through exercises how much through field visit all these things like actually it is that actual deliberation deliberation delivery of the whole thing in the physical real one in the real situation. So, so all these thing assessment to discovering all these things alignment aptitude assessment all these things should be properly aligned with the content with the module.

Now then the evaluation phase after the everything has been done then the formative and summative evaluation like for example, initially we have already given the instruction objective instructional objective and expected learning outcomes not to at the end of the course end of the program then we have to evaluate. Formative evaluation is more of intermittent evaluation assessment of their progress they are they are making their progress they are making the the feedback they are giving the knowledge of their result their feedback there all these things that for intermittently we also self check exercise we can from time to time with each module we can assess their formatively giving some kind of quiz participation activities etcetera.

Summative is at the end of the end of the program now we are going to give them some final final maybe some test some evaluation tool some things are too at the end to summarize that means to as per their instructional objectives instructional goals etcetera how much they have achieved they have understood they have learned so that they can practice it they can transfer these things and practice it in the actual processes. So, formative evaluation is present in each

stage and stepwise is stepwise progress in between in between the training program summative evaluation is more of the domain specific criterion related reference item test which actually takes place at the end maybe before certification on the basis of that evaluation summative evaluation the certification the degree the grade whatever etcetera. So, here now this is the you can see this is the instructional framework. So, the instructional framework it it involves lot many things different kinds of things. So, let us see the instructional framework it identifies and illustrates the interrelationship as you can see interrelationship among different in instructional approaches instructional model is there instructional strategies are there instructional methods are there instructional fields are there.

So, it actually takes into account the interrelationship between the different instructional approaches ok. So, goal of the approach is actually it is definitely it refers to the goal of education goal of the goals and objectives of the various curriculum course courses etcetera and if this instructional model also it refers to the broad approach what is the holistic approach broad approach to different methods different strategies different skills and depending on the different courses different depending on the different target group different audience different learners. So, the instructional that means, instructional model is the holistic framework it takes into account. It varies. There are different options. So, depending on the required need and depending on the target audience. So, requirements and the goals and objectives of the training program these things that objectives then objectives the strategy the skills these are things it varies primarily because to customize the different kinds of courses and different groups of learners.

See here as you can see instructional model can be of different types of models yes different kinds of models instruction models are there. Instructional strategies can also be like we have already discussed direct types of strategy direct indirect you know interactive experimental and all kinds of things these different types of independent study also there. Similarly, in terms instructional methods can also be different case study method is there presentation method cooperative learning is there different kinds of different kinds of methods are being used in instructional skills. So, in taking together all these things the instructional framework takes place. So, this as you can see clearly instructional model, we will be discussing about what are the basic what are the very popular instructional model given by the different educationist and theories.

It is based as models based on the information processing behavioral approach social interaction approach at the personal approach. Instructional strategies can be direct indirect interactive experimental and independent study. And instructional methods can be either can be simulation inquiry based lecture method case studies cooperative learning contracts then you can say focused learning focused amazing database debate discussion all kinds of things methods can also change even flipped blended mode also it can be changed. Instructional skills can be skills in presenting the thing skills in planning the whole thing skills in demonstrating the thing skills in questioning the thing skills in direction giving, skills in demonstrating skills in evaluating. So, here you can say these are the instructional skills the instructor the teacher the instructor need to possess how skillfully he has planned how skillfully he can present it how skillfully he can give the direction for future learning how skillfully he can demonstrate what he intends to teach them how skillfully again a questioning skills asking questions and replying to the questions feedback mechanism all these are instructional skills.

So, you can say this is the whole framework of instruction. So, instruction yes now we will talk discuss about the different instruction models primarily these are the popular models

popular models like being propounded by the different education experts and the based on the theories. So, level of instructional practices. So, these models actually broadly it represents the level of instructional practices and having some present or some present of the present some philosophical orientation information processing means the primary philosophy lies in the information processing theory. Similarly, different theory. Behaviorist model is that primarily based on the philosophy of behavioristic orientation towards learning.

So, on the on the basis of that. So, these models have been developed to structure the teaching strategies in systematic way to decide the methods and skills required to decide the students activities. So, in this way the models have been designed. So, Joyce and Weil. Joyce and Weil. They have identified 4 groups of models 4 types of models one is the information processing model, second is the behavioral model, third is the social interaction model and fourth is the personal model. Let us see what these individual models specify states.

So, instead of instructional strategies are actually the strategies within each model there are several strategies that require and the strategies determine the approach a teacher may take to achieve the learning objectives that is to in order to achieve the instructional objectives and educational goals. The teacher takes accept or delivers adopts that kind of strategy to determines that kind of strategy use that kind of strategy to achieve the goals. Strategies can be classified as a direct strategy or indirect strategy interactive experiential or whatever kind of thing. Now, the instructional methods are used by the teachers to create the learning environment that is the to create that learning experience whether it is interactive, whether it is the sharing, whether it is collaborative, whether it is independent. So, to create that learning environment to and it depends also to specify the nature of activity in which the teacher and learner both will be involved.

Whether it is classroom discussion oriented, whether it is flipped method of teaching or it is of you know individual teaching. So, what type of learning environment is going to create ok. So, that is that is the instructional method. So, varieties of strategies are being used for creating the for used for you know for at the using certain strategy strategies can be involved in using certain methods. Then as you can see the modules to strategies to methods to skills etcetera.

So, these are different modes of the instructional strategies instructional strategies like the direct indirect etcetera. These are the six instructional strategies in order to move on. So, instructional model Joyce and Weil they have discussed that what is the information processing model. This model primarily is based on the information learning theories of cognitive psychologists like acquisition of information, mastery of learning, processing of information is primarily cognitive functioning of the student. That is that is why it has taken up taken the cognitive processing information processing approach of learning or the learning theories as the base of developing the training program.

So, and it is and they have used now here with the information processing model instructional backup. So, now, they have opt for the personal they have opt for the personal things. Personal in the sense that the emphasis is of this model in the development of the individual concept self concept individual development of the each learner ok. So, here that is why it is more personal it involves the development of the. So, this information processing model primarily focuses on the individual development of the self concept of the learner and it involves the development of the processes of an individual as a individual as uses to organize his or her unique self.

That means, here the individual learners development is more important and the for that is that the focus has been given on the give a focus on the strong realistic self concept that helps to build a and produce the relationship with the others in the environment. So, here the focus is more on individual self concept development of the learner. Now, here the social interaction it emphasizes on the social interaction that is why this model emphasizes on the personal and societal relationship among the people. So, individual identity of individual learning the developing the self concept as well as the social relationship. So, here that is that the students' ability to relate to others engage in democratic processes work productivity in the society all these are the focus of information processing model.

Now, behavioral model yes behavioral model as again as you know it is being influenced by the behavioristic theory of learning. Their philosophy like changing the visible behavior of the learner especially you can say so, far as the skill development, competency development this behavioral behavioristic approach can be used very often. Changing the visible behavior of the learner to be consistent with his or her own self concept that is how does he behave how does what are his external observable behavior. So, here again so, here how to give them how to design the learning task in order to bring the changes in the behavior the learning task will be broken down into small steps small sequence of the take some sequential behaviors etcetera. So, unit of instruction it depends on the several models with single lesson it might incorporate different aspects of more than one model like the how stepwise learning lessons will be developed. Here instructional strategies of more to teacher to focus on the curriculum, prior experiences learner's interest is existing knowledge learning style and development and development stage of the learner all these things are required for formulating the instructional strategies.

So, here the decision making primarily relies on the ongoing student assessment how it is linked to the learning objectives. So, these are the these are the focus areas of the behaviorist behavioral instructional model. Then the expositor another is the these are the primary. So, another is the expositors. Here we will be discussing three important theories instructional theories and they are they are elaborations how they have narrated what should be the instructional objective what should be how the instruction models theories and instructional programs should be organized. So, in this way David Ausubel was also instructional theorist educational theorist providing significant contributing significantly in the design of the instructions.

So, David Ausubel's method of teaching instructional method is known as more of expositor and there are some specific features. Now, let us see what David Ausubel has described. So, David Ausubel an American psychologist he said that learning should be very meaningful. So, he gives emphasis on more on the meaningful learning that takes place when the information is integrated into the into the existing knowledge structure in terms of mental schema. Like how the learning can be more meaningful? When the new learning will be embedded in our existing knowledge structure. Like whatever we already know and the new knowledge and new information new knowledge it gets embedded integrated with our existing knowledge then only the learning will be meaningful.

So, therefore, the previous knowledge prior knowledge is most critical for the new aspect for the meaningful learning meaningful learning. So, the new information is learned based when it is linked to the existing knowledge. So, new information can be better understood can be better remembered can be better practice when it is related it can be linked to the existing knowledge. So, at every moment while designing the instruction. So, always we refer back we

have to refer back to that previous prerequisite knowledge or existing knowledge on the basis of what we will develop the new knowledge.

So, understanding the concepts, principles, ideas achieved through deductive reason here deductive then slowly one by one it is from top to bottom from top to bottom it will be deductively divided. So, understanding the concept and principle from the deductive way from the difficult to more complex to simplify simple way. So, that is the top to bottom complex to simple deductive understanding the principle things in a deductive reasoning way. So, most single important single factor is that what is learner already knows that the learners entry behaviour existing knowledge previous knowledge or what is you can say the that is the you might have observed in some of the courses some of the things at some things some prerequisite this must be the basic skill prerequisite is there what is necessary to get into that course that is the prerequisite. So, here it is also knowing about the existing knowledge of the learner is the most important factor because the present learning is going to be based on that past learning.

So, that is the he also in order to make the learning more meaningful he has introduced a new concept that is called the advanced organizer for the effective teaching learning process. Advanced organizer is you can say it is a kind of primer. So, before actually starting the lesson we give a kind of brief orientation primer is priming kind of priming give kind of primer or brief orientation to you know to make the to put the learners in a comfort zone to make them familiar with the learning process. So, he developed the theory of meaningful learning and advanced organizer for the effective teaching learning processes. So, what is that advanced organizer? It is a kind of orientation preliminary orientation or you can say some simulation simulating environment some primer experiences to facilitate the learning process.

So, knowledge is hierarchically organized he said that knowledge is always hierarchically in the organized and new information is meaningful to the extent that it can be related to what it already knows what the learner knows. So, here you can say this is the advanced organizer how it can be related to different stages of stages like phase 1, phase 2, phase 3. How to strengthen the strengthening the cognitive organization of the information and how it can help. So, it is a advanced organizer is a kind of facilitator like for example, as you can see here is a deductive teaching model from the that is from the top to bottom that is from the specific to general. So, here the advanced organizer at the beginning level advanced organizers actually facilitates to get to understand the new topic. So, and the so, your deductive reason is that from top specific to from to generalize how to from this step to general slow from specific events to how to generalize it.

So, advanced organizer actually this advanced organizer actually the it is a mechanism to help the help to link the new learning to the existing learning. So, it is a kind of primer. It is a kind of you know you can say orientation. So, that it establishes it links the past learning past learning whatever you already know with the present learning or the new learning ideas. So, actually it helps the processes of learning because you know before exposing the learners to the new topic new learning material.

So, when material actually is very complex. So, advanced organization actually facilitates or it creates that preparedness mental preparedness mental readiness for the learner to get ready for learning the new content. So, and it satisfies it gets done through two conditions: the student must process the and understand the information presented in in the advanced organization and this increases the effectiveness of the organization itself. So, thing is that it

has the two condition first thing is the student must process whatever it has been given in the advanced organization the student must process that information and understand this information which is presented through this organizer. So, that has a impact that has the impact and effectiveness for the for the whole process of advance organizing itself. And second is that the organizer must indicate the relation among the basic concepts and the terms that will be used.

Here the thing is that two under two conditions the advance organization are being used first thing is that when the student is processing the information they they must they they must understand what is being informed to them and that that improves that improves that enhances the effectiveness of that organizer itself for which purpose this is designed. So, the moment they understand the moment they understand the information they can answer the questions etcetera that means, not only they understand what is the objective of that organization, but it also enhances the effectiveness of that organizer itself. And thereafter thereafter the organizer must also indicate that how what is the relationship between this basic concept and what is the new concept we are going to learn. So, therefore, advance organizers fall into two category one is the comparative organizers and other is the expository organizers. So, the comparative organizers is that the main goal of the comparative organization is to activate the existing schema and that is used as a reminder to bring into the working memory that is to recapitulate.

So, comparative organization that means, it reminds you whatever we have already learned in the past it reminds us. So, it is a kind of reminding us about our past knowledge which is there already in our repository and to retrieve it. So, it is a kind of recapitulation of recapitulating the previous knowledge previous information related to this topic this concept etcetera which is already there in our work which already there in our repository. And it activates our existing schemas and as it acts as a reminder to bring out to bring it out into the our working memory. So, therefore, the comparative organizer is also used both to integrate as well as to discriminate.

So, when we recollect it recapitulate it. So, it so, we try to retrieve it and it to bring and we bring it back to our working memory then either we identify when we identify it either we assimilate it with the new concept or we may find out that no it is different either to integrate it thinking that it is same or we can discriminate we can find out the differences. So, an expository organization is that provide the new knowledge expository is that we are exposed to the new learning comparative is that whenever we are trying to retrieving recapitulating the old concepts either we are identifying it with the new concept or we are finding out something different. Now expository organizer is that it provides us the new knowledge. So, that the students will be will be will be will need to understand in the upcoming information that we are going to learn these are the new topics we are going to learn. So, expository organizers are often used when the new learning material is is unfamiliar to the learners expository.

So, for example, in order to make the learners familiar with the new content which is something different unfamiliar then expository organizers are being used ok. So, they often relate to what the learner already knows with the new and unfamiliar material this is in term is aim to make the unfamiliar material more plausible to the learner. That means, for example, not only we are retrieving or retrieving the old things, but also at the same time in same line we are also going how slowly expository how slowly we are going to expose the new topic with the aim to make this unfamiliar material more plausible. Like suppose we are making

them familiar with the existing pattern now whenever we are exposing them a new concept in that line same line, but it is different. So, once as because it we have already given some organizers advance organizer with regard to some similarity in function operation or maybe mechanism whatever and at the same time we are also exposing the new component.

However, we can say that it these are in the same, but in the updated version, but in the different version, but in the latest version ok. So, here we are exposing the new unfamiliar material, but with the organizing advance organization of already known factors. So, these are the things these are the tables given how in the phase 1, phase 2 and phase 3, how the sequencing of these things are being done you can go through it. And now the Ausubel's idea is actually theory is also known as expository theory expository method of how to expose how to expose the learners to the new concept new concept new idea new learning things etcetera. So, the here learner is an active agent who engages in the interpretation of the information and incorporates it into the existing cognitive schema.

So, we have already learned about this know assimilation and accommodation of like for example, Piaget's theory of you know schemas how the schema modification cognitive restructuring reframing takes place. It is not just Piaget has elaborated it in the in case of the children's as you will intellectual development process he has given the example from the children, but it actually it is a internal mechanism of all individuals all human beings. Like for example, whenever we are exposed to new concept we try to assimilate it with our existing knowledge prior experience. The moment we realize that it is not the same then we change we reframe modify our schema. So, that is called the cognitive reframing cognitive this cognitive reframing, modifying the cognitive schema etcetera.

Similarly the teacher is here not just to present the new information in a meaningful way, but also to bring back the prior experience bring back the learner's prior experience to that. And in that context to compare it and to compare it and then if it is required how to modify the and new knowledge new knowledge new schema can emerge. So, new knowledge should always be subsumed under previously familiar concept ok. So, in this way hierarchical way of organizing the knowledge like whatever new knowledge is being exposed to is being taught to the learner it should be based on some previously learned topics previously learned familiar topics. So, here so, it is again so, automatically the ideas the concept will be structured in a hierarchical way from the simple to complex hierarchical way.

So, in this way the knowledge will be organized in a hierarchical way of organizing the knowledge in the mind.

So, here the primary process of learning is subsumption. What is that subsumption? In which the new material is related to the relevant ideas in the existing cognitive structure and a substantive non verbatim basis like. For example, when we are that in the sub means in the submersive subsumption way it will be subsumed in the process of learning the new things. So, new learning will be subsumed under the old ideas which is already there in the cognitive structure ok. So, the cognitive structure here represents the residue of all experience the cognitive structure of residue of all experiences means whatever you have already learned in the past when we summarize it and we have summarized it and kept it.

So, it is the residue of our old learning experiences which is already there in our cognitive structure ok. So, that is a learning is based on the different kinds of subordinate representational combinational and combinatorial processes that occurs during the

reception of information. So, whenever we receive the information lot of internal mechanism processes takes place superordinate thing representing, combining, integrating, embedding and unlearn maybe sometimes unlearning something and relearning the things. In this way in this way some substantial changes structural changes takes place some non-verbatim. So, without language also some without non-verbatim without uttering it in terms of action words without using the language also these changes also takes place in the cognitive structure at the implicit level.

So, that is why it is both as expository and subsuming teaching means. Subsuming means whenever the teacher is exploring is exposing the learner to the new content, new subject automatically it relates to the past learning experiences existing learning experiences as the mental schema. So, that is all these internal processes mechanisms are ongoing mechanisms going on in the subsumed way ok. That is why it is a subsuming process and expository both expository because expository because the learner is the learner is being exposed to the new concept. So, this in this process of assimilation, accommodation, cognitive restructuring, the restructuring also all these many of the processes are underlying mechanisms underlying subsuming processes which may not be very much explicit or, but structural substantive changes is taking place. So, that is why his theory is more known as expository theorem instruction and subsuming teaching method.

So, with the advanced organizer advanced organizer when the new learning will be exposed to the learner. So, automatically the organizer automatically the advanced organizer will take it take it back into the and relate it to the past learning. And if even if the learning material is new when it relates to the past learning experience learning content and the experiences. So, in this process of relating to the past then some subsuming underlying mechanism changes takes place ok. In that is so, that also that means, that also bring changes in the cognitive structure and with that subsuming changes then we frame that means, we reframe the new cognitive structure develops ok.

So, this is also the theory of hierarchical learning, this is theory of meaningful learning, this is theory of expository learning, subsuming learning. So, Ausubel's theory also is considered as the very important theory of instruction. So, similarly 2-3 more theories are also there that we will discuss in the next class. So, thank you very much.