Is Recording Engineering?
Focus group discussion with 2nd year *Tonmeister* students
University of Surrey, 15th May 2012
Transcription

About twenty five people were present at this event: Jez Wells (University of York) who led the discussion, a sound recording tutor/studio support engineer (listed below as 'SM' – staff member), and second year students of the *Tonmeister* course in Music and Sound Recording. Students are listed anonymously as s1, s2 etc. As this is a transcription from an audio recording of the event it has not been possible to identify those who spoke more than once with the same anonymous label (hence there may be more labels than people who were present). However, it has sometimes been possible to identify one speaker with more than one comment and in these cases the same label is used.

Jez gave an introduction to the project and then began the discussion.

Jez: To start off, has anyone got an opinion they'd like to express on whether what they do in the studio is a musical activity, or whether it's an engineering activity, or a scientific activity.

SM: I'll start. Just to continue what you and I were talking about as we walked in. I think that a lot of the job is keeping musicians happy. It's not musical or technical it's hand-holding or personal skills; and I'm certain that people who do go in and greet musicians and make them happy, make sure they're warm enough, not in a draught etc. actually get better recordings, that sound better than the other people, because the people who are playing are playing better, in a more relaxed way.

Jez: They've elicited a better sound as the source for their recording?

SM: and that's what people connect with when they listen to music, that performance.

Jez: How many people would agree with that? OK, some people are nodding. How many people here think that sound recording is an engineering discipline? How many people think that when they leave this course and qualify that they will be recording 'engineers'? **[about two thirds of people put their hands up]** Just to make sure that I've got that right, if you don't think that you'll be an engineer when you leave here, put your hand up. **[two people put their hands up]** So those people who have said that yes, they do think it is engineering, which aspects do you think are the engineering part of the job? For example, what was just mentioned is about social skills. Is that part of engineering, or is that in addition to the skill-set that an engineer brings into the studio?

SM: I think it's in addition. I think that what I would class as the engineering bit would be an understanding of how things work: you put a microphone here and you think about everything to do with what the microphone does and doesn't pick up. It's almost a

different part of your brain that you've thought about beforehand and got ready before you arrived; and all the knobs, signal flow, gain structures, levels.

Jez: You've got to be able to do both?

SM: Yes.

s1: I think that putting some mics up and just hoping that it will sound good you can't really class as engineering but thinking further than why you're putting the mics in a particular place: all of the issues that you'll have to deal with. That could be classed as engineering.

s2: I think it's definitely not purely engineering because, as was said, with gain structure and all that technical stuff: that's engineering. I think you have to have the musical side too. It is artistic, some of the work you do so I don't think it's purely an engineering job...

Jez: ...but there are aspects of engineering in it?

s2: Yes, there's loads of engineering in it, but you need to have the artistic side to take it further.

s3: I don't think you need an engineering background to be able to plonk a microphone in the middle of a room and end up with some sound, which is recording, technically.

Jez: There's a distinction there between what might be a bad recording. So an engineer wouldn't make a bad recording?

s3: No, I'm not saying that, I'm just saying that anyone can make a recording of some quality.

Jez: The recorders which I'm using to capture this discussion are a very good example of that. I'm simply concerned with being able to hear everything that is said above the ambient noise in the room. These [budget solid state] recorders are very easy to operate. Anyone can easily switch these on, press record and, inherently within them, the audio quality is very good compared to what was possible for a lot more money 20-30 years ago.

s4: I think a lot of people can rig mics in a room and maybe quite a good sound but not necessarily know what's going on technically. On the other hand, you can get someone who's very technically minded rigging a lot of mics in a room, the sound isn't so great but I think the engineering comes in where they know how to fix it. Someone without an engineering background, if they've got a bad sound they will probably live with it,

whereas a recording engineer would maybe start off with a bad sound but would know, with the engineering side, how to improve it.

s5: Are we confining engineer to just a studio situation.

Jez: No, we can open it up.

s5: There's people that, for example, design the loudspeakers, that's all part of the recording. There's people that made the magnetic tape.

Jez: I think a lot of people are more comfortable with the term 'audio engineer' for the kind of people that design loudspeakers and tape machines. How many people in the room would accept that people who do those kinds of things are engineers? **[everyone puts their hand up]** That's unanimous, whereas that was not quite the case for 'recording engineers'. Of course there's also live sound engineering. Although you are studying a course associated with sound recording not a live sound course, hands up if you think that doing live sound is engineering **[about two thirds of people put their hands up]**. Now put your hands up if you think that live sound definitely isn't engineering **[no hands go up]**. So that means there are some people here who aren't sure. So, we have audio engineering, which people agree definitely is engineering, we have live sound which is by a majority considered to be engineering, along with recording. Now let's consider this, what does an engineer do? Think about any kind of engineer, from chemical engineers to civil engineers to mechanical engineers, there are a number of engineering departments in this university. What is it that unites them, what is it that makes them the same thing?

s6: I think you've got a difference in definition of an engineer. You got someone who designs, builds or maintains stuff and then you've got someone who is a skilful contriver of something original and I think it's far more difficult to define someone who is a skilled contriver than someone who makes and designs stuff. I think the idea of recording or something such as that, the engineering comes in when it is skilful. So a good recording that was made skilfully, or with an application of skill, would be classed as engineering. A good recording that was made by chance or luck, not so much.

Jez: That sounds like a well-rounded definition. Is there anyone that would dissent from that?

s7: A similar question might be "is a lorry driver a mechanical engineer?" because they know how it works, but a lot of the time it's just about driving rather than designing or finding ways to build.

s8: An engineer is someone who takes scientific knowledge, either mathematical or physical or biological, and then applies it to real-world problems in order to solve them.

Jez: Yes, that's a classic modern definition of what engineering is: the application of scientific knowledge to solve problems.

s9: Following on from what was just said about a lorry driver just driving, what then happens if the lorry goes wrong? The recording engineer is someone who can drive the desk when it's all working fine but then when something's going wrong and something's 'blown up', has some knowledge to get round that problem rather than just calling the AA.

s7: I'm sure lorry drivers have an understanding of how it works.

s9: but maybe some of them do and some of them don't and maybe it's the same definition with recording.

Jez: Those comments have drawn out an interesting thread, because thinking about the 'thing' the comes out of the activity, the artefact. When someone is 'doing engineering' to make a loudspeaker then the outcome, the artefact is a loudspeaker. When someone makes a recording the outcome is a sound recording. It exists physically somewhere but that may be a physical medium like a disk or it may be a file which can be freely transferred, but it's still an artefact. Going back to the lorry driver analogy, the artefact there is the delivery of goods from one place to another using a piece of equipment [the lorry] which was the outcome of a feat of engineering. So in that analogy would you consider the lorry driver, or the person making the sound recording, is engineering something by using the equipment to do the job it's designed for?

s10: I think as others were saying there's a difference between you using a piece of equipment enough to know how it works and anyone after doing a session in a studio here can say "if I press that button channel 1 appears on the speakers". There's a difference between knowing that that button puts channel 1 on the speakers and knowing that pressing that button makes that happen because it routes it to a buss and so on. There's a difference between knowing what the buttons do and why they do it because of the internal workings of the equipment. I think if you have that applied knowledge then you've got more of an engineering skill set.

Jez: So it sounds like the first person we're describing is an operator: someone who can press a button because they've been told to press that button. It some ways that sounds like the kind of instruction that journalists get these days, to save on expenses journalists are now trained to make their own recordings and so they're told "right, put it on the table, press record" but then there's no way that they have of evaluating whether that's any good or not. So what are the situations in which someone is definitely being an engineer when they're making a recording? Cann you give me some cast-iron examples of someone being an engineer? You can use either of the two definitions that we've had so far: we've had the application of skill – doing something skilfully, not being an operator, not just someone who is pressing some buttons – and

we've also had the definition of an engineer as someone who uses science to solve problems. Can you think of a specific scenario where there is definitely engineering taking place and if there wasn't engineering taking place then the result would not be very good.

s11: Using a reverb device to match a particular venue or something like that.

Jez: Ok, so what's happening there?

s11: Well, choosing stuff like size, shape of room, all of the different parameters, knowing which to adjust to get the desired effect.

Jez: So it's understanding that a reverberator is not just a 'time smearer' but is also a way of representing acoustic spaces in which real performances might take place and being able to translate what is appropriate for the music or what is appropriate for the imagined space into the parameters of the reverberator. Is there any musicality in that?

s11: There's preference but I guess that at the end of the day you've got a vision that you're trying to recreate or produce. So I think you have to know your stuff if you want to recreate something. I'm not really too sure.

Jez: I think one of the key words there was preference. There is a point at which someone expresses a preference: "that's too bright" or "that vocal's too distant", "we need to turn that up", "we need to turn that down". Is that part of engineering, making that judgement? Or is that done by someone thinking in a different mode, or by a different person in the studio?

SM: I think that if you don't have that then you end up with the 'operator' again, don't you? I'm thinking about projectionists who don't call themselves engineers at all but often understand how the projector works: when it was all 35mm they could get it working in the middle of a show, which has obviously changed now because there are computers everywhere; but they would call an engineer if the lamp didn't strike and it was something fatal. They would think they were operators there's no creative judgement going on like you have with your hands on faders. Similarly if you were spinning in sound effects for a musical that person would be an operator: they'd be pressing a button for the next sound effect; I don't know if they'd consider themselves engineers because they're not controlling the level or anything. There's no judgement required but I'm not talking about engineering things I'm talking about artistic things. On another note I just wanted to say something about historical titles: a studio that I worked in first of all, CTS, my door said "engineering" on it and I was doing maintenance but the three things were demarcated originally: there was balance engineer, there was maintenance, who mended things, and engineering who would make things to make the sessions work, like click boxes that were locked to the mains, things that tied projectors to tape machines, circuits, R&D and things like that, and they would also devise

standards for the recordings - what operating level are you using? - that would come from engineering. At Decca they had the same: R&D, engineering who made the things, maintenance and then editors and balance engineers or mixing engineers; in dubbing theatres they call them dubbing mixers, they don't call them engineers, re-recording mixers – the word engineer's not there. So there's a lot of semantics and terminology.

Jez: It's the way that things have developed and the way, perhaps, certain things have grown out of what we be considered by many to definitely be engineering and so has retained that title but with others it hasn't.

SM: Yes.

s12: It depends on whether you take it to be an art or a science, but I suppose you can engineer things artistically. It depends whether you take the literal meaning of the word engineer "to make, to model something". You can make a piece of art, you can mould a piece of art. It just depends whether you take the word engineer to be someone who has a BEng or whether it's just someone who makes and moulds something. You could say a 10 year-old engineers a box, it just depends how you interpret the word, really.

Jez: We use that situation quite a bit don't we? We talk about people 'engineering' a particular situation at a party or whatever even though we don't think that they're from a chartered body of social engineers.

SM: There should be one! **[laughter]**

Jez: Before moving on to the next big question, one final thing in this area which I imagine you might have a lot of opinions on: what's the difference between a producer and an engineer? Where does production stop and engineering begin?

s11: I think production's based more upon musical attributes, the quality of the performance, and the engineering is more related to the sound quality: the actual scientific qualities such as "is the recording noisy?, Are there glitches?", that kind of thing. Obviously there's a space where the two overlap because music is sound and the sound that you're recording is music, but I think you can separate them. I think the engineering is much more about "is the sound scientifically correct" whilst the producer is more concerned with "is the sound artistically suitable".

s12: Surely the engineer has to find what's correct in terms of what the producer wants? Is there a 'scientifically correct' sound?
s11: Actually that's a good point because I guess the engineer does in a way follow the producer; but then they've got to take the advice the producer gives them and apply it to science.

s12: Along that line, surely in a studio environment surely an engineer should know everything about that studio, every aspect of that studio, that's what they're taught to do, they're not just taught to press some buttons. You don't just think about whether the sound is right, you think about what happens if it goes wrong – "I can fix that". A producer would probably not be able to, unless they come from the engineering side which they sometimes do, they wouldn't know how to align a tape machine, they wouldn't know how to use something like Pro Tools in an efficient, quick way. If a channel on the desk just sparked and didn't work any more they're unlikely to know how to fix that whereas an engineer should, or at least have some knowledge of how to go about fixing it. If he can't fully fix it he could work around it and come up with another way, surely that's what an engineer would do? Maybe not so much or the musical side.

Jez: That's the kind of thing that would stymie the operator isn't it? If the configuration changes, if all of a sudden pressing 'that button' doesn't produce the result that you've always had, pressing that button day after day, then if you only know to do that (press that button) then you're going to be stuck.

s13: Following on from what was said about engineer v producer. Is the producer the artistic vision and then the engineer achieving that through the use of knowledge?

Jez: That sounds reasonable. Would anyone disagree with that?

s14: I disagree with it. I think the engineer has to have some vision. You're right, it is making the producer's vision but there's still a level of engineering 'artistic-ness' that you can put on it yourself. The reason that we can argue about recordings as recordings engineers is because there is a person's vision in there that we have preferences over. There isn't just a right or wrong answer, but I still think it can be called engineering. In the same way you could have a civil engineer who builds bridges, but if you get a couple of them together they will disagree on things. There will be technical things that they can talk about, like weights or whatever, but they could still say "I don't like the look of that' but it's still engineering".

Jez: That's very interesting.

s15: We had a guy who came here a couple of months back: an engineer who brought a producer friend with him, they did a seminar, they work together a lot. The engineer often found that he could just get the sound that the other guy wanted, without having to ask him. They've been working together for a while but obviously as an engineer he knows the sound he wants because he's thinking of it in a technical way and he knows what will sound good, but then if the producer thinks that that is what's good then they're on the same wavelength.

Jez: I'm almost sounds is if they've begun to merge, they've worked together for so long.

s15: Is there a line there between engineer and producer or are they just the same as each other? One of them talks to the clients and tells them that it's good, the other one knows it's good.

Jez: Following on from that: whose responsibility is the recording? Whose responsibility is it for the artefact to be any good? Put your hands up if you think it's the producer **[about a quarter of people put their hands up]**. OK now put your hands up if you think it's the job of the engineer to ensure that the artefact is good **[less that a quarter put their hands up]**. Who thinks it's the job of both? **[the majority of people put their hands up]**. Before we move on, there was one other person who wanted to make a point.

s16: I want to go back to that truck analogy because I liked it. I thought that the truck is owned by the record company and inside you've got the producer and the engineer. The engineer is driving and the producer is telling him where he's got to go to.

s17: Perhaps in both situations there may not be such a distinction between the specific person doing the role, so the driver of the truck could know where he's going and the engineer could know what the artistic vision is; but perhaps the idea of what production is, is the artistic side and the idea of what engineering is, is the 'achieving it' side.

s18: Would it not be more that the producer says "I want to go from A to B" and it's up to the engineer to decide what route to take and how to get there; because they wouldn't be sat there saying "I want lee cello, turn the cello down", they'll be saying "sort the cello mix out".

Jez: Yes, I think one thing to acknowledge is that it's going to be different in different scenarios, and that leads me on to what I was going to ask you next: is there a difference in the relationship between engineering and production in pop music and the relationship between engineering and production in art/classical music? Put your hands up if you think they're largely the same **[no one puts their hand up]** If you think there is a difference [in this area] between classical and pop, put your hand up **[the majority of people put their hands up]**. Can anyone summarise what they think that difference is?

s19: I think in classical music you're trying to be accurate and get the sound that's in the room; whereas in pop music you're working towards a sound that's in your head, like an ideal sound. So there are different tasks in different areas.

Jez: So in the first case the engineer's job is to translate as directly as possible from the recording venue to the loudspeakers and that may well be a complex task and require lots of ingenuity, but the main thing to do is to not have any mistakes in that translation. Whereas the goal is perhaps not as clear in pop recording.

SM: I think that, traditionally at least, I don't know about now as times have changed in the classical industry, but I can't think of a classical producer I've met who could mix, who could mics out. They tend to come from a completely musical background. I don't know where they come from actually, perhaps they're formed in an old cave or in the middle of a pyramid for a million years! **[laughter]** but pop producers tend to have been engineers to start with, so they're much more involved with what's going on and have their own opinions about sound. The best ones will leave the engineer alone, but often they don't and the say "don't do it like that, do it like this" and the engineer says "ok then, you're paying my wages". In the classical world really they have do everything because there's no money any more for separate jobs so it's all merged into one person who produces and engineers and assists and sets the mics out and drives the van and everything.

s20: I don't want to take away from all producers because some do know what they're doing and a lot of pop recording these days is very high quality, very good but we don't hear much of it on the radio. With the rise of being able to do it in your own back room, that's obviously changed a lot. The amount of times you hear a engineer talk about "the producer wanted something different so I turned up the fader that had nothing on it and they thought that that had then changed something". That happens all the time and I don't know where these producers are coming from but they try to act like they know what they're doing and actually it's the engineer that is doing all of the work. At the end of the day whether the producer wanted it to sound a certain way, by the time you've listened to a track five times you forget what it might originally have sounded like and you know think that that is what you wanted it to sound like because you've heard it so may times. It's all engineer, the producer in some pop doesn't do anything.

s21: The engineer probably thinks he's doing much more to the sound than the producer is, and the producer probably thinks he's doing more to the sound that the engineer is, but in reality they're probably both doing the same.

s20: It doesn't always have to be like that. There will be sometimes where you get a relationship between the producer and the engineer where things work really well. You both come to some kind of agreement and work together really well.

Jez: That's very interesting and leads on nicely to part two. The next thing is about what you want to do. Starting off from what's just been discussed, who here ultimately sees themself as being a producer? **[about a quarter of people put their hands up]**. Who here seems themself as becoming a sound recordist (avoiding the word 'engineer' in case we're not clear on what the definition of that is just yet). Who is going to do the role which is traditionally credited as being 'recording engineer'? **[about a third of people put their hands up]**. Who thinks they will be doing something different to either of those, maybe equipment design, maybe a musician who will have a very good understanding of the recording process.

s22: Do you mean as a career?

Jez: Yes, when you get to a particular point in life where you expect to arrive, where you are doing the thing that you imagined you would be doing when you started doing the Tonmeister course, what will that be?

s23: Personally, I cam on this course wanting to be a recording engineer and that's changed now. I want to do something more in audio engineering, but I think I'll always have that hobby, I'll always be recording, maybe not as a career but as a pastime, it's always going to be there.

Jez: Does that resonate with other people? I can see a few people nodding their heads in agreement.

s20: I think that partly comes down to how difficult it is to do as a profession now. As I said earlier, you can do it in your room as a hobby and you can get a reasonably good place to record which is not that expensive. I don't know how many high-end studios are actually making money anymore but it can't be more than 10, 15, 20 something like that. Then there's 24 of us in our year and 24 in the year below and if there's only 20 that are actually making money.

s24: But you're just pulling numbers out of your head there though.

s20: Yes, but you know what I mean.

s24: There's a lot of music out there to be recorded still.

s20: Yes, but where there's actual employment in a career where you'll get to move on throughout it...You can do it freelance, which is what a lot of people do, but is that a career?

Jez: Yes, absolutely. If you're doing 'the thing' which produces the artefact, either as a producer or an engineer whether freelance or not, you can say that you are. It needn't happen in a recording studio, it could happen in a broadcast studio. If that's the outcome, and you're being paid for it then, yes, it counts for the purposes of this discussion. OK, so those people who are aspiring to become a recording engineer: what do you need in order to be able to get there?

s25: People skills.

s26: Good knowledge of sound.

Jez: Yes, and exploring that a little more: what specifically are you doing on this course which you think is going to get you where you want to be?

s27: Deciding what you're doing from first principles, rather than following someone saying that "if you want to record a trumpet, always put your mic there". This is how the mic works, this is how the trumpet works, now make up your mind.

Jez: Where do you get that? Do you get that only from lectures?

s27: You get an amount from lectures but also from practice of trying things out. You can try out in a session a different way of mic'ing a particular instrument because you think that, in theory, it might work and then if it does, fantastic you have something new, if it doesn't you can go away and work out why it didn't and take it into consideration for next time and change it to make it better.

Jez: Those sound like very sensible things that you would need. What else? Is it just training and people skills that're all that's required for you to be able to walk into a job be it freelance or be it employed by somebody else.

SM: I think it's primarily listening skills. I'm sure when people first start out, they can't hear whether it's right or wrong, or what I call 'right and wrong': 'conventional and unconventional'. So if the vocal's too quiet, the snare drum's muffled, people just pick it up, gradually. I would like to know how to teach that in order to make people better sooner, but I don't know if there's a way. Everyone says "oh, they can't hear", well how do we teach them to then?

Jez: Well, we'll ask them now shall we? How would you teach 'learning to listen'?

s28: I think a lot of it is experience really. If you listen to a lot of music you kind of figure out what you like, the sound of what you like and the sound of what you don't like. Take stuff like really heavy Sonic Youth: is that too much for me? Do I want something more sparse? Or is that sparse feeling too little?

s29: You've got to limit the variables though first. You could listen to that on anything, any room, anywhere and it would sound different. So limit the variables and try to identify how things change.

s30: I suppose by applying your own opinion to a piece of music, talking about art and science, there comes the argument about whether it's engineering.

Jez: Is that kind of listening, listening intently and listening hard and enjoying music, is that all that's necessary or is there a different kind of listening that's required.

s28: I think it's both an engineering discipline and an artistic one. It's difficult to describe because you're looking for something you'd like and something that's technically good.

Jez: I suppose it's the difference between someone who's really enthusiastic about music but can only say "I like that" or "that sounds rubbish" or "what's wrong with that?", and the person that can answer the questions.

SM: I think we probably know who they are in this room even, but some people just have it; they can just hear what's right and wrong and always have been able to. A lot of people, myself included, I could put records on 12 hours a day, all my life and I wouldn't get any better when I actually sat down in front of a mixing desk with faders and go "right, here's the bass guitar, how loud should that be?" and I wouldn't know. I'm not saying that about now, but when I started for many, many years. When I spoke to people about this before they said that the only way that they've really got it is by doing it professionally every day: either editing or sitting with faders and speakers every day; or copying, just being involved professionally where it really matters that this is right. For myself, who came from dubbing theatres and aligning cinemas and then listening, as soon as the digital era started I could run the film and dialogue and alter the EQ while it was running. You can't do that with [analogue] film because you can only play it though once and you can't stop it. That's what did it for me.

Jez: There was a connection between doing and hearing?

SM: Yes, not just hearing, although some people can just do it via hearing and always have been able to. I'm aware that we're going off-topic a little here.

Jez: That's fine, nothing is really off-topic, provided it's not the price of bread at Sainsbury's or something like that, it's all relevant. Part of this [discussion] is to find out what it is that people think is important (a) to help them achieve what they want to achieve and (b) from an industrial point of view, what is going to make people do the best job that they possibly can, what training is necessary? So, we've listening and a study of 'first principles', which I presume is acoustics, electroacoustics. Do you do any formal listening here? Do you have any timetabled listening sessions? **[people nod]** What sort of format does that take?

s29: We bring in recordings and analyse them.

Jez: How many hours a week do you do of that?

s29: One.

Jez: Would you like to do more? Do you only do technical listening in these technical listening sessions or, as a result of doing one formal hour a week, do you then do technical listening all over the place in other situations? Do you find that you listen to music in a completely different way as a result of doing that? **[some people nod]**

SM: Just to add to that: It's something to do with being analytical in what you're doing and listening. I think that's a skill that you pick up at university whatever you do. So, taking the 'muffled snare drum' as an example, almost every song you hear, the snare drum and the vocals are about the same level and the same brightness. It seems to be very common, I don't know if you've thought about that before but it's an example of something you notice and you think "that's interesting". You might listen to music all your life and never think about that. It's a different skill [to normal listening] it's a different way of thinking.

Jez: So that way of thinking is trying to derive a model which underlies what happens, in order to understand the way things work and the way things are by observing different recordings and saying [for example] "these two recordings are completely different, apart from the vocal and the snare drum, where they both have a similar EQ".

s30: What you're saying about listening analytically, learning by listening, comes back to what you talked about at the beginning about whether it's better to come through a route of education or being an apprentice in a studio where you would listen to music every day. Why not just forget about the technical stuff and spend all your time listening to it in the studio?

Jez: That's a very interesting point actually. As I was discussing at the very beginning, the tea-boy, tea-girl, runner route is often denigrated as being an anachronism but what you're saying is that that is an opportunity for you to be continuously exposed to the kind of music that you will probably end up working on and also, unlike anyone else, you will be exposed to that music being constructed in front of your very eyes; everyone else gets to hear the final product, but you get to hear the product being put together. That's something that can't be constructed in an academic environment.

s31: I think to teach this kind of thing, listening, it all comes back to the whole engineer thing. You need to be able to hear the difference. I imagine that people have made recordings when they were younger, before they came to university. If I listen to the difference between what I did when I was 15 or 16 compared to what I've done at university, there's a huge difference in quality. In between those times I was making recordings too so you can see how you've improved. Not only do you listen to the professional one which is better than where you're at now, but you can see what you can improve on each time and listening is key to that; but not just listening to the stuff that's better than yours but the stuff that's worse. Then you can see what you've done to improve and what still needs to be improved.

Jez: You're able to trace a route backwards but you can also look forwards to where you want to arrive. Anything else on the subject of what's going to make you employable.

s32: Enthusiasm: being enthusiastic to learn, enthusiastic as a person to the people who come in. Making them feel comfortable.

Jez: Is there any way that that can be taught? How could that be engendered in people in an environment like this?

s32: I don't know, it's just a personal thing.

Jez: It's personal development? At York [the university where I work] there's a lot of talk about personal development, employability development and that kind of thing which runs in parallel to degree courses. Do you think there's anything that you can do at university, whether it's studies or anything else (and I'm thinking about the whole of campus life), to develop that particular [skill or attribute]?

s33: I think we're all on this course because we've got that enthusiasm already. I don't think any of us are on this course just because our parents told us to get a degree. I think we're here because we have a passion in what we do.

Jez: You're not here because someone said "no, you mustn't do investment banking because that's frivolous".
s33: I think some of our parents would prefer us to be doctors but we're not, we want to be doing this.

SM: One thing which I think separates this group out from other people on recording courses is the industrial year, which we mustn't underestimate. I am absolutely mouth-open, jaw-dropped by the difference in people when they come back from their industrial year. There's such a big change: they've grown up, and are employable: you would employ this person tomorrow because they understand what they're doing and they got an attitude where you can have a discussion with them about the industry somehow in a different way, just more of a 'world' view of things. I don't know how you teach that but I think having that little bit [industrial year] in the middle [of the course] is invaluable. You must have gone through the same thing.

Jez: Yes, all of a sudden you understand the context of what you're doing. You know where you fit. You know the things that you're good at and you're bad at and that gives you a sense of purpose and a sense of destiny that perhaps you didn't have before you went on placement.

s34: I think there's a certain discipline that you acquire from doing a degree. For example, before having started the degree I don't think there would have been any chance of me being able to read the manual for the SSL [console] until I'd had a whole first year of study. It's not about having more knowledge of what's in it, I don't think that was too much a factor – it's a fairly easy read and it makes a lot of sense. So, I don't think it was having gained knowledge, it was having gained discipline that made it easy to read.

Jez: So, it's proactivity: this knowledge isn't just going to come to me.

s34: yes, partly that and being able to actually read and understand and take in, in a different kind of way.

Jez: An ability to extract information and store it properly.

s34: Both of those. Proactivity and an ability to obtain information.

Jez: Let's move on to the final part of the discussion and that's about the nature of the employment that you expect to have. We've already had a bit of a discussion about that because we've talked about the difference between working freelance and working for a studio. One of the things that we're interested in is whether you think that employment will be stable, whether you think it will be precarious, whether you think you're going to have a gold-plated pension and you'll always work in the same place or whether you think you're going to move around. So, whether you think your work will be peripatetic or whether you think it will be in one place. I'd also like to hear you general feelings, and we've already had some comments on this, about how straightforward it's going to be to get to where you want to be and then how secure you will be when you get there, how comfortable.

s35: I think it's entirely what you make of it. If you a risk taker inherently then you're more likely to go into production which is going to be freelance and not necessarily based at a specific studio. You're going to be booked all over the place, all around the world, potentially. Whereas someone who prefers a more secure 9-5 job maybe even engineering at a studio, is in purely engineering – fixing equipment rather than working on sessions, might have a more stable career.

Jez: You're fully aware of that and you accept it?

s35: I accept it and part of my passion is that I'm prepared to take that risk.

Jez: Is there anyone that's come here having aspirations to do one thing and their understanding of the workplace has made them think "do you know what? Actually I'm still fascinated by the subject that I'm studying, but I'm going to use it in a different way [in my future career]"?

s36: Yes, I came here thinking I'd go into studio engineering but the course has given me the confidence and the knowledge to become really fascinated by electronics within audio. I still really like doing studio engineering but after hearing about the kind of hours [that people work], that's not really for me. In the future I see myself going down an audio equipment design route as my main day job and maybe being a freelance recording engineer with it being a hobby rather than a day job.

Jez: I can see a couple of other people nodding around the room. Has anyone got anything similar to say? I guess we've just had the two extremes, does anyone want to express something in the middle of those? Would anyone here say that as you've learned more about the industry, which this course generally prepares people for, has what you've heard disappointed you or has it excited you? Maybe you've thought "actually, there are loads of opportunities out there that weren't around twenty years ago" or do you think the other way around "that's a real a shame that I was born in 1990 and not 1970 because I would have had many more opportunities and I could have expressed myself, in terms of what I want to do [in the industry], much more"?

s37: I think until maybe this year, and maybe a bit of last year, I definitely thought there wasn't very much scope to go anywhere. I thought there wasn't any work other than freelance. After doing this year and talking to some of the [returning] placement students and seeing what placements were available, you begin to realise that there's actually a lot that you can do. People are still interested in people who are doing these sorts of courses. Whether you're going to be a runner and all that and become a studio engineer, as you would via the traditional route, you can also go into electronics, you can go into design or loudspeakers, live [sound], even though it's not predominantly a live course you can still go into that, you can still apply your knowledge. I've definitely been opened up to a lot more possibilities. I think that after the placement you'll be focussed even more and you'll either know "I didn't want to do that" or "actually, that's something I'm really interested in". I've definitely opened up to seeing a lot more possibilities from doing this course.

s38: I think we're lucky on this course that it sets us so much different stuff. Someone said to me the other day "oh, you're on the Tonmeister course, that means you'll be an acoustical designer, that's all you'll do, just acoustics" and I replied "no, there's so much more". As other people have said you can go off and do electronics, acoustics, equipment design, engineering. People enjoy different bits, some people prefer the editing stuff, some other people prefer to spend the day behind a mixing desk. I think we're lucky that there are so many different opportunities. People naturally over four years mould into different things and most people, I think, by the time they leave are pretty set on the area that they're going into.

Jez: You feel that course is very well-geared towards the things that you need? There isn't really anything else that you need. That's what this course is: it's what you need in order to be able to go and do what you want to do.

SM: I think now that people who are multi-skilled are much more valuable. I think the traditional tea-boy/girl route does sort of turn you into an operator, although somebody who's watched somebody always mic up a trumpet like this, and a guitar like this, so that's what they do although the don't necessarily know the reasons why, they're still making brilliant recordings but just doing what someone else has done. It's the same in the film post production industry where traditionally sound editors, all the jobs really –

they're very very narrow, they just do foley editing they don't really know much else. Someone who was in my year was doing effects editing and they needed someone to record ADR [automatic dialogue replacement] and they didn't have anybody, so he said "I'll do that" and all of a sudden he's recording Daniel Radcliffe putting his head in a bucket of water and things for Harry Potter. They were all amazed by this - I spoke to the people who work with him and they said "he's amazing he can do anything, he can record ADR! and edit it! and it's great!". They said that time and time again. About another course mate "oh, he's the only person who knows how to set up a Pro Tools session so that it's in sync", this was in the mid 90s when [the DAW revolution] was just starting. It's that sort of thing where this education comes in, where you've got to do something slightly outside of what you think you're doing and everyone else is amazed that you know all these things and you can apply yourself to them. That's where the educational side of what you might call engineering comes in.