Indian Institute of Technology Kanpur
National Programme on Technology Enhanced Learning (NPTEL)
Course Title
A Brief Introduction to Psychology

Lecture – 12
Learning

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We are now on the 6th lecture of this very topic learning.

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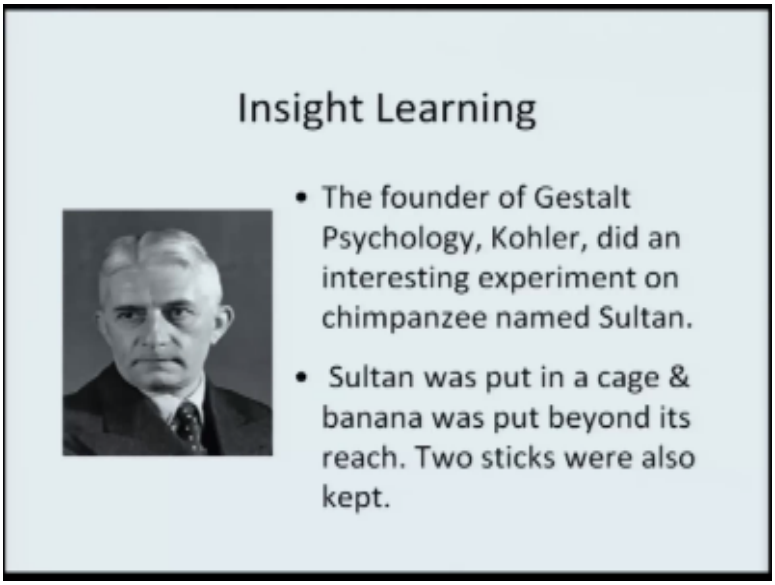

And we would be talking about insight learning now. You all know Kohler, we talked about him when we were talking about Gestalt principles. So the founder of Gestalt psychology, Kohler he did an interesting experiment on chimpanzee, and that chimpanzee was named Sultan. It was now a very interesting type of an experimentation, Sultan was put in a cage and the banana was now put beyond his reach okay.

So you can imagine the situation, Sultan in the cage, banana at a distance, and two sticks were also kept there. Now the distance of the banana was such that the chimpanzee, Sultan was not able to extend his hand through the bars of the cage to reach the banana. If he would have used the first stick, so the length of the hand plus the length of the stick still would not reach the banana.

But if Sultan could fit those two sticks together and hold it, then the length of the arm plus the length of the first stick plus the length of the second stick, this length would now help Sultan reach the banana okay. This is what Kohler did, and he wanted to see how chimpanzee processes the information, and what type of response Sultan comes forward with.

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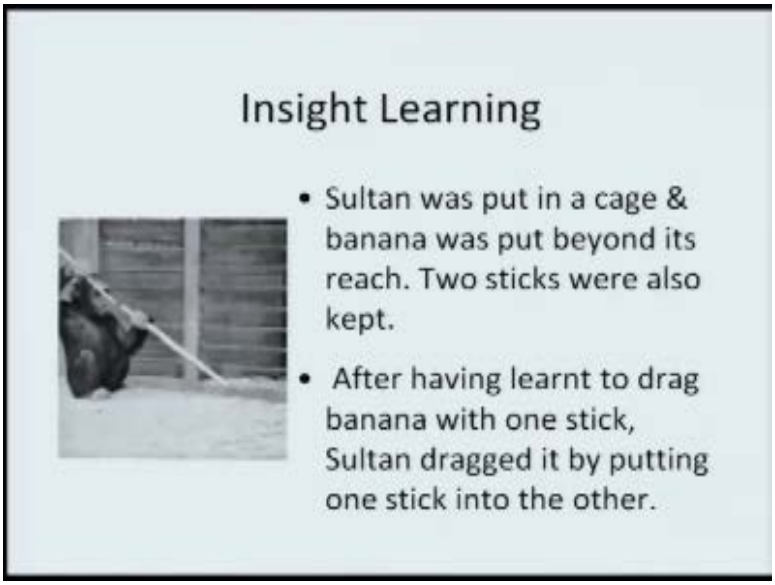

And you can see the photograph here okay, Sultan basically you know kept observing the bunch of banana kept there and the two sticks, then what he did, he simply took the first stick, second one, he just fixed the one in the other, and then Sultan dragged the banana using the stick okay.

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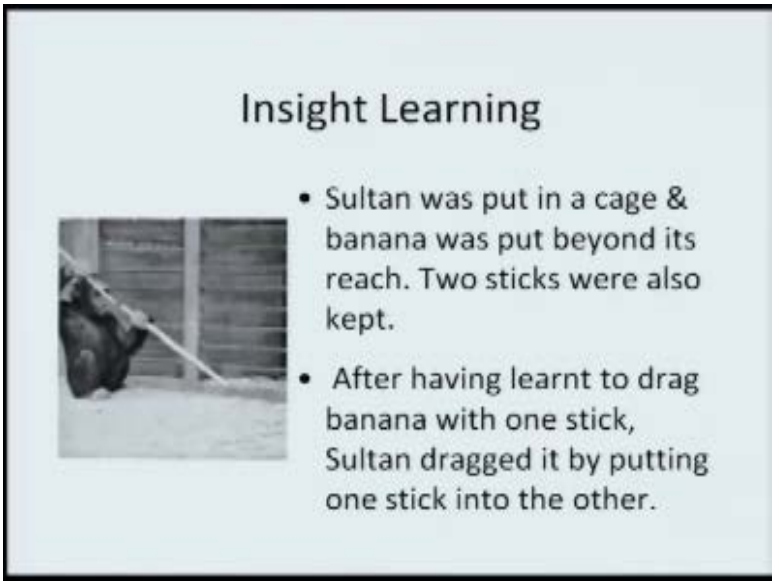

This was an interesting demonstration of a very, very peculiar phenomenon what is called as insight learning. Sultan had that insight okay, it was again – it is a pure case of problem solving that we have been talking about okay. But then Sultan unlike the previous case did not try out options okay. He just now had some approximation based on which part of a possible consequence and executed it, finally Sultan could solve the problem.

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Is it that Sultan would be successful only in case of the two sticks put there, that means there is somewhere a mental map that you draw in terms of the possible sequences that can result you into the desired behavior. Following researches what they did now you can see in the image on your screen now, banana was handed to the ceiling okay. Cases where banana could be simply plucked through the help of the stick, the weight was done in the case of a banana outside the cage.

It was just that instead of putting on the ground, the banana was attached to the ceiling and Sultan had to drag it. Other cases were some crates work, the wooden crates were kept there. And then although multiple crates were kept the chimpanzee could sense that although I have an access to three crates only two crates are sufficient okay to reach the height where the banana is hanging.

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And several such manipulations were done in the entire experimentation; I am not showing you the full images, sequence of images rather. But say, two say – horizontal boxes, one horizontal, one vertical now layout of the box, horizontal to second horizontal, but then, because it is a square box, so the chimpanzee was not able to reach the banana, some other chimpanzee has to help.

And then you realize that all of these things actually took place, now the second chimpanzee when they were put in a group situation.

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This group somehow now collaborated; they helped each other in order to reach the banana, because the thickness of the thigh of one chimpanzee was needed to add the desired height. So these are interesting demonstrations of insight learning, as to how in a normal type of situation we use our cognitive map, we use our past experience to now think of the possible solutions that would help resolve the problem okay.

And I am sure all of you all of you have several of these experiences with you, having discussed all these things now because we are on our last lecture let us now focus on the bicultural factors and those.

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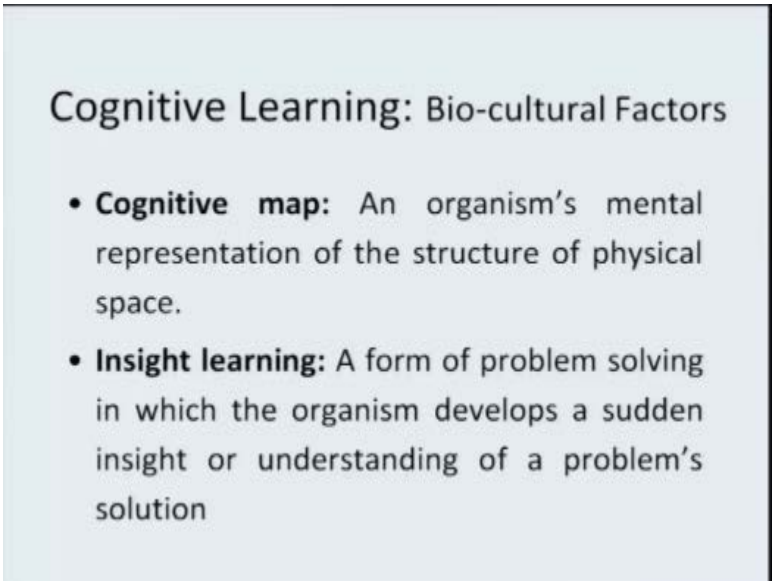

Bicultural factors that would play an extremely important role okay in cognitive learning. First important thing of course we have talked about it the cognitive map that is basically the mental representation of the structure of the physical space how things are the layouts, you can imagine say for instance we took the example of this route map from your house to your school or your college but take example no, say you are visiting an office area which is say spread into six floors and you go on the third floor of the building.

But still you can make a sense of how that space would be okay, so the movement pattern although you are not given training into going into this building there is no previous exposure to it but you can still find route for yourself okay with the help of sinages, with the help of mental map of the constructed space that you have with you, you can think in a given situation what would be the layout okay, which areas to search for and which areas to eliminate, cognitive map therefore is always of great.

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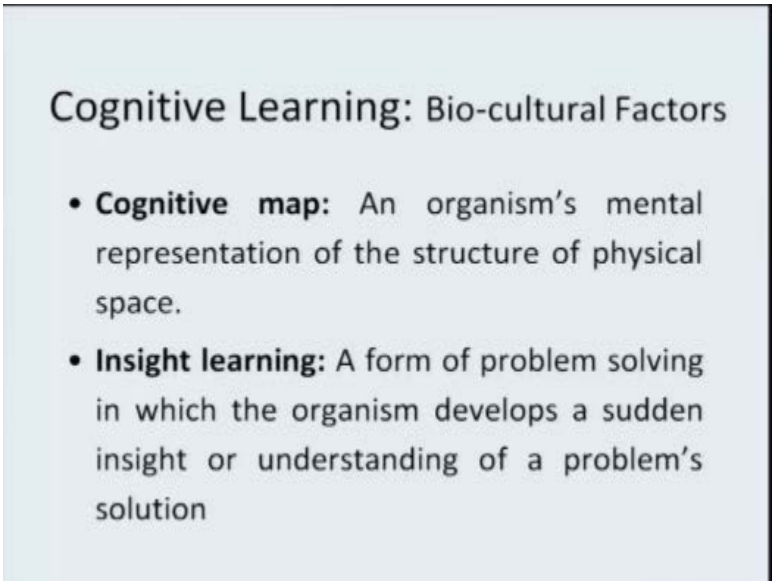

Help to us as human beings, second important we talked about the inside learning, one form of problem solving where the organism develops sudden insight okay, the individual suddenly understands what could be the possible solution in this very case. I am sure many times in your earlier examinations if you were stuck on a given question you would suddenly think that okay this could be one of the ways of resolving this very problem, you work it out okay and sometimes you must have succeeded that you thought that this could, this is how the problem, numerical problem could have been sorted out.

You do so and you succeed, from a biological point of view there are certain things which are extremely important because.

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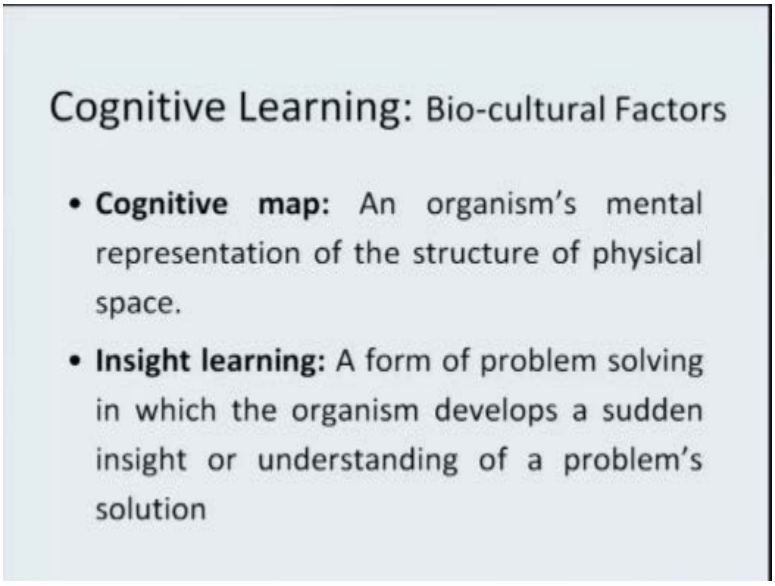

Of the simple fact that you are a biological creature, the important concepts here are 1, preparedness, preparedness basically is the what you call predisposition of a given species to learn things in certain ways and not in the other way okay. Therefore it is basically a species, a specific biological predisposed position. Let me give you an interesting example, the famous scientist Konrad Lorenz he worked on the species specific behavior and basically he was trying to understand how the ducklings behave, what he observed was that when the eggs of the ducks when it hatches and when the ducklings come out.

The mother duck will start now moving towards the water body and all these newly born ducklings they would follow the mother, the mother will go into the water body and will start swimming and so will these young ducklings. This, Lorenz did a fantastic experiment, what he did was that he replaced the mother duck and instead of the mother duck with the outfit which made him look like a duck he thought probably the ducklings would be guided by this.

When the eggs hatched out and the ducklings came out Lorenz started going towards the water body then he started swimming and all these ducklings religiously followed Lorenz. Next time Lorenz what he did, he removed the output it was just like a normal human body and the

ducklings came out, they saw Lorenz and again started now religiously following Lorenz and they went to the water body.

And then there now, several others researches repeated this type of experiment but the reason I am quoting this experiment here is that it is the biological predisposition of the ducklings okay to follow the mother duck in order to learn swimming, so swimming is basically a species specific behavior and this species specific behavior has to be learned in a certain way and not in the other way, it is not yet now the ducklings will have to register, will have to go to the swimming pool, will have to meet a coach, pay the fee the way we humans do okay.

We are not biologically predisposed to learn things that way whereas ducklings are and the entire animal kingdom you would realize that there is a concept called critical period that within this limited amount of time you have to be exposed to that very situation, okay. Say like, in the previous lectures we saw the pigeons picking, picking in many, many birds is basically a species a specific behavior and when the babies they come out of their egg, okay.

The mother bird is supposed to make them learn how to play and this picking has to no take place within a very, very shorter period of time immediately after birth, okay. So that is what I am referring to according to the researches that are available with us. Now one of the most important balance, the biological factor is the level of preparedness that is needed to learn a behavior. Second interesting thing which is related to preparedness is, what is called as instinctive drift.

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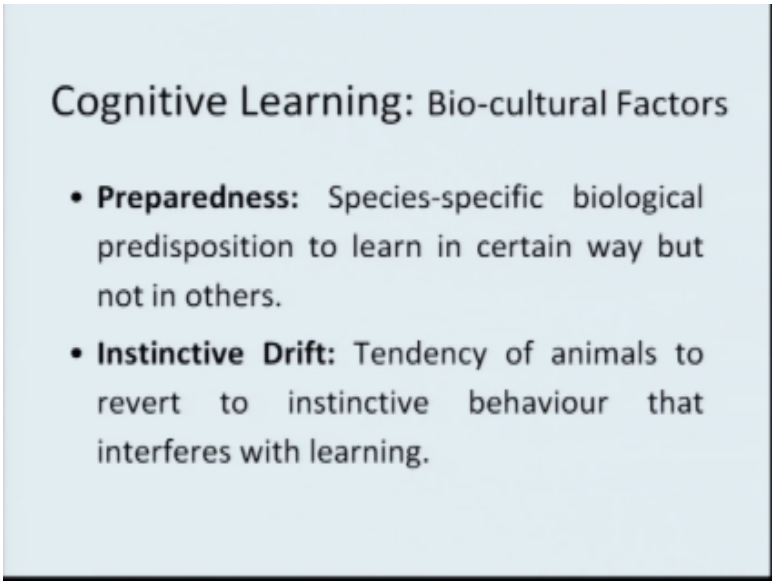

Drift means you would draw, instinctively means it is already biologically predisposed in you. So what you do in terms of instinctive drift basically is that you are already biologically endowed with that insight that in certain type of situation which basically goes against the way you are biologically programmed you withdraw, why? You have a tendency to reward to your instinctive behavior, okay.

That interferes with the way you are supposed to learn as a biological creature. So if I am supposed to learn something for instance picking, for instance swimming, okay. If I am supposed to learn this very behavior in one way and if you give me some other route to learn it, okay it interferes with my learning and then the moment that happens I will suddenly withdraw, I will reward to my instinctive behavior that is called instinctive drift. Couples of things which are also important are factors like local enhancement, okay.

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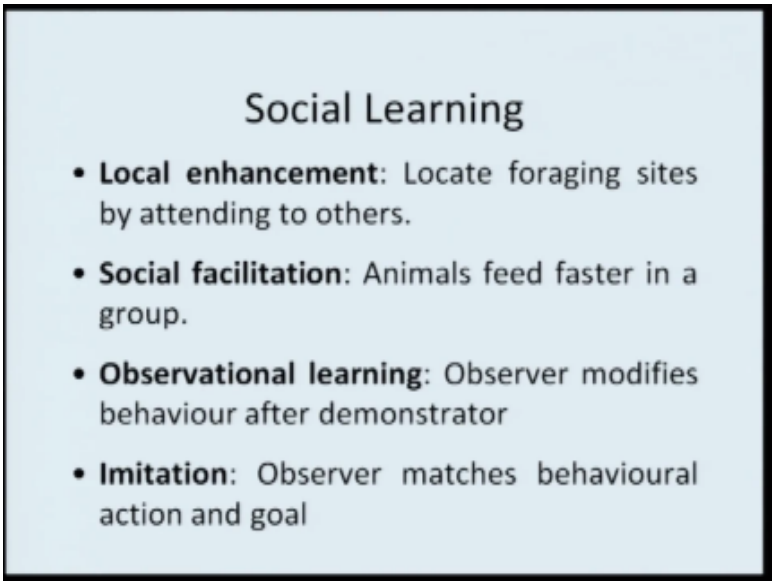

Local enhancement basically refers to locating a foraging sites by attending to others, okay. Which also is associated with social facilitation, okay. Social facilitation again, you know when you do something more vigorously when you are in a group set up, okay. So you behave in a little different way when you are in a explore, outer situation, outside situation you are exposed to others, the way you sit when you are all alone in your house to watch a television is different from the way you sit in the auditorium when there are people sitting on both sides of you, okay. Are behavioral changes, the sitting pattern changes the way we respond to the situation that changes.

So what happens in the case of social facilitation? The behavior is guided by the fact that you are in a group set up. The best example for in the animal kingdom because we have been talking about instincts, biological creatures and such things, is that animals they are they eat faster when they are in a group rather than when they are all alone. Important also from the learning perspective is the fact that the observer modifies behavior after demonstration of it, okay. So you have the model, you try to imitate the model.

And then you try to map whether your action is leading you towards the goal or not. In-between there could be a possibility that based on certain feedback you change the trajectory of your behavior, you change the course of your behavior, okay in order to achieve goal. Say for instance perhaps one of the best examples could be, where you have set a target for yourself, example that we took in the previous lecture.

That you have set the target of achieving say the president metal or say scholar batch after attaining the highest possible score in your goal. But then it is not only the goal that matter, it what also matters is

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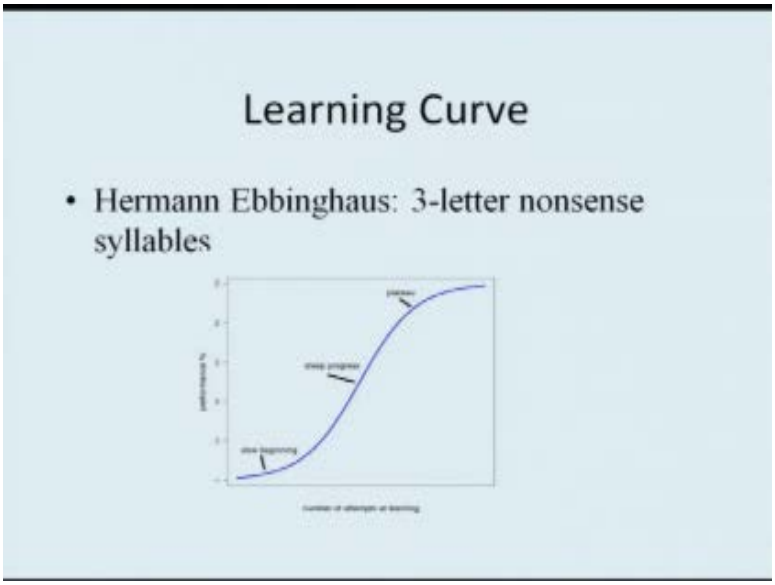

The means that you adopt for it, whether I prepare myself well for the exam and then attain the maximum possible score or I go for cheating and then score the maximum possible score, okay. Now what happens, although you have set the target, achievement of the target is that something that you are eyeing for but then it is not now only merely achieving the highest score in your exam.

Rather the means that you adopt. How whether it is a socially celebrated, socially acceptable model of behavior which will help you attain the goal or any how you attain the goal and nobody will care know, what means was adopted to attain that goal.

So that is very interesting and important in case of human beings. Now that we are left with just few minutes to end this topic, let us talk about two important constructs one, the experiment performed by Ebbinghaus.

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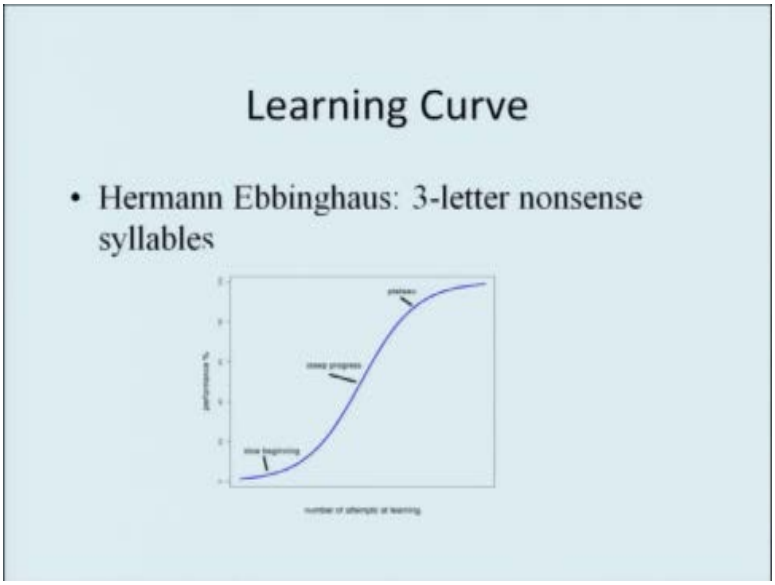

What Ebbinghaus did was that he created three letter composites. What are in psychology called as nonsense syllables okay, nonsense syllables is just the opposite of meaningful words. For instance say we say cat. Now CAT are three independent alphabets but when put together human beings consider that is a meaningful word it represents an animal. But say for example, you have something like NLA okay, OFP, these are no collection of alphabets but they does not make any sense.

So these meaningless type of assembly of letters which does not allow you to make a mental representation because they are nonsense therefore they are called nonsense syllables, and

nonsense syllables are basically very generously used in research in psychology. Because it helps you understand learning in its purest form, if you use meaningful words then many no context dependent variables will interfere with the outcome and you will not be in a position to come forward with the purest form of research of outcome, it will have confounding factors.

You want to eliminate those confounding factors and therefore you need things which although might appear nonsense, but it helps you help, it helps you understand how people learn. What Ebbinghaus did was, he created a set of nonsense levels with three letters and then he wanted to understand that when we learn okay what is the rate of learning? How many attempts do you take okay, and what is the success rate, so what he did was he plotted a curve out of it. The curve basically had the number of attempts here.

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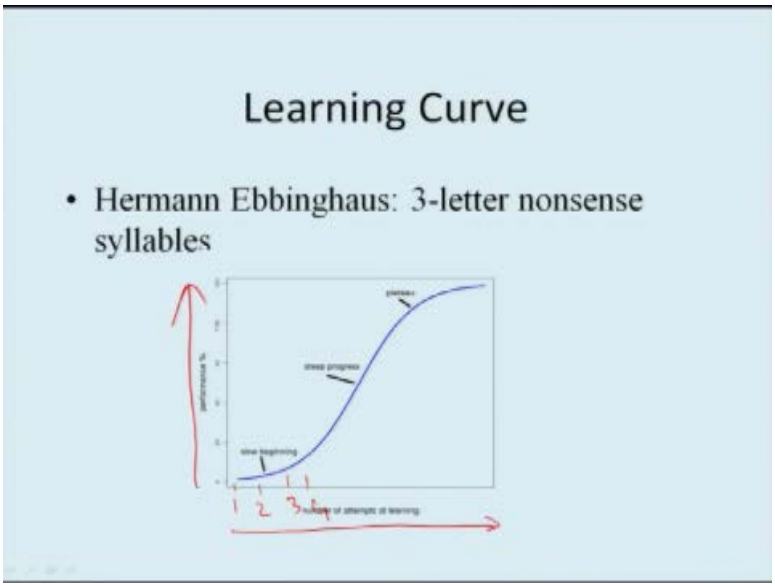

So the number of attempts here, how many trials you would take first time, second time likewise now, first time, second time, third time, fourth time. So likewise now the number of trials and here on the y axis he had the percentage of recall. How many of the nonsense syllables were you able to recall. What he realized was very interesting and this is called as learning curve okay.

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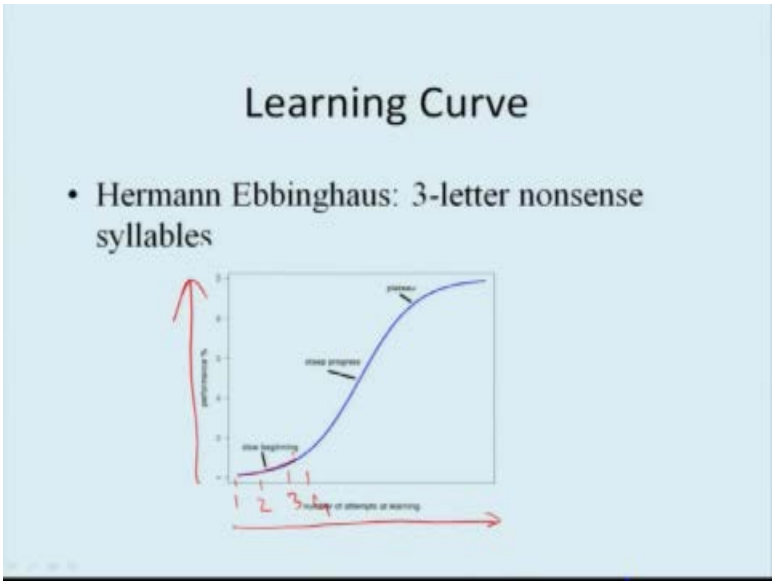

In the beginning our learning slope and suddenly you realized that there is a steep progress okay.

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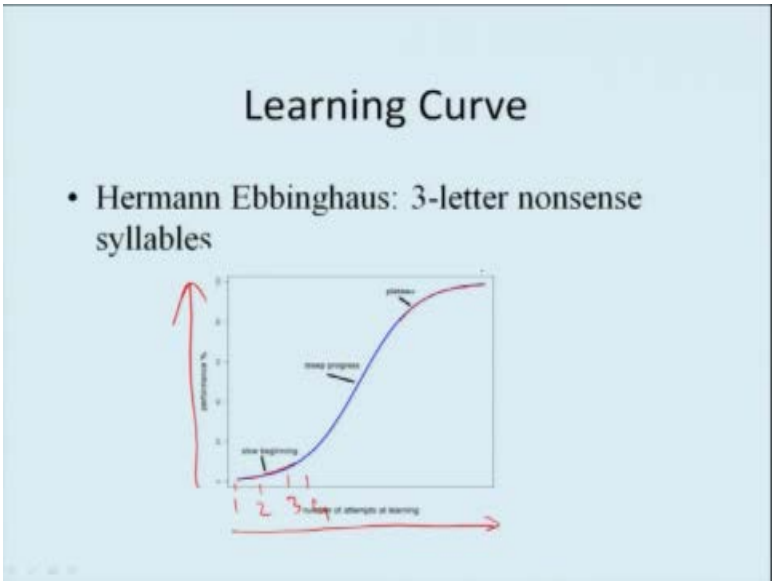

You learn very fast and then after a particular level you realized that you reach a level of stability, what is the call as the plateau state, so no more learning or no more significant enhancement in learning after that, that it is called as the plateau state. So slow beginning, reaching the plateau state, and in between you have a very steep progress that is what is called as learning curve.

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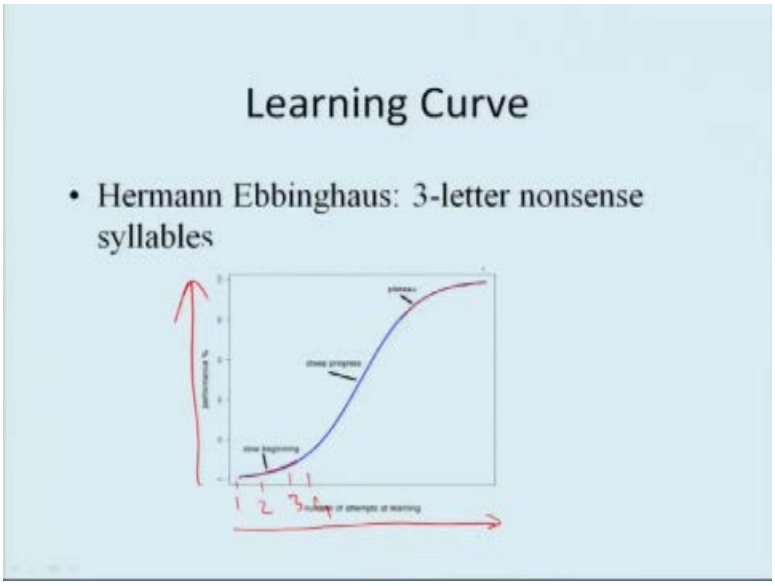

And this was given by Hermann Ebbinghaus. Now at the end let us now talk about transfer of learning.

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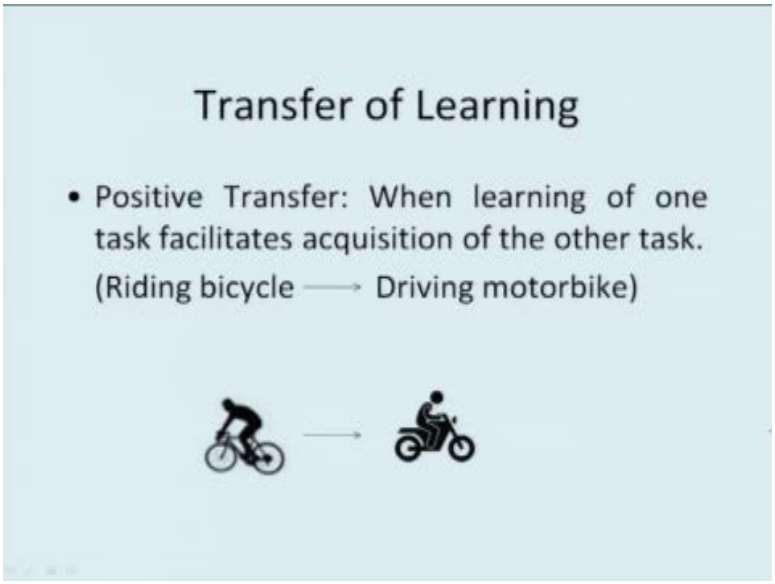

Is it that learning of one thing helps us learn the other thing, so is it that what we learned first has any influence on what we learned later on okay. What could be the possibility okay, so the facilitator role or the inhibitory role or perhaps no role, that the previously learned thing has over the new thing the incoming learning information that is what is called as transfer of learning. There are three possibilities, positive transfer can be there, for example when you learn one task and the acquisition of the first skill.

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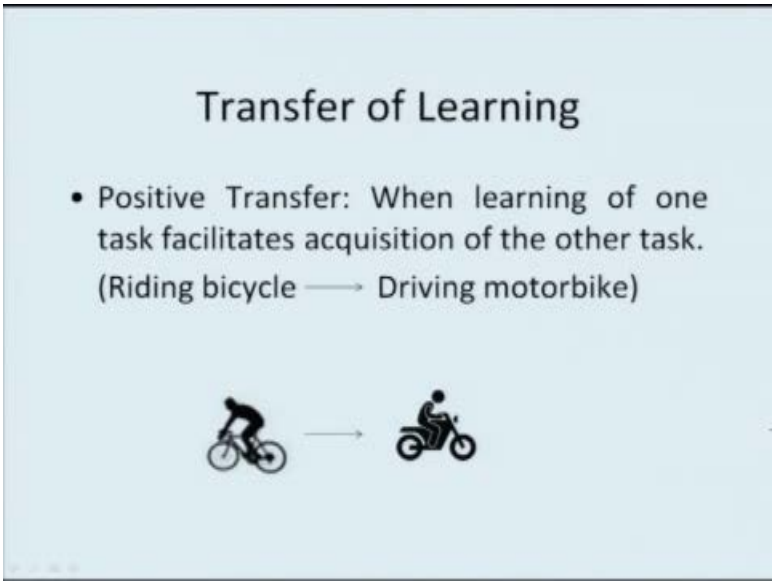

Helps you understand and learn the second set of task that is the example of positive transfer. For example, you learn how to ride a bicycle okay, you learn how to pedal, you learn how to know balance the vehicle, you learn how to take turns, you learn how to use brake, the entire mechanism you learn. Next time when you learn riding a motorbike you realize that it is now facilitated, only few mechanisms have to be learned okay.

But otherwise riding your bicycle has very easily helped you learn the new skill that is driving a motor bike, this is an example of positive transfer, earlier learn task facilitates acquisition of the new task positive transfer, the other possibilities are negative transfer.

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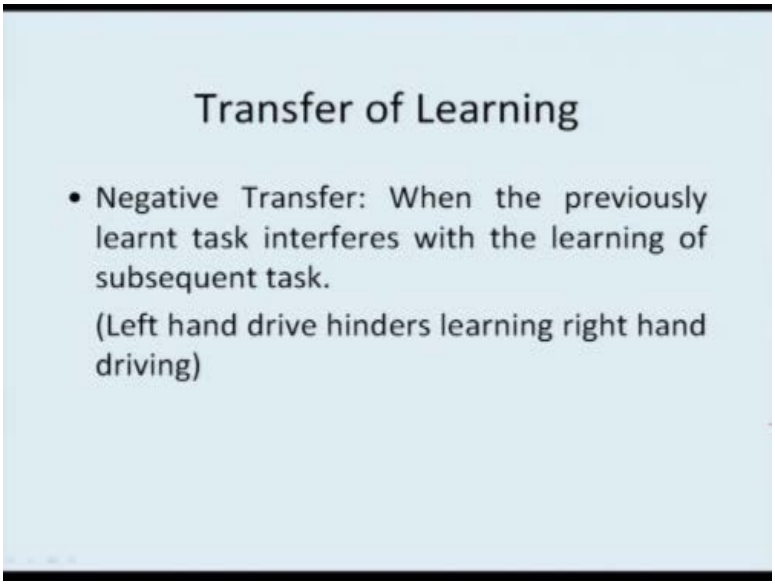

Negative transfer would be a case where think that you have learned previously now it interrupts learning of the subsequent thing okay, you know that in few countries you have cars with the steering on the left side and in few countries you have cars with steering on the right side. For instance in our country we have the cars with the steering on the right side okay, imagine if you are made to drive a car, if you ask me to drive a car with the steering on the left okay, how would I perform and it has been realized that the left hand driving it always hinders the learning of driving using the right hand okay.

Those who know we are says no left lane drive okay so you always you are supposed to be on the left side okay, in few countries the rule is different now you are supposed to be on the right side okay, so you have great difficulty because you have learned task in a particular way and this learning has now started interfering when you have to learn things in the new situation, such type of interferences they are called negative transfer.

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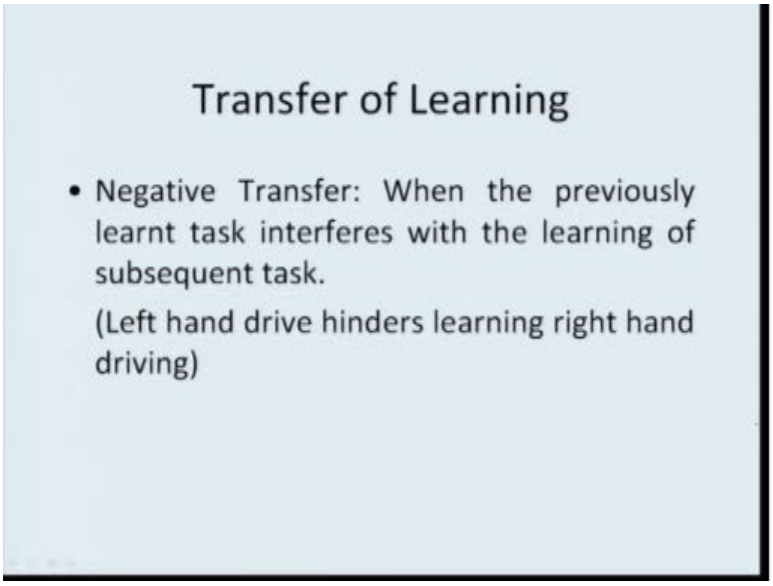

Because it is adversely affecting learning of the subsequent task.

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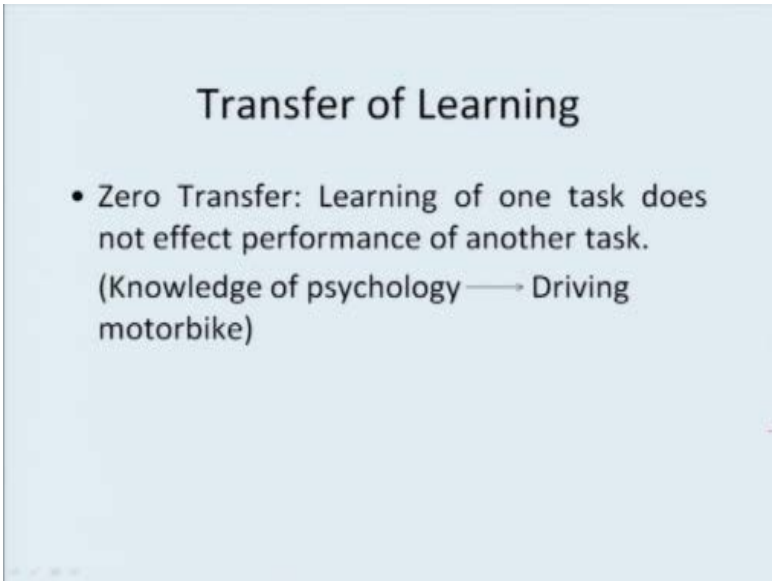

And another possibility could be that the previously learned thing and the new coming thing both of them are completely disconnected, there is no connect between the two, so learning of one task does not affect the performance on the other task, and the best example could be that after now attending how many 12 lectures of this very course if you have to learn how to ride a motorbike knowledge of psychology is not going to either positively or negatively interfere or help in driving the motorbike, so there is 0 transfer.

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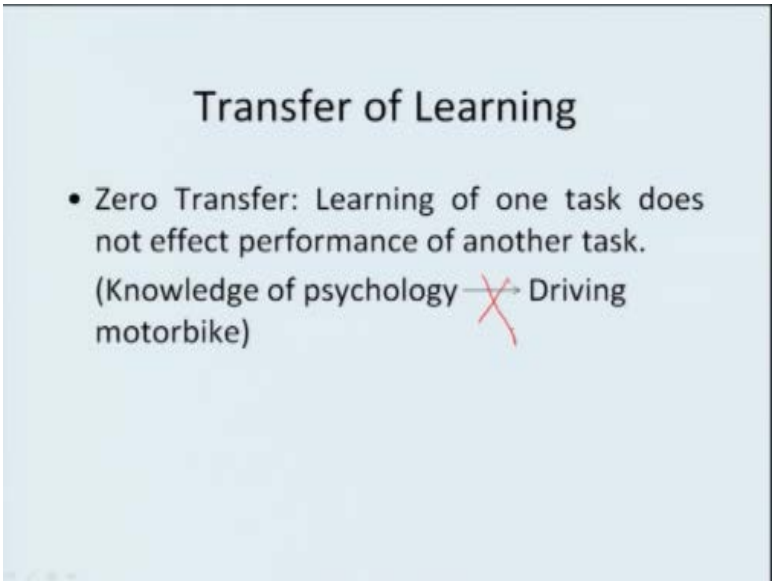

This is a different thing that is a different ball game altogether so knowledge of psychology has no relation with driving of motor bike this is the example of 0 transfer. So you realized that this does not work, this is the case of 0 transfer, so with this we come to our what you call the end of our discussion on learning, what we have done till now, we have talked about how we sense stimuli in the world, how we assign meaning, how we perceive things, having perceived things we learn certain things no there are certain guiding principles.

We are biological creatures, there are some certain bio cultural factors okay, certain things which we passively learn, certain things that we actively engage our self and then we learn first was classical case, second was the operant conditioning case, something now which we learn because of our insights, there are quality factors that helps in this phenomena and now having perceived things I have learned things now okay. What after this, after I have learnt I will try to retain it, when I retain it and that retention helps me recollect that information which further facilities my healthy survival that is what is called memory, so when we meet next we will be talking about a new concept, that is memory.

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