

## Upskilling and maths

KAREN: Hi, and welcome back to the Student Hub Live. Well, you'll notice a change on Yep. After slagging off maths, I'm now joined by two colleagues from the maths department. And we're talking about upskilling and maths. So welcome Katie and Sally. How are you?

KATIE: We're well, thank you. Thank you for inviting us.

KAREN: That's good. What's this all about then?

KATIE: Well, we thought, we had a bit of an inkling that you might dislike mathematics or slag on mathematics.

KAREN: Well. [LAUGHS]

KATIE: So we wanted to start off with a bit of an opener with this. This is a nice puzzle. It's a nice sort of a problem-solving gambit. This can be rearranged into a sofa or into a cube. And if I said to you, right, have a go at this. Are you any good at puzzles? What would you say?

KAREN: Oh, do you know, I'm terrible. I've always been horrendous at Tetris. In fact, parking even is a challenge for me. But yeah, I'm terrible at this.

And like, as a psychologist, I understand that there are different ways of processing things, but my spatial recognition is just appalling. I hope you're not going to ask me to do anything with this.

[LAUGHTER]

KATIE: So I think Karen's nicely walked into our trap, as it were, wasn't it? Because, the first thing we wanted to say is we are enthusiastic about maths. We want to inspire people to study maths, to do some upskilling. Do the maths they need to do, or perhaps that they've been previously frightened of.

But the first thing we wanted to say is, you are not terrible at puzzles. You're not bad at doing puzzles, but perhaps you've got stuck and you've thought, oh, that's because of me. But it's not necessary because of you. It's how many times did you try? If I left you with this puzzle, how long would you try for?

KAREN: Um, maybe three minutes. I'm having high tea with the open programme  
[INAUDIBLE]

[ALL LAUGH]

But, yeah. Do you know, I just think I'm so bad at this, I'd probably have a go and then I'd leave it really quickly. I just wouldn't--

KATIE: It's a self-fulfilling prophecy, then, isn't it?

KAREN: I mean, you can't actually figure this. Is this supposed to go into a square?

KATIE: It will go to a cube.

SALLY: It could go into a cube or various other shapes. It's called a Soma cube because it can start as a cube, but it could be in all kinds of different shapes.

KATIE: And how long would you go at this puzzle for, Sally?

SALLY: To be honest, despite being a mathematician, I'm fairly apprehensive about puzzles as well. But once I'd started, I'd feel that I had to keep going.

KATIE: Yeah, Yeah. And I think the point is that I would never stop until I'd finished it. And so I go along thinking, oh, I'm OK at puzzles. You know, eventually, I'll get there. And it's purely because I just keep at it and I keep at it, and I try.

So if you think of some great inventor like Thomas Edison, he didn't make a light bulb on the first try. It was hundreds, and maybe even a thousand tries. And so it's not unless you try that you're going to get there.

And that's the first thing I wanted to get across. It's not that there are maths people or puzzles people, it's that if you're going to persist past that block, you're going to get this. We really want to get people in the right mindset for maths.

We've got a lot of maths gremlins out there. And I've been kind of curious what the feed might be of how do people feel about maths.

KAREN: So where do we start, then?

KATIE: Well, first of all, you start--

KAREN: Will you do some of this? I want to see what it would turn into.

KATIE: I would be happy to have go at this, providing that it doesn't interfere with the set too much, yeah?

KAREN: Just a little bit, yeah.

KATIE: Just a little bit. Let's go.

KAREN: Just make a start. Because if you don't start, although I'm not very confident that we're going to really get anywhere. But, yeah.

KATIE: Well if I was going to say to you, to start, I would say, do you know what? I've looked at this puzzle before. You have a go at some of the tricky pieces, and once you put the tricky pieces in place, some of the easy pieces are going to slot into place.

So I'd say, well, this is tricky piece because it sticks in every direction. So we'll have a go at that. And, you know, the first thing I'd say to you is have a try. You know, you're not going to have success unless you try.

KAREN: No, you're not going to break it, are you? Not with this particular one.

KATIE: No, and what's the worst thing that could happen? You stop. So why would you stop after one try? Why not have a few more tries? But unless you try, you're not going to get there. So you have to give it a go.

KAREN: So you mentioned this, you said that I'm not bad at puzzles. I am bad at puzzles. But, you know, you were saying, is lot of this in one's mind, then? That people are stopping too soon?

KATIE: Absolutely. And as a psychologist, I thought this would be something you would exactly know about. How can you say in advance that you're not good at it? You've never tried it. You can't do it until you try.

And if you already believe you're not going to be able to do it, well, you've kind of already set yourself the obstacle. You've already told yourself you're not good at it. So we really need to get people out of the idea that their intelligence is like their height. My height is fixed, but my intelligence can grow.

KAREN: We would call this cognitive behavioural therapy. Challenging our behaviours, but also having schemas to think, I know I'm really bad at Tetris.

[LAUGHS]

OK. So, on the proviso, then, that people are going to try more of this. And you also mentioned, as well, that there are gremlins. And people do get anxious about maths. I often find that.

And it's very interesting, you sort of saying breaking down those tasks and things. Because sometimes I think people say, categorically, I'm bad at maths. And then you say, well, what percentage? Or, you know, using mathematical terms in ways that they don't think is maths but is then sort of comfortable for them. Whereas, actually, if they're told, right, you are now going to do a maths task, or something like this, then there's all that anxiety.

If you hadn't told me this was a problem, if you just said, look, this isn't a kid's play area, could you just make this into a square, I might have responded differently.

KATIE: That's a good point.

KAREN: Tip for next time.

[LAUGHS]

KATIE: That is a very good point Yeah. And you think how people would go around enjoying Sudoku. But if you said to them, well, you're solving a very old maths problem there. Maybe there would be a few more demons. But it's massive. It's popular. Much more popular than maths itself.

So there's a little bit of curiosity there. We just need to, yeah, maybe sell it in the right way.

KAREN: So, HJ, are there things in the chat room, or are people finding this all a bit scary?

HJ: Well, people are quite psyched up for maths, I think. But a lot people are interested. They are loving the coloured blocks here. And they really want to just jump out and have a go at it.

[LAUGHTER]

KAREN: Is there a virtual-- there probably is. Somebody can find a virtual version of this and let everybody know. So that's the challenge. Lovely.

SALLY: It's quite interesting. There are 260 different ways of making the Soma cube. And if you're struggling to find one of them, it's quite interesting to know that.

KAREN: Well, OK. Well, yeah. I did tell you.

KATIE: Right you are.

KAREN: OK, so this idea, then, of upskilling and of maths, OK. So how can people then sort of try and upskill?

I mean, I wanted to sort of talk about these two things. And I guess they are very separate. Sometimes we recognise that we may not know something and we think, I need to do this because I'm doing, psychology for example, where I might need to be using figures and I might not feel so confident. So you might think about upskilling in that sort of context. You might equally not know that it's something you could upskill on.

A lot of my students say, Oh I'm really good at essay writing or I'm really good at this, and then they have to write a report or something different. And those skills aren't necessarily the same. When do people recognise that upskilling as an idea matters and when should they do it? Because we've lots of very keen students out there who've got all these tabs and all these things to do and I don't want to put them off their studies. When is it important to look at upskilling?

SALLY: I think it's important for anybody to think about upskilling in their maths, whether their intention is to study more maths or not. And on Open Learn there are lots and lots of different opportunities for people to look at maths things.

And the first thing you have to do, Karen, is to believe that you can. And you can. So if you want to dip your toe in the water for mathematics, you can do something called Succeed With Maths: Part One.

KAREN: Right.

SALLY: And this is a free, standalone module that anybody can log into.

KAREN: OK.

SALLY: And if you succeed and pass, you get a digital certificate and a certificate of completion. So that just starts from nowhere. So if you're thinking, I could be doing with a little bit more maths for my job or for job prospects, then that's absolutely the place for you to start. And anyone can start with that.

Colleges and schools and universities have got together and are working on open digital badges for people to try things like this. And it's a small step. And you can really make a big difference. You can pop it on your CV or your personal statement, and it's just really important for people to be able to think that they can make a start.

Because part of the problem with maths, as Katie knows as well, is that people sometimes just jump in at a level that's too much, and they get put off. They say, oh I'm not a maths person. But we think that absolutely everybody is a maths person. And you just need to start in the right place.

KAREN: So can you tell us then about, are there any people who maybe have got the maths bug late and gone on to do things? Like, if you aren't good at it, if you maybe haven't done well at school, and then start picking this up. Are there any people who've really got into it?

KATIE: I mean, we really know from experience that it is the case that people can think they've been terrible at maths. They come to the OU. It's set to them in a different way and they start to have success in maths, start to really get into the mathematics just for its own sake.

So we had a really nice example of a lady called Penny Lynch who dropped out of university, was doing biology but then, you know, for one reason or another stopped. And just went to get a job, found that she was getting quite used from the job, but could do with some maths skills. Could do with a bit of maths upskilling to understand the work around her. Not even her own work.

So she did a little maths course with the OU and one thing led to another and she carried on, and she got a maths degree. And then she discovered she could do maths with biology. So they became her two passions. And now she researches ways of basically ending malaria. So she researches the spread of malaria and ways of basically new insecticides for mosquitoes. Because the oldest insecticides are not effective anymore. So you need to mathematically model how you can end the spread of the mosquitoes and malaria.

So it's still a major illness, it still kills hundreds of thousands of children every year. But thanks to her OU maths study, she can combine her love of maths and biology to really helping people in the world. And she says it's all thanks to the OU. And late in life--

KAREN: Before that, she'd been a tea girl, hadn't she? At a bank?

KATIE: She says a tea girl for a financial advising company. Yet, she'd just been an assistant, a general assistant, little bit of math study, discovered, actually, I can do this. And once she discovered that, she did a bit more and a bit more. And it's just that initial step of, actually, I can do this.

So it might be that you're helping your kids with their homework and you're thinking, as I do, oh, I've never seen it written like this before. What does this mean? So you have a look on Open Learn. Is there something that can help you along? And you've made that first step. And then, you know, it's the beginning of a mathematical journey.

Or it might just help you. Our maths courses can help you enter the nursing profession or the teaching profession. Sometimes it's a prerequisite and you need it. And people are terrified of

the prerequisite. But you just need to take that first step and then try and have a bit of belief that, you know, you too can become a person who can do this study. And we've had a lot of success with it. We know from experience this absolutely works.

KAREN: Wonderful. Lets go to the social media desk.

HJ: You were just talking about some great free resources from the OU. And Georgina has said as well, I love this. Because people are sharing so much stuff, it's absolutely fantastic.

But Georgina has said that for people not confident in maths and the quick brush up, Kahn Academy is really great as well. I've used it myself.

HELEN: That's true. Yeah, and also Davon made the comment that everyone uses complex maths in everyday life. They just don't realise it. And he gave the example of Candy Crush, and I was wondering if the panel could maybe come up with other examples of the ways we use complex maths without realising it.

SALLY: The thing, is most of the things that we take for granted, like mobile phone technology and things like that, they wouldn't be here had it not been for mathematicians doing the mathematics. And we use them.

KATIE: Yeah, I mean, on a day to day life, you do do very complicated things without realising it. So when you're driving or you're route finding, or you're planning your own personal budget, or your getting ready for some DIY.

So you do do a lot of maths without realising it. Or, more particularly, do complex reasoning without realising it. Critical thinking, you know. You're solving problems, you're doing workarounds. You're trying to balance your time or you're trying to manage what you've got to do next.

So people do do a lot of complicated, logical reasoning but with actual numeracy. You know when you're doing numeracy for the rest it.

KAREN: I'll tell you when maths can be fun. Because, you know, joking aside, I do sometimes do a bit of maths. And things like log linear analysis, and multiple regressions and things.

KATIE: That's quite tricky stuff, that.

KAREN: Often I do those really late at night and I'm thinking, if I hadn't done that, if I haven't done that along that way, what would have happened? What would have been the outcome? And we do have mathematical ways of conceptualising where various factors come into play in terms of things. And we can calculate those probabilities of things happening.

And I think often, you know, lying awake at night and thinking, oh if I hadn't said that, if I hadn't come on the Student Hub Live, I'd have been having a lovely day outside. All our students, if they haven't come along, they'd be getting loads of work done.

So, yeah. It is one of those things, isn't it? That we do calculate probabilities and risks and various calculations every day without realising it.

KATIE: Yeah, you're an absolute dark horse, Karen.

[ALL LAUGH]

That's very complicated mathematics indeed. So, actually, you do quite sophisticated mathematics and you could come up with better examples of where you might use--

KAREN: I knew that.

KATIE: But we know that you could. You've given us a bit of an inkling there. But actually, this has been some lovely, there's a great OU programme that's used in a complicated mathematics lately. Last week did you see the how to end world poverty in 15 years?

KAREN: I did, yes. He had a good set. It was better than mine.

KATIE: He had all the graphs. That was fully data, you know, visualising the graphs, and really just dramatically seeing the poverty coming down with big data analysis. Which is a big growth area in maths, so.

Anytime you upskill in maths, you increase your employability. It's really practical. It's really highly valued by employers. And of course, it's good for your own confidence too. So, yeah. There's always a good reason to study more maths.

KAREN: OK, so you mentioned some of the stuff on Open Learn. I know that there are lots of links and things being shared, but can you tell people where they might start? And how they might find some find of this?

And also I'd like you to mention how some of these things could be in bite-sized chunks. Because we've been doing time management before, and it's important not to get too carried away, isn't it?

SALLY: Well, I think the Succeeds With Maths: Part One is a really good place to look. And you might be surprised to hear that Succeed With Maths: Part One and given the massive amount of courses on Open Learn, that's consistently been in the top five. So mathematics is officially cool.

KATIE: Popular.

SALLY: And popular, absolutely. So if you really weren't confident at all, and you just wanted to have a bit of a toe in the water, as I said before, that would be an excellent place to start. And the sequel, Succeed With Maths, Part Two is also there.

Again, as I said, you get this digital badge, which is a way of getting some recognition for your skills in bite-sized chunks. And there's also lovely other bits and pieces of clips of maths that you can look at just for your own interest.

And actually what you can do is just Google "Succeed With Maths: Part One Open University" and up it comes.

KAREN: OK, and how long does it take to do that, then?

SALLY: How long does it take to do that, Katie?

KATIE: I don't know how many hours it is, but the thing about time management is the Succeed With Maths is a very structured course. It's a proper mini course. And it will tell you, per section, how many hours there are. And it's been poured over, so it has been done really with a view to how much maths could a person doing at one sitting?

So we're not going to get someone to sit down and do three hours of maths. So it's all broken down into chunks for you. And providing you follow the study guide that's on there, you'll find it very manageable. You might find it enjoyable, hopefully, as well. And you'll get somewhere and you'll get this recognition.

SALLY: Yes, what is also important for people to know especially if they're perhaps a little bit unconfident is that you need time for it. It's like learning to play a musical instrument or learning to speak a foreign language. You need to allow yourself the time to work through it. And perhaps you don't get it the first time. That's OK. Perhaps you get stuck. That's absolutely OK. We've got tutors. Professional mathematicians especially get stuck quite a lot.

KAREN: I love that point, because well, my physics teacher once said to me, you know, it's not about how intelligent you are. It's about somebody's ability to teach you something. So then, not really getting physics, I decided to go into teaching.

But the Khan Academy, I love, because I think very visually. And often, in fact, I'll get quite carried away. If I read something and I don't understand it. I might then look and see what else is out there.

So whilst there are these badge courses, sometimes you just want a bite-sized chunks of information. And it's really nice to be able to go and access those. How do you both do that?

KATIE: Well, I do use YouTube a lot. There's quite a lot people putting little snippets on. I do definitely want to reinforce what Sally said, which is, you're not going to learn maths in five minutes. That's the guaranteed way to teach yourself that I'm not a maths person. No, you are. Give yourself the amount of time you need. Have a practise. Have a practise again.

But, yeah, reinforce it with videos, absolutely. Because that's another route into the brain. Allow yourself to make mistakes. You know, the person who never made a mistake never made anything. It's OK. Get it wrong. Try again. You just go to not take that as a message that I'm not a maths person. So, you try, you try again, and then, you're going to get there.

KAREN: I'm still not doing the puzzle. But, HJ and Helen.

HJ: Well, I think we're glad here on the chat that we've got some maths experts here because, well, someone's decided that we should calculate the amount of cake we've had. But I think we might need to bring in some super computers, because I know it's been a lot.

SALLY: Some calculations just shouldn't be done.

[LAUGHTER]



HELEN: We've also been talking about sports a bit. And I guess, also, how the different sports, how you need numeracy sometimes. Like with snooker, calculating how much the balls are worth. Darts, you know, counting down.

SALLY: Darts is a good one.

HELEN: And things like scrabble. And, yes.

KATIE: I think what darts really illustrates is how practise really improves your skills. Because I know that a dart player can hands down beat me at numeracy.

SALLY: Mental arithmetic.

KATIE: Hands down, mental arithmetic. He's got it there in a second. You know, it would take me ages to add up those numbers. Then I would do it wrong and I'd have to do it again. But they practise and practise, so that little section of their brain, like a muscle, is being worked on. And that is a quicker, better muscle than my muscle. And it is pure practise. And I've said that a few times now.

KAREN: I'm not doing it, I'm not. [LAUGHS] OK. So we've got some ideas on Open Learn. And I'd like to start talking a little bit about, you've mentioned that practice is important. And it's about breaking it down into manageable chunks.

KATIE: Yeah.

KAREN: You're also talking about--I'm very conscious of this-- you're talking about learning maths, and that might be a bit of a difference skill to some people who may be studying other disciplines and might think, I might need a bit of maths. But I don't want to do your module. I don't want to sit there and suddenly start learning maths.

So what's your advice for those people who might want to include a little bit of maths to make life easier? To maybe calculate percentages or put things in context, you know? So we've sort of said there are loads of different ways that we use maths. How can they then get those brief, small skills if they don't actually want to look at studying reasoning as such or doing a puzzle?

KATIE: Yeah. I mean I guess I would still bring it back to Succeed With Maths or Maths Help.

SALLY: Or there's a place called Maths Help.

KATIE: Which is similar.

KAREN: Oh, that sounds good.

KATIE: Maths Help is great. It actually is preparation for one of our modules that I just happen to have here. Discovering Mathematics. That's one of our first modules.

And Maths Help is something you can dip in and out of to just brush up on various topics like geometry, trigonometry, algebra. And you can dip in and out of that say to help with your children's homework. Something like that.

KAREN: It's got all the graphs. There's an urgent question on the social media.

Can I have this?

Urgent question on the social media desk.

SALLY: I'll have to sign you up.

HJ: On that point about modules, Georgina has a question for maths. She's doing computing MIT at level one and she says there's two choices for maths. She says, so originally her degree was maths orientated. So she's not ignorant to maths, but it was a long time ago. So what maths module should she take? I think there's like a soft start one and another one isn't there?.

SALLY: That's right. What she should absolutely do is go to something called Maths Choices. And again, you can just Google that and you'll find it. And that tells you all the maths modules that we have.

And it gives you also diagnostic quizzes so you can decide which is the best start for you. And one of them might be the Discovering Mathematics. Or you might feel that you're able to go a little bit further with Essential Mathematics One. But Maths Choices is absolutely your place to go.

KATIE: And if you're doing Maths Choices and doing the diagnostic quiz, don't just read it. Actually do the quiz.

SALLY: Yes, absolutely.

KATIE: Work through it properly and then be honest with yourself. What did I get? What did I get right, what did I get wrong? Don't just look at the question and think, I remember something about trigonometry. See what you can do. Start there, and then, step by step, you'll get all the way.

KAREN: Lovely. We need to start drawing the session to a close. And I see there's some other books and props and things. Is there anything else that you'd like to tell our audience about before we do some more philosophy?

SALLY: Just really, if anybody's interested, we also have a lovely level one module in statistics called Introducing Statistics. It's called M140.

KAREN: This is the one Peter Horrocks is doing.

SALLY: Oh yes! That's actually absolutely right. Yes. So I'm sure that he'll absolutely love it. And what I wanted to say was, and I think that Peter Taylor might say something about this later. But if you want to do a degree where maths isn't your primary intention, you can still

include something like Discovering Mathematics, Introducing Statistics, as part of another degree or even as part of the Open degree. Because mathematics is just useful everywhere.

KATIE: It's going to strengthen so many other things. If it's business, if it's computing, like you say. If it's one of the sciences, if it's psychology, there's actually a lot of maths in there.

SALLY: Especially statistics for psychology, of course.

KATIE: It's going to strengthen your study. So we recommend adding a little bit of maths.

KAREN: Wonderful. Well, thank you both so much for coming on and talking about it.

Would you mind removing this? Because--

[LAUGHTER]

Because I'm not going to do it. We're going to head over to the social media desk and we'll include all of those links that you've mentioned on our resources page on the website. And that's been brilliant. Generated a lot of chat, so thank you very much, Katie and Sally, for coming along and talking to us today.

Let's head to the social media desk and see what completing thoughts we have.

HJ: Well, I think a lot of people are talking about the module My Digital World as well. They're very interested in that, which is lovely.

And apparently some people working out transmission speed through projection. Which sounds very complicated, but I would be interested and find out more about that.

Georgina's very grateful that you've answered her question, and that's helped her a lot as well. And Natasha as well is very pleased. So, yes. We're all happy here and I think we're all psyched up for maths.

SALLY: I think the most important thing is that you just have fun and you enjoy the mathematics.

KAREN: Wonderful. Well, thank you all very much for that. That's been a great session.

OK, so we're now going to go back and do a bit more philosophy. We had a wonderful fight, I mean discussion, earlier. And Shawn is going to be in the chat. And he has written a really interesting question.

So we're going to be taking a look at that. This is a chat-only function. So if you are on the watch-only and you would like to see the chat that's going on, then do come back to the website [studenthublive.kmi.open.ac.uk](http://studenthublive.kmi.open.ac.uk) and go back through the watch and engage or the live and interactive button. And you can see the chat there, because we aren't monitoring the chat in the live stream website.

But I'd like to introduce Shawn [INAUDIBLE], who is going to be our philosopher of the afternoon. Responding to the chat and then summarising some of the key points that we conclude with. So thank you very much for that.