**ID\_MI07\_M\_EE\_N**

**Voice080.3ga\_F\_N\_EE**

Background

I would you like to give a brief background about yourself?

MI07 Yeah, well I’ll tell you the whole thing. I can me to do degree in 1993 Physics and then I did a PhD in 1997 Optoelectronics then I was a research fellow and then senior research fellow until 1997, so no teaching at all

I umm

MI07 and then I worked 20% of my time in the foundation year, I volunteered to do some lecturing in 1997 then 1998 I came into foundation year full time as a Deputy Director

I 1998?

MI07 1990, sorry in 2008 I’ve lost 10 years. Sorry 1993 degree, 1997 PhD, 2000 research fellow, 2007 Part time Lecturer on foundation, 2008 full time Deputy Director of the foundation year. Where does the tem years disappeared

I so, how long have been teaching in the foundation year?

MI07 since 2007

LANGUAGE

I so, what’s your experience teaching over the years, anything changed, the students the syllabus, or…

MI07 no, more or less no, it’s more or less the same syllabus

I umm

MI07 I made a few tweaks. I’ve taken away small parts of it, I’ve taken away Electromagnetism and I put in what we called trans juices, so it’s a small change to the body of the content, but

I which module is that?

MI07 GENG 0004 so, that is called Electricity and Electronics

I so, you moved one of the topics

MI07 yeah, well, it’s small topic I took it away and I put another topic instead, so

I why?

MI07 because we introduced Language Pathways for students with IELTS less than 6.5 and the Language Pathways don’t do one of the Physics topics. Either they don’t do Electricity and Electronics or they don’t do Engineering Principles, so we had to juggle around the content a little bit so that they all studied you know the right amount of material

I so, EE and EP is sort of optional, no it’s not optional even for the Language Pathway students, yeah?

MI07 yes, if they do Language Pathway A they don’t do EE and if they do Language Pathway B then they do EP

I umm, when I interviewed students the Language Pathways students

MI07 yeah

I they were not happy about it, they said they wish they were given the chance to take the module and language as outside the…

MI07 yeah

I well, that's what they said but I’m not sure

MI07 yes, but the problem is they don’t realise they probably not be able to progress to year one because that English language module is a rigorous module which carry the same weight as EE or EP. And there’s a lot of work to do because they can’t go to year one unless they have an IELTS 6.5, and examination is closely linked with IELTS 6.5 so, we have to pass the exam and everything. And we’ve failed students before, they failed a year because they pass everything but haven’t pass English you know, we’re very strict about it. Of course they don’t want to study English, but it’s university requirement and they need that level

LACK CRITICAL SKILLS

MI07 well, this is totally subjective because we don’t measure their critical skills and I don’ t know much about them. I don’t know how to identify them. I can only perhaps only guess based on my experience ( \_ ) you know I can’t even guess, but as usual and this is totally subjective I got no evidence to back this up. As usual students, but no, obviously I’m gonna says students from the UK perhaps. I’ve a greater awareness of this sort of thing that international students but I think that goes without saying doesn’t it, but I might me guessing, I’ve no idea actually. I honestly don’t know. Because you know, I do test reflective skills because I asked then to write reflection portfolio but that is not critical, that just reflective. You know, there’s some students better than the others at identifying their strength and weaknesses and putting strategies to overcome their weaknesses and so on that’s not necessarily critical is it? I don’t know what is it actually

I so, when come to write about their reflection who provide more meaningful information?

MI07 mature students are always best at reflecting

I so, it doesn’t matter who, is that because of their life experience?

MI07 yeah. Yes, but again British students UK students are better at reflecting. But, I’m not sure that’s because their more willing to engage with exercise and they understand more of what they have to do because they done it before because they do it at A level. Where else the Chinese students perhaps not so good at reflecting, because, maybe they don’t understand the exercise, maybe they do reflect maybe they don’t know how to do it in English, I don’t know

I Coming back to UK students how about BTech UK students

MI07 an interesting group of students, yeah

I so, how do they

MI07 in general they struggle on their foundation year not necessarily not necessarily because of their Maths level but because they used to do course works so they tend to do not so well on average as other students in the exams because the exams is a bit of shock for them

LANGUAGE AND CT

I how important is language to acquire the skills

MI07 now I know nothing about it at all, but I would say it nothing to do with it. You can think can’t you without any language at all

I I think you’re contradicting, just now you mentioned language is important for them to perform well

MI07 to study in English, yeah

I so, nothing to do with critical thinking skills? So, language doesn’t

MI07 I honestly don’t know, but I’m just thinking that I know people that are fantastic critical thinkers that their English is not very good at all but they think in their own language, they critically think in their own language so it nothing to do with English

I so, language doesn’t play a role?

MI07 in general, no. But, I suppose the development of critical thinking skills when you’re studying in English is too complicated to even think about it (laughs) too many parameters. My goodness! ( \_ )

I okay, let’s focus on engineering studies

MI07 yeah

I where they have to move on to their first degree. So, does language play a role for them to acquire the skills?

MI07 critical thinking skills in ( \_ )

I like for example, you give them assignment, yes

MI07 umm

I and incorporate some of the words which may reflect, they need to apply their critical skills like analyse, synthesise, evaluate or whatever

MI07 yes

I if they don’t understand those words which is in English

MI07 umm

I do you think it affect their performance or it doesn’t matter?

MI07 well, if they understand the concept somehow, even if they don’t understand the words, I don’t know. It’s too complicated to even think about and I, it’s going into the world of expertise that I’ve no idea about that’s the problem

I so, you’re not sure?

MI07 no. I think everybody is going to be different because once somebody understands even if their English isn’t very good even once they understand what they have to do and the processes they have to carry out surely they’re going to develop their critical skills even of their translate into their own language which I know students do, do. They think in their own language, it takes time to start thinking in English. I know that’s a fact because I’ve taught to PhD students before that have been in this country for several years and I said, ‘what language are you thinking in?’ Sometimes they say their own language, sometimes they say English bit I haven’t been thinking in English for very long. When O go home to China to Greece or whatever for my holidays, I start thinking in Chinese and Greek again but only after couple of weeks’. So, it’s very interesting, really. I’ve no idea what those answers are

I so, form your view can I assume understanding the concept of knowledge will help them to get through rather than them employing that extra skills?

MI07 I would say it’s all about concept, yeah

I so, they just have to memorise then if…

MI07 but then they can analyse in their own language can’t they? But, I’m guessing here, I don’t know

I because when I interview some of the students I asked them, ‘how do you analyse?’, they were struggling. They know the word exist, but how to actually do it

MI07 yeah

I explicitly do it

MI07 to analyse?

I and synthesise, so okay we say synthesise, so how to actually do it

MI07 it’s true lot of international students lack vocabulary, it takes years to get…

I I mean they can always look up in the dictionary but then doing practically

MI07 is not quite the same is it?

I no, especially in engineering or medical

MI07 yeah

I those kinds of sciences

MI07 yeah, it’s interesting actually and hopefully you to the bottom of it (laughs)

I (laughs)

MI07 (laughs), it’s kind of

PEDAGOGIES (16:51)

MIO7 so, for my case I do two lectures a week and then they have one problem sheet per week and uniquely on my course EE they do the problems on-line, so they answer the questions on-line which they prefer, I don’ know whether they always writing the evaluation that they prefer doing them on-line rather than attending a workshop. So, they attend workshops in MS and EP and Maths but they much prefer my method, but it’s just different way of doing it. My style I’m always conscious that you got to keep them engaged so, I do move around a lot and keep them awake and I do a bit of talking and then go on the white board and then I do a bit of power point, so I’m going from one thing to another

I so, do you allocate time for Q & A?

MI07 no

I not at all

MI07 it ‘s all, umm , I ask they you know. If I come at the end of the bit I ask, ‘any questions?’, and usually it works out quite well. If they ask me too many questions I shut them up and I say, ‘come on this information can be found elsewhere’, you know. Like yesterday somebody was asking me, ‘what are we going to do with our experiments?’. You know, when you only got forty five minutes to tell 150 students about electricity twice a week and this student, ‘but what’s in experiment one, what’s in’, I had to say stop asking questions look on Blackboard the information is there. So, I can be quite school ‘teachery’, I’m very strict actually and I get them all laughing as well

I yeah, because I interviewed students most of the students said they enjoyed your session because it’s not boring

MI07 yeah

I and also MS, umm they say it’s very engaging and then there was once, one of the students was mentioning you explained a concept using power point on electromagnet or something, is it like a moving picture or something is it?

MI07 it’s MS I think

I MS is it? Yeah, it was engaging that’s why I wanted to know from you how you actually run

MI07 I do move around I impersonate particles, you know like an electron is a particle that moves along a wire that’s electricity. I am an electron walking along and dancing along and a bit of performance, really, but it engages them and I have a bit of fun

I so do you give them in class practice like sometimes you’ve questions and you want them to practice in the class

MI07 occassionally

I occassionally

MI07 yeah. About once a week I ask them something and discuss it about five minutes and then we vote

I so

MI07 I called them my brain teasers

I so, indirectly you already encouraging them employ the skills, don’t you think?

MI07 yes, it’s a good way for them to understand something because they always get it wrong. But, they always think that’s obvious the answer, but I’ve chosen those questions so they seem trivial and simple, but I’ve designed them so they get it wrong

I okay

MI07 so they all go, ‘yeah, we know the answer’, then I’ll trick them by saying, ‘it’s not correct, you got it wrong’, just to make things you know, ‘God! I thought I understood that but I don't’, it’s just to make them realise that there’s more to it than, it’s not simple, it takes some thought

I so, even though it’s just five minutes it’s actually gives them the opportunity to practice the skills in the class?

MI07 yeah

I so, that’s at least once a week is it?

MI07 yeah, but hopefully they’re thinking all the time

I umm, I mean like giving them the opportunity in the class when you’re around they can always ask you question, so do you think this kind of practice will help them to acquire the skills?

MI07 yeah, I think so. I don’t know (laughs) I don’t know, I just trying them to learn stuff. I’m just trying to get them to understand what’s going on. Some of the concepts in Physics are difficult to follow, you know, ‘resistance’, for example in a circuit. You know, what a, ‘resistance’, do? What happens in a you know, just difficult physical, it sort to do with, ‘electron’, moving on a wire. You know, when we’re talking about electronics there’s actually holes but nothing there moving along a wire. It’s very difficult to understand all of this sort of thing but you know, so I have to get them to think about all this but not necessarily by discussing it by themselves. I’m trying to get them to understand it you know, for me demonstrating it or showing them a picture or you know. I tell you what, what I do, do though I do things, I don’t tell them just once if it’s a difficult concept I give them Maths and I give them my explanation, then I give them a picture because everybody learns it in a different way. I mean I’m a picture person myself I like to see pictures

I umm, visual, very visual, okay

MI07 yeah, but I make sure that everybody has a chance of understanding it but showing them different ways

I So you give them the formula, give them some visual

MI07 yeah

I and then asked them to work it out?

MI07 yes

I is that how you introduce a concept?

MI07 yes and there are lot of concepts because the whole of my course is nothing more really than you know, than these particles moving, this electron moving along wires and that’s the whole of Electronics and Electricity. Umm, it’s sound easy but it’s not, it’s lot of imagination they have to use to realise what is going on

I so, do you think giving them more opportunity like this in the class would benefit the students to actually practise it in the class?

MI07 no, because my on-line problem do that, you know. They have this problem sheet every week and it covers all of the concepts, gives practice for all of the concepts from that week, so they have plenty of opportunity to practise putting what they’ve been learning into practice

I so, but then it’s independent work isn’t it?

MI07 yeah, yes

I so, where do they seek for any kinds of support, do they go for workshops for EE?

MI07 they don’t go for workshops for EE, they do on-line

I so, they do everything by themselves

MI07 yes, and then if they stuck they go to the support class

I oh! okay

MI07 the voluntary support class, they can go to support class if they need help

I right. so, do you think critical thinking skills are important for foundation year students to move on…

MI07 did you ask everyone this question to everybody else to Mike and Ling?

I yeah, everyone is the same question

MI07 and they found them easy to answer so they?

I everyone was different and they struggles, but it’s okay

MI07 yeah

I no one gave me a direct answer

MI07 did anybody say what is critical thinking? Did everybody know?

I that bit is the twist at the end of the interview

MI07 yeah

I I ask the same question to everyone

MI07 yeah, it’s interesting. Okay, what was the question again

I do you think personally critical thinking skill is important for engineering foundation year?

MI07 of course

I why?

MI07 ( \_ ) I’m struggling. I’m struggling because it’s not just the material is it? So, it’s not just the material of the you know, of using the critical thinking to do analytical work and to a problem solve and so on. It’s also management of their own approach to study and learning efficiently isn’t it? Taking the right course and to look to learn things quicker and understand and their own strength and weaknesses that sort of thing, so that’s their approach to study as well as what they studying. So, yeah, of course it’s a, consequently their critical thinking skills develop without they knowing about it and they must do because someone who is graduating after the whole degree has pretty good critical thinking skills although they don’t realise at that time

I so, can I say critical skills is part of their academic skills anyway

MI07 they’re developing them

I so, at the foundation year stage

MI07 yeah, they’re developing them. I think they’re developing them but that never mentioned

I is it important for them, do you think at foundation level?

MI07 yes, I mean their critical thinking skills are further developed, it will be more useful and if they are not very well developed, but that doesn’t mean that students with good critical skills are gonna be better students because they might not be so academically able. You know, somebody might be very good at Maths, you know. Lot of the Chinese students get 100% in their Maths exams, but come to critical thinking skills and to applying them to their study approach they don’t use any of, it’s very hard to identify any critical skills they’re using because they are very good at just learn, learn, learn (snaps his fingers)

I umm

MI07 I don’t know why you’re doing a PhD on this because these questions are really tricky actually

I yeah. So, just now you mentioned about writing a reflection report

MI07 yeah

I there’s also philosophers like John Dewey, he mentioned reflective thinking which then over the years developed and defined as critical thinking

MI07 it has been define as critical thinking?

I it developed to critical thinking, because I think in 1910 he mentioned about reflective thinking he wrote a book on that. In there he mentioned a lot of critical analytical skills involved in reflective thinking?

MI07 yeah

I and other philosophers after him developed the concept of reflective thinking into critical thinking skills

MI07 umm

I so, therefore reflection is part of high level critical skills some philosophers claimed. So, just now you mentioned mature students or the students who already had experience in A level doing reflection

MI07 yeah

I they do better reflection

MI07 they reflect better, yeah

I and you have that in Routes to Success

MI07 yeah

I reflective report writing

MI07 yeah, I asked them to write a reflection portfolio

I so, based on the portfolio is there any obvious difference between students, or is it about the same the way they reflect

MI07 yeah, there is a big difference between them some reflect easily and some are good at doing the exercise because they know what I want to hear, and that not necessarily…

I strategic learners?

MI07 yeah, they are not being reflective they’re just give me they think what I want to hear

I so, who are the students who not really do so well?

MI07 Chinese

I umm

MI07 but usually Chinese are the language pathways, they have this obstacle of English language. It’s a real, I mean when they do their work for the pathway, when they write a piece of work for their English language I think it’s very difficult for them to get through the work cause they’re struggling with the language

I so, they couldn’t write well is not they couldn’t reflect well

MI07 I think, it’s difficult to identify any reflection in a piece of work that isn’t well written, I don’t think

I umm, language is important then?

MI07 no, they might be able to reflect in their own language

I because the problem here is, we’re looking at academic critical thinking skills which is so different from

(37.20) ct in XM

MATHS

MI07 you can argue that pure Mathematics doesn’t require a lot of critical thinking, you can argue that but I’m not going to state that. Because it could be possible because some people learn Mathematics by rote and they’re just like riding a bike. You learn to ride a bike you're not analysing how to ride a bike once you know how to do it and you can argue that you know once you’re good mathematician then you no longer thinking but that I’m just suggesting I’m not saying that’s true. But something like my topic like EE you have to think a bit more because you have to understand the problem, even in MS as well and even in EP I would say as well. You have to understand the physics of what’s going on and this unique scenario that is given in this question, is it going to slip or is it going to fall, you know, what’s gonna happen and you know all the different parameters that you have put them all together so you have to think more critically. So, yeah, again what is better knowing, having lots of practise with problems or thinking critically I think we tried the last couple of years to make the exams more unique so they just can’t do past exam papers and then get to this one is just walk in the farm. Particularly, last year we made a big effort to make things slightly different to make them to think a bit deeper and to struggle a bit more

I yeah, that’s what the students mentioned to me as well

MI07 yeah, we did that on purpose because we feel as though they were just doing past papers and think this is you know, and then doing this year paper and finding it it’s isn’t easy

I yeah, the students mentioned they were practising using past year questions

MI07 yeah

I and then this year like, certain questions like they couldn’t even think and that took so much of their time

MI07 yeah, which month did you interview them?

I immediately after their exam

MI07 immediately after exam

I yeah, that was the second round of the interview

MI07 yeah, students are always shocked by exams

I yeah, they were shocked (laughs)

MI07 every year, they always say to me, ‘that was the hardest exam ever and the next year, ‘that was the hardest exam ever’, next year, ‘that was the hardest exam ever’. Because, if you’re in exam conditions and you haven’t done a new question it’s gonna feel it’s a real hard exam, but this year it was a harder exam genuinely

I yeah, they did say some of the questions were so different especially EP they said

MI07 yeah

I how would he define critical thinking?

DEFINE CT

MI07 my goodness! It’s tough isn’t? Because, you got to be careful you’re not just thinking about deep knowledge. I’m not even sure really that we’re always right, the right questions to bring out to encourage the use critical skills. I’m not sure whether we were as bad as the students in some ways that we just ask for something, a difficult concept that they could have learnt without critical skills

I so you’re not sure with the designing of the questions

MI07 well, I’m not sure whether we were expert enough to bring out ( \_ )

I umm

MI07 but we do ask them, we do know how to test deep knowledge deep understanding. We know how to that, but do we know how to get them to answer the question. But, make them use their critical skills and then, make use of the critical skills, a little use of critical skills and middle use of critical skills. You know, it kind of works but how do I define it? ( \_ ) I’m almost too frighten to go there, it’s

I just now you mentioned about self-management, like when they look at a question and if they don’t know how to manage the time well

MI07 yeah, that’s what I’m saying

I time management is part of critical thinking skills

MI07 it’s all about asking question isn’t it? You sort of asking the question all the time. You’re not taking things for granted. Even down the point where you might say, ‘I got 2 hours I got 20 questions asked’, that not necessarily 2 hours divided by 20 per question because this question is a bit more deeper you got to give more time. You sort of analyse critically over time don’t you?

I so, time management

MI07 yeah, or even before the exam you know thinking about how best approach practising doing exam and developing your exam technique, but actually solving the problems. Again asking several yourself a set questions isn’t it? ‘What’s going on here? Is it this? No. Is it that? No. If this element is introduced, what change will it make and will it make a change at all?’ It even frightened me to even think about it … I struggle with this things because reflection, creativity, critical you know, what are these things? How do they overlap? It’s almost into the world of philosophy, I know I being kind of (laughs) I know people are experts in this sort of thing. When they talk to me it spins around my head. It’s not something you can look in a dictionary and find out what it is and more I know about it the more it spins around my head. It’s harder to put my finger around talking about. It’s awful isn’t it (laughs). That’s what a PhD, you know

I so, engineering what skills are very important? If they were to move on to their destination course

MI07 well, they need to be creative problem solvers because there’s always new problems that need a creative approach … I mean, there might be a bridge builder, a civil engineer that might need to build a bridge where a bridge might not have been built before in a geography where nothing has ever been tried and tested before. It might be in a strange environment, it might be hot, it might be cold. Umm, it might be you know in arctic circle. You know it’s difficult to do anything and you have to be creative in finding a way around the problem. So, for me creative problem solver for an engineer is a good decision to be here. But, it has got nothing to do with critical thinking, God knows! (laughs) I don’t know … I think it’s so closely linked. It’s difficult to separate completely but I don’t think they’re completely the same either. I don’ think critical thinking and creative problem solving, critical and creative are the same thing but they overlap a lot don’t they? … they don’t happened at the same time necessarily, with creativity, ‘Oh! I got an idea, let’s look at the idea if it works’, it’s almost like two different thing isn’t it. I would say, ‘they’re marriage made in heaven’ (laughs out loud) critical thinking and creativity, they’re not the same thing

I not the same thing but then they complement each other very well?

MI07 yeah exactly. Good word, complement, yeah … creativity and critical thinking is complementary and they almost can’t be separated can they? Because it’s okay to think about an idea but to be successful using that idea use critical thinking to put into practice