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**M-UK-M01 (Walter) – 13/05/2015**

**B/g information**

* Started teaching in 1986 in Further Education, taught primarily Electrical and Electronic Engineering
* Prior to that served in apprenticeship as a mechanical engineer …worked in shipyard because of the industry here, ship building and mining, then did a degree in Electrical and Electronic Engineering
* Subsequently ended up working for Sunderland Polytechnique, which then was an organisation before Sunderland University came into existence. Worked in Further Education in Electrical Engineering from 1986 to 1996, and due to interest in information and technology, ended up being involved in computer network management, and became the IT Manager, (???) College which subsequently became the City of Sunderland College and had been an IT Manager for the period of 10 years, line-managing a lot of technical stuff. And, when that college merge with another college, then merge again and became one single college then expand city of Sunderland and surrounding area and became the City of Sunderland IT College, worked there 10 years till 2006. And then left there and self-employed briefly, and started teaching again at Middlesbrough College, and taught for almost 7 years,
* Then came to teach at the University of Sunderland as Senior Lecturer in Electrical Engineering, in January 2014, for almost a year and a half now, became Programme Leader for Extended Engineering which he took on from September last year.

**Q1 What programme do you teach?**

R: Electrical Technology which Sue Armstrong and myself share and also the project.

I: So this project is the combination of Maths and…

R: It’s the group that just met, it’s the Engineering project

I: Engineering project, ok

R: We basically do it sort of group project, where there’s a combination of individual work, individual group presentations, and then we do problem solving in engineering related environment which they work in groups now, but the ideas is that they take on different roles within their group, so somebody become the software programmer, hardware design, and other people have different roles, primarily and little bit of cross-over, but then they hand in individual report. So it’s very much throw them into the deep end, they have to use the engineering skills, if they don’t have the skills they got to find out, and that helps as well obviously

I: So, they basically start as a group and then they delegate their roles, and decide what they want to be by themselves?

R: Yes, they do individual, we use micro controller base system as the scenario, but then they, that’s how it sets on a computer on a chip, a single chip computer, then where they can use those in the modern world. So they start off by doing individual research, they do a presentation where they pick a particular application going how does it works, and that raises their awareness of how these micro controllers are used, but then they then start to develop a lone system, but some of them have to scale back their ambitions, because they can be very ambitious about what they want to achieve. So, in terms of doing research and presentation it can be as ambitious they like, but comes to actually making something, they got to pick a topic that can be achieved, so I have to see it in whether or not it something aren’t not too simple which they actually trying to make it more difficult, more usually the students will pick something that’s little bit too hard, but I try to scale back them

I: Right. So, they start as a group, and then they do individual research, and then presentation is individually assessed?

R: They do a group presentation but they each take part in that presentation so they may deliver a certain section of the presentation

I: Oh Ok, they distribute among themselves, that everyone…

R: Yes, everyone has to take part, yes. If somebody doesn’t take part, then I make them do their own presentation separately.

I: So, how about the report? Do they have to write the report about the whole project?

R: Yes

I: Is it individual or as a group?

R: As a group to design a system and solve the problem, but then and they’ll have their own role in that process, but then when comes to writing up, they have to do their own individual report. What I say to them is, if another member of the group has done say the project plan like a Gantt chart, they can all include the Gantt chart, but they have to say member B did that Gantt chart, you know they can’t take the credit, but they focus on their perspective, so what they did, what was their contribution, but also there’s also a shared of success of their groups here.

**Q2 Which students lack critical thinking skills?**

I: So, in your experience of teaching in the Foundation Year, lots of students come with different learning styles, different way of learning, so based on your observation, the way you assess, which group of students do you think lack critical skills?

R: which group?

I: I wouldn’t say group, I don’t know how to put it

R: I think so more of confidence, definitely, and that may have to do with their background. May be, one of the potential issues with Extended Engineering is that we are taking learners from very diverse backgrounds, so the learners haven’t done traditional A levels or college route, not the same extent, but they need 260 UCAS points roughly if they follow the traditional route going to engineering, these learners haven’t. Maybe, the typical learner in extended engineering might got say 180 UCAS points from whatever they’ve done that might be it, because I haven’t analysed their background, and that’s are fairly typical. But some of them are mature learners that chap Mr X that was talking when we did the talk earlier? He’s a mature learner, and I suspecting he hasn’t as much in the way of qualifications, but equally, he’s one of the most able in that class. So there’s no relationship between academic qualifications and performance necessarily. A lot I find the mature learners are the ones with best work ethics, work hardest and they plough their way if they have difficulties, they sit there and overcome them, much better staying track than some of the younger learners. So, one of my jobs this year when I got my marking done, is to do entry route analyses. So, I’m looking at all the students, when they came into the university, what qualification they come in with, and then I’ll correlate that, to how they go out, how well, they do on subsequent degree. And, that might inform us the terms of a, maybe setting entry tariff to get on the programme

I: That’s your future project?

R: Yes, that’s the future, I find that certain routine, maybe the learners are struggling, that might have been the most (???) idea, if that’s the case, may we need to raise the bar to certain routes, until I do the analysis, and maybe I’ll do it for several years, I won’t know. I’m trying map learners as they come in trying to map their behaviour, their academic levels as far as we could tell versus how well they achieve

I: Right, just now you’ve mentioned interesting details, one is for you confidence is very important for them to apply critical skills?

R: confidence

I: Ya, so those who lack the confidence, they struggle with or they’ve difficulties using the skills, can I say that, right?

R: Mmm…we got some learners who struggle with all aspect of the programme, they’re going to struggle to succeed, and those learners probably struggle with critical skills as well, so I think there must be some correlation between that

I: Right, because there’re two issues here, one is students who come from A Levels, that’s one and those students who come from a different educational background, they’ve issues with confidence?

R: possible

I: ya, not all but some of them, and so, just now you mentioned about mature learners, they handle the programme well

R: on the basis of what I’ve seen, yes

I: so, do you think maturity is important for critical skills as well?

MATURITY

R: Err, it must have some part to it, those mature learners when they come in, they, some of the learners beginning are very lacking in confidence, and some of those learners started going out to get extra Maths tuition, that sorts of thing. But, the general feeling was, but they didn’t need it, they go out to get extra support for Maths, but what they needed was somebody kind of reassure them that, what they’re doing is correct. And in vast majority of cases, those learners got thorough that, and now once got their confidence, they just progress forward. And, as their study progress forward, they tend more academic, and they get where they want to be, that particular group even though they encounter difficulties, they don’t just leave it all, which I’ll give them rather than doing it for them, they just keep on going and going, they wouldn’t give up. Eventually, just today, they got everything working, perfect without me doing it for them

I: So, these are the mature students?

R: Mature, yes

I: Is it because they already have working experience, helped them to be more critical?

R: Could be, ya, they’ve all the experience, maybe something they learn

**Q3 Classroom practice – how do you run your lectures or classes, usually?**

I: So, how do run the lecture, do you lecture the whole hour, or give them works on something given in the class, or lecture and have some time for question and answer, or them to work in the class itself, so how do you usually run your class?

R: It tends to be, go for theory, I personally use power points quite a lot, just because you can present the slide of information, and may be might be some theory, than problem, a worked problem, now go through the solution, something for them to try. Try to break things up a little bit, so it’s a very much case of not just think Bloom’s Hierarchy, you know not just try to get them knowledge all the time, you got to get them applying it and ideally than start to apply in new situations as well

I: So, do they get to practise it in the class itself or …

R: Yes, try to do

I: Try, ok, so they do have practice in the class?

R: Yes, and then when coming-up to exam times, I showed some examples earlier, where we put series of questions on for them, and then they work on the solutions, typical things in class, show them how to approach things, and then they’ve a go to next topic and keep on building that. And, then as approaching exam times, it becomes more them and less me, and next week they’ll do a mock exam, that follows on than to four weeks where we’ve done practise questions one topic at a time and then the mock test, next, well tomorrow, would be the whole subject matter…there’s assignment as well, there’s two assignments… second assignment is three laps , the first one is design scenario where, they give them a problem basically, and then they got to use all of the various equations and rules and applied it in design scenario, try to structure it so, it’s not just a blank canvas for them , non-depending structure like a framework to follow hopefully it shows them how you tackle the problem…so in many cases you try to show them engineering system, how those systems work and how different block works

**Q4 Language in critical thinking skills - how important do you think language is in applying Critical**

**thinking skills?**

I: Coming back to language, so how important do you think language for the students to apply critical skills?

R: They need to understand the language, need quite a good level of knowledge of language, and engineering has a large vocabulary, terms which we try and teach them to use those terms and some of them are better at them than others. Probably, that is mainly related to their academic ability I would say that, but it can. We don’t get many people who’re not fundamentally good at English, not tends to experience that on the extended programmes, got good grasp of English, they may not be good at writing, some of them are not, their written skills are not good as their spoken, but we do try to… get confident in technical terms…

I: So, can I say language is very important for them to be critical? Because, some say whether it is a language problem or it is a thinking problem, so, or is it both?

R: Well, they need to know knowledge and they need to know how to express that knowledge…I suppose… a framework for expressing concepts …one thing relates to another, some lack the vocabulary…engineer…what power means and energy in engineer… they got particular meaning…member of general public, what energy…

I: so for technical term

R: technical term what they are mean, and they relate to each other, and that in engineering very often…relationships

**Q5 Which critical skills are included and which are excluded in your teaching?**

I: so, in the module that you’re teaching, is there any sort of conscious decision to include, because students are different every year, so normally we’ll try to adapt to the needs of that particular group for that particular period, so, is there any critical skills which are taught explicitly, implicitly, that deliberately included, you think they’re very important, and, is there any skills that you feel they already good or they could get it so, you gonna exclude that particular skill?

R: But, I think there are basic skills I won’t say that there’re critical skills ….able to produce an engineering report…references, so that there are justifying …how not to fall into the trap of plagiarising, and how to produce drawings, diagrams, how to draw graphs probably, they are not critical…high level, but they are basic skills engineers need, and …you kind of to teach skills as well teach the knowledge

I: So, this is been taught explicitly, they have been explained how important it is?

R it is embedded…embedded in programme, that’s how students are learning all those things, for example, on the undergraduate programme that I’m teaching module called Engineering Application in IT, and the first part of the module is in a lecture theatre, we kind of teach things like report writing them basic skills that they need, but then we go on and do more using spreadsheet and then taking in engineering knowledge and representing it they do reports. And, it always very nice when they hand in those reports in, I see all the things that I’ve taught in the beginning it…how to do a graph properly…had reference, all of these things are appearing in their reports,…so it’s nice when you know in full circle at the end of the year learners have taken all those skills on board and applying them

I: So, can I say that’s the academic skills

R: Ya, that’s their academic skills ya, but there are also, employability skills aren’t they?....if they can’t write a report, do some analysis and do some calculations…they are not going to succeed

I: so, academic skills, employability skills, and the importance of telling them about the academic integrity as well?

R: Yep, that’s right. There’s also skills arising like analysing the problems, and like this project modules, they will pick a task to do then, they got to work out how to do it…then they learn software skills, electronic skills, interfacing skills, integrating all these skills together…

I: Sorry I didn’t get one word, is that inferencing skills or, what was that?

R: interfacing, the idea being, you have a computer, single chip computer, and basically what they’re doing, its got a pin on it, those pins bringing connection into the computer or sends signal out to control ….the system are being control

Q6 How would you define critical skills? (transcribed based on field notes – this part of the interview was not recorded due to technical problem with the recorder)

I: So, how would you define critical thinking skills for engineering?

R: Critical thinking skills for engineering is about strategic thinking, strategy plan for long term, for example 5 years plan, rather than