

EDUCATIONAL TECHNOLOGY AND ICT

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Lecture-49

Module-49: Computer Managed Learning (CML)

Hello dear learners, welcome to SWAYAM-NPTEL course on Educational Technology and ICT. I am your course coordinator Dr. Sarita Anand from Department of Education, Vinaya Bhavana, Visva-Bharati, Santiniketan, West Bengal, India. Today we will talk about the module 49 on Computer Managed Learning, CML. This is lecture 49 and before going to the topic, we will go through the concepts covered. Earlier we had covered the Computer Assisted Anstruction, CAI and the concept basic assumptions of CAI, its characteristics and technologies utilized in the computer assisted instruction, also we had seen about the evolution of CAI and different types or modes of CAI.

Now, we will go through the concept of CML, the Computer Managed Learning. This CML refers to the using of computers to manage the instruction. By its name we can understand that it is all about the managing instruction with the help of computers. This includes the employing computer applications and services within education.

In computer sciences the term CML is a type of software that helps educators organize and manage instruction. Instructional data ultimately improving the achievement of educational goals. CML is an educational system where computers are used to manage, organize and control the learning activities. Unlike the CAI, Computer Assisted Instruction which focuses on the content delivery, CML primarily handles the administrative and instructional management tasks such as the student progress tracking, assessment and evaluation, personalized learning pathways, resource allocation and scheduling, data analytics and reports and it is often integrated with the LMS and artificial intelligence driven educational platforms to ensure the efficient learning processes.

The main feature of the CML is that, it is automated record systems. Keeping the track records of the student's performance attendance and the progress. Adaptive learning path adjusts with the instruction based on the individual learner's performance, assessment and feedback. It is providing the automatic system of exams quizzes and grading and also suggest the next learning steps based on the analytics proving towards the personalized recommendations. It also gives the source management, it organizes the e-books, video, assignments and tutorials for the learners and how it works the working mechanism of the CML is like computers are the important part of this CML and the program is designed to use the purpose of computer for the teaching learning process and managing the course content for the learners.

It starts with the diagnostic of learner's initial knowledge and skills before going for the teaching and explaining things. Computer software helps assess the student's prior knowledge, strength and weaknesses, interest and learning needs. By analyzing their previous experiences, their attitudes and aptitudes these programs determine a student's readiness for a particular course and their potential for achieving learning objective. Then the second step is defining instructional goals and objective.

After knowing the learner's knowledge and skills their previous knowledge initial knowledge, then we go for instructional goals and objectives by the CML. It advanced software can analyze test results and stored student data to identify the learning needs of the learners at different educational levels. Starting from the school to higher education. This information is used to formulate a specific educational goals and objectives designed to individual learners or broader educational programs. The third step is creating individualized learning plans.

After setting the objectives and goals based on the student's learning profile, computer software can generate customized learning plans. These learning plans cater to diverse learners, including average, gifted, slow, and differently abled students, ensuring that each receives instruction suited to their abilities and needs. The fourth one is developing instructional content and learning experiences. Software programs can create interactive and personalized learning materials that align with individual instructional plans. These materials are accessible through various digital platforms, including e-learning portals, online databases, and multimedia applications.

Instructional content can be delivered in multiple formats, such as tutorials, drill and practice exercises, simulations, educational games, written text, etc. These digital resources

offer significant advantages over traditional teaching materials by enhancing the engagement and interactivity of learners. The fifth one is structuring instructional content into curriculum units. After creating the instructional content, the computer now helps to organize these instructional resources into well-defined curriculum units with clear objectives. Each unit provides step-by-step instructions, guiding learners on what they have to study, how to achieve their learning goals, and whether they should read specific books, complete self-assessments, conduct experiments, or participate in group discussions.

After completing a unit, a student may take an assessment to determine their progress before moving on to the next module. It is a structured process, starting with reading the content, listening to the video content, and after understanding the concept, they can take the test and know their status how well they have learned and accordingly move ahead to the next level. Tracking and monitoring student progress. Computer Managed Learning (CML) provides an effective and efficient way to monitor student progress in real time. These systems keep records of each learner's activities, identifying areas of difficulty and tracking their progress toward instructional goals.

Teachers and administrators can use this data to detect the learning gaps and offer targeted interventions to improve students' outcome. If required they can organize the remedial classes or provide some more resources or content for the learners. The seventh point is providing remedial instruction, keeping the track of the students based on the student learning difficulties, software can suggest remedial actions to address these specific challenges. If a student struggles with a particular concept or the system can offer prerequisite learning materials to build their fundamental knowledge and understanding of the particular concept. Additionally, if the motivational issues hinder learning, the software can recommend goal setting strategies to improve the engagement and focus towards the learning.

The eighth point is Managing Educational Records and Information. Computer based system efficiently collect, store and organize and distribute student data. They maintain records of students, academic performance, personal learning, histories and other relevant information of the learners. These digital database support teachers and the students by providing easy access to learning resources, facilitating seamless administrative management and enhancing the overall instructional experiences. The ninth one is Conducting Assessments and Evaluations.

Software applications see streamline the creation, administration and evaluation of assessments and these programs can design test using a diverse question bank ensuring the assessments align with the instructional objective of the course. Features such as automatic grading, error free question generation and secure test administration minimizes the errors and reduces the instances of academic dishonesty. Also detailed performance analytics helps educators to understand the students progress and their learning outcomes. The last point is generating reports for instructional decision making. Computerized instructional systems can generate a variety of reports including student performance records, instructional resources availability, curriculum progress, update and assessment results.

These reports can used by the teachers, students and the parents to monitor academic development. Identify these for the improvement and take necessary actions. to enhance the learning effectiveness. Furthermore, educational institutions can use these insights to refine instructional strategies and optimize resources allocation to their learners. Thus, we can say that the CML provides a comprehensive approach to managing instruction.

While its applications are widely used in traditional classrooms, its benefits extend beyond formal education and supporting distance learning, adult education and special education also the inclusive learning environment. Now, the types of CML. Whenever we are talking about the CML it is technology driven streamlining instructional process and track the students progress and provide data for the insight of the teachers and the students and there are different types of CMLs and the first one is Learning Management System. The LMS you already know that the LMS is the platform where comprehensive systems that helps manage, deliver and track the educational courses. These systems provide educators with the tools to create, distribute and evaluate learning materials while allowing the students to access resources at their own pace.

For example, Moodle, Blackboard and Google Classroom you are aware of these names. So, the function of the LMS, the different LMSs are functioning like they enable the teachers to upload and organize the course content, course material including video, reading material and assignments. It facilitates the discussion through forums and live chat features like we do in our Google classrooms. Tracks students progress with the built in quizzes, assessments and grade books given in the LMSs. Integration with the third-party tools like Google Meet, Zoom and Microsoft Teams for the virtual classes.

In previous lectures we had seen that the Google Classroom has the Google Meet in their G Suite or Workplace account in free version. And each and every teacher or the learner

can utilize that Google meet facility by default in the G Suite or the Google Workplace account. Allowing the students to access the learning material anytime promoting self-paced learning. The classroom uses any university professor or the teacher can use Moodle to structure an online course, upload lecture video, assign homework and evaluate students progress using the quizzes and discussion forums either it is Moodle, Google classroom or any other LMS. Teachers can use utilize to run their courses to provide the content on a particular one platform and students can access that content anytime anywhere.

The second type is Student Information System (SIS): a platform designed to store and manage the student related data, ensuring efficient record keeping and tracking of academic process. These systems help schools and universities organize essential student information on the regular basis and securely. For example, power school or SAP student life cycle management etc. these are the main online platforms and they function to maintain the student profile including demographics grades and attendance records.

These days school MCB portals are run by the private schools they are using this student information system where all the attendance of the students are managed by the online process. fee, track record, their mark sheet or result or report card everything is kept on this student information system and at present these are the part of schooling system like our kids are studying those schools where they are utilizing this kind of SIS system. It automates the administrative process such as enrollment, fee management and report generation. I have already mentioned allows parents teachers to monitor student performance through dashboard. It provides the access not only the schools, but also the parents and the student to see their development or the growth or the result or the performance. Integrates with the LMS and other educational tools to provide a holistic learning experience.

This can be managed or taken care by the ah LMSs also. So, where we can use a school administrator uses power school to track school attendance and which I have mentioned school MCB is utilized by our kids their school is utilizing. So, these are the CMLs and the third one is AI based adaptive learning platforms. These adaptive learning platforms personalized education by identifying the strength and weaknesses like if you are utilizing the AI based platforms like BYJU'S or any other learning platforms where the they arrange or manage the learning by according to the learners need. Then they analyze the student interaction, customize lesson plans, provide the real time feedback, recommendation and go through their learning process and uses the gamification technique to increase the engagement and motivation.

They adapt the difficulty level of the content based on the student response. If student is not able to respond well, then they make easy questions and if learner is learner is growing slowly then they increase the difficulty levels slowly. So, if high school student is using Newton for mathematics receives the customized practices problems based on their past mistakes ensuring a more effective learning experience. They change the teaching style the content or the resources according to the response of the students or the learners.

The fourth one is e-assessment and online examination system. These are very important for the online platforms like the they enable educators to conduct online assessment ensuring the automated grading as well as the real time feedback and also secure test administration like exam soft or proctor you with the help of this kind of apps. The teachers can conduct the internal test or final examination any surprise test with the proctored facilities using the proctor you type of apps also there is one app called Regain and using Regain you can check out the students they cannot move from your Google form to another by this app and you can organize the your internal test or any kind of proctored examination on their own mobile.

So, the function of this e-assessment online examination system is to support the various test format including multiple choice, essay type or coding exercises. Uses AI based proctor tools for preventing cheating and remote exams. These are very good facilities with the help of this e-assessment it generates the instant performance report and analyzes the analytics of the students and the educators. It saves the time by automating the grading and feedback process and it supports the teacher and their teaching. The university professor uses ProctorU to conduct the secure online exam where students webcam feeds are monitored for any signs of malpractices.

The fifth one is learning analytics and data dashboards. These tools are collecting and analyzing the student performance data, helping educators to make informed decisions about the curriculum improvement and student support strategies. For example, Microsoft Power BI for the education and educational Google Classroom analytics are the example of this dashboard. It tracks the student engagement, participation and academic performance strengths, helps the teachers to identify the students at risk of failing behind the and provided target interventions. and also, the generate the customized reports on the class performance for a school administration.

Integrates with the LMS and SIS platform for unified educational dashboard. So, this is very good feature of the learning analytics platforms like. Microsoft Power BI which can

be integrated in the LMS any LMS also. So, the any school principal or the administrator can utilize Microsoft Power BI to analyze the student performance and and identify the patterns such as decline in math score or non performance in any other subject enabling them to introduce the targeted remedial for the learners. the function of CML.

The CML computer managed learning functions in different way like it provides or creates test generations. record keeping, personalized learning, resource management and monitoring and feedback of the student performance. So, when we talk about the function of the CML it refers to the computer systems to oversee and direct the instructional process encompassing the task such as test generation, record keeping and monitoring students. So, we will go through the functions we know the test generation the automatic test generation record keeping and students according to the students need they decide their learning path and resource provide by provided by the CML and resource management accordingly with the monitoring and feedback system and this feedback and monitoring system is helping the continuous progress of the learners either they are going positive way or not; and if they are not going in a proper way then teachers or the administrator can take the necessary action to improve their learning. So, the use of CML in modern education these days CML is being utilized in many ways in school and higher education also. Student performance tracking, real time dashboard for teacher and the parents, adaptive learning paths, AI suggested, automated assessment like MCQ, quizzes and feedback systems.

In online learning and distance education also we are using like SWAYAM, Coursera, NPTEL uses CML for tracking learners progress especially whenever we are organizing weekly test or utilizing google form in this platforms then we can get the essence that students are performing, how they are performing and the virtual classes google classroom manages assignment discussion and exams with the help of these virtual classes also we can send the documents attachments e-content to the learners. In corporate and skill-based training a skill development portal like NSDC, National Skill Development Corporation uses CML for vocational training professional certification like linked in learning tracks the learners progress and these days you can see the progress report how you are learning, how you are performing, how was your test these things can be easily accessed with the help of using CML.

So, I have compared the CAI and CML computer managed learning for your understanding purpose you can go through it the comparison and you can easily learn and understand that how what is the definition, what is the primary purpose, the function, the user interaction, examples and assessment type, teachers role and the cost factor of CAI and CML. Overall

after completing this table you will find that CAI is about the teaching and learning whereas, CML is about managing and organizing the learning. So, the both are different things CAI is more student focused it is focusing on the delivery of the content while CML is more teacher focused tracking student's progress. So, after talking about this comparison we will see the challenges of the CML.

Any technical topic you know they are having technical issues implementing CML can face challenges, technical problems, lack of training, resistance to change is the Common problem for each and every technical aspects integration of existing system ensuring the CML system align with the current educational practices and curricula can be complex. People are not ready to neither adjust or neither they are trying to learn new things. Cost consideration definitely the cost is every time is the biggest challenge for any systems similarly here in CML case that ongoing maintenance can be significant and posing financial challenges. Teacher training is another issues the major issue like digital skills to use or manage the CML effectively is the challenge and the teacher may, most of the teachers are not interested for this kind of computer managed learning.

Despite the challenges we should not forget that CML is substantially benefit having the benefit for the enhancing efficiency and effectiveness of educational process. If, our administration is ready to use this CML definitely it will benefit the education system, high quality education will be designed with according to the individual learner needs. So, in conclusion we can say that CML has a revolutionized, transformed or benefited education, administration, learning, personalization and performance tracking from LMS and SIS to AI driven adaptive learnings and analytics dashboards. These tools provide personalized learning and experiences, streamline administrative tracks or test task to enhance the assessment efficiency.

The integration of these systems into classrooms helps educators and institutions offer more effective and accessible education, catering to the diverse needs of students in the digital age, and we can also maintain transparency in the entire education system. In India, CML is widely used in schools and colleges for online education, especially when using the LMS. At least during the use of LMS, we are utilizing CML, and while digital literacy and infrastructure gaps still exist, we are hopeful about using more CML for the learners' benefit. Now, I have given a few references; I hope you will go through them. Thank you. Keep learning.