# School C Teacher 1 – 17 Jan 2017

Speaker 1: I can't tell. I don't have to give you as much introduction because you know who I am. You know what I'm doing and you've heard of [inaudible 00:00:08] a couple times and I'm going to record it. You know all of that.

The other thing I'll say to you which I haven't said to the others, but I'm ... I hope after I write a thesis and all that stuff, I'm planning at some point to do sort of an exec summary of some sort so that I don't - people who aren't interested don't have to read the whole thesis, but I thought I'd give that to the schools that have been so kind to give me their time.

It does make me in your debt, so the if you ever need somebody you can say, "C– can you come help with our computing day?"

So please keep that in mind. I'm happy to come and help and even if it's not something that's any relation. If you need an extra pair of hands for some computing activity or you want me to lead something. Tell me.

Speaker 2: All right great.

Speaker 1: Because I really, really appreciate it. But yeah, M– was great. He crystallised a lot of the stuff I've been thinking about and we went in slightly a different direction, but it was really, really good. And it's great here because you guys have such a good perspective of CASS obviously, for obvious reasons. But it's really good to get that perspective of there's the idealised role of CASS but also there's the what's happening in the classroom and they're not always meshed together.

Speaker 2: No they're not. They're not. Because there are too many people involved doing it. You have the industry, but - and you have the universities involved, but we're teaching and it's very different day in the school is very different to other days and you kind of approach things differently I think. Because you're so short of your time as well. You're so short of time and everything we do has to be productive because there is no time otherwise.

Speaker 1: Well and the hardest part it seems is deciding what do we mean by productive. What do we want as a result and ...

Speaker 2: Well it's all about your teaching isn't it. At the end of it, it's all about your lesson. It's all about what you're trying to teach.

Speaker 1: What makes a good lesson ....

Speaker 2: Yeah. That's what it's all about.

Speaker 1: One of the things that really at beginning been feeling for a long time and M– really crystallised for me was that I've always assumed that CASS is kind of industry driven, but it really isn't. And really the industry voices have been silenced. And particularly the non-big player industry voices. The general - I don't know - app developer company in Kirbie Steven or in Carlisle. Those sorts of [inaudible 00:02:48] have been non-existent in this process. So that the people they need or the skills they want just aren't getting any kind of reference.

Speaker 2: No I was talking - cuz we're doing an IT course at the moment and we have to involve businesses to kind of build these projects. So they're doing an app development project and I got a business in Kent that does the design. He said there's such a shortage of the people that can do the jobs here. We can get people down in Manchester and the big cities, but around this area there's an absolute shortage for the skilled - people skilled in IT.

Speaker 1: And it's people skilled in IT. It's not people skilled in [crosstalk 00:03:30]

Speaker 2: No there's a bit of coding, but it's the people that need to be to both. So they need to know how to do a bit of SQL and a website and - so it's that kind of ... yeah.

Speaker 1: Yeah. And understanding that something like SQL probably having a good understanding of SQL is probably more important than having a good understanding of Python. But the way things are weighted currently, Python will get more time.

Speaker 2: Yeah and we don't do - well we do Python, but we do it at A level because R– wants to do it at A level and wants it to be new for everyone. That's why we're now doing VB. We used to do small Basic but it's changed this year with our year ten.

Speaker 1: It was interesting the kids mentioned VB and I learned VB a long time ago. But when I learned I remember it feeling so current. It looked - the VB environment looked like Windows.

Speaker 2: But we scaled it back. At the moment we're learning the skills. We're learning the skill set. We learn how to create variables, how to manipulate arrays. We weren't learning about sequence [inaudible 00:04:35] and we're only learning about that.

Speaker 3: We filed 50 quid for an external hard drive.

Speaker 2: They emailed you back have they? Yes, but could you also because you wanted some books as well didn't you? So write a list of the things that you want. So now you wanted that, but you also wanted ... what's the name of ... that computing OCRAS book, didn't you want that as well?

Speaker 3: I can't remember, actually.

Speaker 2: So have a look and send me a shopping list.

Speaker 3: Yeah. That's cool thank you.

Speaker 1: That's like my life.

Speaker 2: Where was I, I have no idea where I was.

Speaker 1: Visual Basic. You [crosstalk 00:05:08]

Speaker 2: Yeah. So they're only using the console window. So of course that's going to look silly. And I'm - I was sitting there when you were interviewing them and they said this and I purposely have not introduced the form. Because there's so many settings. There's so many. And I need to teach them proper programming first. But I'm thinking because it's new we're only doing the first time this year with our year tens and I'm thinking I'm going to have to do that, because that's what they're craving isn't it?

Speaker 1: They want something that looks like what they use. And that's a really hard ask.

Right. I'm going to try to stick to my questions a little bit with you. We'll jump around some and both M– and S– I said I would send them the questions. So I'll send them to you and then you can give them to people and tell - this is an open process, so people can send me answers. Throw that into the mix.

Can you tell me how long you've been teaching and what you did before teaching?

Speaker 2: Right. I did ...

Speaker 1: How did you end up [crosstalk 00:06:22]

Speaker 2: Graduated in 2001, I graduated Lancaster Uni.

Speaker 1: Okay.

Speaker 2: Did computer science at Lancaster Uni. I graduated and it was kind of strange because I had a friend who said she was going to do teacher training and I didn't even know you could do it. Because being Swedish I just live in the country for four years. I didn't really understand how things worked. It was kind of strange, I was actually pregnant when I finished my degree. So I thought that my future in a year - it was just going to be babies. I was kind of six months pregnant and we lost the baby. Everything kind of late on. And that was literally on my - on the day when I was supposed to collect the grades I was in hospital.

It kind of changed everything, what I was going to do and I wasn't sure. I started looking for jobs because I hadn't looked then because I was going to have a baby there was no point in me looking for jobs. So it kind of changed things. I had thought about doing teacher training. But I had never been in an English school even. I didn't even know what a secondary with cheer groups how things worked at all because it's very different.

Speaker 1: Trust me, I understand that.

Speaker 2: You fully understand that don't you?

Speaker 1: I fully understand.

Speaker 2: So I was kind of - I can do this. Yeah. So very late on after my grieving period over the summer I applied and I literally applied to teaching. I think it was like a week before it was starting and I got some kind of reference from G–. Really late on. Because I had to then kind of get in so I remember I had an interview on a Thursday, on a Monday we started. I remember she was asking me - what kind of programming do you know about what type of programming? Have you heard about Turtle? She said. I said no, I programme in Java. I had no idea at all about anything. Like [inaudible 00:08:21] I didn't know what that was. I knew nothing.

I kind of just - I thought, yeah that's what I would like to do, but I kind of fell into it. It was very strange.

Speaker 1: But you did a computer science degree.

Speaker 2: I'd done a computer science degree. And then I did the ICT, PGC at St. Martin it was called. Yeah, down at Lancaster. And then before then, I was out travelling for a year or two and then I ended up ...

Speaker 4: Do you know where M– is?

Speaker 2: He's gone now I think.

Speaker 4: Oh has he?

Speaker 1: He popped his head in.

Speaker 2: Yeah. He might be ... he's not downstairs.

Speaker 4: Not downstairs, no.

Speaker 2: No. I think he's gone then.

Speaker 4: Okay thanks.

Speaker 2: Uh, so ...

Speaker 1: It's an eclectic bunch. It's great.

Speaker 2: Yeah. And we're so different and we so contribute and we are like totally - when we had one of these leaving speeches for a colleague of mine, the head he said we were all like the planets in the universe because we're all different. Of course R– was the red planet. S–, she ... which one is the largest planet, I forget. She was that because her brain is so big. She used to design submarines.

Speaker 1: This is one of those things, if I was a journalist I'd say off the record, but it's so obvious that the way you deliver computing here is really different and it comes from having this really - this staff team that has such a range of skills and background so that you've got S– who's got engineering. You've got M– who has computer science and a sense of industry. You've got you who have computer science and also this international perspective. And then there's R– who brings in his [crosstalk 00:10:14]

Speaker 2: He's our uber geek, yeah.

Speaker 1: You know, but it really does show that where if you had a smaller or more homogenous team there'd be gaps that nobody would know were gaps. Because everyone would overlap so much that nobody would know that they were looking over here. I think it really shows that you don't have any of those here in the same way because everybody's filling in. So you see that there's the hardware stuff and the physical computing stuff and it all fits together.

Speaker 2: It does.

Speaker 1: That's just being here a day.

Speaker 2: Right yeah and then I lived in Sweden before. I was building cars in Sweden. I worked for Volvo. So when in Sweden I finished my Gymnasium as it's called. I did engineering at Gymnasium. [inaudible 00:11:03]

Speaker 1: Not mine.

Speaker 2: Yeah [inaudible 00:11:10]. At home, people do go to University afterward, but not in the same kind of like you do here. You do A levels, you go to Uni. Slightly different.

Speaker 1: You tend to take more time.

Speaker 2: Yeah. I don't think there was that many when we finished doing it. And then I did - then I finished and went travelling a bit and then I met my husband and then kind of everything changed and I got here and I went to Uni. That's kind of how I ...

Speaker 1: It all falls together.

Speaker 2: Yeah. Very strange.

Speaker 1: Have you taught anywhere else or have you always taught here?

Speaker 2: I taught up in Carlisle a little school called Saint A–.

Speaker 1: I know Saint A–.

Speaker 2: Yeah. It's gone now.

Speaker 1: Is it?

Speaker 2: Yeah. It was opposite the Catholic one.

Speaker 1: It's Richard Rose now.

Speaker 2: Yes. So it was one of the schools that got together.

So I left two years before I think. So I was one of the lucky ones who didn't have to go through that.

Speaker 1: Through that process.

Speaker 2: Because that wasn't good. And it was a shame actually because it was a half decent school. So I have some very passionate stuff about what they were doing and about the kids. It's okay, but it was too far. I live in Kendal so it was too far.

Speaker 1: That's a [crosstalk 00:12:20]

Speaker 2: I always looked for a job around here. That was always the aim. And then yeah, so I did - I was offered a job at Kirbie Kendal, but then I was pregnant. So then yeah. Then we had Hannah. So I think Hannah was a year or something when I started here and it's this school is kind of unique because I - someone who went to my course started working here by doing cover and ended up doing some work here. So he phoned me and said I should apply. And I said well I don't know if I want - it was head of department. I said I can't apply for that, just newly graduated and just got off maternity leave. He said well, if they don't want you to be that, then just to give you something else if they like you they'll keep you.

Very strange. So of course having so many strong individuals in my department they didn't want someone to come in and change things and do things ... it kind of runs by itself this department.

Speaker 1: You wouldn't want. Yeah. They wouldn't want someone telling them what to do.

Speaker 2: R– was head of department. Then S– was head of department. She's in exams now. R– then became this IT Network the whole lot of that. And M– has always been in charge of the website and all the e-learning. Everyone had other roles. Yeah.

Speaker 1: Okay. I'm going to skip over a bunch of questions. What do you think of the change of emphasis from ICT to computing?

Speaker 2: I think nationally it had to happen because it was too much. It was too much focus on certain IT skills that lower school. And there was some strange - so I don't know if you ever looked at strategy ... national strategy. It was very prescriptive of exactly what you had to do. It was very - it wasn't very exactly exciting projects and things that was there. Some of the topics we would have done anyway here. For us as a school it's changed things but it was never a problem for us because we've always done scratch. We've always done units in control. We've always done game maker. We've always taught HTML is not programming as such but we've always taught HTML and CSS and so we were quite geeky anyway here.

It wasn't - when it changed, it was a big change because we dropped all our IT. We literally dropped the lot and just got computing. Which I feel that we shouldn't have. But as I said before, with one hour a week, there's a limit of what you can do. Because at the moment for example in year eight we teach so the focus in year eight is sequence, selection, striation. Your big three as we call them. Variables. That's what we do in year seven. It's kind of the big thing in year seven. Then in year eight we then teach about lists [crosstalk 00:15:33] and procedures.

Speaker 1: My guess is that you guys are quite concept driven rather than process or even language driven. You teach variables as a concept. You don't teach how to use variables. Or you teach lists. You don't teach - I would imagine you do lists and arrays.

Speaker 2: It's not the clicks we teach, it's the ideas of it ... and procedures. In year eight the big jump then is lists and procedures. So you can teach and you can do little mini-projects with them, but the kids don't enjoy it until they apply those skills and they can make it into their own. And unless you spend ten weeks on something you cannot teach those concepts and then give them time to explore with their new knowledge. And with one hour a week it's almost impossible to deliver the curriculum that we want to do.

However, what we did before this year - say in year eight we just started programming and before we did a graphics unit. But in that graphics unit we talked about colour depth. So that was a big thing. We talked about GIFs and bitmaps and we talked about how the colours are stored in the byte or in three bytes - red, green, blue. We taught the big ideas about how the computer saves bitmap graphics, but we also messed about a bit more in Fireworks. Last year or the year before we wouldn't have done that.

We're finding ourselves going back a bit to allow the students to just have a play and enjoy a bit more.

Speaker 1: So I think what's really unique about School C here that other schools just don't have the advantage of is that everyone has - you've got the skills within your department.

[crosstalk 00:17:33]

So I think a lot of other skills, other schools are in a situation where they either have the expertise or they have the computing skills and they don't have both.

Either they're struggling to teach the computing stuff and really wanting to teach the ICT stuff again, but they don't know what to drop from computing. Or they've got somebody who's really good at computing and is so desperate [crosstalk 00:17:57]

Speaker 2: I think we ...

Speaker 1: It's that mix that you guys have here that really seems to be [crosstalk 00:18:01]

Speaker 2: This is something you can't put in your thesis or in your report is that because we are - we're very confident in what we - and Ofsted could come in and say that we're rubbish and we might not tick all the boxes and we might not do everything. We're so passionate about what we're doing and what we believe in that if he comes in and says that we're wrong, we'll be so obnoxious and say that, no actually - no, you're wrong. Does that make sense?

Speaker 1: I think that's - but I think that [crosstalk 00:18:32]

Speaker 2: And because our school

Speaker 1: You guys have the confidence here to do that. You have a mixture of the skills, the knowledge and the confidence.

Speaker 2: And because our school - and this is another thing we're teaching in school, but it's an outstanding school. This is an outstanding school and we got outstanding in Ofsted twice and then after that our results have stayed the same.

Ofsted don't come to us because our results are the same, so therefore there's no concern or worry. And that means that we are even told to of course follow the national curriculum but we're told to make sure that we make things interesting.

Speaker 1: The other thing that probably helps is that there isn't another secondary school, so you're not comparing yourself to someone else that's around the corner.

Speaker 2: Well we do meet a lot. We do meet a lot. So I don't know. We haven't compared, but I think it's that confidence that we know. So I've had students that other teachers tells me that we're doing databases in year eight and I'm ... well I wouldn't touch databases. I wouldn't teach Access in year eight. Do graphics, do something that has value. If we don't want to teach something we more or less haven't. We have always managed to justify that it is relevant.

Speaker 1: The other thing you guys seem to have done is that you've all rejected the idea that any of it's boring. Like even the ICT stuff [crosstalk 00:19:56] is not boring.

Speaker 2: Databases are boring if you have to teach it in Access. You just have to find a different way of teaching it don't you? So yeah. No. We try to.

Speaker 1: So this is a stupid question in some ways considering who you are, but what do you see as the role of computational thinking within the computing curriculum?

Speaker 2: Well it kind of underlines everything isn't it? Everything that we do is that, but we don't say it is. So today, my students were programming and in order to solve something they really have to think about why we're doing certain things. But even when we were doing graphics, that's computational thinking. How does the computer save it? How does it do it. So it's kind of part of all of it, isn't it? In a sense we were teaching big algorithms. That's all computational. It's problem solving. It's all of it.

Speaker 1: What do you think are the limitations of computational thinking?

Speaker 2: I think it's limiting to less able students.

Speaker 1: What do you mean?

Speaker 2: I think a lot of the less able students - so now I'm taking about GCSE's I don't think the curriculum is accessible to less abled students. I think it's too hard for them. I guess you can say that's true for a lot of subjects, but it is up there with physics and it is tricky. It was quite interesting when you were talking to my students before.

I can't remember the question you asked. You asked them about if a student finds it hard, or something in that and one of the kids who was sitting there who was answering a lot of questions, he just couldn't grasp the concept of programming. He just couldn't get it. And I said, you will get it. You just have to give it time and you have to do it and keep doing it. And we were talking about an assignment statement and actually what was happening ... and I'd ask him over and over again. It took him weeks before he could even see that you were actually assigning a value to a variable. He understood the idea of a variable if you purS– it in scratch. He just could not get it in VB. Because text, it was just such a barrier.

The penny's dropping for him now. Slowly. Very slowly. And for some of them at the pace that we have to go it's just, I feel sometimes we don't really cater for because we're so driven by GCSE curriculum. It's not always catered for the curriculum - the computer science is not always catered for the less abled. And they would enjoy it just as much. You just have to ...

Speaker 1: Is it the pace or is it the concepts that ...

Speaker 2: All of it.

Speaker 1: All of it, it's just too hard [crosstalk 00:23:01]

Speaker 2: Yeah, so you needed less. I think a lot of the concepts they would grasp, you just need to give it a lot longer. You might [crosstalk 00:23:06]

Speaker 1: Do you think they need those concepts?

Speaker 2: I do think that the every day things that they use, that the students the kind of new technology and things that they would use. I do think they do need the concept of what a gigabyte and a megabyte ... it's like every day knowledge today. It's not just geeky knowledge to know the difference. If you're gonna have a - most people have a home Network today. It's not just ... they might not need to know the difference between an optical storage device and a magnetical one. They do need to understand that yes this device I use for that and this device I use for that. Programming-wise, I do think the basic ... if the selection sequence situation, I think that is valuable they might be doing spreadsheets ... I do think that even if you're going to be a mechanic and you might be doing a ... you have to have some of those skills I think. Maybe not to the depth.

Speaker 1: So do you think that ... well that kind of answered this other question which is what do you think is the relevance of the computing curriculum for the people, but ...

Speaker 2: I think some of it could be tailored a bit more. But you're never going to get that. You're never going to have a class with just but five kids. But if you had kids - for here example, you're going to have a thing called studio school and there are some students that are going to study PE studio school. Now there will be IT skills that are very relevant to them. There might even be certain computing skills that would be very relevant to them and therefore I think this subject is relevant to all subjects. I do think so. I don't think if I'm doing computing, in my life I'm never going to get into dancing. I don't need a dancing GCSE, but even if I was doing dancing, I might be doing computer science related to my dancing.

At the moment, they're doing a dance company and the guy who's in charge of it is also a proper computer nerd. So he's been borrowing all my little lily pad LED's and microbits.

Speaker 1: The lily pad thing, it's beautiful [crosstalk 00:25:39] its wonderful.

Speaker 2: He's actually borrowed my lily pad LED's, he's borrowed the microbit. And he's trying to code accelerations so when the dancers are moving and moving a lot it's going to be brighter lights. When they're slowing down it's going to ... so he's actually using it - so I do feel that it could be a lot more tailored to certain things. But I do feel that it's kind of part of the world we live in.

Speaker 1: It is kind of a part of the world we live in, I mean I [crosstalk 00:26:10]

Speaker 2: I still think though that a lot of things I'm teaching my GCSE students, not really relevant for all of them. But that could probably be true for most subjects. In physics it'll be the same thing, there might be things that ... Yeah. Or in maths [crosstalk 00:26:22]

Speaker 1: But I think that's one of the things that keeps coming up again. Obviously I'm speaking to computer science teachers, so they would say this wouldn't they? But we need to think of computer science - if we're going to call it computer science from ICT, we have to think of it as along side one of the basic [crosstalk 00:26:40]

Speaker 2: Well it's the third computing subject. That's what we've always said. It's kind of part of what they said in the ... what was that called ... in the science ... in computing you have your three strands, you have computer science, your digital literacy and then you have your IT skills. And I think the digital literacy is vital for a lot of students. And they are the skills we assume they have that they don't really have.

Then of course you have the advanced IT skills. You might be teaching advanced, well, you might be making your database where at the moment we designing apps in year 12. In year 12 we'll be doing websites as well, but advanced ones.

Speaker 1: But also I think that the computer science is as important or will be seen as as important as physics or chemistry or [crosstalk 00:27:41]

Speaker 2: I don't think it will ever be there.

Speaker 1: But in terms of relevance [crosstalk 00:27:47]

Speaker 2: Oh no. It should be there. I tell my year nine students, I say you have a total option here to choose IT or computer science. Now, all of the students from different schools, they will all have one of these qualifications. But you have an option, which we kind of like them having an option. But I said if you're applying for jobs and you don't have these skills.

They are ...

Speaker 1: I just wonder whether one of the biggest mistakes about the computer curriculum is not anything fundamental about it but the priority it's given within the national curriculum, within the inspection framework as well. Where actually I think long-term you could make a far better case for every child needing good computer, computing ICT and computer science skills rather than understanding chemistry. Because it's a skill, not unlike English [crosstalk 00:28:44]

Speaker 2: It's never gonna get there though. I don't think we'll ever get there. And at the moment as the curriculum is, I will get a list for the year nine people that opted to do it and I will go through the list and I'll look at their CAT score and I will ask the teachers. Because it's not accessible to all students, so I would have students ... even if I give extra time to them, they're never going to be able to - well they will have to settle for an F or

Speaker 1: They won't be able to access [crosstalk 00:29:17]

Speaker 2: No they're not. They're not. So it isn't.

Speaker 1: It's hard.

Speaker 2: It isn't relevant to all of them. Yeah it is challenging. But for most of them in the classroom, that's what they love. That it is.

Speaker 1: Yeah.

Speaker 2: You know, it's the satisfaction of solving it, isn't it?

Speaker 1: In the same way Calculus is hard and satisfying at the same time.

How do you feel like you are judged and evaluated on how computing is delivered here?

Speaker 2: What do you mean?

Speaker 1: Who says whether you're doing a good job or not?

Speaker 2: Out of department I have a SEF meeting. So I have a manager who then are in SEF meeting with me with the head and the deputy head and the other head. We have three heads. We all sit in a SEF meeting. It's very ... yeah. One is slightly trying to retire I think.

Speaker 1: The school [crosstalk 00:30:20]

Speaker 2: So it kind of just as he moves the other one just slides into the position, I think. Yeah. It's just how it's happening.

Speaker 1: In terms of kind of heads and Ofsted and things, what are the priorities? What do they want from computing?

Speaker 2: They know us. They know better than to tell us what to do. They just let us be. And of course they want to have good results. We've had - in IT we had ridiculously good results. But we have to give the old qualifications where we have 90% A star and things like that. So we had silly results. In computer science we have good results. Fair results I would say. Yeah.

Speaker 1: Again, one of the things I think that's what makes what you guys say here really relevant to National conversation. Is that you guys have good results, you have an outstanding staff team with a range of skills and background. And if you guys say it's not working, I think that's worth listening to. Because you have the expertise to know what's missing in a way that a lot of there context <[crosstalk 00:31:37]

Speaker 2: But if you have a subject - for example if you have science - I don't ... or maths. I don't know in a key stage three curriculum they will have at least two or three lessons of English a week. But if I only have one lesson a week, I'm never going to get the status of other subjects. It's just how it is.

Speaker 1: Yeah. In some ways it's that difference between computer science and

Speaker 2: IT

Speaker 1: Computer literacy or ICT.

Speaker 2: Yes. ICT used to be a compulsory subject. Then I could push it a little bit more. It's still on the key stage four curriculum, but schools don't really care. And at the moment it's so driven by league tables and finance that it's even getting worse. So I know for example down in Cornforth they're going to stop doing all other qualifications and just do the European [inaudible 00:32:32] licence which is just a pure skills based course designed for adults. Because you get points for that towards your ... and it's - it just yeah. It's just wrong.

But in a small school where [crosstalk 00:32:47]

Speaker 1: So that at the GCSE level or A level ...

Speaker 2: That's at GCSE A level they're going to stop altogether computer science.

But then again that school as well have the very bright from Cornforth will go to boys grammar or girls grammar in Lancaster or they might come here. So you're left with students that might not be as able. And then they are taught to do computer science and they might not be that geeky. So there might be students that would be doing much better on a different qualification.

Speaker 1: But that's, I think that's one of the things about the computing curriculum is that it is ... It's like you said and I don't know the other areas as well. But it really doesn't - it caters for a very specific kind of student that wasn't catered for in the ICT curriculum. But it's a very specific kind of student and there are broader range of students [crosstalk 00:33:37]

Speaker 2: Well in my class room I can say it's the studio skills that do well, because they work their socks off. They always do well don't they? And then pupils that have some kind of Asperger straight. They will do fantastically well. That's just how it is and if you look at my IT class and my computing class, the difference of the type of students to opt for each is enormous. It's just totally a different feel in the classes.

Speaker 1: So what's the hardest thing to teach in the computing curriculum?

Speaker 2: Hardest thing to teach ...

Speaker 1: Or to deliver

Speaker 2: I think the hardest thing for me to teach is to turn things into almost like - it's the theory, but it's generally teaching theory. I find anything that you can't just do a - if you teach binary you can practise it can't you? Conversions. If you're teaching algorithms, you can code an algorithm, but if you're going to teach about memory it's all - it's different. So it's more about convincing a student about something. I can't give proof of it. Does that make sense?

Speaker 1: Yeah. What do you think is the hardest thing to learn for the kids?

Speaker 2: I don't know what's the hardest thing to learn. Well it's the more advanced - the things that they're really, it's - they do love the coding and they do learn it well. But sometimes they're given problems which they just can't solve and it's finding techniques for them to think about it in a different way.

Speaker 1: Save Python for A level. Because that's so different from many schools where they jump into Python early.

Speaker 2: Well we would have loved to teach it at GCSE but we promised R– that we would leave it for his A level. So we weren't really sure what to teach. And then we ended up by doing - we did VB because

Speaker 1: But I think that Python might be harder than it looks.

Speaker 2: Yeah.

Speaker 1: And is

Speaker 2: We did small Basic which is lovely. Which is so good. It's a lovely learning language, but it's not enough. You can't do enough things in it.

Speaker 1: Yeah but ...

Speaker 2: And I do wish Microsoft would just expand it a little bit and it would be perfect for learning at GCSE.

Speaker 1: I think that there is a need for a language that is not a graphic language like Scratch. Is a textual language. But is written to prepare you for other languages.

Speaker 2: But this is small Basic. But small Basic you can't create subroutines with parameters. It doesn't allow you to do that. And all variables are global. And you can't ... there are certain methods that you don't have that you would have to code instead. So remember we did control assessments where they had to sort a list, but they had to code it.

Speaker 1: Code the sorting the list.

Speaker 2: Exactly. Which is not - which they can do, but it's a lot of things that I have to teach them that they have to do. Which in itself is fun, but other schools would just do the function sort-it and that would be it. Sometimes that felt quite unfair.

Speaker 1: It's not fair!

Speaker 2: To our students. But then again we didn't M– anyone down for it and we gave them credit for all the work that they've done, but sometimes it's getting certain concepts, certain ideas sort of how to use a Boolean operator in a wild leap and then when would you change it and how do you control the iteration. Things like that sometimes can be hard for a student to grasp. But otherwise I don't know what is the hardest.

Speaker 1: Okay.

If you are observing another teacher that was delivering computing, what would be the key thing you'd look for other than the basic good teaching? What would be the thing you'd be looking to see if they could deliver very well?

Speaker 2: It depends fully on the lesson, but it's knowledge isn't it? The things that stick out all the time if I observe a lesson. And it's our courses. Yeah. To ensure it's accurate. That would be the kind of - if you sit and listen and they're trying to give [crosstalk 00:38:16]

Speaker 1: Are there any specifics that you think are ... catch people out

Speaker 2: Well, just an example we're teaching - we keep banging all about the more bits the better. That's our big rule. So when we say the more bits the better, the thing we mean is that if you have ASCII you can only have the English alphabet and we needed Unicode. So we can do some more bits to kind of store a character. Or what we do instead of a GIF image we use a byte when you have a JPEG, you use three bytes so you can store more information about it. Then we taught the same thing when we start talking about sound later on. We want the kids to understand that. That is quite a hard thing for students to understand that the more bits the better. Sometimes that's not always explained by the teacher.

Instead, if a teacher could say the more bits the better - look this file is using 5k to store the file. I need more k's to store the file. It's kind of how you teach it. It's the subtleties, isn't it? Of delivering it. Right.

I think the things I look at engagement, so it's making sure the students are engaged. And are stretched and learning something new.

Speaker 1: To what extent do you think the computing curriculum relates to how the people using computers in their every day lives if at all?

Speaker 2: I think it relates very little to what they do in every day life.

Speaker 1: Do you think it should? Or do you think it could? Do you think

Speaker 2: I think it could, it depends very much on the kid. I had a kid who stopped me and said, "Miss, can I bring my raspberry pie to your classroom tomorrow?" He's very unique ... Not many kids will say this.

I think it was nice the idea of the microbit wanting to bring that into the classroom and that was trying it, but I don't think that many kids took it home and did other things. Because you need other things to ... The microbit becomes fun when you can connect things and do other things with it. And they did really nice at attempts in year seven. And of course you saw our robots we were attempting, but that requires you to have an enough interest in order to buy these things.

I think at the moment kids lives with IT or with computing is gadgets isn't it? And computer games and searching the Internet. That's their world of IT and computing. That's what their world is.

Speaker 1: What's interesting is you guys teach game maker, so you do teach some game making which teaches them about if they play games it teaches about that process even if it's only a little bit.

Speaker 2: Today we did game maker today and I got really good questions about ... "So miss, if I put down two diamonds can I still open the door, can I still code it to open the door." I say yeah, but if you have two diamonds, you need a diamond variable, don't you? Oh really, oh. Yes yes ... good stuff.

Yeah, but actually teaching game making we lost loads of kids opting for IT and computer science. So we kind of change slightly what we're doing trying to make it less geeky.

Speaker 1: For computer science.

Speaker 2: No for the IT kids. We still get the same amount of computer science. We get two classes of computer science.

Speaker 1: In GCSE.

Speaker 2: In GCSE and I don't think that many schools [crosstalk 00:42:01]

Speaker 1: How many kids do you get for GCSE? How many kids do you have for the whole school?

Speaker 2: In a year group we have 210, 220. And then what we have is in that lot, in the past we could have had five GCSE classes and an extra class we could have had six GCSE classes. And then that changed so then we got one computing class when computing came in and we would still have about five IT classes. This year we just have two IT classes, that's it. No more kids. Because we don't teach it anymore, so how can they opt for something that we don't teach. It's almost like shooting yourself in the foot.

Our numbers from having seven GCSE classes we're now down to having four this year. But then [crosstalk 00:42:47]

Speaker 1: ... to you guys, I think that's not happening Nationally.

Speaker 2: Yeah. I'm thinking that. I'm hoping that.

Speaker 1: There's a good report which I haven't read [crosstalk 00:42:55]

Speaker 2: It almost feels like our subject is dying a death. So instead of having this big push for it

Speaker 1: There's a report done by a guy who was down at Rohampton and they talk about it on the radio actually, but it was Rohamptons report on computing education. But it found that we were losing people going into ICT at GCSE level. He just analysed all the [crosstalk 00:43:22]

Speaker 2: Ours has dropped. We used to have five ... yeah, we used to have over a hundred kids. About 140 kids, sometimes 160 kids doing IT and I think now we have 30.

Speaker 1: Yeah.

Speaker 2: Or 35

Speaker 1: He also found that diversity instead of increasing was decreasing. The diversity doing computer science and ICT was decreasing.

Speaker 2: Yeah, but diversity we don't have at this school. The only thing we talk about diversity is male-female because it's such a middle class, white school. That's kind of what it is.

We do have more girls though. We used to have no girls.

Speaker 1: You have more girls doing computers [crosstalk 00:44:05]

Speaker 2: You interviewed our girls then didn't you? So I have six girls in my class out of 24 or something. Yeah. So we do have more girls. I would like more though, but ... yeah.

Speaker 1: How ... what have I written here? How do you describe the degree to which the people find the curriculum relevant to themselves?

Do you think they find it relevant at all?

Speaker 2: Not to themselves, but I'm thinking here would they find history relevant to themselves? Would they find English relevant to themselves and I think many times they don't. I do think the time when we were doing graphics they were doing a Christmas card. That was relevant to themselves.

When we were doing memes, they were all doing memes that was kind of something that was related to them, that wasn't rude. That didn't have swear words in it. We had a lot of rules for that one.

We do try to make things relevant to them, but unless they have an interest in games it's not necessarily relevant to them is it?

Speaker 1: Yeah. But you try to do it as a department.

Speaker 2: Oh yeah, yeah, yeah ... we would always try to do it.

Speaker 1: You don't think there's anything inherently in the skills in the concepts you teach that make them not relevant it's just how do you deliver them?

How do you think learning computing - and we talked about this quite a bit already actually - changes their decisions and choices about the future?

Speaker 2: I think a lot of kids either have no idea what they're doing or they're quite fixed. And many times I kind of feel a bit - I have quite a lot of students who I would love to see to do A level because I think they would do really well. But it doesn't suit with their options, so they drop it. So I have one of my best girls in year 11. She wants to be a GP, she wants to be a doctor. She's not going to do computer science. She needs her sciences for that.

If students are going to get into engineering, when you need do physics, you need do chemistry because you might want to go into chemical engineering. And you need to do maths and further maths.

Even though I'd want them to feel the relevance and I want them to feel that they would do it

Speaker 1: But those two fields engineering and [crosstalk 00:46:50]

Speaker 2: Oh they would be so relevant with computer science.

Speaker 1: Not even that. They will be in the next 20 years those fields will be transformed by computer science. Doctors will not be diagnosing without [crosstalk 00:47:02]

Speaker 2: But if you have only four choices or [crosstalk 00:47:06] now ASS are disappearing, then you only have three. So I can see A level disappearing. Computing, IT, I can see it all go because it's, because of the changes in education.

Speaker 1: Yeah but it's shocking. It's so shocking to think [crosstalk 00:47:23]

Speaker 2: But we're having these conversations.

Speaker 1: We'll have GP's who don't know how to work with, or don't know how artificial intelligence works and will be reliant on it. Because it will be one of their main diagnostic tools. So we'll have engineers who don't understand how computer assisted design works and how the parameters you put in are changed and will have ... and I can think [crosstalk 00:47:44]

Speaker 2: We did an assembly me and M– a few years ago now, we did an assembly about our football team of computer scientists. We took how did women and men different ones. But people who are using it today, so we have this biologist down in - called Sophie Kershaw down in Oxford about how she was using biology and how she was developing this 3D human heart. And then we're talking about this woman who developed the lily pad, Leah Buechley.

Speaker 1: She's amazing.

Speaker 2: Yeah Leah Buechley we talked about. We were talking about other scientists. The guy who did the Every Computer for Every Child. So we had all of these people and tried to bring the relevance to loads of different subjects. But yeah. How do you bring that in ...

Speaker 1: This is where I step up and think about my broad field is digital economy and what I'm really trying to drive at is how education is driven by and also impacting on the digital economy. But the digital economy is transforming key ... there hasn't been any ...

Speaker 2: And what we need is, we need every day people. We don't need just the geeks doing it.

Speaker 1: We absolutely need everyday people. We don't need to teach geeks because they'll learn it. We need to have a curriculum that is not for geeks. It's for people who will be GP's and vets ...

Speaker 2: And that's what we're trying to do, but unless you make it more compulsory or unless you ... it's going - and now with ASS going and just having A levels. It's going to die a death.

Speaker 1: Yeah. And that's really worrying. When you think about how one of the best books I've read about the digital economy is called The Second Machine Age by two guys, one of whom has a name I can't pronounce, so I won't even try. But they say at the end of the book, their last chapter is how do we advise people and they say robots aren't going to take away jobs, what we'll have more of is robots plus people jobs where you have humans working alongside robots. I think that's probably overly optimistic, but ...

Speaker 2: It depends on where the robots are. But you're going to have to have somebody controlling the robots.

Speaker 1: Yeah, you're gonna have someone control - we need to prepare every person who will enter the work force or not, how to work alongside a digital device. And work well alongside a digital device. And if we lose A level computing or ICTE, it's probably more important than even reading and writing to a certain extent because it will be something that you won't be able to operate without.

Speaker 2: Yeah. So yeah.

Speaker 1: So what do you think they'll remember in five years, your kids? If I ask them what do you hope or think they'll remember and impact them most?

Speaker 2: I think they'll remember computer is a digital device that thinks in ones and zeroes. I do think they'll remember that. I think they'll remember that they were ... I think if I say the big three, they might remember the images. So they will understand that there's a big concept in programming that are transferable.

What else would they remember? Yeah. I think that's kind of ... yeah. If you're thinking yeah. So I do think they have the idea of afterwards it's not a machine of wonder ... well it is a machine of wonder but it's not magic. And they control it. Whatever they do, they control it.

I do think that kind of big idea. Compared to our parents or grandparents that it's just this thing that they are. Yeah.

I do, yeah.

Speaker 1: What do you think they need the most? Which one thing?

Speaker 2: What do I think they need most?

Well it's this idea - it's the desire to figure out how does it work, isn't it? That's what we want to instil in them, isn't it? How does this work? How can I ... That's what we want our students to do isn't it? To think how can I - Clearly there's some things that are a bit long-winded in this kind of ... how can I make it better? Having that desire to improve on things. Yeah. That makes sense.

Speaker 1: I think so.

Speaker 2: Yeah.

Speaker 1: The desire to find out and improve.

Speaker 2: Yeah. When you teach lower school it's very much to be going forward and I'm turning 90 degrees and I'm doing it again and I'm doing it again and I'm doing it four times. Could I not do this better? Oh yeah ... I can a little bit or, yeah that kind of, oh I could have used a list here instead. Yeah.

Speaker 1: Brilliant. I'm gonna ... stop.