

Transiting from Higher Education to Working Life: the Experience in Two Professions

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Abstract

On completion of their university studies, students make a transition into their professional field. Professions can be described as 'clear' or 'diffuse', depending on whether their nature is obvious or ambiguous, and whether the path from study to working life is seen as evident or vague. In a clear field, professional requirements can be simply utilised as the basis for a pedagogical approach and can direct the course of student learning. In a diffuse field this is more difficult, and the pedagogy and learning are more likely to be directed by the academic structure itself. In this paper, we critically examine the notion of clear and diffuse professional fields, both from a theoretical and an empirical point of view. We conclude that while the 'clear' and 'diffuse' distinction is a useful one theoretically and pedagogically, students' experience of learning and moving to professional work may be more ambiguous.

Keywords: Professional preparation; higher education; transition to work; music; statistics

1. Introduction and background

As a theoretical construct for investigating the transition from higher education to professional work, the notion of clear and diffuse professional fields helps to explain students' differing experience (Reid et al., 2011). When a professional field is clear, professional roles and expectations are visible and well defined. Students in higher education in a clear field have explicit knowledge of their future profession and can anticipate an unproblematic trajectory from study to working life. A tertiary educator can aim pedagogies directly at the inherent requirements of the field and the expected career path, and they can expect that their students' learning is directed by the clear nature of the field. On the other hand, when a professional field is diffuse, professional roles and expectations are not obvious, visible or well defined. Students have only vague ideas about their future professional work and hence they have unclear expectations about their transition from study to working life. Curriculum is based on the perceived structure of knowledge in the field, from the academic viewpoint. Students' learning is focused on the discipline itself, with little discussion of expected career paths, and there is no direction from the diffuse field.

An example of a clear professional field is music. Tertiary students typically enter a course of music study with an explicit knowledge of the profession of music and a clear idea of the nature of work as a professional musician. They have before them a wide range of role models, no matter what instrument or voice they plan to specialise in, and no matter what genre of music. Due to stringent selection procedures, usually including an audition, they have already shown that they are engaged with a musical world. They have been living with their instrumental/vocal speciality for many years before they come to university studies and in many cases have been working as musicians since their early teenage years often sitting alongside adult working musicians. On the other hand, the mathematical sciences – mathematics, statistics, operations research and related areas – are an example of a diffuse professional field representing a complete contrast to music. Tertiary students enrol themselves for such studies based on earlier interest and success in mathematics at school. However, they have few role models aside from their school mathematics teachers, and they generally have little idea of the possibilities for professional work as a mathematician. While they have been engaging with mathematics throughout their schooling, they have predominantly been exposed to a particular (somewhat artificial) view of the discipline.

The relationships between students' perceptions of professional work and their views of learning have been investigated in several discipline areas, including music and mathematics (Reid et al., 2011). The abstract notion of the 'Professional Entity' (Reid & Petocz, 2004) can be summarised as a three-level hierarchy of conceptions. If a student has a narrow view of their future profession as comprising techniques and being contained within specific boundaries and processes, they will tend to view their learning in an atomistic way, focusing on individual technical components. If they view their profession more broadly as concerned with developing the meaning of specific disciplinary objects, such as musical scores in music, or mathematical models and sets of data in the mathematical sciences, they will tend to see their learning in a broader way, as increasing their understanding of their discipline through the process of investigating such objects. If students view their profession at the broadest level as forming an essential part of their life, personal as well as professional, then they will take a holistic approach to their learning, integrating it with other aspects of their life.

From the other side of the study-work divide, learning in the workplace, Billett (2001, pp.209–210) suggested that *"... it seems learners afforded the richest opportunities for participation reported the strongest development, and that workplace readiness was central to the quality of experiences. Readiness is more than the preparedness for guided learning to proceed. It also includes the norms and work practices that constitute the invitational qualities for individuals to participate in and learn through work."* Our research on the Professional Entity would seem to support this viewpoint. At the broadest level, the notion of professional work is inclusive, integrating aspects of the workplace with an individual's personal as well as professional life.

Given this close connection between perceptions of professional work and current learning, we wish to re-examine the role played by the clarity or diffuseness of the professional field on students' experiences of learning in disciplines that seem to have quite different connections between tertiary studies and the professional role. To what extent do professional disciplines such as music correspond to clear fields, and to what extent do humanistic disciplines such as mathematics correspond to diffuse fields? Further, to what extent do students in a clear field such as music experience their transition to working life in an evident way, and students in a diffuse field such as mathematics experience the transition in a vaguer way?

2. The nature of professional and humanistic disciplines

The classical distinction between the arts and the sciences, Snow's 'two cultures', seems to have given way in the university of the early 21st century to a distinction between professional and non-professional degrees. The former seem much more common, to the extent that we can refer to the 'university of the professions' (Reid et al., 2011, ch.1). The latter include the traditional arts or humanities degree, but could also be extended to a broader range of degrees. Generic science degrees in, say, chemistry or geology could be included under the umbrella of the non-professional (or humanistic) degrees, and the current focus in business degrees on generic skills (Vu et al., 2011) for the large number of students studying the generic degree in business suggests that such a degree could be positioned as a contemporary 'arts degree'.

To some extent, the distinction between professional and humanistic tertiary courses is tied to a different balance between substantive and generic knowledge (Reid et al., 2011, ch.4). In a professional course, there will be a greater focus on the substantive knowledge that pertains to a specific professional field, while in a humanistic course the focus will shift towards the generic knowledge and skills that are valued in a context where the aim is to develop generic abilities independent of specific context. Both these rational forms of knowledge can be contrasted with the 'ritual' knowledge that is presented to students in some discipline areas without any (rational) justification for its inclusion except as a way of proving one's ability to enter the field (for example, the traditional approach to mathematics early in an engineering degree).

So, do professional and humanistic disciplines correspond to clear and diffuse fields? Only to a certain extent. First, in any tertiary course the pedagogy utilised can influence the clarity of the field. A problem-based course in a discipline such as psychology makes the field clearer, while a traditional medical education that emphasises ritual knowledge, particularly in its early stages, works against the clarity. An engineering course that emphasises the professional contexts of the problems and introduces the people who are responsible for professional decisions will result in greater clarity than one that focuses on the component skills without authentic context. Other pedagogy will increase the diffuse nature of a discipline. For example, in mathematics *"for many years now the majority of teachers and lecturers have been presenting the subject as if it was just a set of rules that needed to be learnt"* (Thomas & Holton, 2003, p.351). In classes of this type, students may be unable to see the relevance of mathematics to their own studies, let alone their professional or life situations.

Secondly, most academic disciplines have distinct subfields that comprise specific aspects of the discipline and may cross disciplinary boundaries. Such subfields have become more visible in the form of 'named degrees' as universities put more effort into marketing their courses. For example, forensic archaeology or financial mathematics are more specific, and, it seems, more appealing to prospective students than archaeology and mathematics. While this occurs in professional fields as well as humanistic ones, the effect is more pronounced in the case of a diffuse field, leading to greater clarity for the subfield. On the other hand, restricted employment opportunities can cause diffusion as students and graduates are provoked to move towards and even beyond the boundaries of the discipline in order to secure professional employment.

We move now to investigating the second of our questions, whether students in a clear or diffuse field experience their transition to professional work as clear or diffuse respectively. We do this by looking at empirical evidence obtained from interviews with tertiary students of music and mathematical sciences. These interviews were carried out in a semi-structured fashion to investigate participants' conceptions of their discipline and their learning and the relationship with their perceptions of their profession and professional role. We have given more background about these interviews and our phenomenographic approach to their analysis in Reid et al. (2011, ch.2).

3. The empirical evidence in music

Our series of investigations commenced in the field of music, one that we have identified as a clear field. Students of music at the tertiary level generally have explicit knowledge of professional work as a musician, from their own prior music learning experiences and the experience of their teachers. Further, high-profile examples of professional music making are widely available, such as orchestral or operatic performances in the classical arena, and band performances of popular music. Initially, the focus of our interviews with music students (and their teachers) was on their perception of the learning environment. However, analysis of this set of interviews showed that learning and teaching music is highly contextualised. The interviews showed that learning was directed towards professional activity and also that teaching focused enormously on professional preparation. From this study we tentatively identified the 'Music Entity' (Reid, 1999). Later studies, in fields such as design, law and mathematics included direct questions on students' perceptions of professional work and the impact that it may have on their studies.

The music study included interviews with teachers and students from one of Australia's premier music schools, the Sydney Conservatorium of Music (SCM), a faculty of the University of Sydney. Prior to entry into the tertiary level of the SCM, students will have encountered the building and faculty through their involvement as young people undertaking music lessons and workshops, orchestral rehearsals and performances, and pre-tertiary music examinations. These early experiences contribute to students developing identities as musicians (McPherson & Hallam, 2009). They are already familiar with the forms of work that professional musicians do, and with the musical artefacts produced. They have effectively been enculturated into the music profession whilst still at school.

Once in the institution, students have three primary areas of study: musicology, rehearsal and performance practice, and individual tuition. The rehearsal techniques mirror professional practices very closely, with their 100% attendance requirement, professional 'calls', repertoire and etiquette. In this regard, SCM can be seen as a generic model of conservatoire training all over the world. Students' range of experiences during their studies is closely related to the professional reality. The ensemble experiences develop students' appreciation of working in diverse teams towards a common goal, their ability to interpret a leader's direction, and to extend their personal performance identity into a coherent group identity.

However, the most important aspect of learning music, from the students' point of view, is the relationship that they have with their individual teacher. The teacher is usually a prominent musician and acts as a conduit between the area of formal studies and professional work. This tradition of individual instruction in music is very old. As in any master/apprentice model, students are often provided with work alongside the professional musician. In the study reported here, teachers were interviewed about their perception of individual students' learning approaches, and students were asked about their learning and their views of their teachers' responsibilities for their learning. Conceptions of learning and teaching (from the students' and teachers' perspectives) were strongly related (Reid, 2001). What is of interest for this paper is the ways in which students saw that their learning was linked with professional work. There is, however, a problem with the description given above of the field of music.

On the whole, music students think that their future work will be similar to that which they are experiencing during their studies. But professional work in music in the traditional areas such as orchestral work, opera and recordings is limited, especially in Australia where geographical isolation limits musician mobility. Recent graduates may have to be creative to secure enough work for a professional career. Some of these graduates become members of established musical institutions, such as symphony orchestras (Throsby, 2010), some abandon the musical life of Sydney and move overseas, and some become music teachers at various levels. Yet others develop “portfolio careers” (Bennett, 2008), combining diverse and irregular professional opportunities into a musical working life. In this sense, the field that they prepare for is very clear, but the exigencies of working life can suddenly make it seem diffuse.

The work of musicians, re-interpreting compositions from earlier times or presenting the artistic expression of living cultural groups, can be seen as a core element of contemporary culture. In this sense, the graduate musician has an important role in cultural sustainability. We have observed that that cultural sustainability is understood in a variety of ways ranging from a ‘distancing’ view to an ‘integrated’ view. It is only when people see their professional work as ‘integrated’ that they also understand the value of their contribution towards cultural life (Reid & Petocz, 2006). The clear-field musical activities such as the symphony orchestras have been recognised through the work of Throsby and Hollister (2003) as having an impact on cultural economy. In contrast, Bartleet et al. (2009) detail the importance of community music making, a more diffuse area of the music industry. They identified the contributions of people with formal and non-formal musical backgrounds to programs for youth at risk, children’s ensemble programs and multi-cultural activities. Yet such community musical activity is rarely directly discussed in the context of the formal conservatoire.

Becoming a musician involves an element of embodiment which includes the space in which the music is created as well as the means through which it is created. There is a strong sense of physical relationship with the instrument, as Angus informs us:

Angus: I just knew I had to play the trombone and the trombone is like the call on my life, you know, and if you stand every day with a trombone in your hand eventually you feel like you are a trombonist. And it’s a pretty bizarre thing to do to stand with an instrument in your hand like you’ve got to have something which drives you there, not just the fact that you want money.

In this instance we can see a commitment to music, especially a particular kind of music – jazz trombone. There appears to be a strong intrinsic element to Angus’s choice of instrument. Another student, Kaitlyn, agrees:

Kaitlyn: Well to me playing the piano and learning is a sense of self-satisfaction. When I don’t practise – like, sometimes I go ages without practising and I feel there’s a part of me that I’ve been neglecting, and so I suppose to get personal satisfaction, and to learn and to take it seriously and to really learn you’ve got to get the technical things right and things that’s a real challenge, to know when I’m progressing and getting good at it. And I find it relaxing and just a way of I suppose venting your emotions and expressing yourself as well. And first the love of it, I suppose.

The experience of both of these young musicians demonstrates an emotional and cognitive commitment to music making. However, making a firm living out of music can seem a little out of reach. Many students, such as Jane, display an ambivalence towards earning an income from music as it could corrupt something that is perceived to be essential to their identity, but also something that they know they are good at and can be used to their financial advantage. This is a peculiar tension in which the very embodied means of creating music serves an intrinsic but also a material purpose:

Jane: It’s a lot harder than I expected. It’s more of a struggle. It’s not a very secure position that I’m in at the moment because the scene’s not the best, like, there’s not much money. That is why there are some players or teachers that would like to be playing all the time but they have to teach to make a living.

There is an assumption that musicians make a living from playing music in concert situations (and this is the type of activity that Throsby accounts for). Jane, and other students, point out that teaching music can also be used to earn an income, but is in some way an inferior form of income. Fiona, a pianist, presents another view. In a more integrated perspective, she suggests that music is more than simply sound creation or employment, but something that gets to the very fabric of existence.

Fiona: *Well personally, first and foremost I'm a human being and through being human as a way of expression I play the piano. And it's a means of my own expression of myself and what I wish to communicate, be it through other people, playing with other people or through an audience. and through teaching. /.../ The wonderful thing about music is you just strive for perfection the whole time. Because it's not just learning an instrument, it's learning about life.*

All the music students quoted here describe the strong intrinsic element of music, with personal satisfaction as the goal. Fiona takes the concept further. Personal satisfaction is still there, but the value of the activity is what is communicated to the audience. Angus presents another interesting perspective for professional music making. As a trombonist he will nearly always have to play in group situations.

Angus: *Playing with people, that's interesting. It's not like when you sit at a computer all day. You're with other people when you play you know – it's always positive to be with other people. And I like, intellectually, musically it's very stimulating. I like that. It's really diverse. If I knew where it was taking me, I suppose I'd be getting more satisfaction out of it. You know it is such a large vast area.*

Where Fiona could focus on the impact of her individual music making on her audience, Angus has to consider how his art form fits with other players. While he finds it 'interesting' and 'stimulating', there are tensions between personal autonomy and the exigencies of work. Each of these students is on the cusp of a professional career in music. Each has developed a strong identity as a musician, based on the clarity of the profession of music and their knowledge of the role of a professional musician. This would support our identification of music as a clear field. However, the evidence is that their identity as a *working* musician is far more tenuous, due to the reality of professional musical life and the somewhat limited opportunities to become part of exactly that aspect of the world of music that results in it being viewed as a clear field.

4. The empirical evidence in the mathematical sciences

Our interviews were carried out with students undertaking a degree in Mathematical Sciences at the University of Technology, Sydney, with possible majors in pure mathematics, mathematical finance, statistics and operations research (OR). Many of the students, even those in their later years of study, showed only a vague understanding of the profession of mathematical scientist and little knowledge of their professional opportunities. Their interviews confirmed our identification of mathematical science as a diffuse field of study. Elly, in her third and final year of an operations research major, exemplifies this vagueness:

Elly: *A lot of people say to me 'oh well you are doing a maths degree, you going to be a mathematician or something?' and I'll say, 'I don't know, what does a mathematician do?' When I hear the word mathematician I think of, you know, Pythagoras, you know someone who is sitting in a closed room proving theories and discovering things, I really don't think I have the ability to do that, I mean it'd be lovely, but, you know, I don't have the ability to discover something or invent something.*

Ashleigh, in his third year of a degree in mathematical sciences displays a similar naivety about his future professional role. While he seems to have thought very little about the profession, he does recognise that his contribution will be to help others with his mathematical abilities, which provides the motivation for his learning.

Ashleigh: [What do you think it will be like to work as a qualified mathematician?] *A bit different. It will be good for me because, you know, I would know everything, and I think it's different because not many people know it, so I would be able to help them with a lot of things, like mathematical things. [Why do you think statistics is something you'd like to work with?] It's just something I chose because it involves, you know, computing and maths, and these are the two major fields that I like to work with. [What do you think your aims will be when you are working?] I don't know, just to help others with my mathematical abilities, and I guess it gives you the opportunity to learn more about like different companies and like different things that goes on. [How do you think your expectations of what working might be like may affect what you learn?] I haven't really thought about workplaces much. I think what I am learning here is actually quite good, it's more, I think it will help me work better, yeah.*

Candy, also in her third year of a general mathematical sciences degree, also illustrates the common mathematics student's diffuse perception of future profession:

Candy: *A lot of people ask me what degree I'm doing and I tell them I'm doing a mathematics degree and then they go 'oh, what's that going to get you to do in the real world?' And, I'm not exactly sure myself, so I can't really imagine what it will be like to work as a mathematician, or be recognised as a mathematician until I graduate, and a lot of people wouldn't even realise, they will be probably thinking 'what can I do, what can a mathematician like offer me?' in a sense, if you know what I am saying. It's not like oh accountant, lawyer, like that's just straight away 'oh I need one of those' but like with a mathematician 'what can I do with a mathematician, what do I need one for?' you know. So I'm not exactly sure, because right now that's what I think as well, I think it will become clearer to me once I probably maybe start going to interviews, applying for jobs, then I will probably realise what people are looking for, and what people see mathematicians as, because at the moment I'm not very clear either on that.*

Candy believes that university study and degree qualification in mathematics are an indication to employers that a person is “*smart enough*”. Although she is unclear about her professional identity and specific roles, she has a broad view of the role of mathematics. Indeed, she seems to have focused on studying mathematics as a ‘generic skill’ that will “*come in useful*” in the workplace.

Candy: *To be quite honest, I actually, I don't really think of myself as a mathematician even if I do graduate from this degree, because, it was just something I fell into. So I guess with the mathematics degree, it would, for me it would mean a very broad range of things I can do, because everything involves mathematics, in any area, in any type of work it will involve mathematics, and I'm just hoping that it will come in useful to me when I actually do graduate and go into the workplace.*

However, there are some students in the same course who from some combination of circumstances have a much clearer idea of their professional future. Melissa's view is clarified by a family connection with the profession.

Melissa: [Why did you decide to study statistics?] *Basically because I have always loved maths even from primary school and I knew I had a passion for it from a very young age even before I got to school. Statistics I have always liked because I have researched a lot in the Bureau of Statistics, and plus mum's a statistician. /.../ I have always wanted to work in the Bureau of Statistics, so it'll help me a lot. I want to work with the modelling side, even with stocks, or the general Census they send around, so especially I want to work with regression and models and sampling. Everything I have learnt is directly going to help me.*

As an older student, Gabrielle has experience of the world of work, though not in her new field of mathematical sciences.

Gabrielle: *I'm a mature-aged student, so I worked in the work place for about ten years and I decided that what I was doing was not what I want to end up doing and that I wanted a professional job, which is the reason that I am coming back to study, I want to go into a professional career. My experience of, yes, of the outside world with regards to mathematics is very limited at the moment, so as to what I will end up doing is still a mystery to me.*

With her experience, she is more proactive than most of her fellow students in investigating the opportunities and clarifying her new professional field.

Gabrielle: *The ones that interest me are consultancy based jobs, that's what interests me, because that's what I'd like to do, I'd like to get into a consultancy based job, how or which industry or whatever, I really don't know. So I sound really terrible now because I sound like I just don't know what I'm doing, but I don't because I don't know enough about what's going on out there. My aim this year is to get a work placement over summer so that I can go and actually gain some sort of practical experience of what it is like to work with mathematics and to apply what I've learnt.*

Yet other students have specific views of a future professional path. Dave, another third-year student majoring in statistics, has a particular career path in mind, based on earlier work as a driving instructor.

Dave: *The specific motivation was that I quite like the road safety industry, but there is absolutely no career path for a driving instructor except possibly owning a driving school, and I mean no one in any of the driving type organisations, the RTA, the police, insurance companies, whatever, car companies, no one is going to employ anyone who only has a driving instructor's background, it's simply, it almost sort of puts you at the bottom of the pile. There's one or two TAFE openings possibly in teaching, and I wasn't that interested in that.*

So I guess I was thinking of becoming some sort of a road safety consultant, that was my original idea, in getting a maths degree, maths and stats or something like that, and that's still reasonably high up on the list. I've broadened my horizons a little bit, there's other things I might be interested in now. But I would think that most students would spend a fair bit of their time during their degrees sort of preparing to head off in one direction or another, and that could be quite broad, whereas for me I think it was a little bit narrow when I started, and it's still probably narrower than other students.

Despite his specific direction, he has found that the degree has broadened his interest in mathematical sciences beyond his original plan.

Dave: I think I've been reasonably enthusiastic about more or less all my subjects. If you're saying that, you know, you like a certain subject because you think 'yeah, that might be something that I'll be doing career wise later on', that hasn't really been the case, and in fact some of the subjects where I should really have pulled my finger out, some of the stats subjects, I haven't, and I've actually ended up working harder on subjects that I will probably never use, so maybe I'm shooting myself in the foot a bit there.

We have quoted extensively from interviews with our student sample in order to understand in their own words their perceptions of the field of mathematical sciences. Most of the students are uncertain about their future professional role as mathematicians, and would seem to agree with our classification of the mathematical sciences as a diffuse field. However, a minority see the field in a clearer way, or are actively working to clarify it for themselves.

5. Conclusion

We began this paper with a discussion of the difference between clear and diffuse fields of study, a theoretical construct that we have utilised in investigating students' transition to the professional world of work. We have seen that disciplines that are described as professional tend to represent clear fields, while those described as humanistic tend to show characteristics of diffuse fields. However, the relationship is not straightforward, and other influences can affect the clarity or diffuseness of a field. In particular, the pedagogy that is utilised in a course of study can do much towards making the field clearer. A focus on authentic problems, set in a real working context and mediated by interaction with the professionals involved (whether in person or via video or other means), can contribute to the clarity of a field. Alternatively, a pedagogy that focuses on development of 'ritual' knowledge, divorced from context and application, leads to a more diffuse field.

But maybe the most important conclusion from our investigation of clear and diffuse fields is that despite the underlying characteristics of the discipline, and the pedagogy on which the course is based, individual students will have different experiences of the extent to which a field is clear or diffuse. Students are going through a process of constructing their professional identity during the time that they are developing the skills, knowledge and dispositions that will allow them to develop into mature professionals. The clearer they find their field of study, and the clearer that we are able to present it to them, the easier will be their transition to the world of professional work.

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