##### [00:00:00.090] - Introduction

Welcome to EU Code Week Podcasts. We bring coding, computational thinking, robotics and innovation closer to you, your community and your school.

##### [00:00:22.410] - Eugenia Casariego

Hello everyone, and welcome this is your host speaking Eugenia Casariego and together with Arjana Blazic and we bring you another episode of the Code Week podcast.

##### [00:00:30.990] - Arjana Blazic

With this series of podcasts we'd like to contribute to changing education in Europe and adapting it to a society that is getting more and more digitalized.

##### [00:00:40.380] - Eugenia Casariego

Indeed, Arjana and also I wanted to comment that both Arjana and myself are part of the EU Code Week team, we're in charge of all educational resources and we're very passionate about everything, technology and, of course, teaching and education in general.

##### [00:01:02.010] - Arjana Blazic

In this episode, we are going to talk about coding for students with special educational needs. We think that we can encourage all students in our classrooms to give it a try. Very often students with autism, ADHD or some learning difficulties find they love programming.

##### [00:01:21.870] - Eugenia Casariego

Exactly. But how can we bring coding to these classrooms? Is there a specific methodology that we can bring about and is there any tips, tips recommendation? Is there something that we can actually do better? Well, this is something that we want to cover in today's episode, and so we have brought with us another guest speaker, Niamh Brady from Ireland, who will solve these questions and much more, Niamh, very welcome. How are you today?

##### [00:01:44.160] - Niamh Brady

Thanks so much for the invitation, and I'm delighted to be joining you here today.

##### [00:01:47.490] - Eugenia Casariego

Tell us a bit more about your expertise on the topic. Why don't you introduce yourself to our listeners, to our audience today?

##### [00:01:54.090] - Niamh Brady

My name is Niamh and I'm a primary school teacher in Ireland and I've been teaching for the last 15 years and 14 years of that has been in mainstream education. And in the last year, I've moved to special education and I'm actually working in a special school for the last year, teaching a special class. I have been teaching coding outside of school and during school for a number of years now. I had the opportunity to work as a special education teacher in mainstream, which is slightly different to what I'm doing now.

##### [00:02:22.920] - Niamh Brady

And I also taught coding to the students that I was teaching as a special education teacher. And I suppose that experience led me then or helped me grow in confidence with diversifying coding and it-that has allowed me to bring it into a special class setting in, in my new school.

##### [00:02:50.760] - Arjana Blazic

Before we start, can you please define a special educational needs so that our listeners understand it better what it actually means? What type of children does this include or what does it refer too?

##### [00:03:03.720] - Niamh Brady

For example, the class that I had this year, I had six students in my room. They were fifth year, so that means they were 16/17 years of age and they all had a diagnosis of mild general learning difficulties. And what that means is that they're lagging behind in all subject areas in comparison to older students of their age. And with that diagnosis, then they are entitled to access a specialist school setting, which is, which is separate to mainstream education. As well as my students having a diagnosis of mild gender learning difficulties,

##### [00:03:38.130] - Niamh Brady

they're also on the autism spectrum disorder.

##### [00:03:41.130] - Arjana Blazic

Niamh you've mentioned different needs that your students have. What would you say, how deeply can these different educational needs affect their ability to learn?

##### [00:03:51.540] - Niamh Brady

The needs of the children that I'm teaching they vary greatly from child to child. I might have children with severe literacy needs, so they find it very difficult to read or to write because they, they they are ASD students, some of them might stem a lot, which is like, maybe might be an involuntary movement, but that's them trying to self-regulate.

##### [00:04:13.660] - Niamh Brady

So that might be rocking back and forth, or they might be making noises to themselves to regulate themselves, to bring themselves back down. They might be nonverbal or pre-verbal or have a very limited vocabulary, or they could be a multitude of other different issues going on. And I suppose that's why it's very important as a teacher to know exactly what the individual needs of each pupil in your class is, and then to be able to address those needs and help them access the curriculum in a meaningful way, and also to allow them to, to grow individually and that you're nurturing their educational learning as well.

##### [00:04:50.190] - Eugenia Casariego

Do your students have major curriculum adaptations, or do they follow mostly the main curriculum of Ireland?

##### [00:04:57.520] - Niamh Brady

It's a different curriculum that they're following, so typically a fifth year would be, would in mainstream would be following the Leaving, Leaving Certificate cycle. For the students that I have are studying the QQI level three curriculum, which is equivalent to the junior cycle in mainstream secondary schools here in Ireland. So to answer your question, it's a slightly different curriculum. But it does mean that they can go on to access further education if they want to once they've passed the QQI level three curriculum.

##### [00:05:31.670] - Eugenia Casariego

Do we do enough to bring diversity to materials to special education needs schools, is teaching coding and computational thinking common in these schools or are you one of the first? Tell us a bit more about this then?

##### [00:05:44.750] - Niamh Brady

I'm only coming from my own context, so I don't know if I'm one of the first. I do know traditionally in the school that I'm in pre-COVID, they would have had a coding club on, on a Friday, and I know my class did stop motion animation last year. With, with their class teacher, I think traditionally in my school, exploring other avenues and expressing themselves in different ways has always been like a part of the ethos of the school that I'm working in.

##### [00:06:14.330] - Niamh Brady

But I do think in general, I don't think coding would typically be a subject that would be taught to children with special educational needs. I think people might have the misconception that it'd be too difficult for them. I suppose coding is relatively new in the primary school setting in Ireland anyway. It's only, in recent years that it has, has crept into our into our school setting and becoming more more the norm. From my experience of teaching coding and for my love of coding, and also from teaching it specifically to students with special educational needs and mainstream -

##### [00:06:45.890] - Niamh Brady

And I just I didn't even contemplate, I didn't even think about it, it just was, this is happening, I'm going to be teaching coding to my my fifth year group this year. And it was, it was a very exciting not going to say challenge, very exciting experience, and it was just amazing to see how the children were able to express themselves in different ways using the coding and even like a child that would have very limited vocabulary in my room -

##### [00:07:09.350] - Niamh Brady

How she expressed herself, how she spoke through her animations was just fabulous.

##### [00:07:14.690] - Eugenia Casariego

That is great to hear. The good thing as well about coding and programming is that there's so many different options, like there is visual programming languages, but as well there is text based and so there's so many options for them to learn, the thing that fits them, that fits their way of expressing themselves, as you were saying right now. So it's, it's great that this is something to be started, that we are starting on and that there's, of course, lots of work to be done as well in mainstream education.

##### [00:07:39.110] - Arjana Blazic

What type of activities do you do when teaching coding to your students? Do you see any specific tools or programming languages?

##### [00:07:46.700] - Niamh Brady

Yeah. So I suppose a few years ago, I actually did a postgraduate certificate in 21st century teaching and learning, and I from that course, I learned a new approach to teaching programming with students, and that's called the Bridge21 model. And it's, it's an inquiry based learning approach. So usually I'd start off my lessons by having a CS unplugged activity, and that's just to help the children understand the concepts that they're going to be learning in the main body of lesson.

##### [00:08:16.580] - Niamh Brady

And then once we've completed that, then we go on to look at the main lesson. I find with children that have special education needs, the more visual the resources, the better. So I'd have a lot of extras. So if I was using like a Scratch lesson, for example, I would have my own visual aids to accompany that lesson. These children need that scaffolding to, to help them access the curriculum and whatever individual lesson you're teaching. So once they've understood the concept, once we've had a talk about it, then it's very much leaving the children up to their own devices.

##### [00:08:54.500] - Niamh Brady

Really, you're giving them that space, that space for them to like at a safe space, for them to be creative and to express themselves. And some of them might have visual aids beside them or on the interactive whiteboard at the top of the room. I might be coding along and they have to follow me. It's very much pupil led, and sometimes teachers can be nervous using that approach because I suppose traditionally it's always been kind of teacher led.

##### [00:09:18.020] - Niamh Brady

So I very much once I've kind of delivered the outcomes and expectations and the success criteria, I step back and let them, let them loose, basically, and just let their creative juices flow, which is very exciting to see the end results, then it's very exciting.

##### [00:09:34.280] - Arjana Blazic

How they react to this because, you know, it's also difficult in mainstream education for the teachers to step back, also for the teacher to be willing to lose the control. So to say, and then also difficult for the students to understand that they own their learning.

##### [00:09:51.800] - Arjana Blazic

So how do they react to this?

##### [00:09:54.200] - Niamh Brady

They react really well to it because because of the age group that I'm teaching, like they're young adults, they're, they're finding themselves, they're like they're expressing themselves, they know that they're almost adults. So I think they like that element of freedom that I think it creates a great culture of trust in the classroom. It gives them a great self-confidence. And I think they like that freedom to be able to express themselves.

##### [00:10:20.480] - Niamh Brady

They have respect then for me that I'm allowing them that, that I'm not, you know, that's not a controlled environment that they can go and do whatever they want within reason, of course. And then they're able to show like, they all have different likes and interests, so the fact that they're able to bring that in they're really able to show their personality then in what they, in what they code. But they like that they don't have to copy what I'm doing -

##### [00:10:42.100] - Niamh Brady

they don't have to copy what the person beside them is doing, that they have their free rein to express themselves.

##### [00:10:48.760] - Eugenia Casariego

Yeah and to take ownership as Arjana was now saying for their own learning, I think it's really motivating.

##### [00:10:54.460] - Niamh Brady

They're more proud of their work then as a result because it's their work. You know, it's their ideas, their thoughts, their work.

##### [00:11:02.090] - Eugenia Casariego

Their decisions, ultimately indeed, and it's what they decided on. So yeah, I find this actually very valuable then to bring to special education because very often it's done the opposite way, you know, it's so control, and it's so without their decisions in mind, at least from my experience of special education in Spain, it's it's quite a bit the opposite.

##### [00:11:19.450] - Eugenia Casariego

So it's very good to see that there's already been done the contrary, you know that you let them decide. I'm curious to hear a bit more concrete projects and ideas that you've been developing with your class and that your students then have developed, what some projects, some applications of coding that you've seen in your class? I'm now very curious and excited to hear more.

##### [00:11:39.320] - Niamh Brady

Well, I try to vary it. So traditionally this year, coding happens every Friday, and the children they like routine and they're like, they don't like when there's change, so they know the coding happens on a Friday. So I started off at the beginning of the year, assuming that they had no prior knowledge of coding and then only afterwards then I realized that they had a little bit of experience with the stop motion animation. And actually, their digital literacy is very good.

##### [00:12:04.480] - Niamh Brady

It's one of the modules that they would have completed for their junior cycle. So they are very au fait with digital technologies, and a lot of the kids in my class would be gamers as well at home in their free time. So just to help them understand the whole concept of coding and block based coding and snapping the code together, so that little run, I used an online resource called Blockly and that helped them become familiar with, as I said, snapping the code together.

##### [00:12:31.480] - Niamh Brady

We were using Chromebooks, so even using the mouse pad to even drag and drop, that was for some of them with fine motor skills, they found that a little bit tricky, so it was a good activity to, to help them develop that skill that they'd need to go on then for Scratch or LEGO WeDo, or whatever other block based programming platform that we're using. So once we'd achieved a few levels in the Blockly, we progressed to Scratch then because we were getting ready for Code Week and they really, really enjoyed Scratch.

##### [00:13:00.610] - Niamh Brady

I would have it on the board so they could clearly see the workspace area, the different categories with all the different color coded sections. So once I talked through all the different sections and explained it to them, then we just started off small and then built. Each week we gradually built on it, and then we were ready for the Code Week animation that we all did. And the children all did that individually, and it was like there was very little input from me or the special needs assistants working with me, and they really, really enjoyed it.

##### [00:13:32.200] - Niamh Brady

And then we showcased all their work on the boards afterwards. So it's really nice for them. Because of COVID, we have to all maintain social distancing practices. So it was really nice to be able to see each individual project and open there on the big screen. And there were very, very again, very proud of the work. They were delighted with the certificate they got, it just meant so much to them and they felt, Oh! We're the only class doing this.

##### [00:13:54.880] - Niamh Brady

It just felt as if, they felt as if they were brilliant and they are brilliant!

##### [00:13:59.290] - Eugenia Casariego

They are. Yeah, that's so, it's so great to hear and I'm glad that Code Week provided them this opportunity of recognition, of their work and of their efforts, So it's, it's really good to hear as well from your side how that worked. So yeah, that that's really amazing, and I'm really glad that your class then collaborated to Code Week eventually, that's the whole idea of Code Week is to bring people together to recognize the students work and students creativity.

##### [00:14:20.980] - Eugenia Casariego

So. So thank you very much for that.

##### [00:14:23.860] - Niamh Brady

Yeah, we were so successful with Scratch and we kept up with Scratch. But then, as I said, I like to vary it up a bit so that it's it's different every week. I actually have a class set of micro: bits. So once they had learned the basics of Scratch, then to just change it up, we applied the same skills and knowledge in Microsoft MakeCode, and the interface is quite similar to Scratch. So they're able to transition almost seamlessly from Scratch then to the Microsoft MakeCode.

##### [00:14:51.430] - Niamh Brady

What I liked about the micro: bits then had something tangible. Something physical with Scratch its very much on the screen, and they love that, they love creating the animations and cartoons and things like that. But then for them to have a physical device in their hands that they have coded and told what to do, that just brought a whole new dimension to the class and to the, to our coding experiences. So that's another area that we did. We also followed along a few episodes of Microsoft DreamSpace.

##### [00:15:18.820] - Niamh Brady

So I'm not sure if you've heard of dream space here in Ireland, Microsoft in Dublin have a dedicated DreamSpace center. And before COVID, children could go up there and participate in coding events face to face with the experts up there. So during COVID then, they created TV programs that you could follow along with coding so we could have a live teams call with the experts in DreamSpace, and they would teach a coding class to the class via the interactive whiteboard.

##### [00:15:46.980] - Niamh Brady

So we actually participated in an arcade game, and the children all designed their own retro arcade game using Microsoft Arcade, and that just blew their minds completely. It was fantastic because this has been delivered to mainstream schools as well and to see my class and, you know, just been so capable and they just enjoyed it so much and got so much from it. We kind of just chop and change each week. We also use Lego WeDo again -

##### [00:16:12.120] - Niamh Brady

they love that because they could build something and then code it, which was very enjoyable. And we also participated in Hour of Code, and they completed a curriculum on code.org as well. So they've had huge exposure to different types of coding, and it's funny some of them will have a preferred platform over another. And sometimes, yeah, on a Friday, like, can we do this one instead? Or, you know, and then I had to take in turns, OK, we will do whatever so-and-so wants to do today, and then we'll do whatever you want to do next week.

##### [00:16:45.600] - Eugenia Casariego

That's really nice that they're, as well, they start to learn what they prefer. And yeah, it's very interesting to hear your experience as well within tinkering and making.

##### [00:17:03.260] - Eugenia Casariego

And so for the next section, we want to focus a bit more on the teaching aspect and we want to provide some tips and recommendations. My first question to Niamh is how to get started because within our audience I'm sure will be teachers who either work in special education needs schools or who have students in their classrooms who have teaching adpatations or curriculum adaptations.

##### [00:17:24.560] - Eugenia Casariego

And so what would be your recommendation to these listeners, how to get started? How to go on about it? What's the first step that you would recommend?

##### [00:17:33.260] - Niamh Brady

Well, I would say start small and don't be scared, like coding is so accessible and so achievable. And children like it's very effective. So by even snapping a few blocks of code together, it is amazing the results. So you can have a very effective, very impressive end result because of, of a few bits of code. So just go with it, I would say, that would be my recommendation, just embrace it because you're going to be blown away by the results, really.

##### [00:18:01.220] - Niamh Brady

And I suppose that's what makes it so worthwhile. As I said, start off small. Go through the lesson. Know exactly what's coming up. You don't have to be an expert in this, and I would say you're never going to be an expert in it because the children nowadays are so in tune with gaming and the online worlds, they're going to bring it to a whole new level. They're going to just be able to hit the ground running and just open up a whole new world.

##### [00:18:28.850] - Niamh Brady

You never even thought was possible. And it's actually the children love knowing more than you. So it's wonderful for them to say, no, that's not how you do it. This is how you do it. And that's great for them as well, that they're building up their self-confidence. And, you know, let them show off a little bit and have that moment of glory because they don't often get it. So it's really nice that they can excel in an area where maybe they never have had an area that they could excel in before.

##### [00:18:54.230] - Niamh Brady

So just make sure that you, you are familiar with the lesson you know exactly what it entails. You only need to be maybe one lesson ahead of the class. Have all your resources made, just know your audience. Remember these children, the majority of them are visual learners. So have the visual aids. I've often had to code the lesson ahead of the lesson, screenshot it, print it off, laminate it, and there's a visual aid for the child.

##### [00:19:18.920] - Niamh Brady

Maybe one child in the class needs that to keep up, well, then that's what you give them, you know you don't want to leave anyone behind. And then because with coding, it's so open, you can easily assign extra challenges for the more able children or the early finishers. So if they've created an animation in Scratch you can say right, let's have a two page story, let's have a three page story. Can you bring in another character so that them being challenged and then working away on that area.

##### [00:19:46.890] - Niamh Brady

I suppose there's just loads out there and even just so much online CPD that you can do as well. So I would say, if it's an area that you want to explore further, just yeah, jump in, jump in the deep end. And don't worry, you won't, you won't sink you're definitely going to, you're going to be- you're going to be diving.

##### [00:20:05.270] - Arjana Blazic

I have a question about the students who are unwilling to learn coding those who are not so motivated, or maybe those students who don't feel confident enough or don't believe that they can code or belief that this is not something they they would excel in. So how to deal with these students?

##### [00:20:27.140] - Niamh Brady

Children don't like failure, and they're very nervous. They don't want their peers to see them not being able to achieve. So that's where I think coding lends itself really well to like peer programming or pair programming. So have mixed ability groups have them in pairs so that the children are like ideating together. And it's just even that, that itself is a skill that's an area that we like, we all want to develop for students, back and forth conversation, asking each other questions, Well, what do you think will happen if I do this?

##### [00:20:59.210] - Niamh Brady

Well, you know it just, it's just fabulous. the learning, the secondary learning, I suppose. So I suppose the main learning is the coding. But then you have this secondary learning going on vocabulary collaboration, ideating and so forth. So it's just that I love, I'm a big fan of pair programming. And if you do have children in your room, they're a little bit apprehensive. That's a great way for them to be comfortable with coding.

##### [00:21:26.900] - Niamh Brady

And then after a while, they can they can start coding by themselves, or they might want that support. So it's up to you.

##### [00:21:35.090] - Arjana Blazic

Thank you for sharing both these wonderful activities and resources and also your experiences. And before we sum it up, would you like to add something else?

##### [00:21:46.310] - Niamh Brady

I thought a thing that I found that worked really well with my students and it's showcasing their work, and they really like their successes to be shared. So even, for example, when I was teaching in mainstream and I had my, I was teaching as a special education teacher, the group that I was taking out for for literacy, we actually coded little stories in Scratch. And so these pupils were fifth, sixth class age, so that's 11, 12, 10, 11, 12 -

##### [00:22:15.580] - Niamh Brady

so we coded stories that we then read to the junior kids in the school, and that was just fabulous. So little things like that, just for the children to share their successes and to highlight maybe how/what they're learning. And I think that too will help create a culture of maybe enhance the coding culture in your school. Other the teachers might get on board then because you might be the pioneer of coding in your school and maybe the only teacher teaching it, so it's great for other teachers to see the benefits of coding what it can bring to the classroom, what it means to these students, how we can really enhance their lives.

##### [00:22:56.440] - Eugenia Casariego

And then maybe you could build up something beautiful in your school then as a result of that.

##### [00:23:02.020] - Eugenia Casariego

Indeed, I think that's a great tip, and I think that's eventually what Code Week is about is building community, inspiring teachers, inspiring other students, I think that's a great tip and a great closing statement. And to sum up for our audience today, we've talked about special education needs and how to bring code into these classrooms, and our guest Niamh has provided a lot of interesting tips and suggestions and tools that you can try out. So our recommendation is that you go out, try it and just dive into the deep end and you're going to find yourself, that it's actually easier than you would have thought.

##### [00:23:35.620] - Eugenia Casariego

And there's a specific Learning Bit on how to teach coding to students with special education needs. So for those of you who don't know yet listeners, a Learning Bit is a sort of training module where we include a three lesson plans together with a video translated into 29 languages, and so I very much recommend that you check this out in the website codeweek.eu and so thanks a lot Niamh for joining us today. It's been a pleasure to have you.

##### [00:24:01.510] - Niamh Brady

Thanks a million. Thanks so much for having me as well.

##### [00:24:02.920] - Eugenia Casariego

It's been really interesting to hear your perspective. I really hope listeners that you have learned a lot, same as us today. And we hope you have liked the episode and we invite you to check our website codeweek.eu where we have a lot of interesting tutorials and materials prepared, so have a look.

##### [00:24:17.080] - Arjana Blazic

And see you next time for a new episode of our Code Week podcast with some interesting facts on coding and digital technologies in education. Goodbye.

##### [00:24:27.060] - Eugenia Casariego

Goodbye.

##### [00:24:28.120] - Niamh Brady

Bye.