**Driving creativity and innovation in the classrooms through coding**

**Speaker 1** [00:00:00] Welcome to EU Code Week Podcasts. We bring coding, computational thinking, robotics and innovation closer to you, your community and your school.

**Speaker 2** [00:00:20] Hello everyone and welcome back to a new episode of the EU Code Week podcast series. My name is Tommaso Dalla Vecchia and today I have the chance to co-host this episode with Arjana Blazic.

**Speaker 3** [00:00:32] We are part of the EU Code Week team that contributes to changing education in Europe and helps teachers and students adapt to the digitalized society of today and tomorrow. In this episode, we are going to talk about how learning coding and programing, can be the driving force behind creativity and innovation. We'll also talk a bit about tinkering in the classroom.

**Speaker 2** [00:00:54] Also, we are looking at what are the obstacles when it comes to teaching programing as well as what changes need to be implemented to facilitate the work of teachers. Today, our guest speaker is Petra Bohackova, she's a teacher and a Future Classroom Lab ambassador.

**Speaker 3** [00:01:14] Thank you for coming to our podcast, Petra. Could you tell us more about yourself, please?

**Speaker 4** [00:01:20] Okay. Hello, Arjana, hello, Tommaso, and hello, everyone. My name is Petra Bohackova. I am a teacher and also a deputy headmistress in the Czech Republic in a school that teaches children from 6 to 15 years old. I teach physics and I teach English, and I love to add into my lessons, digital technology and also robots and things like that.

**Speaker 3** [00:01:46] Thank you. So let's start with a more personal question. I know you are a very innovative person. Does knowing how to code help you enhance creativity?

**Speaker 4** [00:01:58] First of all, I think we have to say to the people that are listening, that to no coding, doesn't mean exactly to know a language, to code for me means to think in a more proper way and maybe to make some things happen quicker. To teach coding also means to play a game, maybe, you know a game, which is called Black Stories. It's a card game, you have a pile of cards and each card has got one sentence on one side and a story on the other side. You just read the sentence. "When she came home, she found out that her husband is dead", for example, because they are black. So usually it's about things like this. And your work or the work of the player is, to reconstruct the story. What happened? What's behind the sentence? Those who are playing are asking yes, no questions, and the one who is holding the card is reading the story and saying yes or no. To play this story, also helps kind of computational thinking. It helps children to learn code without learning that they are coding. After this game, you have to revise a bit. Which questions helped us to reconstruct the story faster? Which questions were useless? After this reconstruction, I think, it's a possible way how to how to teach and learn coding in different ways. This can help your creativity because you can ask proper questions, organize things faster. So I think this helps.

**Speaker 3** [00:03:49] Petra I would like to ask you about some obstacles for a teacher when it comes to teaching coding, computational sciences. What are the biggest challenges?

**Speaker 4** [00:04:01] When we start teaching coding and programing and we haven't taught it before, I think we have to answer a lot of questions. Why are we doing this? Why do I have to learn it? I want to be a shop assistant, so I won't need coding and programing at all. And I think these are very important discussion that you can have with your students. In the Czech Republic, we have a special subject which is called informatics. This school year on, we should add into informatics coding and programing. A big discussion was, where we will find informatics teachers who will be able to teach coding and programing. In some schools, there are still teachers who usually teach physics or I don't know and another subject, and because they needed more lessons, more hours. So they teach informatics. And when they have discussions with their children, about why do they have to learn informatics, it can be tricky to answer. Children can get bored and maybe they don't want to learn. You never have enough money, despite we are getting more. But some schools can struggle with this. In the Czech Republic, we are trying to help them. Ministry of Education prepared a special website where we can share good practices or when we can read successful stories from schools which implemented coding and programing. So this can be an obstacle.

**Speaker 2** [00:05:44] Code Week tries to make some, one of its missions in a way to ease teachers into teaching and learning about how to code. Would you have some suggestions for educators that are actually starting learning themselves about programing or computer science? Or that they're trying to use it as a teaching tool or that are actually now having these new responsibility, to teach them computer science, basics or elements to to their students?

**Speaker 4** [00:06:14] First of all, going to the webpages connected with the Code Week. I think it helps a lot because there you can find a lot of examples, tools that you can use inside your classes, and it helps you to code within different lessons. And what I can see in the Czech Republic, is that teachers like, under estimate themselves, because also on the webpages you can find a map with teachers or with actions that are connected to Code Week. And if you click on the Czech Republic, you see the numbers there. There are quite low, they come higher during, I don't know, October, but not very much. So when I talk to teachers, they tell me usually that they have nothing to put there, they have nothing to show, but it's not true. Even a small activity can help. And if there is another teacher who replicates the activity which you have put there, I think it might help to spread coding and programing into lessons and into different subjects. I would definitely advise to go there and to explore which activities, which tools, you can use and which activities you can do. To help teachers in the Czech Republic, some time ago, we also prepared a part of the page which is called IT Fitness, and we put the there 10, 12 ideas of lessons that you can use programing in them. In my experience, as I'm teaching English, we have robots which are called Dash or which is called Dash. You probably know it. I think it's the cutest robot under the sun. I use this robot in English, because you can upload your voice there. So it's not you who is speaking. Isn't the robot. Children who are not like brave enough, and who think that they cannot speak English at all, I prepare an activity with the robots for them. For example, we create a map of a city. There on the map, we put I don't know, a hotel, an airport, a train station, whatever you can find in a city. And these robots walking, wandering in the city, are like strangers and they have to find their way somewhere. So it's up to the children. The robot is at the airport and has to go to the hotel and during the journey it has to say something. So for example, there the robot goes into the supermarket and it says, I'm very hungry, I have to buy some food. So the robot is talking and I know that the child can, can say it in English, because it was him or her who uploaded her or his voice into the robot and said a sentence. Of course, it depends on the situation. There are children who can make robot interact, so they can lead the dialog or excuse me, is there a supermarket near here? Just go that way. This type of using coding and robots can help children with, who are shy, for example.

**Speaker 2** [00:09:50] Well, that's that's a very nice example of an activity that uses and teaches students how to code in a subject that normally people wouldn't think is the place for technical skills to be taught. But it's exactly also what Code Week tries to communicate. So, actually digital creativity, programing, robotics, they can be integrated across all different subjects and hopefully will serve as an inspiration for other language teachers, for instance, that would like to try. And I totally agree with you about the the confidence issue. So, many teachers are, sometimes they try to be discreet. They don't want to brag about it. They feel they are not good enough. But actually they are doing wonderful efforts to innovate, to bring to their pupils something new, something engaging, something meaningful. So they should just be proud of what they are doing and also give it a try, as you as you said. I would like to have your point of view, given the hard times that, of course, we all pass through and the fact that students and pupils had this overload sometimes and this relationship sometimes positive, sometimes less positive with technology, that any way, especially in its digital forms, is everywhere. Do you saw a change in the way your pupils interact with digital technology? And do you think that learning programing coding can actually provide them with additional instrument to converse with the Digital World?

**Speaker 4** [00:11:23] What I noticed like for sure, is that before this harsh times that we had, there were many teachers who were strictly against using technology in the classroom. When children entered the classroom, they had to hand out their mobile phones and they didn't use them during the lessons at all. And this definitely changed. More teachers are using technology. At least for going on Internet and trying to find answers or examples of something they are talking in the classroom. It wasn't like common before, I say it before the COVID era, that children had their personal devices connected to Internet via data. Nowadays, it's common that they have parents pay for the data and they can use them during lessons or playing games. But of course, we're learning. For example, last week we had a blended mobility Erasmus meeting and we wanted to show around our friends in other countries around the school. That was easy because we have the free wifi within the school. But we also wanted to go out the school and we wanted to show them how it looks like in the part which is called [00:12:58]Chakovitza?. [0.0s] And it was no problem at all. Almost each child had their data and could use them, and they were guides and they showed them around like professional guides, with their mobile phones, with connection via teams. So they showed them places which are special for them.

**Speaker 2** [00:13:19] And it's nice integrating this activity in the classroom or in the school or any way with your students, which I understand, of course, you you bring outside the four walls of the of the classroom to learn and share, really gives them the chance also to change possibly the mindset they have towards technology or smartphones or video communication. They can see that they also provide opportunities for learning, for sharing, for connecting. It's definitely very telling. Thanks for sharing that example.

**Speaker 3** [00:13:51] And even despite all these challenges that the pandemic has brought, it has put us into a different perspective, in fact, so we can see what we can do with technology, and thanks for describing how it can be used for the benefit of students. And speaking of benefits, what are the benefits for children to learn coding? You've already mentioned how it can help, for example, with learning languages. But my question would be, for example, how they can benefit from it after having acquired coding skills?

**Speaker 4** [00:14:24] To code, at least for me, it doesn't mean to know a new language, but it means not to make mistake, to think clearly and to plan, I don't know, my day efficiently, because I know how to decide, where to decide, what to choose. I know where to go, what to ask to, how to decide. To know coding, helps also with the real say normal life. This is the first thing. Then there is also another thing, that children will know how computers, how mobile phones are working and some of them maybe in the future, will help to create them. In our school we are trying to support when teachers want to cooperate and we also are trying to support when they want to create, let's say, kind parateaching or co-teaching, in some lessons. And I decided to connect with my colleague, who is teaching little children, like six years old. I said to myself, Mmm, you are a bit afraid of the little children. You don't know how to teach them. You don't know which activity you can do with them. So let's find a teacher who could help. And the other teacher said, mmm, I cannot work with technology. I'm like terrible with computers. I'm terrible with tablets. Who can help me? So we created the pair. We started to co-teach. And time from time, we prepare a lisson for children, with some technology. But also the other teacher implements the technology or what we did during these meetings into other subjects or into the daily life of the class. When the children were six years old, we started to work with little prints, and based on this book, for example, we create different planets. And these planets were only pieces of paper with a line on them. And we put them like we made a circle. And inside this we put an Ozobot, you know, that Ozobot follows the line. So it followed the line, like a, like a hamster in a reel, and the whole circle was moving around the classroom, and we said that these are different planets, as we can see them in in space or somewhere. Was this coding? Using the Ozobot? Inside the circle, we've created, I think very nice lesson or activity. And also, what we did was, with that, we made a competition, which planet is growing faster? And from that point, it is coding, because children knew that there are some color codes that Ozobot works with, and there is a color code which says to the Ozobot, go faster or go very, very fast. So they used it and they put it into the line, which was inside the circle, and those circles were moving quite faster than the others. This is how we, how we used at least basics of coding in a lesson or lessons with six years old children.

**Speaker 2** [00:17:53] Well, then I would quote you then, basically. Was this coding? Because it should work for the teacher, for the pupil, for that specific learning context or activity that is being designed. It is also something that we try to promote our self as an idea, that you can mix different learning activities and practices and approaches. Brilliant how you mixed some robotics with programing where, with tinkering. And actually my next question was really about tinkering. I wanted to ask you about that, because we think that is also a nice way to promote creativity and to give to students a sense of engagement. So, yeah, can you, can you tell us more about why and what kind of tinkering activities you you introduce in the class?

**Speaker 4** [00:18:43] I like when students are creating, can be a video, kind of podcast, let's say, or a stop motion. But also, we try to put hands on in other activities. Children like them, and I tend to not to be so strict when I'm creating the lessons. So, I know that we want to use this sensor and make a card, but it's up to the children or a group of children, which card day will produce or what the songs or will start or will do. After these lessons or these projects, I usually ask children to reflect a bit, and I usually put a sentence "What the teacher should do differently next time?". And there is usually an answer for nothing. Everything was perfect, so we would like to do it this way. So I think children honor learning and children like this type of activities.

**Speaker 3** [00:19:51] Being involved in the activity from the beginning and also provide them with choice, so that they decide what and how they are going to complete the task. Some time ago, you published a paper about pupils becoming game designers, not only players, but designers of games. How important it is to encourage kids to create and design with computers rather than just play, like or share?

**Speaker 4** [00:20:19] So, we designed a game and we repeated it, I don't know, three times let's say. In the first time we had children who only play the game, and we had children who designed the game and then they play it. And we gave them the same test or questions, the same questions afterwards. And we got the results that those, you were creating the game, they aswered better. Maybe we can conclude, that creating the game helps children to learn things. It's a coincidence that today we tried to design a game. So today we were choosing the topic of the game. And then we will work and we will see what we can achieve.

**Speaker 3** [00:21:08] And this is what they like, right? For the end of this episode, let's talk a bit about the changes required in the current educational system. How can schools help teachers with their activities? What insight can you share?

**Speaker 4** [00:21:25] It doesn't matter which subject we are talking about. Like in the schools, there should be the atmosphere of learning, helping and sharing. We want children to do this, but we as teachers, don't do it, or don't know how to do it. To share, to cooperate, to ask for help, for example. So if the schools can build a supportive atmosphere, the teachers don't have to go somewhere else for workshops to learn. They can learn from each other, inside the school. And I think this is a very important thing.

**Speaker 3** [00:22:08] Petra I think that sums it up very nicely. To wrap it up, I would say that it is important for teachers to start small, to do short activities, but also be inspired by their peers to learn from each other and have fun while learning, which will also mean that students will have fun when learning as well. Any last thoughts you would like to share with our audience?

**Speaker 4** [00:22:36] I think the most important is the pedagogy, is how we teach, is that we as teachers, we step back. We are not in the middle of the classroom and we are not the most important people in the classroom. Be brave, and try to click whatever you want because you cannot make any damage.

**Speaker 3** [00:23:01] Thank you again for joining us today. And I think that our talk was both insightful and constructive, and our listeners gathered a lot of new ideas for their next activities. Thank you so much for sharing your practical experiences from the classroom.

**Speaker 3** [00:23:19] It is my pleasure and your welcome Arjana.

**Speaker 3** [00:23:23] The pleasure is all ours. And to our listeners, we hope you enjoyed this episode and are now more confident in trying new things in the classroom involving coding and everything digital.

**Speaker 2** [00:23:39] Don't forget about CodeWeek.eu . Where you will find everything you need to get you started or keep you going in your code teaching and code learning journey.

**Speaker 3** [00:23:51] Don't forget to tune in next week for a new EU Code Week podcast episode, where we'll discuss new topics and ideas about digital technology, teaching and education. Goodbye.

**Speaker 3** [00:24:03] Goodbye.