1-1-2007

Double degrees: double the trouble or twice the return?

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Abstract

Double degrees (also called joint or combined degrees) – programs of study combining two bachelor degrees – are increasingly popular in Australian universities, particularly among women. A case study using qualitative and quantitative surveys of current and past double degree students is presented. The study indicates that double degrees benefit students in providing a broad education and increasing skills and options. However, benefits are not fully realised because of administrative difficulties, lack of support and absence of 'learning communities'. These problems arise because double degrees sit outside the disciplinary structure of universities. As such, however, double degrees have potential to provide transdisciplinary education. We suggest initiatives that would improve the experience, performance and persistence of double degrees students. They would also build the skills of integration, boundary work, communication and teamwork associated with transdisciplinarity. These skills not only equip students for a range of employment; they are sorely needed in society.

Keywords

Double degrees, Gender, Interdisciplinarity, Learning communities, Student surveys, Transdisciplinarity

Disciplines

Business | Social and Behavioral Sciences

Publication Details

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Dedication: This article is dedicated to the memory of Diana Temple, an inspiration to women in science.

Abstract

Double degrees (also called joint or combined degrees) – programs of study combining two bachelor degrees – are increasingly popular in Australian universities, particularly among women. A case study using qualitative and quantitative surveys of current and past double degree students is presented. The study indicates that double degrees benefit students in providing a broad education and increasing skills and options. However, benefits are not fully realised because of administrative difficulties, lack of support and absence of 'learning communities'. These problems arise because double degrees sit outside the disciplinary structure of universities. As such, however, double degrees have potential to provide transdisciplinary education. We suggest initiatives that would improve the experience, performance and persistence of double degrees students. They would also build the skills of integration, boundary work, communication and teamwork associated with transdisciplinarity. These skills not only equip students for a range of employment; they are sorely needed in society.

Introduction

Double degrees (also known as dual, combined or joint degrees) are undergraduate courses involving two bachelor degrees studied concomitantly over approximately five (for three year degrees) or six years (for four year degrees eg law and engineering). They generally require higher entrance scores than the corresponding single degrees. Students graduate with both degrees, receiving a 'discount' in terms of credit and time compared with the sum of two degrees. This discount is generally based on the allowance in most degrees for students to enrol in subjects outside their faculty or discipline area. Double degree programs in most Australian universities involve no formal integration of content, skills or teaching between disciplines. Apart from rare examples of courses or degree programs in particular areas such as environment or health, double degrees are simply two degrees study concurrently. As such, they are administrative rather than pedagogical structures.

Double degrees, in covering more than one disciplinary area, seem ideally suited to provide the kind of education that graduates, employers and society need in a complex, changing, knowledge-intensive world (Batson et al. 2001). To begin with, two degrees provide options to graduates unlikely to remain on a single, stable career path. New niches exist for graduates with a mix of knowledge and skills: biologists with law to work in biotechnology companies, historians with management to work in public agencies, IT specialists with creative arts to work in web design. Moreover, there is an increasing emphasis on transferable skills and literacies, reflected in government policy and initiatives within Universities (Rosenman 1996; Batson 2001; North 2005). Studies have suggested that many such skills and literacies are developed in discipline-specific contexts and are not in fact easily transferable (North 2005; Neumann et al. 2002). In developing skills in at least two disciplines, and in learning to switch between, double degree students may emerge more able to adapt their skills and knowledge to new contexts in flexible and responsive ways.

Double degrees

Beyond flexible knowledge and transferable skills, double degrees have potential to contribute to *transdisciplinary* education, which crosses and bridges disciplinary boundaries[i]. This is one of the most neglected and exciting opportunities associated with double degree programs. Transdisciplinarity is characterised by knowledge production that is problem-focused, draws knowledge and methods flexibly from diverse sources, involves collaboration between academic disciplines and other parts of society, and produces knowledge that is 'socially robust' (Wickson et al. 2006; Thompson Klein et al. 2001; Nowotny et al. 2003). Such approaches are promoted for their ability to tackle complex real-world problems, particularly associated with sustainability (Thompson Klein 2004; Rapport 2000; Meppem & Gill 1998). Transdisciplinarity may be an important response within a shifting context in which new knowledge producers and users interact with universities (Gibbons et al. 1994)[ii] and in which universities adopt new roles (King 2004; Etzkowitz 2000; Gunasekara 2004).

There is rhetorical support for transdisciplinary and other cross-disciplinary[iii] approaches, including within universities and from government (Grigg et al. 2003; King 2004; Winberg 2006). However, considerable structural and cultural obstacles to the development of transdisciplinary research and education exist, owing to the strength of disciplines in structuring universities (Russell 2005; Boucher et al. 2004). While the growing popularity of double degrees may be responding to calls for more breadth and transferability in higher education, disciplinary obstacles may reduce the contribution that double degrees can make in the face of new demands on universities and graduates (Rosenman 1996). With this in mind, we sought to investigate the experiences of double degree students. In addition to a concern that they face unnecessary obstacles in their time at university, we were also concerned that universities are not taking advantage of a considerable opportunity.

The study was carried out at the University of Wollongong (UoW) in Australia in 2004-2005 and involved surveying students enrolled in double degrees at UoW, and students who had completed a double degree at UoW or elsewhere. The research investigated the experiences of these current and past double degree

students with a two-stage (qualitative and quantitative) survey process. In this article, we discuss the students' responses and make general observations about enrolment in double degrees. Despite their popularity, there is very little literature about this type of degree, which we see as having an increasingly important role in universities. Based on our results, we make recommendations for improving double degree programs, and for developing this unique opportunity to prepare graduates for transdisciplinary knowledge production.

Methods

A preliminary qualitative questionnaire was designed to explore the experiences and concerns of a range of double degree students and to collect in-depth responses that would inform our further investigations. The questionnaire gathered data about respondents (double degree combination, age, gender, international or domestic status, ethnicity) and responses to open questions about their motivations and experiences. The questionnaire was sent to a group of 48 current double degree students, selected to represent the range of degree combinations (approx. 2% of students from each combination) and to include both genders. The questionnaire was also sent to two groups of past double degree students, one of current postgraduates at UoW contacted via an email list (not all of these had done their double degree at Wollongong), and the second drawn from students selected randomly from a UoW Alumni Association list. The questionnaire was delivered by email, with the inducement of a chance to win a $50 book voucher. Respondents included 15 current students and 27 past students (12 Alumni and 15 postgraduates), from a range of double degree combinations representing all but 6 of the 23 possible combinations of faculties,[iv] in proportions roughly reflective of the double degree cohort as a whole. There was a slight over-representation of Creative Arts - Arts students[v].

The qualitative responses were coded using NuDist v4 software (QSR) and the coding used to develop categories for a quantitative survey. This web-based survey included similar questions, offering between 7

and 12 possible responses (based on the qualitative survey), with most questions requiring students to select "all that apply". The survey was sent to current and past students via an email requesting their participation with a link to the survey website and a password (to prohibit accidental respondents). This email was sent to all current double degree students on campus (1344 students), all past students on the Alumni list with email addresses (350) and all postgraduates via the email list (unfortunately, the request was sent as part of a newsletter by the list moderator, which reduced the number of respondents).

452 current students and 95 past students responded to the survey. The data collected was compared with data for the undergraduate student cohort at UoW (Wollongong campus) in the same year (2005). The range of double degree combinations of the sample reflected the general population of double degree students at the university (Table 1). If anything, students from more popular double degrees, such as Arts–Law and Commerce–Law, were under-represented compared with students from less popular degrees. The sample should thus reflect the range of experiences double degree students are likely to have. Data from the web survey were analyzed using SPSS 13.0. Descriptive statistics were computed to gain insight into the frequency distributions of responses, and Chi-squares tests were used to assess whether hypothesized independent variables (such as gender) had an effect on dependent variables of interest (such as the kind of double degree enrolled in). P-values are reported to indicate whether the hypothesized associations are statistically significant or not.

Table 1. Percentage of double degree students in major double degree combinations at the University of Wollongong, showing representativeness of the survey sample. Note that not all combinations are shown.

Results

Who takes double degrees?

It appears that double degrees are taken predominantly by school leavers. The majority of respondents had completed a High School Certificate (88%) and 12% had entered with a non-university qualification of another kind. Only 1% had begun their double degree with a prior university qualification. In terms of work experience, 82% began a double degree with no prior work experience, 14% had worked for one or two years and 2% had been in the workforce for ten or more years. Among those with work experience, the majority had worked in business/industry.

Gender

More women take double degrees than men. In 2005, women represented 60% of double degree students at UoW, compared with 50% of single degree students (women make up 51% of undergraduates overall). In our survey, 64% of respondents were women, suggesting a minor selection effect in the survey. There was a significant difference (Chi-square p-value < 0.001) in the kind of double degree male and female students chose. Female students systematically preferred Arts–Law, Arts–Commerce, Creative Arts–Arts, and Health and Behavioural Science (H&BS)–Commerce and male students were significantly over-represented in Commerce–Engineering, Informatics–Engineering, and Science–Engineering (Table 2). These preferences were largely a reflection of the faculty preferences of female and male students generally. However, women's representation in double degrees was greater than their representation in single degrees compared with men in most faculties. Thus, double degrees functioned to raise the proportion of females in faculties in which they were under-represented (in Engineering and Informatics, in which women represent 13% and 14%, respectively).

Table 2: Percentage of females and males in each double degree combination

Double degrees

The observation that females have higher participation rates in double degrees is consistent with a national study by Batson et al. (2001), which also found that participation in double degrees brought women above target for non-traditional areas such as IT and engineering. This is interesting in light of research by Kim Thomas (1988), who found that women were disadvantaged in both 'male' and 'female' disciplines. In her study, they lacked confidence and struggled to match their identity as women with their identity within the discipline, whether physics or English. A preference for double degrees among women suggests a willingness to take up a challenge and likely reflects the higher proportion of girls who achieve a high tertiary entrance score (Temple 1997) (double degrees require a higher score for entrance). In terms of motivation, it may signal a preference among women for integrating different knowledge areas and crossing boundaries. Perhaps, rather than 'male' and 'female' disciplines, disciplinarity itself as a way of ordering knowledge is more suited to males. Spanning disciplines potentially involves the skills of integration, synthesis and communication; and the attributes of breadth of perspective, respect for diversity and appreciation of paradox. Perhaps these skills and attributes are better embraced by women. If so, education across disciplines, through programs such as double degrees, may provide an important opportunity for women to contribute and excel.

International vs domestic students

Double degrees are a domestic student domain. Only 1% of double degree students were international (both across campus and in the survey), compared to 16% for single degrees. Double degrees are clearly an area of opportunity for internationalisation. International students may currently be put off by the extra time and money required. "It's difficult enough for international students throughout a normal degree, having to pay full fees and support themselves living in a new country and culture, and being separate from their families and friends" (D Hull, International Student Advisor, UoW, pers comm, 2006). However, it may be that double degrees are little known overseas or are unattractive to international students without clear guidance about job opportunities and career prospects. There is evidence that the proportion of international students enrolling in double degrees is increasing nationally (Batson et al.

2001). Providing more support, streamlining adminstrative aspects, providing career information and advice, and creating incentives for double degree students may open this area up for international students. This would potentially increase international enrolments, increase cultural diversity in double degree programs and provide international students with opportunities to broaden their education.

Why do students take double degrees?

Some students have to take a double degree (Law, at the time of the survey, was only available as a double degree). However, nearly 50% of Law students did *not* include 'I had to take a double degree' as one of their main reasons for enrolling, suggesting that they would have taken a double degree anyway. Most students (about 75% of respondents), chose a double degree to acquire job-relevant skills and improve employment prospects (Table 3). Some felt that the double degree would 'give them an edge' in competing with other students and would demonstrate their special qualities, for example, "that I am a lateral thinker and also a keen learner". Some identified particular employment opportunities associated with a combination of degrees.

> I chose to do the double as I thought it would benefit me in the science sector as I wanted to get into mining with my geology background. I knew that mining companies used the stock market quite a bit and I was also interested in the finance side of business. (Science - Commerce)

Table 3: Main reasons for undertaking a double degree

However, when asked whether the double degree had been useful to past students, only about 50% of students chose, among their selections, that the skills learnt had been useful at work or that the degree had made them more competitive (Table 4). This is a surprisingly low figure, suggesting that the students were disappointed with their double degree in terms of improving their work skills and/or opportunities.

> … despite the fact that I utilize both disciplines in my work... it made no difference in my ability to get a job.
> Employers in Australia were not interested in whether or not I had one or two degrees - but more concerned
> about how much work experience I had. My peers who did a single degree were already in higher positions
> due to their two year head start. Interestingly, …I found to my pleasant suprise that employers in the USA did
> recognize that I had two undergraduate degrees (Arts - Commerce)

Table 4: Responses of former students when asked whether their double degree had been useful.

More than half of respondents undertook a double degree to explore different areas of study and a similar number enrolled out of interest (Table 3). This was even higher for some combinations, eg 85% of the Arts-Commerce students wanted to explore different areas of study. Students clearly use double degrees as an opportunity to engage with different disciplines they have strength and/or interest in. Some may be putting off making a decision, but many want to leave their options open.

> Finishing high school hadn't made it any clearer as to what I wished to continue studying, except that I had a
> huge range of choices. I didn't want to narrow my options just yet (or was putting off making decisions
> perhaps) so a double degree seemed quite a natural choice. (Science - Arts)

Others wanted the extra 'challenge' and 'stimulation' of a different discipline, or to have one area of strength while developing an area they were weaker in.

> I was curious about the practical side of engineering. I also realised that i wanted to improve on things that i
> was not good at. In regards to the commerce component, I wanted to develop the skills that I knew I could do
> well at. (Engineering - Commerce)

Of those who had graduated and entered the workforce, it was the breadth of knowledge and perspective that was most commonly selected as having been useful (by 87%; Table 4). Given that this was emphasised less as a reason for enrolling, it may be that the double degrees had given them this breadth,

and had also lead them to value it. For a few, this breadth extended to exploring the connections between disciplines. For example, one chose a double degree "because I was interested in the idea of an interdisciplinary approach to my visual arts practice and English studies." However, in a related question, only 11% selected integration of disciplines as the main benefit of a double degree.

What is their overall experience of double degrees?

The responses to what they like/liked about their double degree mirror their reasons for enrolling and the benefits they perceive, with a majority liking the broader base of knowledge and the career opportunities (Table 5). The also liked the mixing of subjects, and the associated diversity of perspectives and range of teaching styles. Some noted that having two degrees allowed them a 'break' from one type of discipline/knowledge (for example, practical vs theoretical), which kept them from getting bored with either discipline. Some students also benefited socially from exposure to two sets of different people (presumably staff and students) and some former double degree students indicated that this had improved their ability to communicate with a range of people at work.

Table 5: Aspects students liked about their double degree

Interestingly, 64% of respondents liked the fact that they could transfer knowledge and/or skills between disciplines, while only 44% liked the fact that they could link/integrate their disciplines areas (when able to select multiple options; Table 5). The transfer of skills and knowledge across disciplines and the complementarity of disciplines gave them advantages in each degree.

> the opportunity to apply other modes of learning to your principal degree, for example the organisational behaviour course was beneficial for the engineering component of my degree as well as the commerce component. (Engineering - Commerce)

Double degrees

While respondents said many positive things about their degrees, these were expressed in light of considerable challenges they also faced. Advantages that came from transferring knowledge between disciplines were countered by formidable workloads, conflicting expectations and administrative difficulties. These challenges, which reflected the majority of comments from the web survey, are discussed below. Their enthusiasm therefore seemed to exist in spite of problems.

> When it comes down to it however, I am ever grateful that it is possible for me to do such an unusual double degree and I know nowhere else offers it, so I would rather the hectic-ness anyday than to not be able to do it at all! (Science - Creative Arts)

> I would go through times were I wished that I only did one degree so that I would finish quicker and have less work load, but now that I am in my final year and almost finished I am happy that I did both! It is worth it! (Arts - Informatics)

What are the problems and challenges of double degrees?

There was considerable dissatisfaction and disillusion among double degree students. This may be reflected in approximately 4% (net[vi]) of the cohort switching to single degrees each year for the last five years at UoW. This 'switching' may reflect intentional choices, or dropping out of one degree and settling for the other; but may nevertheless reflect the challenges and problems double degree students face.

Table 6: Aspects students disliked about their double degree

Course structure and timetabling

A majority of respondents faced difficulties with timetable and course structure (Table 6). About 40% indicated the length of the degree and the high workload as problems, these exacerbated by timetabling problems. With the exception of Law, faculties do not have set structures for double degrees. Students must select subjects to satisfy the requirements of each degree, including prerequisites and core subjects,

12

and sufficient subjects in each year for a major in each discipline. This task is exacerbated by the difficulty of fitting subjects from two faculties into one timetable, especially as more subjects may be taken than in a single degree. Students experience timetable clashes, and it seems rare for special accommodation to be given to double degree students in tutorial and practical class allocations. Timetabling is a particular problem for degrees involving more contact hours; a significantly larger number of Science and Engineering students (72%) had problems with timetables or course structures compared to double degree students from other faculties (<60%)**.** Students are forced to postpone subjects (complicating and often prolonging the degree), miss classes, or live with an exhausting timetable, which adds to their effective workload. These problems often compromise students' performance.

> There were occasions where I would have a day that started at 8:30 and finish at 8:30 with no breaks in between. (Science - Engineering)

> Timetabling has been awful to the extent that for some classes I had to miss all/ the majority of lectures for that subject, and doing the subject another year meant that whole degree got put back another year. (Creative Arts - Engineering)

Similarly, double degree students often have multiple assessments due at the same time. Study breaks such as reading weeks and study weeks (before exams) may be taken up with classes and assessments for the other faculty. The same timetable problems extend to examination timetables, with some students having multiple examinations for different faculties in one day.

> My main complaint was the exam timetable - every year without fail, I had a major maths exam on the first Saturday morning, and a major law exam on Saturday afternoon. I know I should have been thankful for them not clashing…(Informatics - Law)

> I once had 5 exams (across both faculties) in the space of 3 1/2 days with no special consideration. I have even been scheduled to have a law exam and a commerce exam separated by only 45 minutes provided exams finish on time. That's 5 1/2 hours worth of very demanding exams in the space of basically six hours including leaving the exam room and finding the next room. (Commerce - Law)

In addition, students found that faculties had different expectations, and over half included this as something they disliked about their double degree. This is particularly the case for presentations and written work, with differences in styles and standards of writing and presenting, different approaches to researching and different referencing systems. Expectations and standards were not only different, but were not necessarily made explicit and were sometimes inconsistent, within and between disciplines. Some students responded by dedicating less time to one of their degrees, and many described difficulties in reaching their potential academically.

> When doing a presentation for the engineering component of the degree the interest was focussed solely on the presentation content. When doing a presentation for a sales course your personal presentation, gimmicks attached to presentation and audience handouts were equally as important as the presentation content. Most students …are not aware of this and find themselves receiving very low marks because they appear not to have put much time into putting their presentation together. (Engineering - Commerce)

> Trying to allocate readings so as to balance between the work loads of both degrees, i.e. A law degree consists of a substantial amount of readings which usually took up most of the time leaving very little hours left for preparation for the other degree (Computer Science – Law)

Guidance and Support

Course structure and timetabling difficulties were confounded by a lack of administrative support from faculties, as 40% reported. A lack of support does not necessarily reflect on individual faculty staff, who cannot be expected to be familiar with course structures in other faculties, and is therefore likely to be a general problem for universities offering double degrees. For staff in central roles, such as Dean of Students, the lack of quality advice at faculty level means a disproportionate number of enquiries and complaints. This issue is clearly a significant one for both double degree students and for the University.

> I would not recommend my double degree to anyone as it stands - it was too difficult to find help when I
>
> needed it. (Science - Engineering).

> Throughout my double degree I did not have any help in relation to working out how many subjects I needed
>
> to do. Each faculty continued to tell me the complete opposite information. In the end I had to work
>
> everything out myself but was always left thinking 'have I chosen the right subjects' and 'will I be able to
>
> graduate on time'… (Health &Behavioral Science - Commerce).

Guidance and support are important practically, but also psychologically. Double degree students

potentially have less sense of belonging and being valued by the university. In addition, because of their

schedules and the duration of double degrees, these students may have difficulties maintaining a peer

group, as nearly 30% of respondents indicated. They usually establish relationships with single degree

students from one or both of their faculties, who graduate earlier, leaving them to find a new social group.

> Because students undertaking single degrees move at almost double the speed, friends move on in all faculties
>
> and you are left in fourth year with new second-years etc. You make new friends, but it is hard to make close
>
> friends and achieve continuity. (Arts - Commerce)

Together with a lack of institutional support, this failure to develop peer connections may exclude double

degree students from a 'learning community', with implications for their performance and persistence

(Gablenick et al. 1990, Smith and Bath, 2006).

Academic recognition

Lack of support extended to a lack of recognition of their double efforts, with a third of respondents

expressing dissatisfaction with this (Table 6). Given that we would expect this dissatisfaction to come only

from the highest-achieving students, this figure probably understates the problem. Double degree students,

despite academic achievement, may not be eligible for entry into Advanced degree programs (which allow

fast-tracking, special research projects, additional faculty support and Advanced badging on their

graduation details), work placements and Dean's Merit lists. This ineligibility may be explicit, or based on

double degree students not having enough credit in either of their disciplines in a particular year. Some also feel that there is not enough recognition at graduation that they have completed two degrees.

> … I was never recognised for my academic achievements as I never (until my last year) did enough subjects from one faculty to make the Dean's Merit list. I was always in the top 5% of students but never got recognised for my efforts. I graduated with distinction from both my degrees. Being on the Dean's Merit List is extremely important when applying for summer vacation jobs and graduate jobs. (Health &Behavioral Science - Commerce)

> …upon graduation, there was almost no recognition within the graduation ceremony that I had actually completed a double degree. Double degree graduates for Arts / Commerce were lumped in with all the BA graduates. It was a real let down of a graduation ceremony - after putting in so much extra study compared to regular one-degree students, and the University did not seem to recognize that at all…(Arts - Commerce)

A lack of recognition is not only unfair to double degree students who achieve as highly as their single degree peers, and may miss out on employment opportunities as a result, it also reflects a failure to recognise the special effort of these students in coping with the administrative, workload and epistomological challenges of studying in two disciplines. This failure to recognise the emergent qualities of double degrees is probably related to disciplinary culture and the central role of disciplines in the structure of universities (Russell 2000).

How could double degrees be improved?

When asked what was missing from their degree, a lack of real world job skills was criticized by two thirds of the respondents, followed by a lack of integration (38%). The lack of real world job skills was criticised systematically more often (p-value < 0.004) by students enrolled in Arts-Law, Science-Engineering and Science-Law. We suggested a number of initiatives that might be implemented to improve double degree programs and asked whether they would be helpful. Three quarters indicated that a handbook for double degree students would help them, 55% would find a website for information, announcements and discussions useful, 41% would make use of subjects that integrate their disciplines

and 21% would appreciate regular meetings, seminars or discussion groups. No differences existed

between different combinations with respect to these responses, suggesting that they could be introduced

for all double degree students.

Support & Community

Dedicating resources and staff to supporting double degree students could mitigate many of the problems

described above. Providing information, guidance and support is one of the simplest and most constructive

ways that universities can invest in double degrees.

> The availability of ... information would not only benefit the student, but would also encourage more students
>
> to undertake a double degree program. This would benefit the university financially and also raise the
>
> Universities domestic/international standing. (Commerce-Engineering)

As well as providing dedicated information resources such as handbooks and websites, a useful suggestion

from the surveys was the provision of a double degree mediator or professional officer, a person employed

to deal specifically with double degrees. This person would give information and support to students, and

could also develop initiatives, arrange meetings and events, liaise with faculties and feedback to the

university about issues and problems for double degrees. The mediator's important role in generating a

'learning community' for double degree students would help to reduce alienation and stress and likely

improve the performance of double degree students.

> Administrative support targeted at double degree students or a main contact person who is equipped to discuss
>
> all issues with not "see both sub-deans" (Arts-Commerce)

> I like the idea of having a meeting, perhaps one a fortnight or a month that brings the double degree students
>
> together, just an informal thing so we could all stress about the workload together!!…An introduction to first
>
> year double degree students from those who are already doing it would have been very helpful! (Arts -
>
> Creative Arts)

'Learning communities' have the potential to improve performance, outcomes, satisfaction and persistence in higher education (Gablenick 1990; Tinto 1997; Smith and Bath 2006). As well as improving conventional educational outcomes, a strategy to develop learning communities could make important contributions to the development of integration and transdisciplinary skills (Dodge 2004).

Job Skills and Career information

The desire for job skills was combined with uncertainty about career paths and prospects for double degree graduates. In the words of a Creative Arts-Arts student, "it gets to the end and we say, what the hell do I do with this?". These students would benefit from career guidance as well as work experience.

> Another good thing could be some kind of forum in which career possibilities are explored, as what job opportunities exist in this field is somewhat unknown to a lot of students (including myself). As part of this, the opportunity to do work experience could be very very positive. A Creative Arts/Arts degree can sometimes feel like twice the unemployment prospects when a lot of what we're learning doesn't necessarily seem to transfer into a job!!! (Creative Arts - Arts)

Further research on double degrees and employability could assess the extent to which a double degree adds value, and use this in promoting double degrees, and giving information to students about career prospects. Research engaging with employers could also provide information about the advantages of double degrees, and perhaps change employers' attitudes about their desirability.

> … universities should really let employers and others know that doing a double degree is challenging and thus the student is of a higher standard than a single degree student (all other things being equal)…the universities including UOW should really make a point that double degree students have more knowledge/skills etc. (Arts - Commerce)

Preliminary discussions with employers during this study suggested that there is limited awareness of the existence and value of double degrees.

Double degrees

When students complain about a lack of 'job skills', they are often thinking of specific vocational skills. Whether universities have a responsibility to provide such skills is debatable, particularly given the diverse range of graduate jobs. However, when employers complain of employees lacking relevant skills, it is often generic and transferable skills, particular communication and teamwork, that are missing, rather than specific vocational skills and knowledge (Barker et al. 1998). Universities have responded by emphasising generic skills and graduate attributes. However, when taught in a disciplinary setting, these may lack the transferability necessary in many jobs (North 2005; Neumann et al 2002) and employers note graduates' inability to make cross- or interdisciplinary connections and to operate cross-functionally (Barker et al. 1998).

Can double degrees provide transdisciplinary education?

Most graduate employees work on problems that are not organised along disciplinary lines. It is ironic that double degree students suffer from rigid disciplinarity during their degrees, and also miss opportunities to develop cross-disciplinary skills that would improve their prospects and performance when they graduate. For society generally, emerging issues in, for example, sustainable energy production, urban planning and natural resource management also span disciplinary boundaries and require a high level of integration (Rapport 2000; Ramadier 2004; Bammer 2005). Transdisciplinary scholarship has emergent properties that are not recognised in disciplinary settings, but are likely to be valued in settings outside universities (Russell 2000). We believe double degree programs have significant untapped potential in preparing graduates for employment, bringing universities into line with a shifting context of knowledge production, and assisting society in dealing with complex problems.

Nearly 40% of respondents experienced their two degrees as separate, rather than 'fitting together'. Of those that said their degrees fit together, only 29% said that they *integrated* knowledge and skills from their two disciplines. Integration was most commonly associated with (in rank order): skills that crossed over, integration in the context of work/career, and overlap in content. Some students found that one

discipline changed their perspective on the other. When asked to choose one main benefit of the double degree, only 11% selected the fact that it allowed them to integrate disciplines[vii]. Moreover, those who did attempt to integrate their knowledge and skills felt a sense of frustration or disappointment that their efforts were not acknowledged or supported by the University.

> I believe that as far as the university was concerned they were totally separate (for eg. there were no opportunities to discuss/integrate the work I was doing in one degree with lecturers/tutors from the other). However, my own interests in both disciplines did allow me to draw from each in the study of the other -- but this was done in a personal and independent way and was, unfortunately, not formally recognised by the uni. (Creative Arts - Arts)

> In my experience I studied two degrees rather than a 'double degree'. There was essentially no connection between the two strands of study. … there is (to my knowledge) no effort on the part of the university to maximise the unique potential of the study of concurrent degrees. (Informatics - Law)

Students suggested that cross-disciplinary subjects would benefit them by assisting to 'link' their two areas. Such subjects could be based on interdisciplinary or transdisciplinary topics, and we have heard of examples such as forensic law (Judith Marychurch, UoW), human ecology (School of Resources, Environment and Society, The Australian National University), health care (Smith & Christie 2004) and environmental management (Hammer & Söderqvist 2001). Alternatively, a skills-based course could rely for its content on the students bringing topics from the intersection of their disciplines. Research or project subjects linking disciplines were also suggested. As well as providing students with skills of integration and transdisciplinarity, such initiatives could contribute to their disciplinary learning.

> I would have jumped at the chance to undertake an (supervised) independent project (during my undergrad not after) that allowed me to integrate my research. I believe something like this would be beneficial since it would allow the capable students to extend themselves and integrate their skills and knowledge from both disciplines. (Creative Arts - Arts)

Unfortunately, it is currently difficult for a double degree student to pursue honours or post-graduate studies in an area that combines two disciplines. Several students felt pressured to pursue higher studies in only one area.

> I would have appreciated the opportunity to integrate both degree specialisations in my honours project, possibly even have two supervisors - one from each discipline. It is with a degree of disappointment that I am now wholly committed to engineering research and have left arts behind altogether. (Arts - Engineering)

We suggest that the development of transdisciplinary undergraduate subjects should be supported by the development of rules and guidelines for cross-faculty and cross-discipline honours and postgraduate degrees. This would have the added benefit of fostering interaction between staff in different areas, fostering a more cohesive university community and more communication and cross-fertilisation, both in teaching and potentially in research.

Conclusion

Double degrees represent an area of growing significance, for universities and society. For universities, they represent a significant proportion of enrolments (approaching 10%), they attract strong students (higher entry requirements) who are more likely to undertake postgraduate work (for students who enrolled in double degrees at UoW between 1983 and 2003, 3.5% went on to research doctorates, compared with 1.8% of single degree students), and they are preferentially selected by women, providing an avenue for improving women's participation in higher education. There is potential for expansion of double degree enrolments, particularly among international students. Double degrees potentially provide an avenue for developing transferable skills in graduates, including skills in transdisciplinarity and integration. At the same time, our research reveals considerable obstacles and challenges associated with double degrees, which affect students' satisfaction, performance and persistence.

Double degrees

These observations suggest that double degrees should be a hot topic in higher education. However, this is one of very few studies we are aware of that has specifically investigated double degrees. This paucity of research may reflect the underlying problem for double degrees — they don't fit. They potentially sit outside, or above, the disciplinary structure of universities. This characteristic likely contributes to the failure of universities to invest in the improvement of double degree programs — they are 'nobody's baby' and have no champions. And yet it is also this boundary-spanning characteristic that gives them so much promise. Given the talents of these strong and enthusiastic students, and the potential of double degrees to create graduates able to traverse and integrate across disciplinary boundaries, to suggest that this is a lost opportunity is to understate the issue.

Below is a summary of recommendations for universities to support and improve the experiences, performance and persistence of double degree students. These relatively straightforward initiatives should help to create learning communities for double degree students, and improve the status of double degrees on and off campus, including among employers and prospective students.

- a dedicated handbook and website — providing information about course structures and rules, links to relevant faculty information, careers profiles of past double degree students, and interactive communication tools
- a coordinator/professional officer — giving information and support, developing initiatives, arranging meetings and events, liaising with faculties and the university in developing double degree programs and initiatives
- meetings, events and communication organised via the website and the coordinator
- scholarships and awards for double degree students and a review of rules for other scholarships, awards and accolades.

Further developments to promote and develop the transdisciplinary potential of double degrees include:

- Transdisciplinary subjects or programs, either topic or skills-based, course-work or research

- A framework for honours and postgraduate studies that integrate multiple disciplines.

In addition to enhancing the skills and performance of double degree students and improving their graduate attributes, these would provide opportunities for collaboration and cross-fertilisation among staff across the university.

If universities commit to supporting double degrees and the transdisciplinary opportunities they represent, this would be a useful step in broadening university knowledge production. There is general agreement about the value of disciplinary specialists both inside and outside academia, providing depth in academic research and a foundational education for graduates (Costanza 1990). What is missing is a group of transdisciplinary specialists who act as bridges across disciplinary boundaries, addressing complex, big-picture problems, and providing breadth and responsiveness to academic endeavour (Bammer 2005, p 12). While there remain obstacles for those who seek an ongoing academic career as transdisciplinary specialists, notably the lack of recruitment opportunities (Russell 2005), training a bright cohort of double degree students seems like a good place to start.

Endnotes

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[i] Transdisciplinarity (transgresses disciplinary boundaries) is distinguished from multidisciplinarity (disciplinary scholars collaborating while remaining within their respective disciplinary frameworks) and interdisciplinarity (work at the intersection of two or more disciplines) (Wickson et al. 2006).

[ii] Gibbons et al. describe a new approach to knowledge production, Mode 2, characterised by heterogeneous, transient teams of academics and knowledge producers from other parts of society, which form in response to particular problems or opportunities.

[iii] 'Cross-disciplinary' is an umbrella term for multidisciplinary, interdisciplinary and transdisciplinary approaches (Grigg et al. 2003)

[iv] Each of these 6 combinations constitute a small proportion (less than 3%) of the overall double degree enrolment.

[v] 12% compared to 5% of the double degree cohort overall.

[vi] Corrected for students switching from single to double degrees

[vii] Interestingly, this small proportion comprised roughly equal numbers of females and males.

Acknowledgements

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