**PODCAST: Learning analytics: Why, What, How – Valuable tool for teachers and learners**

**Episode 3, part 2: How do I use learning analytics in my teaching?**

This is a “Why, What, How” podcast series in which we delve into the world of data and learning analytics from the perspective of teachers and learners.

In the third episode of our podcast, we hear how teachers from different fields use learning analytics in their own teaching. In this episode, we'll hear how **Vesa Lappalainen**, Senior University Lecturer from the University of Jyväskylä, utilizes learning analytics in his courses. Vesa primarily teaches courses related to programming. The host of the episode is **Olesia Kullberg**, lecturer at LAB University of Applied Sciences.

OLESIA KULLBERG

Welcome to the ‘Learning analytics: Why, What, How – Valuable tool for teachers and learners’ series, where we’ll focus on the basics of learning analytics and why its use is so central in the development of teaching. We’ll discuss the role of learning analytics in supporting teacher decision-making and how it can help students succeed. The podcast series is part of the Digivisio work of higher education institutions.

In the episode How to use learning analytics in my teaching?, I’ll interview three teachers and find out how they use learning analytics in their teaching.

I’m Olesia Kullberg, Senior Lecturer at LAB University of Applied Sciences, and I have an expert guest here today, Vesa Lappalainen, Senior Lecturer at the University of Jyväskylä. Welcome, Vesa!

VESA LAPPALAINEN

Thank you! Glad to be here.

OLESIA KULLBERG

Would you like to share with us which courses you usually teach and what you think is special about learning in the courses you teach?

VESA LAPPALAINEN

Now, this autumn, I have Programming 1 until November, which is a course of 6 credits. And in January starts Programming 2 course, of 8 credits, that lasts the whole spring. These are difficult courses in the sense that when you construct new things on top of existing ones all the time, you cannot afford to fall behind in any week. The number of students on these courses is 250 in the autumn and 200 in the spring.

OLESIA KULLBERG

In which learning environment do you run your courses?

VESA LAPPALAINEN

Well, we have TIM: Interactive Material. We got the impulse about ten years ago when we discovered that it was too difficult to make interactive material online. We started with the goal of making traditional lecture handouts interactive. We needed to be able to modify them in the middle of the lecture if there were any mistakes. In other words, we now have a platform where students can complete assignments directly between theory parts and receive feedback on them.

OLESIA KULLBERG

Is it possible to collect data on student completion using the TIM learning platform?

VESA LAPPALAINEN

Yeah, we've got weekly assignments for students, we call them demos, so they get automatic points when they complete assignments. They get feedback when the deadline for the task closes. Or in other open courses without time limits, the student locks the assignments and then sees the model answers.

As the teacher, I can see each attempt the student has made in the weekly assignments. Some may have a few attempts, others have dozens and hundreds of them. On the basis of these, you have to think about what goes wrong in the way you think. A good example of this is if the teacher hasn't remembered to say something that's obvious to them, you can find out by looking at the answers and asking yourself why the students have chosen to start it this way.

And then students see their own weekly progress.

I can see when tasks have been done, whether they have started doing things on time, in the last minute or whatever else you can imagine. Then, I see particularly well how much they've read the materials. And then, during the live lecture, I can ask these live questions that the students can answer. And then we look at the distribution: can everyone answer it or do we have a lot of wrong answers? Based on this, I can then direct the progress of the lecture, so that this issue will be addressed further.

OLESIA KULLBERG

Let's talk a little bit more about homework or weekly assignments. You mentioned at the beginning that in programming you always need to learn one thing before moving on to the next one. Would you tell us more about what data you collect on these homework tasks and how you analyse it?

VESA LAPPALAINEN

Before starting the following week's assignment, each student must up their score: if they didn't know the basic tasks, they must then be raised to at least seven points in our category. And the idea is that before starting a new week, you should definitely know what the answers were for the previous week. And the students can see it marked in red, white or green according to how well they’re doing. I have a table where I can see the same thing very quickly and I can easily filter out students who have difficulties. I can use the table for those who have difficulties and send emails in such a way that it looks private, but from my perspective it goes everyone at once.

OLESIA KULLBERG

In addition to weekly assignments, your study unit also has an exam. So, do you analyse how the results of the weekly assignments affect their performance in the exam?

VESA LAPPALAINEN

After the exam, I get a diagram, for example, in which, in addition to other information, I can also see how the weekly assignments rank compared to the student's test result. And often you get a cluster of students with a lot of completed assignments, but a poor quiz result. And there are many reasons for that. Some may experience nervousness. Another one might be sick during the exam. For example, it’s now exciting to see whether the cluster is growing for those who use artificial intelligence to solve tasks and not complete them themselves.

OLESIA KULLBERG

Do you compare the data accumulated over the years and are you able to use it in the development of the study unit?

VESA LAPPALAINEN

For all years of teaching, I’ve drawn a curve, which shows how each year has been. And the purpose of this is to see if there’s a week when people just disappear from the course more than some other year. And the aim is to correct the weeks either by centralising them, by providing more education on what’s been difficult there. Or then you warn the students that the following week has traditionally been somewhat more difficult: it’s a good idea to focus now!

OLESIA KULLBERG

Can the collected data be used to predict the behaviour of students during the course?

VESA LAPPALAINEN

Well, you can't predict how they'll behave, but you can predict how they're going to do in the course.

My colleague Denis Zikdkikh is the main developer of TIM. He’s carried out research on how approximately 200 measurement objects that we can extract from the course predict success.

It’s clear that if you've taken the course in the past and do it again, then the forecast will be rather poor, because for a student who has previously taken the course, things will feel familiar at first and then they’ll not start working immediately. And when work has already started, then one day the other students will go past you and then it’ll be difficult to accelerate again.

On the other hand, the student may have the impression that if I’ve never heard about programming, I can't do anything here. But it’s been clearly demonstrated that the lack of previous knowledge isn’t a negative prognosis; they’ll certainly do just as well as those who have. It’s still somewhat unclear whether the previous knowledge is even a burden or not; there are some contradictory results.

Then, you can make observations that entrance exam points don't always correlate with success, for example. In other words, those who enter as good students may not notice that we’re now in a place where we have to work from the beginning. On the other hand, those who have poor entrance exam points may already realise that they need to work straight from the start. And they might do better at least in these initial courses.

After all, the aim is now that, in a way, based on these studies, we could perhaps get something that would predict success and show the students in advance that you have to work hard now. I'm not entirely sure how you could tell this to them: is it motivating to tell someone that our indicators show that you won't be able to succeed in the course? Or vice versa: if we tell them in advance that you have such good genes here that you’ll manage, then the student won't engage. There will be quite a few moral problems here if we start forecasting; how you do share about the data? But let's see what we can do about it.

OLESIA KULLBERG

If we now talk about student life, how can they use the data collected in the course on their progress?

VESA LAPPALAINEN

It does leave them with a record of each assignment and all their attempts and scores, and the feedback they've received. And then you can use the feedback next time. It, then, accumulates a weekly balance and accumulates the weekly scores for the entire course, the colours indicating how they've done.

Then, they’ll have a calendar showing all the deadlines. We have quite a few smaller tasks, where you must give debug samples and show the task in many instances and so on.

Then, the possible approvals and any remarks. Then, they’ll also see how they've managed weekly in relation to the other course, the average of the course. I don't know if it's encouraging or depressing to see how your own pillar evolves each week.

But eventually, you’ll see the exam score for the course. During the exam, you can see your own score. And right at the end of the exam, you can see the final score of the entire course and a text description of what’s still missing. For example, a debug sample is missing. That's the kind of stuff they see there.

OLESIA KULLBERG

If we’re talking about limitations, have you noticed any limitations in the use of learning analytics or in the results it produces?

VESA LAPPALAINEN

Personally, I don't think we should talk about learning analytics in the first place. I think the word "learning" is used too easily. I don't actually believe that true learning takes place during the course. But learning can't happen without the work. So that's why I, personally, see to it that I get the performance analytics there. I’d say it takes a very long time, for example on Bloom's scale, before you can say you're at the point where you can create something new.

OLESIA KULLBERG

Thank you, Vesa! It was very nice talking to you today, and it was great that you were able to share your expertise with us. Thank you!

VESA LAPPALAINEN

I'm really glad you got in touch with me. Thank you!

OLESIA KULLBERG

Thank you also to the listeners for joining in this interesting discussion on the practical applications of learning analytics in education. We hope this podcast gave you the impetus to gather useful information about your students’ learning process and how you can apply it. Olesia Kullberg is responsible for producing and editing the episode.