Show and Tell: 'Personal finance' with Martin Upton and 'Working with the NASA Curiosity Mars Rover team' with Susanne Schwenzer

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KAREN FOLEY: Hi. And welcome back to the Student Hub Live. Well, I hope you enjoyed that break. And thank you for that video. That was a long title on the board, wasn't it?

And I know you're all really excited to see what we've got for show and tell. And I'm pleased to announce we have Susanne, who's coming to talk about to us about Mars, and Martin, who's going to talk to us about debt.

MARTIN UPTON: And money.

SUSANNE SCHWENZER: And money.

MARTIN UPTON: And investments and pensions.

KAREN FOLEY: Which, as you pointed out, you need to get to Mars. So that's brilliant. We're looking forward to hearing about that.

But first, can I go to the social media desk and see what's been going on there.

HJ: Yeah. We're still very excited about books. And we're also very excited to see what bits and bobs you've got for us, which...

[DING]

Oh. OK. I'm very psyched now. We've got email in the inbox.

HELEN: Email. Good.

HJ: OK. And let's have a little look. What have we got? Oh. Another red envelope. Red envelopes. I think they're gonna be our lucky envelopes this time. We always get good stuff through the red ones, I think.

So keep them coming. Remember, #studenthublive15. And email address, studenthub@open.ac.uk.

And let's see what we've got here. We've got a fair few. And oh, that's lovely. We did ask for study areas. I always like to see how other people set theirs up.

And that's Laura's study area there. It's very neat and tidy, as well. But I think, Helen may be get a bit cross with me, cause I'm not as tidy as that. It's looking a bit messy over here.

We've also got Rosa from West Wales. And she's studying an open degree. Love to hear what subjects you're doing with that. Because you can mix it up so much with an open degree, and

do lots of fascinating things. And they're so many new modules coming out. I'm slightly jealous, actually.

What else have we got? We've got Georgina from Worcester, who's studying TU100 That's... I actually can't remember what course that is. So if you let us know, I'd be interested to find out. I think it's something like...

HELEN: Design?

HJ: It's design, isn't it? Technology type of one.

What else have we got? We've got... oh, there you go. Natalie, who says she's never far from the coffee machine when writing assignments. But we all have those funny study vices, don't we?

But coffee seems to be the mainstay of some people. What about with librarians? Do librarians drink a lot of coffee?

HELEN: We drink a lot of tea.

HJ: Tea.

HELEN: Yes. yeah There's lots of conflabbing that goes on in the staff room while we're all making cups of tea.

So I've got some fantastic ones here. I've got Ellie with her tiniest study buddy, which is Millie. And so, yeah. That's a really lovely one of them hugging.

And I've also got Dee's study pet. I'm rather alarmed that Dee's study pet appears to be in the fridge. So I'm not quite sure what's going on there.

And then finally, we've got Neil, who's sending through his selfie there. So thanks very much for that, Neil. That's great.

HJ: Yeah. Keep them coming in. We love them. Studenthub@open.ac.uk. #studenthublive15. And send us your videos, as well. I've heard there's lot of good ones coming in. We want to know about your study journey. How did you start? Interesting facts, as well.

We've put our interesting facts out here about the cassettes up here. With our first cassette in 1963. And apparently it was Love for Sale by Eartha Kitt. That was one of the first cassettes. That's very interesting. So we're hoping to add a lot more to that era as well.

KAREN FOLEY: Wonderful. Thank you very, very much for all of that. That's brilliant.

My producer's asked me to say, please could you stop sending the spam. It's clogging up the mail box, which is over its size limit now. And it's great to see so much chat going on as well. And Zaynah saying, you know, that she was feeling alone but now we're all with friends. So that's brilliant. So do, do chat alongside what we're talking about in the studio.

I'm really pleased to hear that. And if you are watching only, you can choose the 'live and interactive' button so you can see what everyone's chatting about. And you just go back to the website, and click on 'live and interactive'. And get your OUCU, which is free and very easy to do. And you can do that.

So we had a really enjoyable first start to the day. And we've just been talking about my life in books. And I wanted to ask you both, what's your favourite book ever? Martin?

MARTIN UPTON: Favorite book ever? Well, I really liked Dominic Sandbrook coverage of the Ted Heath government in the 1970s, called State of Emergency. Took me back to the time I was a student. And good things were going on. Inflation was 20%. It was a three-day week. Power cuts. But it was a good time for me.

KAREN FOLEY: Wow. Excellent.

OK. And Susanne, what was your favourite book?

SUSANNE SCHWENZER: I think I'm going a bit geeky here. I picked one of the Apollo books, maybe First on the Moon, where they describe the journey to the moon and what it took them to reach there. And these great sacrifices that this group of people who actually reached it did at the time. So yeah. All about astronauts.

KAREN FOLEY: Oh. Brilliant. I can't think of mine, but it probably wouldn't be anything quite so high brow.

So listen. We've done the show and tell. And this is where we show and talk about something. And Martin, you're from the True Potential Centre at the business school. That's a very grand title. What's that all about?

MARTIN UPTON: Well, basically True Potential LLP, a financial services company, have given us 1.4 million over five years to run a centre to help develop public financial capability. We've got an education side to it. And we've got a research side to it. And lots of exciting things are going on.

KAREN FOLEY: Fantastic. So what happens for those new students who don't know about the business school? What happens there? What sorts of things do you guys do?

MARTIN UPTON: Well, we've got an undergraduate curriculum and a postgraduate curriculum, and major research as well. But so, the True Potential Centre is focused on developing public financial capability. And we've been developing a number of courses to help people understand their personal finances better.

And they're all free of charge.

KAREN FOLEY: Really?

MARTIN UPTON: Yup.

KAREN FOLEY: Fantastic. So tell us then, because you wanted to talk about MOOC, which is a massive open online course that you're involved with. Now, for those of you who don't

know, I'd like to ask Martin to explain what a MOOC is, because they're a great way to sort of gen up on your knowledge, and also encourage friends who maybe don't understand that sort of distance environment journey. And they can maybe do a MOOC too. So that's always a good idea.

MARTIN UPTON: Well, the first thing to take into account, particularly since we're talking about finances, is a they're free. OK. And you go to futurelearn.com/courses. And you can see the range of courses which are offered on this platform. And Managing My Money, which is the first of the MOOCs produced by the True Potential Centre of the business school is one of those.

It next presents for eight weeks starting on October 12. It's about three hours of study per week. It's very interactive. Got a huge number of people studying it.

And we've got Q&A sessions. We've got various interactive activities. And plenty of information about how to improve your personal financial position.

KAREN FOLEY: Wow. So for people who've never done a MOOC... because we do know from our research, don't we, that most people who do MOOCs have been educated. So it's not necessarily something that people would do just to get interested. A lot of the time, people are squeezing this in. You know, ask a busy person, and they're always busy, et cetera.

What is the experience like doing a MOOC? You mentioned a start date. How does it all happen.

MARTIN UPTON: Yeah. There's a start date. MOOCs typically have four, six, or eight weeks of study. Managing My Money is eight weeks of study covering the full spectrum of personal finance issues. Each week of study is around about three hours. It depends on the individual, of course.

And some people take longer. Some people just whiz through it in a short time. So you can study it at any point. You don't have to sort of follow it week by week.

You can actually go onto the course, log in, and you obtain access to the course even after the eight-week period. So it's there for you forever to study. In the case of Managing My Money, to follow your financial improvement.

KAREN FOLEY: Excellent. I wonder if anybody's got an experience, and maybe you could put in the chat if you've done in MOOC, or if you're thinking about doing one. And as we mentioned, futurelearn.com has... well, whenever I go on there, I think oh, I've got to do this, this, and this. There's so many interesting things.

MARTIN UPTON: What I'd really stress, though is the interactivity. The learners, as they're called on MOOCs, can post comments to each of the steps each week. And on some of the steps on Managing My Money, we've got over 2,000 questions posted by learners. So it's huge interactivity.

The courses are facilitated. So guidance is provided by experts.

KAREN FOLEY: And I believe you MOOC also coincides with Managing My Money on radio, too.

MARTIN UPTON: Yes. Share Radio have bought up the rights to Managing My Money. And it's being broadcast currently on Share Radio. So if you just go to the internet, put in Share Radio, you can listen to the course as it's been adapted by the Share Radio team.

KAREN FOLEY: I've heard it's very. entertaining.

MARTIN UPTON: It's very entertaining. Very wacky. But it brings a lot of life to important subjects around finance.

KAREN FOLEY: OK. So you're talking about how finance can be fun, engaging, enjoyable, interactive, et cetera. Why is this an important area for people to look at? What might people learn?

MARTIN UPTON: Well there's a huge problem when it comes to personal finance in this country. We did a survey here at the OU last year and we found that 70% of adults couldn't answer basic questions about personal finance. Another survey last year showed that only 20% of employees actually have a financial plan in place. And that 50% of the employees have actually gone to employers to ask for financial education.

There's a huge demand is for education in this subject area. And we know there's a problem because of the over-indebtedness of people in this country. People aren't planning probably for pensions. We know there's a pensions crisis in this country. We know there's a savings gap. People aren't saving enough for the future.

So there's a huge gap in adult education when it comes to understanding and developing your personal financial capabilities.

KAREN FOLEY: Excellent. Now that sounds really interesting. Well, I'd like to go to the social media desk and talk about MOOCs and why they sound like cows with hiccups.

HJ: Well, I'm not sure about cows with hiccups. But uh... oh, the Moo-c. A bit slow on that one. Oh, dear. But yeah. There's lots of interesting MOOCs. I did one on energy. And we talked about the different ones we've done.

Naomi's done one on robotics. We've got a few of the moons MOOC people, which apparently there's a very popular one that I really want to try out. And we've got one about learning how to learn. That's coming up. And I think that's recently started, which is a very good one, since a lot of people are starting this week, their OU studies.

But some people just absolutely love them. Simon's doing six. Which is a lot. So he must be up all night. I don't think he sleeps to be able to do that many MOOCs, to be honest.

KAREN FOLEY: Now, I'm very interested in seeing what those are, Simon, and how you cope with all of that busy schedule.

Well, Martin, thank you very much for coming and telling us all about the MOOC. That sounds really interesting.

And that's on our Resources page on the website, if you're interested. And you've also got the...

MARTIN UPTON: Starts October 12 on Future Learn.

KAREN FOLEY: October 12 on Future Learn. So if you're interested in that, or if you know someone who is, do get them to log on around that time. Well, thank you very much.

So Susanne, you've brought some LEGO for us.

SUSANNE SCHWENZER: Yes! I indeed have.

KAREN FOLEY: What's this all about?

SUSANNE SCHWENZER: And I might retrieve it from behind the jelly beans jar. This is a LEGO model of the Curiosity Rover. This landed on the 12th of August, 2012 on Mars at Gale Crater. And it's driving around there since. And it's giving us a lot of very interesting results. And that's not a surprise.

This entire thing isn't quite to scale here. The arm is a little long. The mast is a little short. But you see the head with the laser and the cameras that gives us all the pretty pictures. You see the arm where it does all the chemistry and the interaction, and also where it can scoop up a piece of Mars and put it into the robot belly, where we've even got more instruments. So that's Curiosity in its LEGO version. And the real version is on Mars.

KAREN FOLEY: Wow. That's fantastic. Tell us why was the landing on Mars a seven-minute terror?

SUSANNE SCHWENZER: Well, if you land on a planet, you've got a problem, because you've got the atmosphere. And you've got the planetary surface.

So you come in at cosmic speed, and then you hit the atmosphere. That's a little bit like if you jump into water from a height, the water feels actually quite hard. And atmosphere feels actually quite hard.

And so if you come in without any protection or too fast, you might burn up. So you need a heat shield. You need the exact right angle. You need the exact right speed. And everything has to be just right.

But then once the spacecraft has entered the atmosphere, it has to come down. The Martian atmosphere is very thin. So yes, you can use a parachute for a while, but it doesn't finish the job.

And actually the Curiosity Rover had the largest supersonic parachute that ever was built and flown. So lots of new things there.

And then the real thing here weighs one metric tonne. And so to put this down on Mars, you couldn't do what other robots had done before. They were wrapped in air bags, and just fell the last couple of metres when the parachute got deployed and the air bags cushioned it.

But a metric tonne is too much weight for that. So they had to invent the sky crane. So what happened there is, they had a platform with [INAUDIBLE] rockets. And the Rover was tucked under it. All folded up. Tucked under it.

And then it was lowered like you'd sometimes lower a weight from a helicopter. On the Martian surface, the sky crane going down, down, down, down, down. And the moment the robot had touched the ground, the cables need to be cut. And the sky crane flew away.

And so imagine how many things could go wrong there. And we Earthlings, we could just watch the data as they came in, because we've got a long, long signal transfer time. It is exactly seven minutes. So the moment this happened, for us on our screens, and you saw all the numbers, the Rover was already on Mars. Alive? Dead? We didn't know. We just knew it were.

KAREN FOLEY: Aw. I saw when Philae landed on the comet, as well. And how nerve-wracking, because they broadcast that whole sort of gap between when something happens, and when you're waiting then, for that data. So I just wanted to say, because Mars is really I guess hot in the news this week, isn't it? In terms of some of the stuff we're finding.

And I wondered if you could sort of explain, just generally, because you're involved obviously in this one particular project. And various members of the Open University are involved obviously in Rosetta and various space initiatives as well.

How does that all work? How does it work for Milton Keynes with NASA, with all these agencies, with the instruments, with the robotics, all of that. How does that work?

SUSANNE SCHWENZER: Well, first of all, it comes down to money. We have to manage finances a lot. Because of course, it's time. It's investment in travel that you need. And these things aren't cheap either.

So what usually happens is a space agency proposes a mission. And that could be ESA for the Rosetta lander, or NASA for this Rover. We've got the ExoMars Rover to Mars coming up, which is an ESA thing again. Or other space agencies around the world. They propose a mission.

And they put together a small team of experts that build the mission. And if you think back to Beagle, Beagle 2, the spacecraft that was built here. It was part of a larger orbital mission. And the Beagle 2 spacecraft was added to it.

So there are lots of teams around the world working on this to first design and put together the spacecraft. But the moment a spacecraft is actually flying and landing and getting data back, you need a much larger team. And that's how I came on. Because the moment they know it's not all going to happen, they need to expand the science team. You need to few to design it, but you need a lot to deal with all the data.

And so they put out a call and asked scientists to apply. Like you would do a job application, with all your skills. And then they made choices, whom they needed on their team. And we were lucky... and I say "we" here because the UK team lead for the, as they call it, participating scientist team is Professor Bridges from University of Leicester.

And he led the writing of all of this. And he's leading our team. And I'm part of that. And with that, part of the Curiosity Rover team.

So it's a very diverse answer, because there are so many ways to get involved.

KAREN FOLEY: Fantastic. And I think the studio was initially where one of these landers was built, wasn't it?

SUSANNE SCHWENZER: Yes. Yes. Yes, exactly. That was the Beagle 2, clean room. So we couldn't have sat in here like we are now. We would have had bunny suits on and everything because every single dust strain that gets somewhere where it shouldn't be would be detrimental. And they don't have tow trucks on Mars. So if something goes wrong, it's done.

KAREN FOLEY: Wow. That's incredible. So in this very room, I'm glad they've moved all of that out, and allowed us some nice comfy seats and other things going on instead. But it is incredible, isn't it, the sort of involvement with all of these missions?

And of course, so you're working as part of, I guess, a wider body of academics, researching, getting the data, analysing the data. What are you finding? What sorts of things are you looking for? And what are you finding at the moment? Because it's been very big in the news, hasn't it?

SUSANNE SCHWENZER: Yes. Well, that wasn't us. That was an orbiter that's around Mars. And what are we finding? Well, what we are looking for is we try to understand Mars in terms of the planet and the habitability off that planet. So if life ever was on Mars... and now think of little bacteria... could they have lived there? Would they have water?

And that's why water, which was in the news this week again, is such a big topic. Because you need water as a solvent, and with all its special properties. Those of you who are studying natural science subjects on any level... S104, for example... they will learn about the water molecule and why this is so special.

And we need that. And we need it in its liquid form, not ice like we found it on Pluto just a few weeks ago. And then we need other things. The nutrients. You know that you have to eat calcium, and not so much sodium, but you need potassium. They all have to be there for life.

And what we try to study is, has water been there? Was it liquid? When was it liquid? And what are the other circumstances? Is there any poison? Are there enough nutrients?

And for that we need to understand the geology. We need to understand the atmosphere. Habitability is more than just water. It's also irradiation environment.

Mars has a very thin atmosphere. How does this interact with the surface? What does this mean for cosmic interaction for the solar flares and everything that comes to the Martian surface much less filtered than it comes to the terrestrial surface. And so we are studying a wide variety of these things to understand Mars as a planet, and whether it was ever habitable.

KAREN FOLEY: Wow. You brought something else I want to touch on in the last few minutes of the show and tell. But for those of you at home, I know that this is really interesting. The space stuff always goes down so well. So if you've got any questions for Susanne about what it's like to actually be doing this... sounds like you're doing a lot of math and statistics and analysis.

SUSANNE SCHWENZER: Of course.

KAREN FOLEY: But If you've got any questions for her about this, do let us know. What's the final thing you brought in?

SUSANNE SCHWENZER: Well, I brought actually a little piece of Mars. We have never brought some back. Like the Apollo missions, the astronauts, they brought samples back.

But from Mars we need to use what my professor called the space probe of the poor man. Meteorites. They come to us.

And they look like this. Very shiny and very black, because that's the fusion crust. We've talked about atmospheric entry. They don't have the luxury of a heat shield. So they have to take the heating as is. And a lot of the rock melts. And then you get this shiny fusion crust, which [INAUDIBLE], I'm trying to not drop this here.

First I opened it with the top open, so here you see it. And this is how we know that this is a meteorite. And we know that it is from Mars, because we know what the Martian atmosphere looks like. And Martian atmosphere actually has become incorporated into these rocks. And we can measure that. And we can find that, and this way make the link between Mars and these rocks.

KAREN FOLEY: Wow. That's incredible. What do you think? Kevin Hetherington brought us this meteorite earlier? What do you think of that? We're not sure what to do with it.

SUSANNE SCHWENZER: Well, I would give it back to him.

KAREN FOLEY: I know. He actually did say it was very, very valuable. And we're not to let it out of the studio.

SUSANNE SCHWENZER: Yes. Or shall I take it?

KAREN FOLEY: No! We'd be in so much trouble.

SUSANNE SCHWENZER: No. Meteorites are actually very fascinating objects, because they sample the entire solar system for us. We've got the condrites, which are very primitive meteorites, from the very beginning of the solar system. And we've got pieces of Mars. And we've got pieces of what we think are pieces of Vesta, from the chemical composition and what we know about Vesta.

And so we can study all these objects. Some of them have pre-solar grains. So they have grains from the universe included there that are older than our solar system. So studying these meteorites gives you this huge wide range of opportunity to study our solar system from its very beginning to today.

KAREN FOLEY: Wonderful. Well, I know the students are talking about Mars and water. We just have time for quick break over to the social media desk.

HJ: Yeah. Well, there's always so much exciting stuff going on about space. And a lot people are looking about the Philae lander as well, and there's so much news. It's all very exciting.

But one thing that we have been talking about and we did wonder, is how many people does it actually take to put a mission like this together, and what type of skills and specialisms? Because it's not just one group of scientists. It's loads, isn't it? And there's lot of cooperation between countries and agencies. We'd love to hear about that.

SUSANNE SCHWENZER: So, it first of all takes some engineers and scientists to put together an idea. It then takes the finances people to calculate how much would this actually cost. Is it feasible.

It takes lawyers to make all the contracts around the world and international lawyers to put together the contracts where finally after you've decided what you want to do. Then it takes work from the very, I say basic level, but it's really not, of putting things together. To the engineering, to a lot of administration. Because especially with international things, there's a lot of administration that goes on.

And then you need the scientists. We are actually the smallest part of this all. Just to give you an idea, there are about 500 scientists. But there are right now for driving this, about the same amount of engineers and administration and all of this. So it's always a huge enterprise.

KAREN FOLEY: I wonder how much a bottle of Martian spring water would cost. Martin, any thoughts on that? It's a very good point.

SUSANNE SCHWENZER: So that's $2.9 billion to get it there. So.

MARTIN UPTON: I think you might find that the Earth equivalent is slightly cheaper.

KAREN FOLEY: You wouldn't recommend investing, maybe. Check if it's genuine. Right.

Well, we're going to end the session now. But thank you very much Susanne and Martin for coming and showing and telling. That's been really great.

We're going to now show the sequel of the video that you saw before. The Where To First video. This is Where To Next. So lots more advice. Keep that chat coming. Keep those selfies coming.

We love seeing who you are, what you're doing, et cetera. And don't forget, questions for the Vice Chancellor piece for later tonight. We'll see you in just over 5 minutes.

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