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

**Episode 5: How can I use learning analytics and AI to streamline the assessment and feedback process?**

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 final episode, we discuss the role of learning analytics in the assessment process. We consider what can be automated in the feedback process and how learning analytics can enhance the giving of feedback. We also discuss how artificial intelligence affects the assessment and feedback process.

Expert guests include **Jussi Pekka Järvinen**, Head of Training, Teaching and Learning Services of the University of Helsinki and **Niina Halonen**, entrepreneur and Doctoral Researcher at the University of Helsinki, Research Group in Educational Psychology. The episode is presented by **Olesia Kullberg**, Senior 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 this final episode, we’ll discuss the role of learning analytics and artificial intelligence in the evaluation process. In the first episode, we discussed what can be automated in the feedback process and how learning analytics can enhance the giving of feedback. After this, we discussed how artificial intelligence affects the evaluation and feedback process.

Our first guest is Jussi-Pekka Järvinen, Head of Training (Educational Technology Services) at the University of Helsinki. Welcome, Jussi-Pekka!

JUSSI-PEKKA JÄRVINEN

Thank you.

OLESIA KULLBERG

Would you like to start by talking about yourself, what your work entails and how learning analytics and artificial intelligence are involved in your work?

JUSSI-PEKKA JÄRVINEN

I first started studying computer science and then swiftly transferred to teacher education and graduated as a special education teacher. At that time, digital this and that was the thing, and, after graduation, I stayed at DigiErko to start projects together with two colleagues at the University of Turku. Then, alongside DigiErko, we launched a minor subject of 60 credits in digital learning and teaching, and the areas of responsibility were partly related to learning analytics. Before arriving to the University of Helsinki, I worked at an education export company called Edute that brings the learning platform Ville to the world. There, my responsibilities were specifically related to the development of education, including the pedagogical development of learning analytics together with other experts. In other words, learning analytics, data, and the use of technology to improve learning and teaching have practically always been central in my career.

OLESIA KULLBERG

We could start our discussion with a case description. I’ll now describe the situation of an imaginary teacher, shall we see how we can help that teacher? So, I’m Minna, I'm a teacher, I'm currently teaching three different courses, and there are several implementations for them. A couple of implementations are online, one implementation is an intensive week, and the rest are such where I see students once a week and the remaining time they work independently. In total, I have a few hundred students in these courses. I also have other tasks. So, I'm busy. A few hundred students means a few hundred course grades. And that’s difficult. Evaluation is the most difficult task for me in the first place for two reasons: it takes time to get to know the students’ results and give feedback, and it’s also a rather heavy process because it involves a bunch of recurring routines. It's also very difficult for me to decide on grades, and I often feel that I’m alone in the evaluation work. So, could learning analytics help me in any way?

JUSSI-PEKKA JÄRVINEN

The short answer is yes, or at least we hope so. Now as I answer, I could be making predictions or talking about an ideal situation. Of course, how all this happens in concrete terms depends a great deal on the environment and the tools we use.

The first thing that comes to mind here is that when you have quite a large number of students who produce different traces of their work in different ways, learning analytics will, in principle, enable us to use the right tools, so that we can have a standardised view of the development of competence or progress in the course. So, we basically get a formative evaluation perspective from these different courses. And when it’s based on some defined intermediate stages, it’s somewhat comparable.

Another thing that I'm thinking is that, in a course like this, we can carry out some automatically evaluated assignments, in which case the evaluation burden can partly be outsourced to technology. And I don't mean handing over the responsibility for evaluation to tech in any significant way. But doing it so that the learner's competence development is divided into smaller parts during the course from a larger final exam. In other words, at least part of this group could complete these small chunks, which are then automatically evaluated; they'd be tasks planned in such a way that you get feedback that I, as a teacher, might’ve written in advance. So, the students also receive support and immediate feedback on their work during the course, which also supports the development of their competence during the studies. And, of course, all of this leaves me with analytical information or data that can be analysed.

It’s now possible that, if the tools allow it, such a large mass would be particularly helpful if the teacher had some kind of predictive analytics in place. So, the learning environment could, for instance, tell me that these ten learners stand out from this mass. In other words, they run a greater risk that the study unit remains incomplete, or their performances start to show something different from those of others, so as a teacher, I can allocate my limited resources to these people. If we use the word 'differentiate', then in some way I’m differentiating my presence to these people.

Of course, there's a person involved in the process. We’re not blindly relying on machines to do everything. However, if we define in advance where we want to collect information and with which parameters, and then give feedback written by humans or why not, today, perhaps some written by artificial intelligence, it will reduce the teacher's burden quite a lot. And, as regards the final evaluation, I have quite a lot of data to support my evaluation. That means I can mirror my own evaluation of a thesis or whatever the course may be about, to what this person's work in the course otherwise looks like. And, if I also have the evaluation criteria defined, and both of these have an impact on the final grade, I’ll have at least partly objective data and observations to support my subjective or partly subjective view.

OLESIA KULLBERG

You also talked about automation, in which some of the tasks could be divided into tasks that are automatically checked with some tools such as Moodle. That’s where you could also give ready-made feedback. What else could automation include?

JUSSI-PEKKA JÄRVINEN

Automation, in this case, can be more than just automatically evaluated tasks. When we talk about learning analytics, we also start talking naturally about its possibilities from the perspective of the adaptability of the material. In other words, when we can use analytics to deduce certain things from data, we can adapt the material that the student works with. For example, these kinds of scenario tools can be used to create alternative paths, which you then end up with based on parameters that may arise from data through analytics. I do need to admit that this requires quite a lot of the teacher's time. The more creative you are with combining different tools, the more you need to plan and do manual work to build the path. I mentioned feedback. In a way, evaluations can be carried out even though such evaluations can be somewhat automated through matrices. Here we are in a new situation, where various attractive tools of generative artificial intelligence and large language models are available, and yet I’d like to emphasise that even if they could be used to mirror, for example, a list of criteria, an evaluation matrix and use it to evaluate a written text, we’re still in a situation where, in some respects perhaps even legally, we still need a human being in the loop, so we can't quite outsource the evaluation work anyway, even though these latest technologies are quite bewilderingly capable.

OLESIA KULLBERG

Well, why should learning analytics be used in evaluation?

JUSSI-PEKKA JÄRVINEN

Inevitably, it’s happened and happens that more and more of our work takes place in digital environments, leaving certain artifacts on the digital platform of everything we do as students. So that data already exists. Learning analytics provides us with a better understanding, whether it’s the students’ learning, competence or coping, or the functionality of your teaching, and all such things that are often difficult to get a good overall picture of otherwise. So, the question is why would you not use it when the data exists and is stored in the systems? The answer is often time resources, competence. I'd rather approach it thinking how to get better, easier-to-use analytics tools integrated into existing tools used by the teacher, so that we can take advantage of one of the very important improvements brought about by digitalisation. In other words, we’ll have an objective indicator of what’s happened, and we’ll be able to complement our own understanding of the big picture. And, by means of formative evaluation, for example, it provides a very good channel for us to see the process, to see development, to return to a certain point and to provide the student with dialogue through it. So, yeah, I think that in analytics it’s great, if it’s built so that it provides the student with feedback on the development of their competence, this way they’d be able to assess what they should do more or less and so on. Because we’re realistic, most higher education teachers don’t have the time to give personal feedback to everyone in a three hundred-person course. Pretty amazing if once during that course, but even that’s not always a reality. Not to mention that you’d always be there for every week's assignments to fuss about and write feedback. This gives us more hands, more digital hands to help the teacher.

OLESIA KULLBERG

Learning analytics provides objective information about the learner's progress during the course, but it’s not enough on its own. The teacher's personal feedback is very important to the student for many reasons. However, providing personal feedback is a very time-consuming process. In addition to learning analytics data and automation, could the teacher get help from, for example, artificial intelligence when they start writing personal feedback to students?

JUSSI-PEKKA JÄRVINEN

This is a really good question, indeed, and I think we’ll be seeing rather creative solutions in the near future. In principle, these language models can already be utilised, for example, we have a plug-in in Moodle that brings additional functionalities there. And one possibility could be that the teachers themselves define certain criteria for feedback (they could give a few samples of the style of the text they use, so that the text would be closer to something actually written by them) and then the language model analyses a short essay answer or written text and gives feedback based on the defined criteria regarding the text. It’s highly likely that in many cases, the student would probably be very happy to get feedback, and it would even be good feedback. However, in my opinion, this must be transparent: you need to tell them that some of it is feedback from artificial intelligence, or that artificial intelligence has analysed and produced feedback based on text written by the teacher, or something similar. This way it'd also be clear to the student. And, yes, according to my experience, nine out of ten, the feedback can be very good, but then you get this criterion in the essay that causes the language model to come up with more unusual feedback and that can cause confusing situations. In other words, the human-in-the-loop aspect of this will probably be involved in this for quite some time; it’ll require the person there.

On the other hand, I know that there are also services (which have existed before ChatGPT and linguistic models and such) that analyse, for example, the feedback given by the teacher, save it, and then provide feedback from there. So, when you evaluate a hundred similar tests or essays, it tells you that ‘Hey, here are the same elements, you have given feedback on three of them earlier. Would you like to reuse these?’ And, so, instead of generating feedback directly, it’s offered to the teacher according to the principle ‘because you’ve done this before...’. In a way, it's autofill type feedback provision. All of these can potentially save a lot of the teacher's time.

OLESIA KULLBERG

Let's continue with the application of artificial intelligence to evaluation and invite our next guest to the discussion. Niina Halonen, a doctoral researcher at the University of Helsinki from the research group on educational psychology and also an entrepreneur. Welcome, Niina!

NIINA HALONEN

Thank you! Nice to be here.

OLESIA KULLBERG

Would you first like to tell me about your background and your research? How are digital teaching and artificial intelligence related to your work?

NIINA HALONEN

Yeah, I'd love to. So, I’m almost at the finishing lines of my doctoral dissertation. And, of course, I've worked with and studied these topics for years. Well, collaborative knowledge creation in the digital and now also in the AI era is at the heart of my own research. I’ve recently published an independent study, the role of AI was seen in a group innovation/brainstorming session; and then we’ll examine what role AI can play when we're learning together.

OLESIA KULLBERG

Thanks, we just talked with Jussi-Pekka about how technology can help in the evaluation process. As an example, how automation can provide real-time feedback to learners about their learning process and also how we can use the available learning analytics on the learning platform. But what else would you suggest; how could we improve and perhaps facilitate the teacher's work in the evaluation process?

NIINA HALONEN

This is one way; learning data in real time on platforms to provide feedback.

Of course, the extensive language models that have emerged such as ChatGPT, Bing and Google's Bard, they, them... "they" or "them", this is just that this personalised, the artificial intelligence. These platforms can also provide and help with certain types of feedback. Of course, we always need to remember privacy and other important safety factors. In other words, the teacher can, for example, generate ready-made answer templates, which they then personalise before sending them to the students. So, to a certain extent, this is also a kind of routine, but of course the teacher's personal touch is a good thing. However, we still believe that the teacher is the best expert for these learners. Even artificial intelligence can’t do everything. But there are a few ways that you can easily use.

And, of course, the learners themselves can make the system reflect and ask questions about the topic they need to learn, even at home, with the right commands. So, it's also important to find ways for the students to easily assess their own learning. We don't need to leave it to just the teacher. So, this self-regulation also involves understanding and taking responsibility and not waiting for the teacher to always be the one who gives me feedback on this. I can give it to myself. Peer evaluation and peer feedback are also very important. And reflection in general: how do we learn together as well?

OLESIA KULLBERG

You usually talk about artificial intelligence or “artificial support intelligence” as a member of the learning community. And now that you were talking about these language models, you said "they" and of ChatGPT you often use the pronoun "them". But if we have a technology that is a member of the learning community, how does it affect evaluation?

NIINA HALONEN

Yeah, this is the core of my own research, too. In my previous article, I specifically examined a communal learning process through system theories, and there, artificial intelligence, technology, was given agency. And that agency in that study meant that it pushed and fed a group of students to produce something new. In other words, the most recent research emphasises this, so that technological artifacts such as what the ChatGPT provides, also have a certain agency. When I started my own research work, it was considered a crazy idea how technology can be a member of the learning community. No way! That's out of this world. But now, really, in the last year, we've noticed that this is how it is, because, for example, just for example, there's group work and thoughts are stuck, so yes, you can get a new seed of thinking, when you ask ChatGPT, for example, related to the topic, just plant crazy ideas. Yes, it’s a member in the sense that it helps people surpass themselves, to get out of the bottlenecks that inevitably appear in learning, which are needed.

Even if you think about it as a member of a learning community, technology doesn’t necessarily always have to be the one that only provides ready-made answers and correct answers, but it can also cause confusion, because confusion in learning situations is actually very significant. In other words, learning isn't straightforward from A to Z. Instead, you should make an effort there, you need to tolerate uncertainty. And even in my research, technology specifically brought these challenges to that situation, but at the same time it fuelled new thinking. And when a group is able to overcome these challenges, they have a genuine opportunity to learn, understand and create something new.

I think your question about what this means in the evaluation is still unanswered. Artificial intelligence solutions have naturally changed the entire field. So, we must also stop and think about what kind of learning and competence we want to support. The whole idea of how learning is understood must be rethought in the age of artificial intelligence at the latest. Just transferring information, meaning, remembering certain things and vomiting them on paper and forgetting them after the exam, is no longer working. Or in homework, an essay alone or, for example, a learning diary alone, doesn’t work as such, because now learners who are able to use language models, for example, can get the exam answers or essay answers needed with just one click. However, they can also be covered up so that you can’t tell whether artificial intelligence has written them or not. So, first, you have to think about what kind of competence and what kind of learning we want to support.

And now we’re talking a lot about the need to reform certain types of tasks. The tasks must include critical reflection, analysis, perhaps bringing in a case study, perhaps considering it genuinely from a personal perspective, and linking it to one's own life. Because language models are not yet able to give everything ready-made. So, the evaluation is linked to the concept of learning and this way to also making the entire process more visible.

And then we need to teach our students how to use these solutions. This will change so rapidly, and they must be incorporated into your own thinking and work process. So, we need to make it visible that this item is from ChatGPT, a reference. This is my own thinking. This is our common thinking. So, you need to break it down. And then we come back to the process, showing the whole process that's been happening there. And we take it as a criterion for evaluation, how well you may have been able to mirror the answers from ChatGPT to your own thinking.

OLESIA KULLBERG

You mentioned the essay, and the essay is probably an assignment that at least every other course requires the learner to work on. And, as you said, you can easily get them ready-made now. What is, then, the future essay?

NIINA HALONEN

Involve AI in this, what I mean is that it's not prohibited, prevented, threatened with, but, of course, it must be considered in every subject: how can AI support learning? And is it one source among others, marking it down, of course. The answer artificial intelligence produced cannot be used as your own thinking. Instead, we can already teach that it's one source that we really need to take a critical view of.

And no doubt there'll be more going towards diversifying tasks. In other words, you can build different paths around the essay. This was in a Facebook group, I can't remember whose example, but the teacher had posted that instead of writing a traditional essay, they did an AI-assisted assignment where they put the AI in different roles: it was a knight in the Middle Ages and then it was a third-grade learner; and they had to think about how to teach them a privacy policy through these different roles in the essay. The old assignment was ‘Write an essay of 500 words on privacy statements’. So, now through these roles, there were five to six of them, they included the artificial intelligence that inspired the work. And the end result was based on these, what’s a good privacy statement? So, tell me, share about and, of course, mark down what's your own thinking. So, this is how you can change the assignments.

OLESIA KULLBERG

Thank you, Niina! Very good and concrete examples. Artificial intelligence is useful for many things, but both you and Jussi-Pekka also mentioned the importance of the human in this process. Let’s talk about the obstacles that exist in applying artificial intelligence to evaluation. Jussi-Pekka, in addition to data protection, what other challenges and obstacles are there?

JUSSI-PEKKA JÄRVINEN

The challenges are related to a couple of things. That is, on the one hand, the way these large language models work is, at least partly, a so-called black box mindset, meaning that things get confusingly complicated for algorithms to chew on, and, at the other end, some really beautiful stuff comes out. But why we get this answer and why does this combination give it, an individual teacher can’t really understand it very well or see behind the scenes, why it gave this feedback? And it brings with it a lot of questions about how well this can be used in evaluation.

On the other hand, when we think of evaluation as a certain kind of official business or official function, as I understand it is now coming at the EU level, there is already a little regulation on what AI can and cannot be used for. So, in a way, what kinds of things can and cannot be outsourced, so that this view alone can be considered. I’d somehow see that the best promise in these is a preliminary evaluation or some kind of groundwork on behalf of the teacher, finding the repetitive items there. That’s when the teacher can, in a way, look from top down when technology is used to support evaluation, as is already the case in a certain sense, for example through learning analytics, but the teacher compiles it and makes the final decision on it.

You mentioned privacy. Of course, because these AIs require huge amounts of computing power to operate, at least generative AIs, they usually run in a cloud service. Some companies offer it as a product outwards, and quite a few of these companies don't operate in the EU alone, so GDPR questions emerge very quickly. At the moment, we’re still in the midst of such a rapid change that I’d perhaps be a little cautious about the use of AI in the evaluation and, at least, I'd ask the data protection officers for their own organisation's views on whether this can be done or not.

OLESIA KULLBERG

Niina, do you have input for the challenge/obstacle list?

NIINA HALONEN

Obstacles to infrastructure, they must still be about things like certain applications don’t work for everyone. This prevents the teacher from necessarily having access to them, which means that they don't understand, for example, what students can use at home. That is why one of the obstacles is, of course, a lack of awareness. So, training, both technical competence and pedagogical understanding, must be increased so that artificial support intelligence solutions can then be used in these learning and evaluation processes.

Information security is the most essential one: everyone works according to the policies of their own educational institution or municipality.

Then, of course, we must remember how these language models are being developed at the moment, and the information provided by the users will be used to train them. And now there are also big questions about how equal, for example, the AI responses are, whether the processes used to develop these are transparent enough so that there aren't any hidden messages there, and so on.

Ethical reflections are also important.

So, there are obstacles. But, of course, it may be better to start with potentials and think about what this could mean in your work. And it also seems easiest to think about what it could mean to use these tools to save time at work. Of course, all of this is aimed at supporting learning and at supporting the citizens of the future. In other words, it’s a mission all of us in the field of education share. This should really be a civic skill, that you know it, understand it and can use in a manner that suits you.

OLESIA KULLBERG

Thank you, Niina and Jussi-Pekka! Great conversation! It was very inspiring to talk to you today.

NIINA HALONEN

Well, thank you! Likewise!

JUSSI-PEKKA JÄRVINEN

Thank you!

OLESIA KULLBERG

Thank you also to the listeners for joining in this interesting discussion on the role of learning analytics and artificial intelligence in the evaluation and feedback process. We hope this podcast gave you inspiration to how you can use learning analytics and artificial intelligence in supporting the evaluation process. This was the last episode of the podcast ‘Learning analytics: Why, What, How - Valuable tool for teachers and learners’.

Olesia Kullberg is responsible for producing and editing the episode.