

**NPTEL**  
**NPTEL ONLINE CERTIFICATION COURSE**

**Course**  
**on**  
**Educational Leadership**

**by**  
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**Lecture 34: Innovative Pedagogy and Technology**  
**for Learning (Contd.)**

Welcome viewers once again to this NPTEL course on educational leadership, so we were discussing about the innovative pedagogy and technology how it enhances the learning and performance so we have already discussed about number of pedagogical methods and how technology has been blended with pedagogy to make it more effective so we have already discussed about number of techniques. So we will discuss about one more technique that is called the puzzle based learning.

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✓ **Puzzle – based Learning-**

1. A puzzle is non-standard , non-routine unstructured question presented in an entertaining way;
2. Puzzles can not be solved by rote learning, are invaluable in making students think
3. Interesting puzzles can engage students' emotions, creativity & curiosity & also enhance their conceptual understanding, critical thinking skills, problem solving strategies & lateral thinking ("out of the box")

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So this is also innovative pedagogy where we can use the puzzle different kinds of puzzle or we can say we can design the different kinds of puzzles for enhancing the children's thinking they

critical thinking, computational thinking, mathematical using it for mathematical learning for vocabulary learning all kinds of thing. So a puzzle is actually a non standard, puzzle is actually non-standard, non-routine and unstructured question presented in a very entertaining way.

So for deciding a puzzle also it requires a lot of you know cognitive effort like how to design a puzzle so that means it is unstructured or you can say sometime semi-structure non routine it, it is not related to any kind of particular object content our knowledge it is non-standard but it is entertaining because it creates generous a kind of curiosity, so curiosity in most of the you know books, text books also at the end of the towards, at the end of the topic also there is some puzzles to and the children they have been asked to complete those puzzles in terms of framing the words, in terms of you know creating a design or network kind of thing, even in the newspaper also we get the you know word puzzles for creating the new words etc.

So puzzles can be used for educational purpose as well and puzzles cannot be solve by rote learning, however it is a form of active learning where you cannot solve it through rote learning or memorizing something or just getting by heart, it is not a kind of that mode of learning. Here the learner is to think actively in case they mean the learning situation and exercise his brain, uses cognitive abilities to think actively to get the solution.

So puzzle cannot be solve by rote learning and arte invaluable in making the students things, it promotes, it you can say it forces the other children to think actively, it compels everybody to think actively because otherwise you cannot get the solutions, so it is such a tool so which you know not only prompts but it forces the children to think actively so we can purposefully use it you know as a part of as a component of assignments for children so that they start thinking actively.

Interesting puzzles can engage the students emotions, creativity and curiosity so if you can design the puzzles or if you can get the puzzles which are very interesting so and it motivates the children especially children are the students to engage them and it can generate some kind of you know emotional appeal, emotional appeal for the children to get attached to that kind of activity then create a kind of imagination fantasy so it also boost their creativity, creative thinking and it creates a kind of curiosity and also enhance their conceptual understanding, because in order to solve the puzzle they need to clarify the conceptual understanding of certain features, certain phenomenon or certain components.

So the critical thinking skills it also problem solving strategies and the lateral thinking out of the box so it consider a puzzle base learning is such a tool which you know which activates all our thinking capacity, all our cognitive processes, started it yes, it cannot be solve from the rote, through the rote learning, but suppose when we go back to the your past learning so you it also helps on seeing remembering, recollecting, recapitulating your past learning skills and knowledge.

So it that means it activates you can say it is stimulates, it activates, it mobilizes all our thought processes, all modes of starting from application to critical thinking, to curiosity, to imagination and we though in affective component like with the emotional appeal, with the emotional attachment to that game like that person unless and until you complete that you do not feel like withdrawing yourself or stopping in, because it also gives a kind of sense of self efficacy and also challenge a sense of challenge and sense of you know self satisfaction so all this things, all this components have been embedded in that puzzle game.

So puzzle base learning it can be tried out for higher education students also for engineering student, for science student, for higher secondary students for generating interest among them for the mathematics, for the science, for different kinds of problem solving skills. So this solving the problems can be linked to the development of the professional skills and solving on usual non-routine kind of business man.

So often this puzzles, this puzzle layer, puzzle task, puzzles have been used by different employers also for testing the, to testing them prospective employers or the candidates you know problem solving ability like whether they can think out of the box or how quickly they can grass prosecution and what is their common sense intelligence and how promptly, quickly they can think of a solution so how professional they are, how good they are in understanding the business problems and how actively they can think about the problem and quickly reach to solution, so professionals for enhancing the professional skills, business skills also the employers are often they are using the puzzles sometimes during the interview also for the placement interview also, so in order to evaluate the students or the candidates.

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✓ **Puzzle – based Learning – contd....**

4. Solving puzzles can be linked to development of professional skills like solving unusual /non-routine business problems

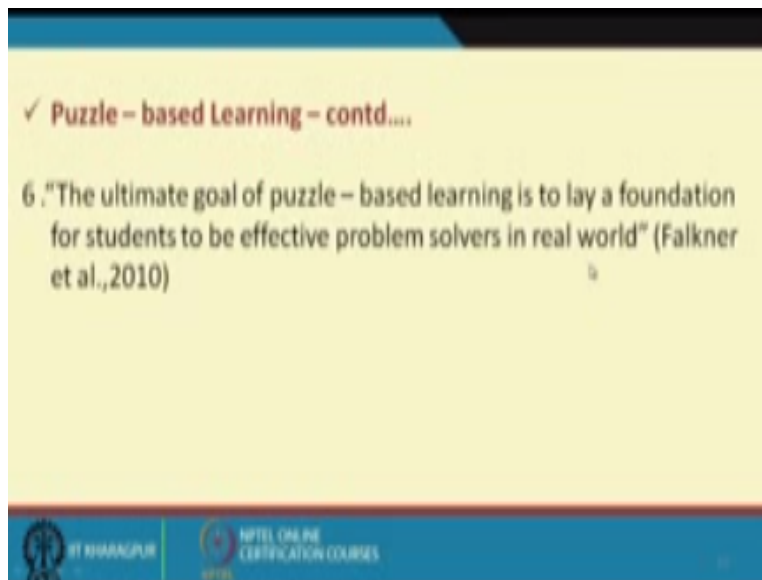
5. Often puzzles are used at the time of job interviews to evaluate the candidates' problem solving skills, creative thinking needed for solving innovative real life problems

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Problem solving skills their creative thinking skills are innovative ideas or the skills for thinking out of the box that means beyond their text books or beyond their content or the domain knowledge which they have gone through so this kind of innovative real life problems our real life problems were solving the different unnatural or you can say that means unpredictable problems or emergent problems how can you solve it for this kind of things.

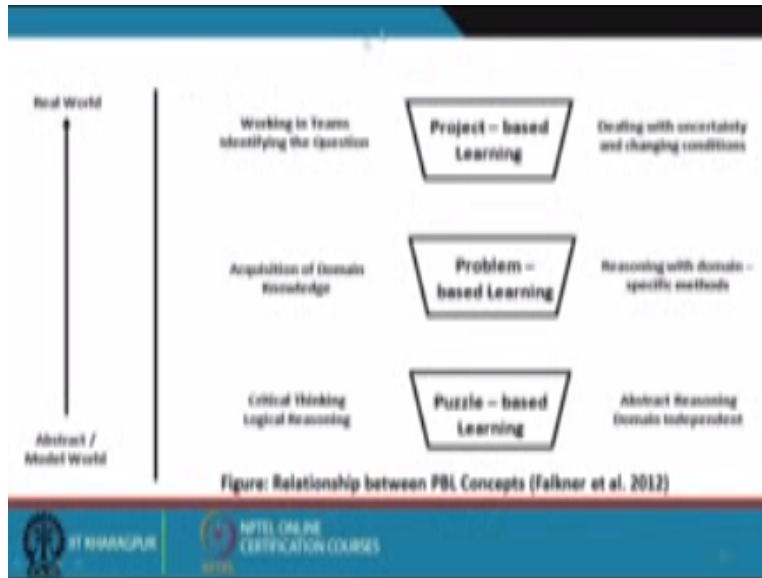
Sometimes the placement interview in case of placement interview the employers also they use it, they use the puzzle so it is the best method not only to engage but to exercise to activate mobilize all our thinking processes, but again you know to reaches you can say to reach our recharge or stimulate our higher order thinking process to actively engage you know it is actively engage our brain power.

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So the ultimate goal of the puzzle based learning is to lay the foundation for the students to be effective problems solvers in the real world, it shows the ultimate goal of this puzzle based learning is that not only they will be the very good problem solvers in the classroom situation in the educational setup etc, but how they can be very good thinkers, then how they can be very good problem solvers in the real life situation.

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Now this is the diagram you can see this is also puzzle based learning you can say it is also one type of experiential learning so now here you can see like from the physical world to the parameters it is like from the real world to the abstract world and how the different types of learning's helps us like in this is suppose your project based learning focuses on dealing with uncertainty under changing condition and working in the teams identifying the questions, okay.

Then problem based learning reasoning with the domain and knowledge like even problem based learning primarily we use our domain knowledge conceptual understanding about the subject, so acquisition of the domain knowledge that is problem learning's focus, problem based learning's focus where is the puzzle based learning focus is that abstract reasoning higher level of reasoning and logical thinking which is domain independent.

As it is related to out of the box so even though you have prepared the subject very well you know the A to Z of your subject domain etc, but it is thinking out of the box so it is stimulates the abstract reasoning in high level of intellectual exercises, so it and again it stimulates your critical thinking and logical reasoning high and at the abstract level. So these are this is the you know this is the relationship pattern of all these kinds of experience learning that is project based learning, problem based learning and the puzzle based learning.

Now recently more recently this puzzle based learning are been extensible used by the you know by the mentors, by the tutors at a higher level education at the engineering education, in the science education for you know for enabling our students for enabling our future perspective,

prospective jobs seekers are the employs to activate their out of box thinking that is the problem solving skills that means beyond out textual knowledge.

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✓ **Learning Management System (LMS)**

1. Now a days mostly used by the colleges to support their on-campus with large students
2. It provides online discussion forums, electronic delivery of readings & assignments, & electronic return of graded assignments & performance assessment
3. LMS i.e. **Moodle, Blackboard, Sakai** are extensively being used by teachers & educational institutions for handling large no. of students
4. Some other LMS i.e. **Piazza & Classroom Salon** are also integrating social networking features like Facebook for drawing more audience

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So another component is like it is also there which facilitates teaching and pedagogy that is the learning management system it is a tool, you can say it is a tool it is a technology is a tool which can be used to facilitate our teaching learning process, so learning management system now a days it is mostly being used by the different colleges, different on campus educational institutions, coaching centers, tutorials as well as the universities for deal primarily to deal with the large number of students.

So with the large number of students so this LMS system learning management system helps a lot at being used as a learning tool that means to monitored, to evaluate, to give the feedback, to conduct the assessment to provide them the teaching learning materials all kinds of for educational purpose these elements are being used for dealing with the large size classrooms, large number of in campus students.

So it also provides online discussion forums through LMS we can also provide online discussion forums it is electronic delivery of not only reading materials but reassignments the messages from the instated, then electronic return of the graded assignments whenever the students they complete the assignments they send it back then it will be checked and evaluated by the twitter

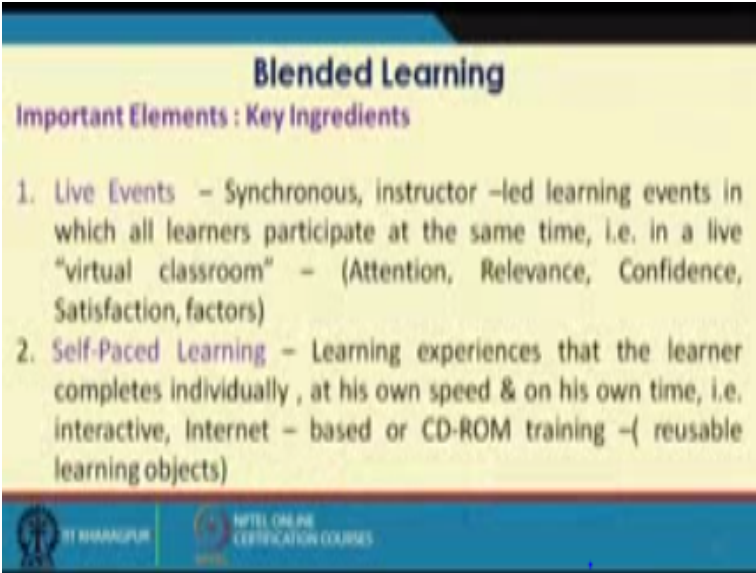
and the performance assessment for all kinds of you know teaching learning activities day to day activities evaluation assessment.

Providing the learning materials, monitoring, catering to the individual needs we are using this LMS just to make it more personalize, just to monitor and make it more personalized give the personalized experience to each and every learner. Because otherwise it is very difficult to give the feedback to 300 students in a classroom or may be in some subject basic subject like physics, chemistry, mathematics students strength can be 800, 1000 for per batch.

So how to monitor that progress, how to give them feedback, how to provide them the assignments, how to check it, how to so for day to day you know a regular classroom activities, academic activities we need this LMS tool, so the LMS tools where very popular LMS tools are like this moodle, blackboard, sakai which are extensively useful for the teachers, for their educational institutions for handling the large number of students.

Some other LMS like the Piazza and the classrooms Salon are also very well integrated with the social networking features like the Facebook and for drawing more audience were drawing more audience. So nowadays this kind of LMS tools are you know it is become a you know mandatory component or you can say it is a very much required essential component for using it for dealing with the large classes. Now next we will discuss about the Blended learning mode.

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**Blended Learning**

**Important Elements : Key Ingredients**

1. **Live Events** – Synchronous, instructor –led learning events in which all learners participate at the same time, i.e. in a live “virtual classroom” – (Attention, Relevance, Confidence, Satisfaction, factors)
2. **Self-Paced Learning** – Learning experiences that the learner completes individually , at his own speed & on his own time, i.e. interactive, Internet – based or CD-ROM training –( reusable learning objects)

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Blended learning mode is you know it is a kind of perfectly mixing or you can say it is a hybrid mode of using sometimes a physical classroom situation face to face real life situation mode and sometimes digital mode but how perfectly we can blend it so it is a kind of hybrid mode so how perfectly we can blend it for our benefit, for our convince, for our requirements, so that is called the blended learning.

And research has proven that even though the online digital mode, online modes are popular nowadays we e-learning etc, but blended mode has been proven to be more successful because often we need to interact with the human beings we need to interact with the physical teacher, actual teacher, real twitter because all of us we are you know we are the human beings, we are not the digital characters or of that etc.

We want to experience the kind of human feeling, human interactions, human response so that is how blended learning mode has been the most effective one but depending on the situation, depending on the context, depending on the audience, depending on the time at hands the space the other contents we can decide how to blend it perfectly for our purpose. So what are the important elements of this blended learning?

One is that live events yes, synchronous, instructor lead live events can take place in which learners participate at the same time. For example, in a live virtual classroom in the lecture video conferencing we are arranging it live classroom, live virtual classroom where all the participants they can see each other, they can interact each other these are the live events where attention, relevance, confidence, satisfaction factors have been incorporated.




Then another is that self paced learning, another blended learning when another mode can be self paced learning where the learning experiences is that learner completes individually again sit with his computer it is convenient time and go through the material at his own speed on his own time and even also interact with other members and use the internet based CD-ROM or training modules etc, reusable learning objects you can go through it discuss or interact with others through mail, through chats etc.

But that means he can decide his own pace and his own timing, his own place and comfort etc that is the self pace learning as per the requirement as per the need of the, need and convince of the individual learner.

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**Blended Learning-contd.....**

3. Collaboration- Environment in which learners communicate with others, i.e. e-mail, threaded discussions or online chat – (Peer –to – Peer , Peer-to-Mentor)
4. Assessment- A measure of learners' knowledge; Pre-assessment can come before live or self – paced events, to determine prior knowledge, & post-assessments can occur following live or self – paced learning events, to measure learning transfer

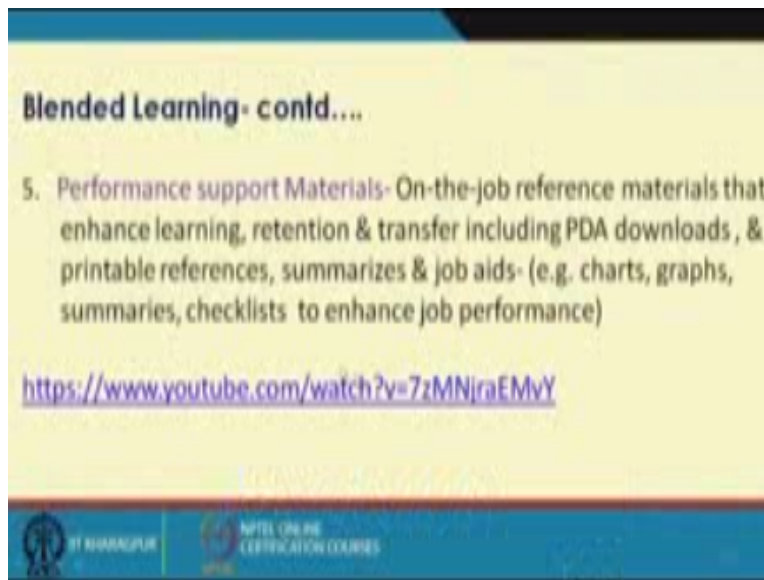


The next is the collaboration is also another blended learning mode where environment in which the learners communicate with others either through e-mail or the you know online discussion, online chat peer to peer chat or peer to mentor chat it can be a collaborative mode with the online discussion and the mail etc.

Another assessment can also be done assessment a measure of learners and knowledge pre-assessment can be, can come before the life or the self paced events to determine the prior knowledge and the post assessments can also be done for the self pace learning events to measure the learning transfer. So through blended learning a kind of pre-assessment can be done before the learner goes through the learning material is his as a personalized mode or in his in self paced mode and after he has gone through a course of module or subject content for few weeks or something like in, then he assessment can also be done at the.

So it also measures the learning transfer as well as the learning gate for assessment purpose blended learning is also perfect mode.

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So performance support materials on the job reference materials, can also be provided through blended learning mode that is to enhance the learning, to enhance the retention and transfer and transfer it can also include some of the PDA downloads printable references, summarizes and the job aids as often we can use the charts, graphs, summaries etc. So sometimes we can also use some hand outs, some physical materials or sometimes we can use some digital materials and we can to support our performance some online materials, some offline materials, some hands on activities, some PDF downloads etc. So here we can see one of the YouTube video to go through it this.

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Today information and communication technology or ICT we internet and the mobile revolution have changed how we do things. Everything is going on line, think instant data access, social media, e-commerce, mobile communication, cloud computing and the internet of things. In our globalize knowledge based world the spread of mobile phones, communication systems and internet infrastructure is had a big impact on trade and development.

Information and communication technologies are critical tools for job creation e-commerce and economic growth. The production of ITC goods and services is an industry in itself there is however a long way to go before everyone is able to participate in this evolving information economy. It is essential we have strategies and partnerships in place to help developing countries and transition economics grow their information economies, so everyone can participate in line with the United Nations 2030 agenda of sustainable development.

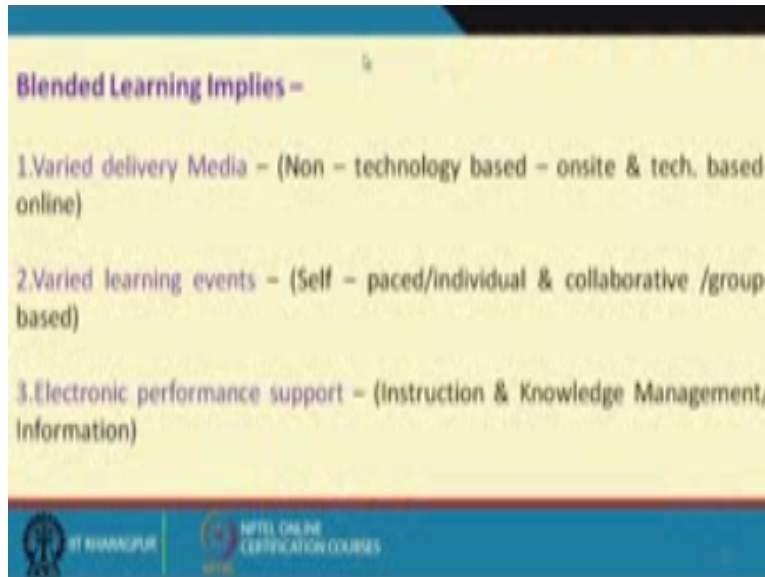
The United Nations conference on trade and development or UNCTAD assists the governments of developing countries towards this goal. It has so in collaboration with many partners including international agency, donors, the private sector and civil society. In order for governments to faster productive and inclusively use a YCT's they not only need physical infrastructure, but also the right policy institutional and legal frameworks to help generate trust online and thereby more productively use a YCT.

These our areas where UNCTAD makes a difference drawing you know the 15 years of experience we help countries good policies and pays to increase their participation in the global information economy. We provide research analysis on ICT trainings developments include, in response to a correspond developing countries we help developing inclusive ICT's strategies better ITC data and comparative legal frameworks for e-commerce.

We provide guidance on house more enterprises including women own one can sees ICT induced opportunities to spread the neuron business and reach out to customers. We also provide governments with opportunities to share experiences and build concerns around the key issues, relating to the information economy and e-commerce. UNCTAD mission is to support the growth of the information economy in developing countries and transition economies define out more visit our website, follow us in twitter or send us an e-mail. United Nations Conference on

Trade and Development, Prosperity for all. So welcome back to the session, so we are discussing about the blended learning.

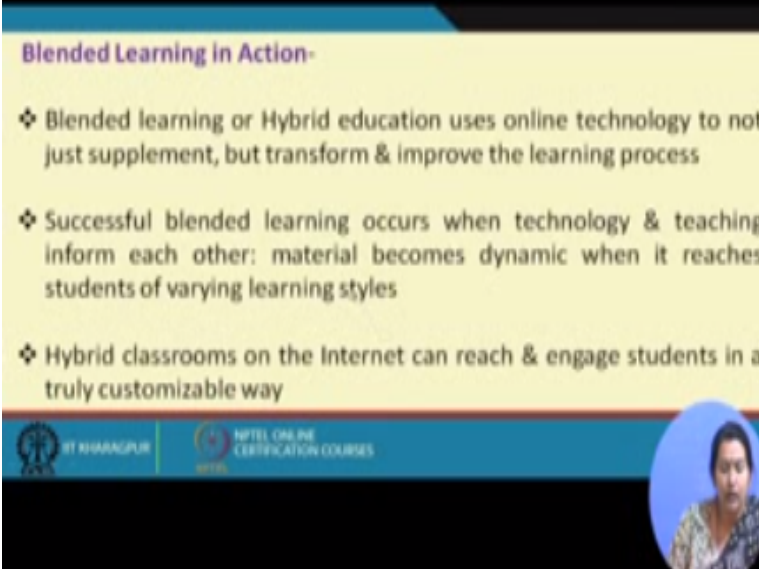
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So what are the implications of the blended learning, now the features of blended learning like variety delivery media, so in blended learning you can use non-technology based onsite as well as the technology based online, any kind of delivery media we can use for the blended learning and where varied learning events so similarly the learning events can take place either in the self paced mode or individual mode or the collaborative mode or the group based mode and electronic performance support like the instruction and knowledge management and information it facilitates it can be provided.

So we can blend all these things variety of delivery mode, delivery media so a variety of the learning events either in individual case or in the group case, collaborative case on and that electronic performance report and assessment report can also be provided.


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**Blended Learning in Action-**

- ❖ Blended learning or Hybrid education uses online technology to not just supplement, but transform & improve the learning process
- ❖ Successful blended learning occurs when technology & teaching inform each other: material becomes dynamic when it reaches students of varying learning styles
- ❖ Hybrid classrooms on the Internet can reach & engage students in a truly customizable way

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So blended learning has certain advantages as we have the freedom to synthesis to a stimulate number of options in terms of modes, in terms of the technology, in terms of tools, in terms of you know assessment so a blended learning actually is the hybrid education uses on both the users, both the online technology to not just supplement but transform and improve the learning process, so why do we need to blend the different modes because we want to improve the effectiveness and efficacy.

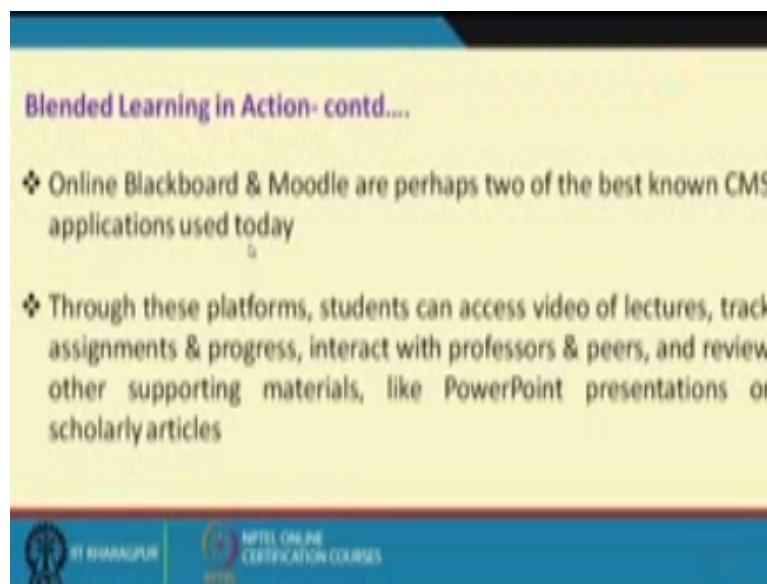
So hybrid education this is blended learning is such a hybrid education mode so it is not there to supplement to provide the materials but to improve the learning efficacy, learning effectiveness so learning process so that is why we need to blend, we need to mix of, we need to perfectly hybrid the whole learning situation to make it, to maximize that effectiveness. Successful blended learning occurs when technology and teaching inform each other, when technology and teaching when facilitate they support each other, they supplement each other, they facilitate each other when the technology is just not only adaptable but it is facilitating the teaching and inform each other and materials become dynamics.

So the materials become dynamic when it reaches the students of varying learning styles, so in order to character to the learning needs of different kinds of learners who are having different learning styles, different preference of studying the materials so here we can make it more

dynamic, more flexible by, mixing the technology with the learning material. So hybrid classrooms on the internet can reach and engage the students in a truly customizable way.

So if you can use blended learning approach in our classroom situation that is hybrid classrooms on the internet through by using the internet so it can reach and it can engage to the students to different students and it truly customizable way means as for their requirement as for their satisfaction, as for their learning style, as for their speed and ability. So it can be, it can truly chattered to the needs of really individualized learning a personalized learning.

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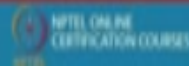
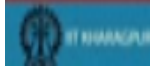


Online blackboards and moodle are perhaps two best known CMS applications used today, so we use that is why here to perfectly blend the technology weaker learning material or the pedagogy an make it, make the hybrid classroom more effective and perfectly personalized for providing the learning experiences so we use the LMS tools that is the moodle and the open the online blackboard which are the you can say these are the useful tools for making the blended learning or hybrid classroom more successful through these platforms the students can access video lectures, they can track their assignments, they can monitor their progress, they can interact with the professors, they can with the peers, they can review other supporting materials, they go through the materials like the power point presentations or any other is colour article they can flexibly use it.

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### Advantages of Blended Learning-

- ❖ Incorporating the "Asynchronous Internet Communication Technology" into courses serves to facilitate a simultaneous independent & collaborative learning experience;
- ❖ Contributing to student satisfaction & success;
- ❖ By incorporating IT into class projects, communication between lecturers & part-time students improves, & students are able to better evaluate their understanding of course material via the use of computer-based qualitative & quantitative assessment modules



Now the advantages or like it in cooperates both the synchronous internet communication network as well as the it facilitates the simultaneous of the collaborative network, collaborative learning experience so blended learning is such a platform which facilitates both the synchronous as well as asynchronous and how to blend it, how to mix it, when to use it this the freedoms are with the students and the twitters.

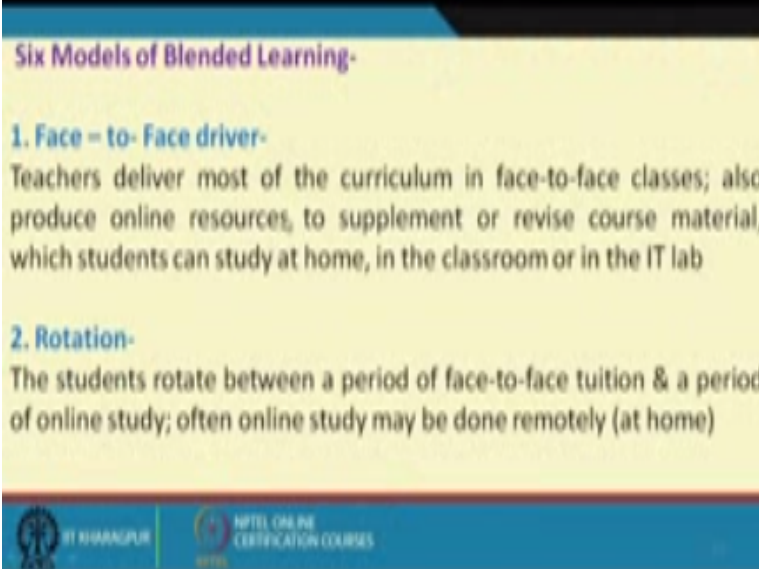
So it can in cooperate both the synchronous and asynchronous modes as per the preference and choice of the twitters and the students or the participants and it contributes to the students satisfaction and success because he dictates but he says he has a bios, so he has the opinion of you know how to select, how to match and mix the modes and the materials. So by in cooperating IT into the classroom projects are communication between the lectures and the part time students can also improve by in cooperating this IT.

Those right communication can be established interaction can be established between the twitter and those who are the part time students. Even though they are not physically present, even though are not in touch with the twitter 24x7 but they can through the communication can be done and they can learn and they have access to the lectures and they can improve their performance, the students are better able to evaluate their own understanding of the course material why I am using the quality and the quantitative assignment modules.



So in blended learning mode the students have the more freedom and access even though those who are not the regular boarders, regular students or regular students of the formal education even though they are doing it part timely or remotely they are doing it but they can monitor their progress and clarify their doubts through, from the twitters well going to the materials and they can monitor their performance through various qualitative and qualitative assessment modes.

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**Six Models of Blended Learning-**

- 1. Face – to- Face driver-**  
Teachers deliver most of the curriculum in face-to-face classes; also produce online resources, to supplement or revise course material, which students can study at home, in the classroom or in the IT lab
- 2. Rotation-**  
The students rotate between a period of face-to-face tuition & a period of online study; often online study may be done remotely (at home)

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There are six modules of the blended learning one is the face to face driver, that is one is the face to face driver the teachers deliver the most curriculum in face to face classes and also produce the online resources to supplement it and revise and again the students they can study at home in the classroom or in the IT lab that is the face to face driver. Second is the rotation, rotation mode in their rotation model the students rotate between the period of face to face tuition and a period of online studies so from time to time they can switch on and off from the face to face to the inline mode often online study may be done remotely it can be done from the home also.

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**Six Models of Blended Learning- contd....**

**3. Flex-**  
In this model, most learning is done in the online environment; Face-to-face teaching is still available, but for small groups / individuals on requirement basis


**4. Online Lab-**  
All course material given & teaching is done online, but in a physical classroom on computer lab; teachers interact with students online (through pre-recorded videos, audio & video conferences or discussion forums & email)



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Another is the flex model in the flex model most learning is done through the online environment and face to face teaching is still available but for the small groups and individuals it is done as for that requirement and online lab is also there in the online lab all the course materials given is on the online but in the physical classroom in the computer lab the teachers interact with the students through period accorded either through period recorded videos, audios, video conferencing of the discussion forum or the e-mail.

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**Six Models of Blended Learning- contd....**

**5. Self – blend-**  
A fully individualized approach; the students takes online classes a la carte; Much of the learning is done online, but the student can still attend face-to-face classes


**6. Online driver-**  
Students work mainly online in a remote location & come to school for optional or required face-to-face/ contact classes



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Then another two modes is self blend mode where we have already discussed individualize approach the students can, the students take on the online classes their conveniences but much of the learning is done online but the students can still attend to the face to face classes whenever they need, they need to attend it.

The online drivers students work mainly online in remote location come to school optionally or if it required and if when it is required to have the face to face communication or some contact classes then only they come to the classroom. So this is all about this innovative pedagogy and technology and how it facilitates what teaching learning process and enhances our teaching effectiveness.

Now in the present error with a large number of or increasing number of students, trends and chartering to their, for chattering to their needs individual needs, educational needs and we have you know you can say handful of good teachers, handful of effective teachers then how to you know how to maintain the ratio, how the chartered to their needs with the limited human resources like limited teachers, few teachers and so we can use the technology as a tool for making it as effective as you know successful as possible.

Of course technology cannot replace the twitter, the technology can really cannot replace the good twitter or good teaching a good human being or good mentor but however we can how extensible we can use the technology for handling large classes, for dealing with large number of students in the classroom and again updating our knowledge regarding the global education, the quality education and the you know what is going on around the world and again what is required what is the 21<sup>st</sup> century requires scales both the generic scales, functional scales, soft skills, domain knowledge, right skills and attitude and to make us you know well accounted with the ongoing job platforms employment opportunities and all kinds of you know enterprises skill.

So to for all kinds of this multipurpose you know function of the multipurpose function of the education for into starting from the development to the job, to their you know enterprises to the sustainable maintain sustainable development and all kinds of activities we need to have a very education system and for which we have to be innovative not only in terms of technology but in terms of pedagogical techniques also.

So how can be perfectly blend there is a pedagogical technique, pedagogical principles with the technology and but however with good intension, positive attitude, motivation, energy,

enthusiasm then we can strengthen our education system we can motivate our students for being self learners and the 21<sup>st</sup> century, job seekers and the you know potential employs as well, so thank you very much this point we end this chapter of innovative pedagogy and technology for learning enhancing learning effectiveness. Now in the next class we will start a new topic thank you very much.