Learning Analytics Tools

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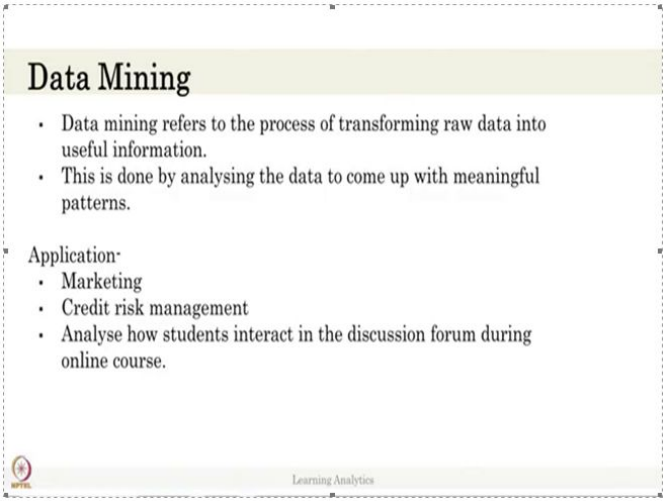
Lecture – 1.2

Academic Analytics and Educational Data Mining

Welcome back to Learning Analytics course. What is data mining? Data mining refers to the process of transforming raw data into useful information. There will be a lot of data as I mentioned in the first video. The users have started creating a lot of data in social media or in the entertainment industry or health industry. How to use this lot of data and transform that data into useful information so that the company can give you recommendations or provide meaningful advertisements to you. So, how to do that? It is actually done using data mining. (Refer Slide Time: 0:55)



Data mining is done by analyzing the data, by using pattern mining or process mining or predicting something or by doing correlations, regressions; or developing some algorithms to predict which product you will buy next, or which movie you would like to watch next. For example, this data mining is used in marketing for e-commerce. It supports you to find which product to buy or it provides advertisements like the targeted advertisements based on your search behaviour.

So, your behaviour in the browser or the content of the email can be used to provide targeted advertisements. Or in a credit risk management. For example, whether based on the user's past

behaviour of, how much loan he had or whether the user has paid the loan on time. All this data can be used to assess the credit rating, and then whether we should give a loan to the user or not. The banks can take decisions using data analysis or data mining. And also the data mining can be useful to analyze, how the students interact in a discussion forum.

For example, in a MOOC course, there will be like thousands of users registered and a lot of them will be discussing in the MOOC forum. Can we use these discussions in the MOOC classrooms? The data from the discussion forums to give meaningful feedback to the learners. This also can be done by data mining; by finding the useful patterns in the discussion forums.

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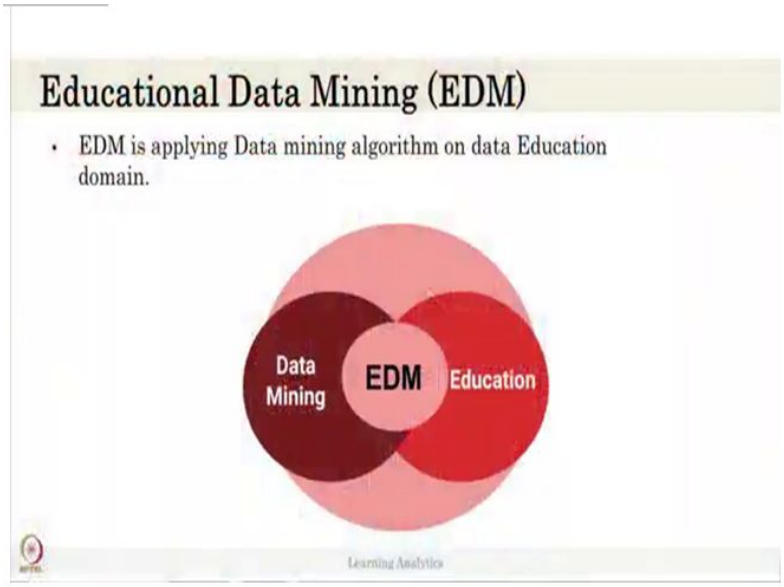

So, what is educational data mining? EDM or Educational Data Mining is you can put it very simply. It is applying data mining algorithms on educational data or data from the education domain or learner's data. For example, when you apply data mining on education data; it is can be called as EDM, very simple as such.

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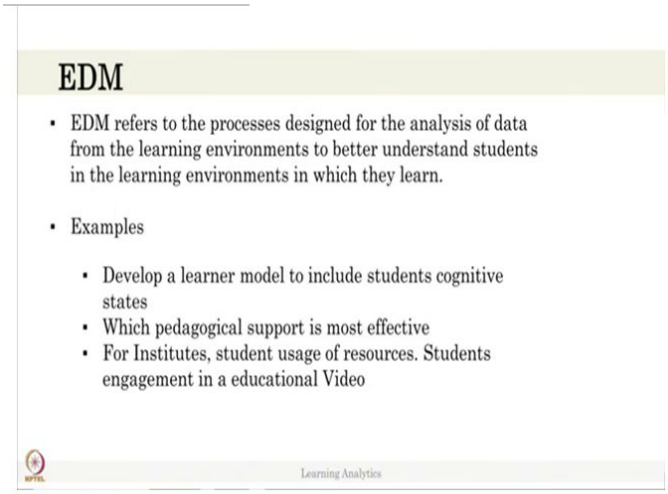

So, EDM actually refers to the process designed for analysis of data from the learner's environment to better understand students in the learning environment in which they learn. So, here it's not talking about measuring, collecting, data reporting; instead, it talks about the process designed for the analysis of data from the environment.

The learning environment can be a classroom or a MOOC or a technology-enhanced learning environment. To understand the students in the particular learning environment, and to provide an adaptable content, provide better feedback, so that they can learn better. So, you would see that EDM is almost kind of a subset of learning analytics. For example, developing a learner model that includes student's cognitive states to understand whether the student will able to perform the test correctly; whether the student is able to complete this course.

This kind of information can go into EDM that uses learner's data; or which pedagogical support is most effective? For example, if a teacher teaches a particular course using two different teaching strategies. Which pedagogical strategy or the teaching strategy is most effective? For example, collecting the pretest, then the teaching method, interaction data during the class; this data can be useful to give support and feedback to the learners.

For institutes, if we talk about EDM for the institutes; we can use the data like students usage of resources. How many students used resources like books available or LMS like a Moodle, whether the student uploaded assignments on time, student's engagement in the class. All this data can be collected and we can apply data mining on that. And we can model the student's interaction behaviour in that particular video resources or the institute resources. And the institute can make a decision about whether we should put more money on that particular resource or not.

So, EDM in the sense is applying a data mining on educational data; also can be useful to develop the learner model; to understand the students learning in the learning environment to provide some feedback, or to make some decisions at different levels.

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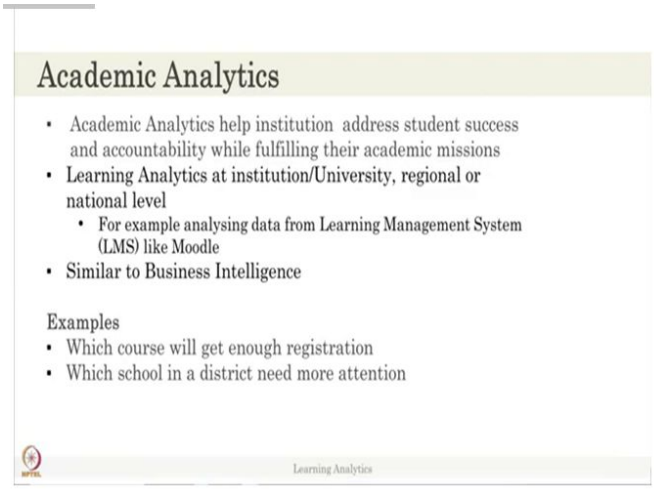

So, there is this other word called academic analytics. Academic analytics helps institutes address student success and accountability while fulfilling their academic missions. Or simply academic analytics is learning analytics applied at the institutional level, or the university level, or the regional level; or the national level.

For example, analyzing the data from the learner management system like a Moodle; for the institute level, seeing how teachers interact with the students. Whether the teacher is present in the class all the time or the teacher-student interaction in Moodle. All these details can be used by the institute to make a decision about their teaching strategy, the hiring principles; or the LMS data can be useful to predict whether to run a course next year or not.

So, academic analytics is similar to business intelligence. So, what happened in the last four years, from 2016 onwards people do not use the word academic analytics; instead, they call it business intelligence as they use it in other domains. Like business intelligence is a very common and popular word in other domains like health, finance. Now, they use the same word business intelligence in academic institutes also which is called academic analytics previously. Academic analytics you can think of applying data not just at the university level, also at the district level.

The government officials can use this data to predict; whether a particular school is doing good or bad, all these things can be done. For example, which course will get enough registrations?

This is for the institute; or which school in the district needs more attention. Like which school is not performing well and why it is not performing well and what are the factors that are affecting its performance. So, do we need more attention or can we predict which school will not perform in the next public exam? That kind of information can be looked at as academic analytics or business intelligence.

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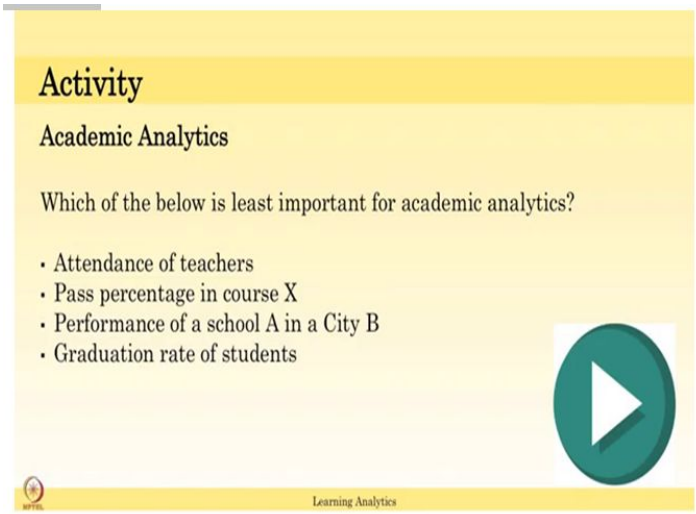

So, let us start with the activity for this video. You learned about what academic analytics is. So which of the below is least important for academic analytics? Or which of the below is not considered as academic analytics. For example, attendance of teachers or pass percentage of students in a course X or performance of a school A in a city B like a school in a particular city or graduation rate of students in a particular university. You can pause this video. Think about your answer, write down your answer. After writing down, you can resume the video to continue.

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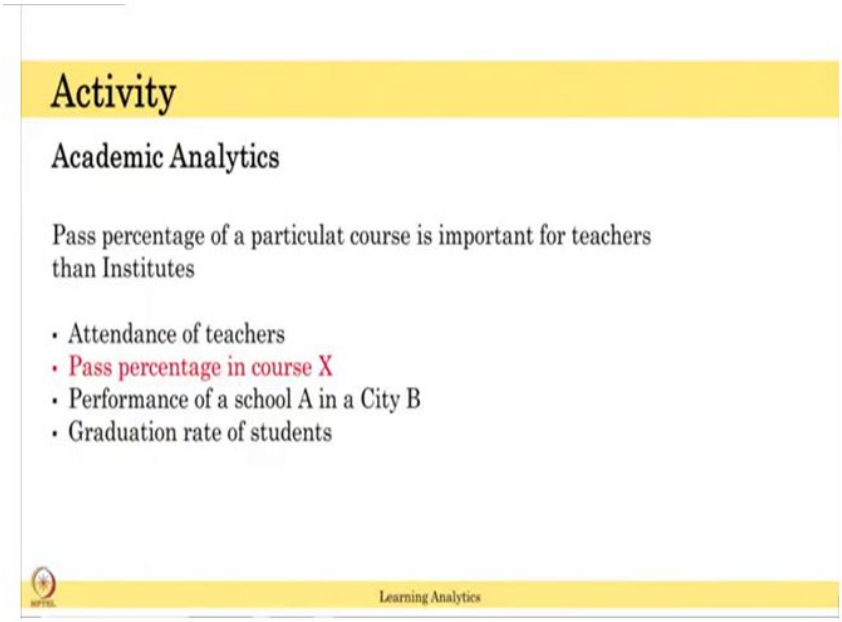

The pass percentage of a particular course is more important for teachers than institutes. It can be considered academic analytics for the institutes also. But, given other three options like attendance of teachers; which means the teachers of all the courses or performance of a school A in a city B, like we are comparing school performance among all other schools.

Or the graduation rate of students in a particular course over the years. We think the pass percentage is not as much important for academic analytics compared to it is important for the teacher; so, we can classify this as learning analytics. So, if I put pass percentage of a student in a course X; it is definitely learning analytics. But, given these other three options, even this can be considered to be learning analytics.

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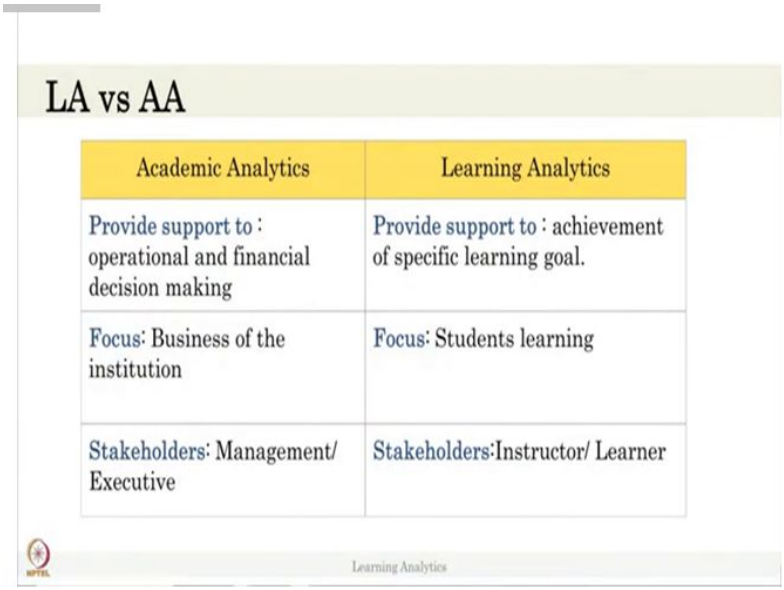

So, what is the difference between academic analytics and learning analytics? So, academic analytics provides support to operational and financial decision making for the stakeholders; such as management executives. The focus is on the business of the institution like the business of the institutions, or focus is on how to improve the education developed at a particular district. What are the new methods to implement, to improve the education of the country or something like that? Focus is very high level.

Whereas, the learning analytics, the achievement of a specific learning goal or the students' performance in a particular score or students completing the particular goal is very very important. Here the focus is on the student, the student who is learning; whether the student learns or not. So, the stakeholders can be students, instructors also researchers; also can be the institute management. But, mostly it is for instructors and learners. So, the primary purpose, the focus is on student and how can we help them to learn better. How can we help them to achieve their learning goal?

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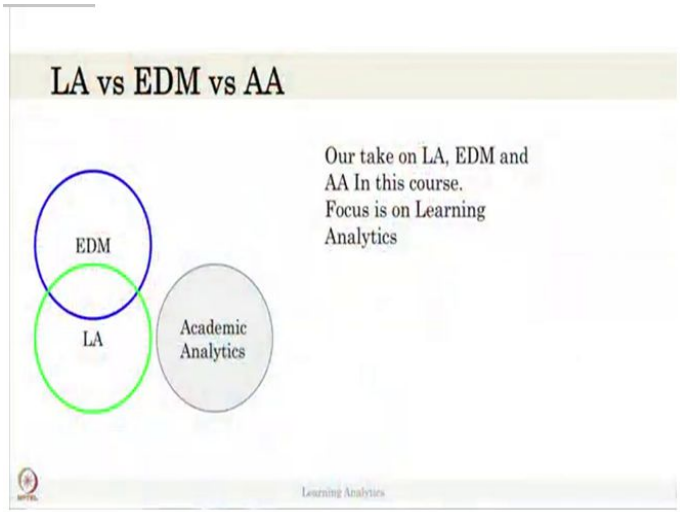

So, for us, our take about LA and EDM is this. So, we can see LA and EDM as interrelated; however, in this course, we will use the term learning analytics for all this EDM and LA related topics. So, we use one word called learning analytics. For us the academic analytics is an area which we do not touch; it is a kind of grey area. We might talk about that field very rarely; but the focus of this course is only on learning analytics, and we might call the techniques, algorithms in EDM also as LA. This is our take for this course.

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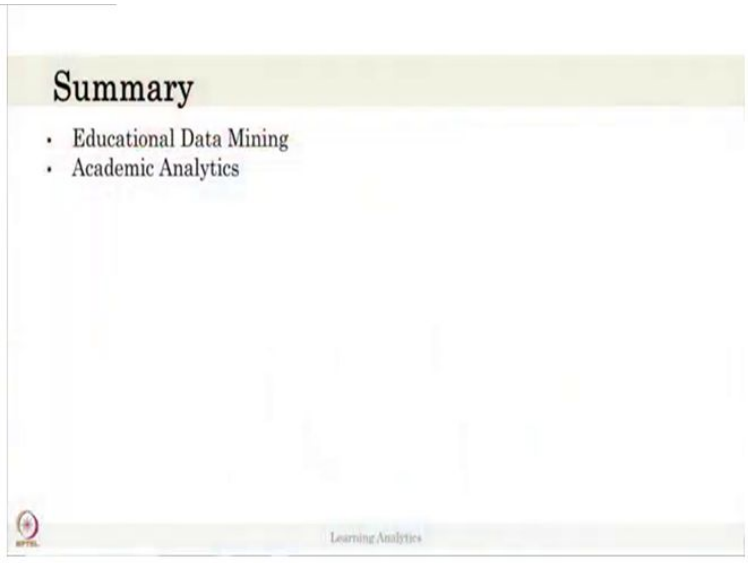

So, in this video we talked about, what is educational data mining; also what is academic analytics; and you might have understood the difference between LA and academic analytics. In this course as I mentioned EDM and LA are the same for us and also we used the term called LA going forward. And we will not talk or focus on academic analytics in this course. Thank you.