

Psychology of Learning

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Lecture – 38

Learning and Pedagogy (Contd.)

Hello viewers, welcome back to this NPTEL course on Psychology of Learning. In the last class we were discussing about critical pedagogy, how critical pedagogy has been a very important aspect of teaching learning process because it is a part of you know social movement that involves the questioning normalizing the power because it actually it ask the you know it ignites the learners understanding about the social issues, inequalities, social structures, the hierarchies that exist today, what are the reasons, all kinds of the social issues, challenges, cause and effect relationships. So, there are different steps of the critical pedagogy. So, critical pedagogy is to develop the learner to develop the kind of you know critical awareness among the learners about the society, how they can be the responsible citizens, how they can be the responsible you know stakeholder of the society by critically evaluating the different inequalities, different social issues, challenges etcetera. And for that matter they have also narrated different steps stages of critical pedagogy, how it can be integrated, how it can be embedded in the curriculum in the teaching learning process.

First thing is that the steps with the critical pedagogy is that first thing is the unlearning like all kinds of the unlearning that rote memorization all kinds of traditional ways of learning we have to and in this process we need to unlearn certain things. So, unlearning is the thing first thing is that we need to in order to prepare ourselves for the rational thinking and social learning or critical pedagogy oriented learning we have to unlearn certain things. So, it first thing is that the unlearning, second is that learning yes the learning new learning and again if required relearning certain of certain issues, relearning of new certain important issues then after relearning the reflecting on the learning situation, after relearning the reflections then after reflection then again evaluations. So, these are the steps of critical pedagogy and critical pedagogy it supports primarily a student-centered classroom because its intention is to prepare the students as the future citizen with the making them the global citizens, making them the responsible citizens who can address to the social issues, social inequality, social challenges.

So, how these things how the things should be to put should be put into the practice the philosophy of educators, those who have adopted this critical pedagogy actually it is based on some paradigm of philosophy, paradigm of thoughts of different various groups of researchers. So, and the critical pedagogy here the educators who advocates. So, practice this kind of pedagogy they may ask the questions to critique to evaluate both sides of an argument both in favor or in against. So, they have to critically evaluate both the sides of an issue of the challenge of the topic and evaluated in both the sides. So, critical pedagogy is the theory of learning that ask the questions, ask the students to critique power structure in the society.

So, critical pedagogy is primarily empowering the learners to understand, to critically evaluate the social issues, social structure, social challenges. So, in this process they can better

understand the societies, better understand the cause and effect relationship, better understand the inequalities in the society and can develop a rational mindset to be the responsible citizen, to be an active citizen, to be a global citizen, to be an active participant, active you know administrator, active spokesperson for the community development, social well being, social cohesiveness etcetera. So, teachers who adopt this critical pedagogy actually they regularly challenge the inequalities, inequities that exist in the families, health and education any sector of the society. So, it is about pinpointing, highlighting, identifying some injustice, gap areas, inequalities etcetera to address these things by critically evaluating it ok. So, now it involves the challenging, the dominant familiar narratives that have become the normalized.

For example, we take into account that you know pre independence era just pre independence era like the when the Mughal empire were there, where the you know British India was governing us etcetera. So, many issues social issues, inequalities to you know inequalities, injustice so many issues are there. So, critical pedagogy is to instigate, induce the citizen to think actively about the social challenges. So, then only we can bring the reform in the societies, then only we can normalize the society, then only we can establish the democratic society. So, it is primarily focusing on the challenging dominant familiar you know familiar narratives or the you know dominant societies or communities pressure stress on the that means, the gap to that means, the gap between the rich and poor, haves and have nots all these kind issues of the society.

So, students should become more aware of all these issues. So, that in future they can be the better decision makers, they can be better administrators, they can be better you know community service person, community you know social service person, community you know human rights person, community advocate. So, that is to establish how to establish the justice, equality, then equal opportunity, all kinds of equalities among the society and how to address the inequalities, injustice and the gap areas of between rich and poor, haves and have nots. So, this is the primary focus of introducing critical pedagogy to empower the learners to be the future responsible citizens to develop a kind of mindset ok, critical mindset to ask the questions to address the challenges and issues in the society.

Now another is that personalizing pedagogy, personalizing pedagogy is that is a new application of the information and technology that has given varieties of choices in higher education, varieties of choices because it is you know how to customize all these choices opportunities available as per our requirements that is personal how can I personalize the personalize the my learning in online platform by using the technology as per my requirements.

So, here the thing is that the varieties of choices are available and not only about what is taught and learned, but about how it is being taught. So, may be like same content for example, same content we are getting in different platforms. So, we go through it, but we have to evaluate whether do we really need it or not, what exactly we do need it, how can we customize the whole thing. So, varieties of things are available, but we have to we have to pin point on what exactly we want. So, how it is taught and learn.

So, how can I personalize my pedagogy as much as what is what do I require ok. So, in recent years there have been lot of excite excitements about the new ways of using the information technology even post covid. So, many technologies technology platforms online platforms online portals are available etcetera. So, that means, to meet the needs of the learners more effective for thing, but here is the thing is that how to customize the whole thing, how to select

how to be selective, how to identify all these requirements as per my requirement, as per the learners requirement, as per you know as per learner's flexibility, learner's even adaptability, as per the learners preferences. So, how can I customize as per my as per my requirement learner center, how can I make it more learner center, how can I make it more personalized as per in so, far as the time is time content duration topic is required.

So, learner centeredness anytime anywhere that is the flexibility of delivery and learners and learners how the learners' needs can be addressed all these are the issues that has been addressed through this that is the personalizing the pedagogy. So, different online portal platforms they are trying to address this different needs of individual learners and they try to personalize their pedagogy accordingly. So, there are different kinds of you know to increase of non formal mode of things self directed learning, their students have the more access to information again, but yes, but again it here the student also requires the skills, the knowledge, the ideas about how to how to you know how to screen those information, how to go through this information, how to evaluate this information and out of out of this massive sources of information how do I how can they select pick up, how can they pick up the relevant most relevant learning and information in the digital platform and how can they select identify and customize those thing pick up those things select those thing as per their requirements their choices. So, here also it requires more attention in guiding them. So, here the teachers role is just like the facilitator in giving them the tips about right sources of information adjusting the lecture content about content with the purpose for the proper students collaboration, engagement etcetera, innovative pedagogies you know it is the kind of you know power shared between the educator and the students.

Like student from the teacher also often takes the suggestion from the student side that means, in which way they learn better. So, the this kind of information this kind of feedback can be given to the teacher. So, the teacher can also innovate can identify can introduce some innovation in his or pedagogy. So, that to customize it to personalize it as per the students requirement. So, students learn more independently.

So, here in this process because when the students also gives the feedback they identify they select they personalize the whole thing they also become independent. So, self directed promotes actually self directed learning methods and of course, use the lecture time more effectively for discussion, collaborative work. Similarly discussion forums are there feedbacks and the you know live lecture sessions are also often there live question and answer sessions all these are things are to be introduced as a part of the collaborative work even in the virtual platform also.

So, now next is the culturally responsible teaching. It is a more a kind of modern pedagogy which acknowledges response to the and celebrates the fundamental cultural aspect is diversity that exist in multicultural societies and to address the cultural perspective and to take care of while not just engaging in the teaching and learning and discussion, but also to identify this cultural nuances, cultural identities and how to respect these how to equally how to do justice.

Like for example, in a classroom which is suppose the majority are of majority are of one ethnic group another minorities are there small ethnic group. So, the here the teacher cannot afford to ignore the minority is required, minorities you know comforts, minorities understanding, minorities cultural practices, minorities understanding they cannot afford to ignore. So, here even if the in the classroom the minority groups are there how to take care of their cultural perspective, cultural identities how to respect them mutually and

understand them understand all these practices and then to then to you know customize the customize the teaching, customize the pedagogy accordingly. So, that they do not feel that they are not being heard. So, they can they also feel you know comfortable and they also feel you know very important this means they are equal to other major stakeholders that is called the culturally responsible responsive practices.

Then I mean then next comes from multimedia learning and with the you know with the explosion of technology educational technology and post covid also yes even though it was there also multimedia learning how using the multimedia we can enhance the learning enhance the learning performance learning pedagogy content etcetera. So, it is consistent with how the human mind works with the research based principle. So, it is not just about human computer interface, but in this interface how the human learning takes place. And what are the technological factors technological issues that enhances those learning and other factors that hinders the learning to identify those things and how to customize prepare the multimedia learning in such a way that it it enhances the human performance human understanding and also focuses on research based principles. So, multimedia provides the technology based constructive learning environment where the students are exposed to you know to solve the different kinds of problems through self exploration collaboration active participation etcetera everything, but again in the again in the virtual and the online platform also.

So, this model is based upon three primary assumptions. So, three primary assumptions: the major contribution of contribution towards multimedia learning is the mayor researchers mayor. So, he is these three primary assumptions are there visual and auditory experiences of experiences or information are processed through separate and distinct information channels. Like for example, when we are learning through multi multimedia. So, one thing is that yes we are learning listening to the audios listening to the lectures audio thing is there and as well as the visual thing.

So, information are coming from two sources one is the visual source another is the audio source. So, audio visual learning and information and experiences are there. So, here two channels of information sources are there and each information processing channel is limited in its ability. Like for example, visual information where how much at the moment particular moment how much visual information can we instantly process it as per our attention span and how much auditory information that we can process at the moment. So, the as because simultaneously we are receiving two sources of information from the visual and the auditory channels then how much at the moment we can we can process it, we can retain it, we can address it, we can understand it, we can process it effectively.

So, again so, on the basis of that as because we receive two different types of information learning experiences at the same time simultaneously from two different channels and our brain also our brain also our system also processes simultaneously the two different types of information. But what should be the combination, what should be the timing, what should be the sequence, what should be the presentation, mode what of the presentation should be there should be in such a way that scientific way that so, that it can give us the maximum benefit maximum learning experiences. So, each information processing channel the visual information processing and auditory information processing challenge are related are limited to process the how much information we can process at the moment in our visual channel and visual processing channel and another is the auditory processing channel. So, processing experiences information in channel is an active cognitive process. When we see look at the picture, look at the content or look at the text we are also reading it.

So, that is the visual information we are reading it, but may at the same time may be that we are listening from audio, audio channel is there and the visual channel is there. So, again when we are processing receiving the information trying to retain it understanding it is again the cognitive processes ok. So, how these two channels so, how these information in the channels is an active. So, it is an as because it is an cognitive process active cognitive process designed to construct coherent mental presentation. So, through multimedia learning when we are receiving the information from two sources two channels how these two should be coordinated.

So, that we can properly process it, process it, retain it, understand it and so, that it can develop a constructive content and coherent complementary coherent mental representation. That means, whatever we learn so, both the visual information and auditory information should complement each other ok. It should not be separate, it should not be chaotic, it should not be disturbing like this so that means, one visual information should complement in supplement the auditory information. So, it should be mutually inclusive, mutually supportive, mutually complementary and so, that at the end we can learn better ok. So, here multimedia learning actually multimedia is the presenting the word such as the printed text spoken as well as the pictures like animation photos etcetera.

So, multimedia when talk about the multimedia learning means it is a composition of both the presented words either printed in the text or spoken. And the pictures in terms of photos, illustration, graphs, animation, video etcetera. So, multimedia learning building the mental representation when we are looking at going through the content both the words being narrated or if given in the text visual visual clicks as well as the animation the photos etcetera. How do we perfectly blend it? How can we integrate the words with the pictures? So, multimedia instruction is that presenting the words and pictures that are intended to promote the learning. So, these so, in multimedia instruction these words and the pictures should be perfectly blended, perfectly integrated, scientifically integrated so, that it can promote the learning.

Its intention is objective is to promote the learning not to hamper disturb the learning, not to hamper the obstruct the learning. So, that is why it has to be scientifically related complementary and complementary related and compatible to our human information processing abilities. So, as you can see interactive multimedia content once the technology in the media teachers so, here teachers educational content and the technology of the media. So, here we can say how can we design this interactive multimedia content? One is that yes it should be student-centered and it should be in the hybrid mode not purely online not purely offline and the teacher-centered it has the three dimensions. When the interactive multimedia content is being developed technology multimedia content is being used as well as the teachers education content is there.

So, it has it will be it would be offered in three different ways: one is the hybrid mode teach and it should be student centered as well as the teacher centered ok. So, these are the so, you know Mayers then he has given his Mayers theory actually Mayers theory is based on the cognitive theory of multimedia learning which is the you know he has Mayers developed a scientific theory that how the multimedia content should be designed. So, his theory as you can say multimedia presentation as you can see words in terms one channel is the words that is auditory channel another is that pictures, pictures that is the when we were exposed to pictures through our visual sensory organs. So, here the thing is that the moment we are

looking at the pictures at the same time we are also listening to the words. So, here the words not just coming to the to our ears only, but also it relates to the eyes also it also comes it also comes and comes to the picture related to pictures it is also coming in front of that the in front that means, when we are looking at the pictures it is also relating to that pictures.

So, here auditory channel information is the pictures and visual information is all there. So, when we are selecting the words sound is coming up and again when we are selecting the images are coming. So, we are receiving the information either in terms of that is both in sounds in terms of words and the images in terms of the pictures. So, these sounds and images they interact with each other it is ongoing it is ongoing information are being processed both sounds and images. So, here again we need to organize the words whatever words we are listening that has to be organized and whatever images that we are looking at that should be the pictorial model this would also be.

So, ultimately what happens from the word verbal model comes in and from the images pictorial model comes in. So, in this combination with this combination these two get integrated these two get integrated and that is the multimedia content we are being presented to, but at the same time when we are learning it going through it trying to understand it our previous experience is also there prior knowledge is also there ok. So, taking together putting together all these things visual content verbal content verbal mode of information processing visual pictorial visual or pictorial mode of information processing and the prior knowledge and the prior knowledge the previous taking putting together all these thing integrated when it is integrated then multimedia learning take place and may have proposed some of the rules some of the assumptions some of the principles of multimedia learning also. So, this model is activated through five steps again these are the called multimedia learning Mayers model activated the five steps. So, for example, selecting the relevant words most appropriate most accurate most meaning meaningful and to the point were.

So, selecting the relevant word for processing the verbal working memory when the learner will be listening to it should be most meaningful most accurate most authentic. So, that it can enhance its working memory because the moment we are learning we are retaining so many information in our working memory and simultaneously we are processing it. So, then only we can then only the meaningful learning takes place. So, selecting the relevant words for the processing the verbal memory selecting the relevant image also like the words should be complementary to image should be appropriate to the words ok. So, selecting the relevant image for processing visual information then organizing the selected words into the verbal mental model and organizing the images into the visual mental model.

After receiving then we have to prepare it convert it into a mental model mental representation verbal representation visual representation and verbal representation so, mental model. So, integrating then first then receiving the information relevant words and relevant images converting these organizing these into verbal mental model and the pictorial or visual mental model then integrate it perfectly blend it. Then integrating the verbal and visual representation as well as the prior knowledge then integrating all these three visual verbal representation as well as the past knowledge and all those things would be would be there in our working memory. Then can then only we can better understand the whole then the meaningful learning takes place then once the meaningful learning takes place then only it will be retained in our long term memory ok. So, again so, Mayer has given some assumptions there are certain assumptions of the cognitive theory of multimedia learning.

So, multimedia learning is also based on certain theoretical assumptions theoretical framework and out of which these assumptions this cognitive theory says that first thing is the dual channel one is the first assumption one is the dual channel. Dual channel is definitely we are receiving a human processes separate the channels for the processing the visual information and the auditory information. So, even if we retain we store we keep all the required relevant information in our working memory, but we process the visual information different way and in the process the auditory information. So, dual channels two different channels auditory and visual channels are used. So, that is the human memory information processes.

The limited capacity both the visual and the auditory channel we have the limited capacity to process the information the whole the information for the time being for at a particular point of time. So, visual in how much information visual information that we can store we can retain at the in our visual channel and how much auditory or what auditory information that we can retain in our auditory channel. So, active processing when the humans engage in active learning by attending to relevant information organizing the selected information into a coherent mental presentation into a coherent mental. So, after receiving the visual information and auditory information we have to customize it we have to organize it in a very in a very specific way. So, that it becomes a pictorial mental representation either mental auditory mental representation or the visual mental representation and integrate this mental representation with each other with other knowledge like the past knowledge ok.

So, auditory mental representation we need to develop visual interpretation mental representation we need to develop and then we have to perfectly blend it integrate with our past knowledge. Then only so, these are the basic assumption dual channel information processing limited capacity and active processing. So, these are some of the principles of multimedia learning which are relevant for the instruction and pedagogy. The multimedia principle one is the students learn better from the words and the pictures than from the words alone. So, here when we are receiving the dual channel information from the dual channel both the visual and auditory information the students learn better rather than any single one ok. So, students learn better from the word and the pictures in both ways when by using the dual channel, but rather they are learning better than from any single channel single information.

Then special in a contiguity principle what special contiguity principle says that students learn better when the corresponding words and the pictures are presented near rather than far away from each other in the pages. Suppose we are looking at the slides in the page. So, visual information is there auditory information words text descriptions are also there picture is there they are very adjacent to each other with the close in the close special contiguity. So, then where they are presented very closely with the close proximity then it becomes more meaningful than if there is a then they are being separated. Then temporal contiguity principle says the students learn better when corresponding words and the pictures are presented simultaneously rather than successfully.

Like for example, you know in trial and error learning in the Pavlov's classical conditioning Pavlov's classical conditioning when we discuss about you know conditioning how conditioning also creates the learning conditioning also makes learning to happens the makes conditioning also makes learning to happen in the process of conditioning. So, proximity that means, between the UCS and CS the time space and similarly here temporal contiguity is a both the things pictures and the words where they are presented simultaneously at the same time than the successively. If one comes after the other that is less

effective in comparison to when both the auditory that is the perfect matching of the words with the pictures simultaneously. So, just like you know conditioning processes. So, these are the three the multimedia principle special contiguity principle and temporal contiguity principle.

The now next is the coherence principle coherence is that students learn better when the extraneous words pictures and sounds are excluded rather than included. That is a for example, when we are preparing the slide for the content like which are we that which are most relevant which are appropriate which are related to subject content. So, instead of overloading the whole thing with all irrelevant extra kind of things if we just pinpoint and focus on just relevant as our most appropriate objective or what is required for the thing that is more comprehensive than the other extraneous thing. So, students learn better when extraneous words extra unnecessary pictures unnecessary or repetition of words or repetition of sounds are eliminated or excluded. So, as much as it is required and the words and the pictures must be presented with close proximity and one complements and supplements the other one.

So, to avoid the so, here one of the thing is that to avoid the extra things because you know extraneous things extra pictures extra sound extra words may be the repetition of some words it creates unnecessary cognitive load ok. So, when we divert our attention what is there what is there etcetera then the learning not only learning becomes more less effective, but also unnecessary cognitive load are being created. So, then modality principle modality is that students learn better from animated and narration than from animation and on screen animation and on screen text. So, when animation pictures are being presented modality in which modality one is auditory modality another is visual modality.

So, dual modality is there. So, when the students are learning at the observing at the looking at the animation at that point is the visual image at the same time when the if the narration is being given in auditory mode that become that makes the learning more effective than animated with the on screen because these both of these are the visual content reading the reading the text is also visual content and observing the animation. So, both the two modalities are different should be one should be auditory another should be image visual. So, animation and narrations are animation visual and the auditory are be more effective than visual and visual ok. Redundancy principle says that student learn better from animation and narration than from the animation and narration on the screen test again animation and narration than from animation narration and the. So, unnecessary here animation is there narration is there again on the screen test.

So, it is overloading extra load is this is extra extraneous animation and narration is there it is better on the screen then on screen text should not be there. So, it is so, how to reduce the extraneous load then individual differences principle is that this design effects are also stronger for the low knowledge learners than for the high knowledge learners who and for the high special learners than the from the thing is that here the design this design effect the multimedia effect becomes more significant why it is becomes very impactful very significant in case of children because they are their standard of learning their developmental stage are very low and whereas, the adult learner or the more mature learner they are more acquainted well acquainted with were habituated with the learning going through the text and learn it. So, for them design effect or this multimedia effect seems to be less effective because they are already matured they are already capable of handling all these things, but whereas, the lower category learners young learners low knowledge learners design effect like like for example, you know slow

learners for the slow learners for the dyslexics we use this multimedia you know to draw their attention to make them understand the whole thing for them it is this multimedia content multimedia design becomes more important more effective whereas, if you take any normal and the above average of the gifted child. So, these things are contributes less contribute less because they are already well adopted to the normal textual visual content of the learning process. Then so, now here the thing is that yes the design of the multimedia learning is primarily it has the two approach one is the theory based another is the research based.

So, theory based is the design of multimedia message should be based on the theory of how the human mind works when we design the multimedia content it should be based on some or other theory and research based is the design of the multimedia message should be based on research findings. So, ongoing research is also taking place is going on and we should take into account the recent latest research findings and incorporate it. So, Mayer has based majority of his multimedia work on Sweller's cognitive load theory you know cognitive load extraneous load intrinsic and the extraneous load and all kind different types of cognitive loads and German load extraneous intrinsic load extrinsic load and German load. So, Sweller's cognitive load theory has been taken by Mayer for designing his multimedia theory and Paivio's dual coding theory visual and auditory that theory has been taken into and Baddeley's working memory model. How much how can how much do we retain the information working model how the working model working memory functions unless and until we solve the problems solve the issues or learn the lesson.

So, these three theories so, Sweller's cognitive load theory, Paivio's dual coding theory and Baddeley's working model theory has been taken by Mayer for designing his multimedia learning theory. So, research based principles for design learning or design of the multimedia research. One is that personalized principle people learn better when the words are in conversational style rather than formal style. Interactive principle people learn better when they have the control over the presentation pace of the presentation etcetera. And signalling principle is that people learn better when the words include cues about the organization of the presentation and individual difference principle. These four principles are being used in the when designing the multimedia content because these are the research based principle.

Individual difference principle design effects are stronger for the low learner learn knowledge learner and for the high learners learner. So, that is why whenever we are designing a learning content whether we are designing it for the fast learner, good learners, mature learners or for the slow learners and the lower level of learners. So, design effects are stronger for the high special learners than the low special learners like high special learners that means, those that means, who want the close proximity of the visual capture visual images and the auditory or the textual contents are there it is design effect is will be different and than the low special learners. So, this is where we are ending this lecture on the multimedia learning. In the next class, we will continue with another type of pedagogy. Thank you very much.