Intellectual Property education – In the Law School and Beyond

Professor Ruth Soetendorp
Centre for Intellectual Property Policy and Management
Bournemouth Law School
Bournemouth University

Anyone involved with intellectual property cannot escape the recent expansion in intellectual property education and awareness initiatives. No one active in higher education can ignore the demands that faculties, despite shrinking resources, deliver to new agendas that must take account of the fuzzying of disciplinary boundaries. Learning and teaching, curriculum design and research strategies reflect these changes, driven by changing expectations of how future graduates will contribute to the economy.

This paper looks at ways in which intellectual property education is responding to changing demands, from within the law school and across the disciplines.

Hennessey (1999) in 'The place of intellectual property teaching in the curricula of universities and technical institutes'[1] asks what the place is of intellectual property teaching in universities and technical institutions. He begins with a consideration of intellectual property teaching within the law school. He discusses the challenges faced by the 'adjunct' or visiting law teacher, encountering students from other disciplines. His categorisation of the different styles of law teaching is insightful, and is explored below in the context of IP education examples.

In 2001 Booton and Prime [2](2001) reviewed the teaching of intellectual property law in UK law schools, within the LLB programme. They recognised 'the deep moral, philosophic and ethical issues to which it [a study of intellectual property law] gives rise'. Their research focussed on how changing demands from the legal professional bodies impacted on the teaching of intellectual property law. In their concluding comments, they note the observation of Ross Cranston that students who have come to legal practice as a result of a conversion course do as well in practice as lawyers with a first degree in law[3]. Which illustrates the suitability of law to successful interdisciplinary education. It is especially relevant for intellectual property practitioners. Patent agents in particular are required to have a first degree in science or technology before they begin their study of intellectual property law.

Kaplan and Kaplan (2003), are academics who are also U.S. patent attorneys. They include intellectual property in their university engineering classes. They give the following reasons for teaching engineers about intellectual property:

> IP knowledge is important for engineers: engineers should try to understand IP basics to protect their creations. Also, IP searches can indicate the growth of different engineering fields. Furthermore, the proper use of IP promotes the progress of a field. Engineers should become familiar with the basics of the three traditional IP areas: copyrights, trade marks and patents. The should know which IP rights are needed to protect their creations. All of the students have reported that the enjoyed the information and will use the material in the future.
>
> The best result came well after the completion of the course. Ms W returned to thank the professor. Apparently she impressed an interviewer with her knowledge of IP and received an engineering position because of it![4]

Leeds and Koppelman(2004)[5] raise issues of ownership and authorship in science and engineering joint discoveries and inventions. They suggest that technological advances raise questions about

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[1] Hennessey W, The Place of intellectual property teaching in the curricula of universities and technical insitutes, © Franklin Pearce Law Centre, http://www.ipmall.info/hosted_resources/Teaching_IP_Hennessey_99.htm
[2] Booton D and Prime T (2001) Intellectual Property as part of the undergraduate law curriculum: theory and practice, potential and reality [unpublished]
,[3] Cranston R, foreword to Reviewing Legal Education, P. Birks (ed) OUP, 1994
[4] Kaplan K and Kaplan Lt J (2003) *Incorporating intellectual Property into Engineering Education* session 2793, Proceedings of the 2003 American Society for Engineering Education Annual Conference & Exposition

whether tangible, material property can be treated the same as technological *[intellectual*] property or whether new moral or legal laws are needed.

The number of books[6] and online resources[7] on intellectual property has grown to support the increased interest in intellectual property education. There are resources appropriate to every level, and some which are specifically relevant to teaching intellectual property across the disciplines, or within a particular discipline.

Relevance of intellectual property rights to non-lawyers

IPRs pose challenges, risks and benefits to any operation. If IPR is to deliver its true worth to an organisation, the value of IPR needs to be understood in many different contexts, including buying, selling, and investment. Venture capitalists want to maximise returns and minimise risks. Some may prefer to invest in innovation that has been protected by trade secret, rather than a weak patent that carries the risk of litigation. Others will only work with enterprises 'that have exceptional intellectual property.'[8] Most large companies these days will not undertake a new venture without a thorough analytical IP plan. In the commercial and business world, the development of new tactics and new strategies for deployment of intellectual property rights for commercial advantage has been identified as the next corporate challenge on the battlefields of the Knowledge Economy (Rivette & Kline, 2000)[9]. Take the example of IBM. Their patent portfolio gives the company the freedom to do what they need to do through cross licensing. It gives them access to the inventions of others that are key to rapid innovation. Access is far more valuable to IBM than the fees it earns from its thousands of active patents, about $2 billion per year (Bessen, 2003)[10]. Survey evidence finds that many other firms obtain patents in order to 'block competitors'. Some firms rather than license carefully chosen individual patents interact over entire portfolios. Firms in semiconductors, electronics and computers license entire portfolios for a technology field, including patents for which they have not yet filed applications.

Baumol (2004) divides inventions into two polar categories: revolutionary breakthroughs and cumulative incremental improvements. Most inventions are somewhere in between. U.S. Small Business Administration research (2003) supports that idea. They found

> 'that most of the revolutionary new ideas of the past two centuries have been – and are likely to continue to be – provided more heavily by independent innovators who, essentially operate small business enterprises'.[11]

He suggests that large companies will tend to specialise in the incremental improvements, to avoid the risks of the unknown that the revolutionary breakthrough entails.[12] Revolutionary breakthrough is most often left to the small or newly founded enterprises, which are unlikely to enjoy the benefit of in-house IPR professional. Instead, they will be reliant on a general IPR awareness within the enterprise, to provide the right environment for the timely recognition and appropriate protection of IPR

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[5] Leeds M and Koppelman E, Teaching the Individual Engineer about Fair Credit and Intellectual Property, The Online Ethics Centre for Engineering and Science at Case Western Reserve University, 2004 http://onlineethics.org/edu/credit.html

[6] www.amazon.com lists titles that combine intellectual property rights with cyberspace, the boardroom; software, trade and biodiversity, information studies, entertainment industries, engineers and scientists, foreign investment, global economy.

[7] The Intellectual Property Awareness Network is currently undertaking a review of free to use intellectual property awareness resources, for example:

> http://www.the-key.biz/ DTI intellectual property information portal
> http://www.ip-europe.org a 5th fwk initiative, includes patent information
> http://www.european-patent-office.org/wbt/espacenet/# espacenet assistant, self assessment learning tool for using espacenet
> www.patent.gov.uk check out the decision tree behind the 'click here for help choosing' icon

[8] Thompson M, (2002) *Intellectual Property – the basis for venture capital investments*, WIPO http://www.wipo.int/sme/en/documents//venture_capital_investments.htm#p21_2713

[9] Rivette K & Klein D, (2000) *Rembrandts in the Attic*, Harvard

[10] Bessen J, (2003) *Patent Thickets*: *Strategic Patenting of Complex Technologies*, 2003 unpublished

[11] U.S. Small Business Administration(2003) *Small Business Research summary, 2003*

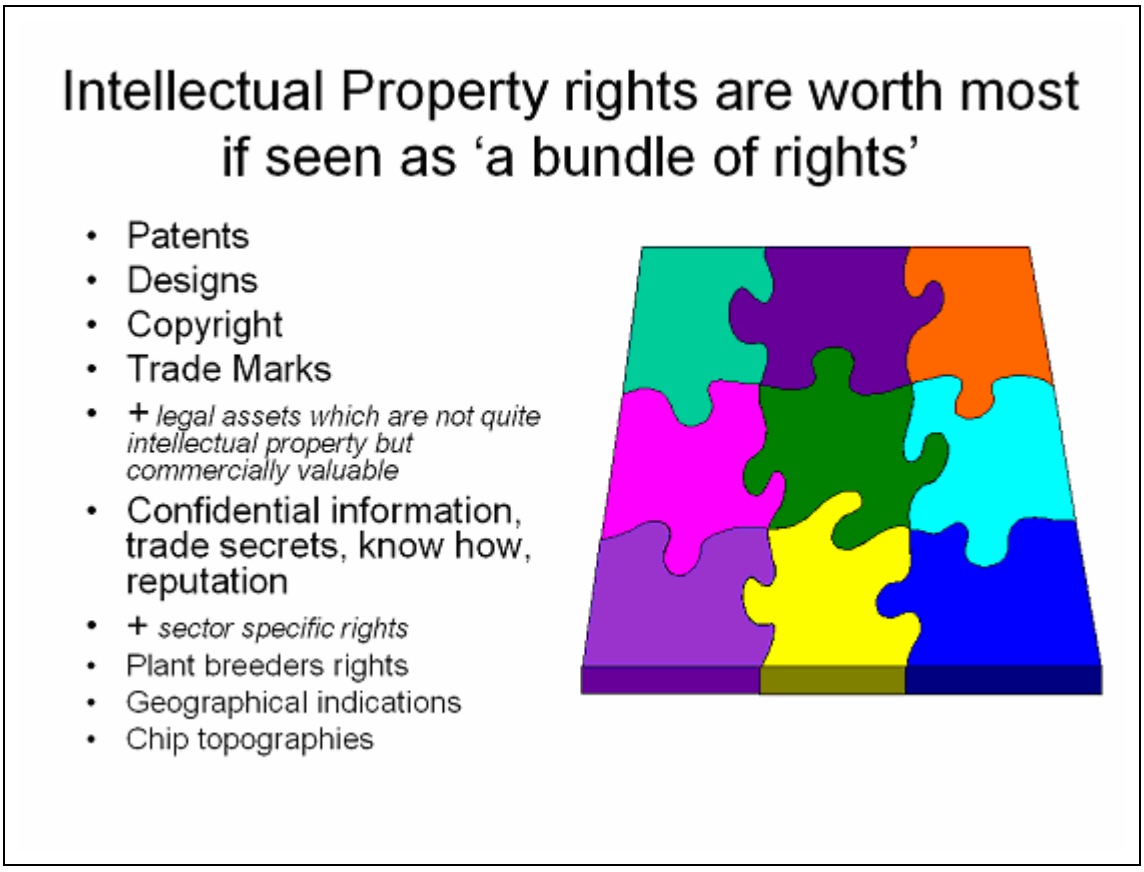
[12] Baumol W, *Entrepreneurial Cultures and Countercultures*, Academy of Management Learning and Education, 2004 vol3, No 3 316-326

Research (ESRC, 1998)[13] has shown that in the UK overall there is poor engagement with the patent system, especially amongst SMEs. Poor SME handling of IPR is a factor in UK manufacturing sector international underperformance[14]. A common perception of the patent system is that it is slow, uncertain and expensive. There can be a gap of 4.5 years between filing a patent application and receiving the patent grant. A granted patent can be revoked if it doesn't survive a challenge to its validity. And maintaining an international patent over 20 years could cost $250,000.

Dependence on patents as a sole source of IPR revenue should be discouraged. Rather, the notion of a 'bundle of rights' should be promoted. 'My patents may cause me aggravation, but my trade marks sit in the corner quietly earning royalties' was the observation of one successful inventor.[15] Kaplan and Kaplan[16] observe that in written work assessments set by engineering faculty

> References are sometimes required, specifically references to copyrighted material but rarely are patent or trademark searches required for projects. This is a disservice to engineering students.

Introducing undergraduates to intellectual property concepts before they graduate can help new graduates make better informed decisions in this difficult area.



[13] *Determinants of Intellectual Property in UK Companies* based on the final report to theESRC,1998 http://info.sm.umist.ac.uk/esrcip/Projects/L5253023/Final%20Report.htm#top

[14] Network in Next Generation Manufacturing Enterprises, a Faraday Partnership initiative.

[15] Mandy Haberman, inventor of the 'anywayup®' cup, to a class of product design engineers, Bournemouth. see (1)Mandy Nicola Haberman (2) V & A Marketing Ltd v Jackel International (1999) FSR 683

[16] Kaplan & Kaplan see endnote 3

Consider the exploitable aspects of IPR in a mobile phone

- Patents for inventions of products or processes
- Design protection for individual character
- Trade Mark protection
- Copyright for ring tones, instructions, original drawings
- Confidential information, trade secrets, know how, reputation

Bridging a cognitive divide

Since an engineer from her first day at work may be required to sign agreements concerning disclosure, development, and ownership of IPRs, it is important to hit the ground running. Engineers are exposed to and create a company's proprietary and confidential information. They need to be aware of the risks and obligations in using someone else's proprietary IPR. IPRs can affects an engineer in all aspects of professional development, whether as an employee or running her own business.

Karl Heinrich Oppenlander (1990)[17] said

> If a young engineer comes into contact with patent information at a very early stage, during his training if possible, he will use this source of information regularly since he will already be familiar with it'. Non-law students do not expect to become IPR experts, but they do need to know enough before graduating to be able to use IP resources in the future, and to feel confident they know

- where to find patent information,
- when it is time to call in an expert,
- how to commence the dialogue with a professional intellectual property adviser.

Kaplan and Kaplan (2003) say much the same thing

> Of all the academic disciplines, engineering may encompass most of the patentable breakthroughs, yet some engineering students are never exposed to IP education. If taught early, starting in the freshman year, and often, throughout the undergraduate education, IP education will be ingrained into the students' creative thought process. It will also give the undergraduate engineering student other options upon graduation, perhaps to study patent law or technology transfer

[17] President of Munich's Institute for Economic Research. At EPO Patinnova Conference1990

In 2003 at Tokyo Metropolitan University, I was invited to give a guest lecture to the second year mechanical engineering students, which introduced them to IPRs. The students reported back to their Dean:

> 'Intellectual property rights - it's like food for engineers – they should have a little everyday".

Engineers work with ideas, which they translate into concrete, innovative solutions, that can be useful and commercially valuable, *only* if someone has identified and protected them as intellectual property. They may have concerns regarding ownership of their solutions, particularly where they work in teams[18]. Engineers taking the Intellectual Property unit at John Hopkins University,[19] for example, are required to research, develop and present an intellectual property plan for a local company.

The idea of intellectual property education as part of the undergraduate experience is gaining ground. In May 2003 Phiilippe Busquin, EU Research Commissioner said[20] 'The Commission is proposing the objective that all students in science, engineering, or business studies receive at least basic training on intellectual property rights and technology transfer.'

At the end of 2003 the UK Engineering Council completed the review of its standards for the training and registration of Chartered and Incorporated Engineers, with the publication of UK-SPEC[21]. For the first time, the threshold standard of competence and commitment for a Chartered Engineer will include an ability to 'secure the necessary intellectual property rights'. This is a breakthrough, which hopefully will influence academic curriculum designers to include opportunities for undergraduates to develop IPR awareness and competence.

Intellectual Property – increasingly present, but not yet pervasive

There are many new initiatives aimed at teaching why it is important to respect and enforce IPRs. The dangers posed to society through the purchase of counterfeit cd-roms and dvds[22], the risks associated with computer copying[23], and the recognition that school children are both vulnerable and a captive audience, has prompted government institutions to develop resources to make pupils IP aware. Since young people do not naturally make the link between counterfeits and crime, they need to be alerted to the dangers presented by the market in counterfeit and pirate fashion and leisure products[24].

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[18] Leeds & Koppelman see endnote 4

[19] John Hopkins University Whiting School of Engineering Intellectual Property Course, no. 551305, Spring 2004.

[20] COM(2003)226, *Investing in research: an action plan for Europe* [Communication from the Commission]

[21] UK-SPEC http://www.uk-spec.org.uk/

[22] Lakhan S. E.(2002) *Stop Piracy with edification: Intellectual Property Education in School*, Harvard University, 2002, http://cogprints.ecs.soton.ac.uk/archive/00002935/

[23] See Bill H. R. 2517 to enhance criminal enforcement of the copyright laws, educate the public about the application of copyright law to the internet and clarify the authority to seize unauthorised copyrighted works. Introduced June 19 2003 in the U.S. House of Representatives.

[24] The International Federation of Phonographic Industries [IFPI /secretariat 2003: The identification of Pirate Music product] defines types of piracies as follows:
Pirate copy – the unauthorised duplication of an original recording for commercial gain without the consent of the rights owner. The packaging of pirate copies is different from the original. 'they are often compilations, such as 'the greatest hits' of a specific artist. They are the most common type of of illegal product.
Counterfeit: copied and packaged to resemble the original as closely as possible. Original producer's trademarks and logos are often reproduced in order to mislead the consumer into believeing that they are buying a legitimate product.
Bootleg: these are unauthorised recordings of live or broadcast performances. They are duplicated and sold, often at a premium price, without the permission of the artist, composer or record company.

The EU Enforcement Directive in its early iterations called specifically for IP education, to support the expectation that EU citizens would have an

The UK is not alone in having introduced intellectual property to primary and secondary schools. In March 2003 the UK Patent Office introduced its 'Think Kit'[25] with great success. Within a few months of its release in March 2003 it was taken up by 51% of schools, and will contribute to delivery of the national citizenship curriculum. The Australian Government's IP Australia Innovat*ed*[26] is another such a resource. In 2000 the Intellectual Property Group of the Creative Industries Task Force championed the intellectual property portal, which offers information and links that include a section on IP and education.[27]

Development of the 'Think Kit' could be linked to the European Union's intellectual property enforcement directive, which in its early stages made clear references to the need for intellectual property education..[28] The proposed enforcement directive drew harsh criticism for its potential to restrict civil liberties and impose sanctions. The final version of the directive[29] refers to publication of intellectual property infringement decisions as a useful contribution to public awareness[30], but has dropped earlier specific reference to education. This is regretted, particularly by enforcement agencies in the countries currently preparing for accession to the EU. It was succinctly put by a Bulgarian customs training manager, bemoaning the endemic lack of awareness of and respect for IPR in his country 'You need education and engagement as well as enforcement'.

In educational terms, IP enforcement is a 'negative' aspect of intellectual property. It focuses the pupils mind on what they should not do. IP in enterprise, on the other hand, provides a 'positive' dimension because of it underpins commercial exploitation, and would sit easily in innovation, technology, design, business and enterprise studies.

In Japan, intellectual property education in school is emphasised because 'Knowledge about the protection and utilisation of intellectual property rights is important to every citizen in order to ensure that Japan establishes for the 21st century a society based on creative science and technology'[31]. The Japanese Patent Office sets out a programme that will include teacher education and the production of appropriately engaging free of charge IPR text books, as well as promoting invention through public libraries and museums.

IP competence is also seen as a key skill of the successful entrepreneur. An expressed ambition of UK and European governments is to increase the volume and capacity of enterprising graduates in all disciplines, especially science, technology and business[32]. The European Patent Office is championing a development called 'five2twelve'. The hope is that EPO staff, giving their services as volunteers, will create 'a palette of characters, activities and resources that could turn budding European inventors, innovators and entrepreneurs on to the potential of patents for their future creativity'.[33]

In the next few years, most students will start their undergraduate studies having been introduced to intellectual property concepts during their schooldays. Even those students who have not been introduced to IP concepts at school have a tacit knowledge[34] of IPRs. They are actively engaged in downloading and sharing music files; they proudly display rip-off designer label garments. There is growing publicity of the exploitative practices involved in producing designer label sportswear. Thoughtful students may be engaged in campaigning to make patented pharmaceuticals more freely

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[25] UK Patent Office Think Kit http://www.patent.gov.uk/about/marketing/thinkkit/
[26] http://www.innovated.gov.au/
[27] Report from the IP Group of the Government's Creative Industries Task Force, 2000 http://www.patent.gov.uk/copy/notices/pdf/ipgroup.pdf
[28] Article 19a of the Proposed enforcement directive, as amended
[29] Directive 2004/48/EC of the European Parliament and of the Council of 29 April 2004 on the enforcement of intellectual property rights
[30] Directive 2004/48/EC of the European Parliament and of the Council of 29 April 2004 on the enforcement of intellectual property rights (19)
[31] Japanese Patent Office Annual Report (2001), chapter 4 *Nationwide Promotion of Intellectual Property Education*
[32] Higher Education Innovation Fund http://www.hefce.ac.uk/reachout/heif
[33] See Epidos News, 3/2004 October 2004 published by the EPO, Vienna.
[34] Tacit [silent] knowledge is the kind of knowledge which is taken not documented, informs our day to day behaviour, and tends to be taken for granted [see Polanyi M, (1958)*Personal Knowledge: towards a post-critical philosophy* London: Routledge and Kegan Paul]

available to treat disease in poor countries, or against the use of genetic modifications in crops and animals.

Ownership of intellectual property rights created in the course of their studies by higher education students has been debated for many years. A 'consensus' of opinion on ownership of IPR created by students in the course of their studies has emerged broadly along the lines that

- the institution cannot automatically assume it owns the rights
- the institution can require a student to assign future rights relating to a particular activity
- if students work leads to a strong royalty stream, an institution could claim an equitable share[35].

This statement is included in all Bournemouth University course specification documents, alongside the copyright notice:
Bournemouth University undertakes to encourage the recognition, protection and exploitation of intellectual property rights generated by participants in this programme, to the benefit as appropriate of students, staff, industrial/other third parties/partners and the university

At a recent IP awareness event a question was asked about ownership of copyright in music created by a young pupil in the course of his schoolwork. Followed by 'could the school forbid the pupil to present the music as part of his portfolio to future employers?'

Higher education awareness of intellectual property has been heightened by two developments. One is the increase in the volume of plagiarism in assessed academic work. Direct and unattributed copying is seen by most as cheating. As the higher education community becomes more diverse, thought has had to be given to how respect for academic convention [not to copy without attribution] can be preserved.[36] Leeds and Koppelman ask at what point does something become plagiarism?

> With the glut of work out there today it is easier and easier to get away with minor bits of plagiarism. Although it is easier it is still unethical. Talking to students about the definition of plagiarism and the use of internet sources is vital. Exactly how much text can be used in a publication (assuming every word of it is properly credited) before it moves from an original work to a derivative work?[37]

The second is the drive to manage the intellectual property generated within the academic community. Government funding initiatives have supported expansion of numbers employed in higher education technology transfer offices.[38] Government funding has been found to support their continuing professional development, particularly in the area of intellectual property management. Today, most H.E. institutions aim to employ at least one intellectual property literate staff member.

Intellectual property is relevant to all professions and businesses. Individuals and organisations can capitalise on opportunities presented by accelerating developments in the knowledge economy if they increase their intellectual property competence. Increasingly, graduating students expect to study and pursue their careers in an international community, and need to be equipped with an awareness of the implications of trading beyond their native shores.

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[35] For fuller details of University intellectual property ownership policies, visit the websites of AURIL http://www.auril.org.uk UNICO http://www.unico.org.uk or AUTM http://www.autm.net/index_ie.html

[36] Yang Yusheng (Associate Professor of Beijing Normal University): 'At present, five unhealthy phenomena prevail in academic circles – low standards, slipshod reproduction of materials, bubble academia, counterfeit production, and plagiarism. It's hard to imagine that students who have grown up in such a corrupt academic atmosphere would inherit the academic essence, and carry on pure Confucian principles in their academic research.' From report on Peking University Plagiarism case, February 2002, www.china.org.cn

[37] Leeds & Koppelman see endnote 4

[38] Higher Education Innovation Fund http://www.hefce.ac.uk/reachout/heif

Professor James Boyle (2003), speaking in London March 2003, said:[39]

> "We need to bring together the programmers and the web publishers, design artists and the film makers and the people who are computer scientists and the entrepreneurs and say '[intellectual property] is affecting you and you ought to be thinking about how it's affecting you'…. This is something in which we have to educate people. There's no single strategy, we should substantially change the way we look at intellectual property."

Yo Takagi(2004), Executive Director of the World Intellectual Property Organisation, said at an IP education conference in Dubai

> In view of the expanded role of IP in knowledge-based economies and societies, it is increasingly important to teach IP to students who do not have a legal background. [40]

Intellectual property educators can expect to receive more requests for input from researchers, teachers or students of any academic discipline, as well as from industry and commerce, professional advisers, and enforcement agencies.

Including intellectual property in the non-law curriculum
– **an example of interdisciplinary education**

Intellectual property is a rapidly evolving area of law and its study benefits from an interdisciplinary approach. Intellectual property judicial decisions are more comprehensible when the context of the dispute is familiar. For example, the debate surrounding patentability of computer implemented inventions is easier to understand when someone is on hand to clarify the way in which the computer software works to provide functionality.

The Intellectual Property Management masters programme at Bournemouth attracts an interdisciplinary group of graduates, only some of whom have a legal background. Their first patents and designs seminar was intriguing. The students were asked to read and prepare notes on the House of Lords decision in British Leyland v Armstrong[41]. I was curious as to what they would make of it, and the students were nervous. The seminar discussion was fascinating. The lawyers explained legal terminology, the science and technology graduates shared insights of the technical subject matter, and those from business and finance disciplines shed light on why the parties might have chosen a court hearing rather than settle in private.

Michael Fountain[42] (2004) describes interdisciplinary teams [comprising graduate students from business, engineering, arts, science and medicine] that work together on an entrepreneurship programme at the University of South Florida. The tasks the students are set enable the teams to evaluate intellectual property portfolios, produce competitive analyses of products and services currently in the market place and strategic alternatives for commercialising technologies. Applying the techniques learnt 'they have increased the number of new ventures launched to aid in the development and commercialisation of USF faculty new technologies'.

When IP is studied by non-lawyers as a key, but not core, element of their core discipline, the indicative content should cover IP law and practical aspects of IP in the context of the core discipline. The level and volume of IP law to be included is a matter for discretion, following discussion with the core discipline team.

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[39] Boyle, James(2003) *Ideas in Cyberspace*, The Eversheds Lecture, RSA London, March 2003, http://www.rsa.org.uk/acrobat/james_boyle190303.pdf

[40] Takagi Y Executive Director, World Intellectual Property Organisation, *Teaching of Intellectual Property*, WIPO Arab Regional Conference on the teach of Intellectual Property, Dubai 2004, www.wipo.org

[41] British Leyland v Armstrong [1986] RPC 279

[42] Fountain M, (2004)The Development and Implementation of an Interdisciplinary Graduate Course Linking Business, Engineering, Arts and Sciences and Medical Students with University Research Investigators to Develop Strategies to Commercialise New Technologies, 2003, ECI Conference on Teaching Entrepreneurship to Engineering Students.

There is a growing body of legal[43] and interdisciplinary[44] education research. Both are valuable for the intellectual property educator who is a lawyer, especially when faced with a group of non-lawyers who need to learn something of IP. Of course, the interdisciplinary education projects that have actually involved introduction of IP to non-lawyers are particularly useful.[45]

Modern law teachers are increasingly aware of the way in which economics, sociology and politics affect the legal environment. We teach not only what the courts decide and the principles by which they decide, but also draw students' attention to the circumstances and conditions, social and economic, to which these principles are to be applied. Law teaching is becoming less doctrinaire and conservative, and there is growing evidence of criticality in the intellectual property law syllabus.

Examples of criticality in the Intellectual Property syllabus

At Bournemouth, undergraduate students taking Intellectual Property Practice are required to work in small groups on an intellectual property issue which is the subject of ethical or policy debate, e.g. export of patent pharmaceuticals to poor countries. The 'issues' are not formally taught. At the end of the year, students present the work that they have researched to their colleagues. The presentations are formatively, rather than summatively, assessed. The students have the opportunity to write up their research in the end of year examination.
Post graduate students of Intellectual Property Management take a full unit on Intellectual Property Policy and ethics, where assessment is based on a critical assessment of a current intellectual property issue, from an economic, philosophical and political perspective.

At University of New South Wales LLM students can take Issues in Intellectual Property unit[46]
At Australian National University with Griffith University, students on the IP in Agriculture course can choose an Issues in Intellectual Property unit.[47]

Developments in technology and biotechnology, changing attitudes to rights in the knowledge and cultural resources of indigenous peoples, and the growth of income generated by counterfeits and piracy for international terror and crime make it difficult to imagine how intellectual property can be taught uncritically.

Higher education intellectual property law teachers have had to adapt to the changing demands of a diverse student group, who may not be studying law with a view to practice. Widening participation and the globalisation agenda have influenced the design and delivery of the university curriculum, including intellectual property law. When a lawyer teaches intellectual property beyond the law school, to students of another discipline, it is necessary to take account of the discipline context and also the cognitive style of the student group[48].

Intellectual property education comprises more than intellectual property law alone. An IP lawyer who graduates with an awareness of IP portfolio management, IP valuation and exploitation, IP policy and IP ethical issues alongside their study of substantive intellectual property law, will be a more rounded practitioner.

Using a judicial decision as an interdisciplinary resource

[43] See for example UK Centre for Legal Education http://www.ukcle.ac.uk/research/
[44] Education Resource Information Center (ERIC) www/eric.ed.gov sponsored by the Institute of Education Sciences (IES) of the US Department of Education, archives education research publications on United States, United Kingdom and Australia databases
[45] Leeds M and Koppelman E see endnote 4
Fountain M see endnote 41
Kaplan K and Kaplan Lt. J see endnote 3
[46] http://www.law.unsw.edu.au/course/laws4021/
[47] http://www14.gu.edu.au/cis/p_cat/admission.asp?ProgCode=5372
[48] Research on adult learning styles by Kolb D. (1984) *Experiential Learning: experience as the source of learning and development New Jersey: Prentice-Hall (013 295261 0)*, suggests four different cognitive styles apply to artists and creatives, scientists and mathematicians, applied scientists and lawyers, and the professions that require intuitive operation, e.g teaching.

A recent Queens Bench Division decision concerns negligence of a solicitor advising one of the co-founders of the Eden Project[49]. In deciding the quantum of damages to be paid, close attention is given to the valuation of the intellectual property in the relevant name and logo, copyright in drawings, and associated confidential material.

An accounting and finance colleague will use the case to illustrate the significance of intellectual property valuation to his students. The accounting and finance students will be invited to an intellectual property guest lecture on valuation.

Law units are no longer populated solely by law students. The design of higher education programmes makes it quite possible for an intellectual property cohort to include students whose main discipline is not law. Accounting and finance students taking the intellectual property law module will be invited to lead a seminar discussion on how the intellectual property in the case was valued.

At Undergraduate Level

Intellectual property law is taught by increasing numbers of UK Law Schools. However, a search in September 2004 of the UCAS [the UK University Combined Application System] database using the term 'intellectual property' produced a nil return.

Not much work has been done to identify *how* intellectual property should be integrated into the undergraduate curriculum of non-law disciplines, despite governments calling for graduates with IPR competence.

Professor Bill Hennessey[50], writing from Franklin Pierce Law School, suggests that there are three barriers to the inclusion of IPR in the non-law curriculum

- the engineering curriculum at most engineering and technical institutes is very concentrated and focused on acquisition of the knowledge and professional skills needed to become licensed as engineers
- professional engineering organisations do not require an understanding of intellectual property as an area of knowledge within the engineering discipline
- the absence of a member of the faculty who is qualified to teach the subject

His last suggestion is supported by research undertaken at Curtin University[51], where staff responses to requests to teaching non-core professional skills included:

- I shouldn't have to teach this
- I don't know how to teach this
- If we had decent students in the first place, I wouldn't need to teach this.

The students, however, do not present a barrier. Even though they may be apprehensive in anticipation of an IPR class, their confidence can be won. Once they understand the link between IPR and commercial exploitation, they respond positively to IPR education, particularly when examples and case studies relate to their practice. (Kaplan and Kaplan (2003), Soetendorp (2001).

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[49] Jonathan Macartney Ball v Druces & Attlee (A firm) 2004 QBD (Nelson J) 17/6/2004, available on LAWTEL. Discussion of quantum from paragraph 274.

[50] Hennessey, W (1999)*The place of intellectual property teaching in the curricula of Universities and technical institutes*, © 1996-1999 Franklin Pierce Law Center, http://www.ipmall.info/hosted_resources/Teaching_IP_Hennessey_99.htm visited 01.04

[51] Harpe, Radloff, Wyber (2000) *What do professional skills mean for different disciplines in a business school?' Lessons learned from integrating professional skills across the curriculum*, in Improving Student Learning through the Disciplines, OCSLD, 2000

The UK Engineering Council has recently published UK-SPEC, which details the standards for registration as a Chartered engineer[52] that now include the expectation that engineers, engaged in the creative and innovative development of engineering technology and continuous improvement systems, will have the ability to secure necessary intellectual property rights.

Intellectual Property – a named, undergraduate programme

The Japanese Government sees IPR competence as key to increasing international competitiveness of industry and stimulating the economy. They have passed legislation (2002)[53] that requires universities and similar institutions to promote education and learning on intellectual property. Four Japanese universities were tasked with researching IP education at four stages: school, undergraduate, postgraduate, and lifelong learning.

The Osaka Institute of Technology[54] has been asked to research the undergraduate stage. It has identified a human resource need for 'para intellectual property professionals' who have an understanding of science, technology, and intellectual property management. It recently received government approval to run a four year undergraduate programme that covers

- Fundamentals of intellectual property
- Related areas within engineering
- Venture creation and industrial management
- Intellectual property prosecution
- Intellectual property management
- Intellectual property strategy
- International legal affairs
- Internship in the intellectual property department of a large company, or with an intellectual property attorney
- Preparatory research
- Thesis research

Osaka Institute is well aware that the degree in Intellectual Property will not address the issue of integrating IPR across the undergraduate non-law disciplines. It will be interesting to monitor the influence of an IP department operating outside of a law school, working in close collaboration with science and technology faculties. Tanami(2004) acknowledges the difficulties imposed by the absence of an established pedagogy for the inclusion of IPR in the non-law curriculum[55]. He points out, though, that there is insistence from Japanese government and business that such a pedagogy be developed[56]

At Postgraduate Level

At postgraduate level the approach is quite different, and there is a recognition that it is appropriate to study intellectual property in conjunction with another discipline. A modest research exercise undertaken for the UK IP Teachers Network meeting in 2003[57] (using google™[58]) identified 20 institutions in Europe, Australia, South Africa and Japan offering named Masters programmes in intellectual property. Of these, 14 offered intellectual property law in combination with one or more of ethics and policy, corporate financial management, global economics, accounting and finance, e-commerce, internet aspects, refugee law, civil and political rights, human rights, international law and organisations, sport marketing, agriculture, engineering and management. A similar google™ search,

[52] Engineering Council UK (2003) UK-SPEC http://www.engc.org.uk/
[53] Government of Japan's Basic Law on Intellectual Property (Law no 122 or 2002) Articles 7, 13, 21, 22
[54] Osaka Institute of Technology, 2003/2004 http://www.oit.ac.jp [IP information in English available in hard copy only, and online in Japanese only at time of writing 9.04]
[55] see notes 46, 47 below
[56] Tanami, Prof K, Osaka Institute of Technology, email exchanges with the author, 09.2004, unpublished.
[57] Soetendorp R, for Intellectual Property Teachers Network workshop, Durham, 2003, unpublished.
[58] New application: Community Trade Mark E1104306

using 'engineering intellectual property post graduate' provided useful detail of course design, course content, assessment strategies and learning outcomes, on courses primarily from U.S. universities[59].

Intellectual Property Education for non-lawyers

The student perspective

When students are required to engage with key, but non-core aspects of their primary discipline study, they may be anxious and lack confidence. Taking the fear of the unknown out of such education encounters is challenging. When meeting a group of non-lawyers for their first IP class, their anxiety may manifest as suspicion and resentment at this intrusion into their normal studies.

Not all first responses to intellectual property education are positive

A UK Patent Office funded research project in 1996 allowed a 'free' hour of 'intellectual property education' across the undergraduate programmes at Bournemouth. The Head of Nursing thought it was a good idea for her students. But the group of nurses was not happy at having to attend a one-off IP class. Part time, mature BA (Hons) Nursing students, they resented the intrusion of an hour seemingly unrelated to their nursing studies. They were hostile to the idea of engaging with IP concepts. Comments about the commercial significance of IP drew the response 'we're here to make people better, not to make money'. Halfway through the class it felt as if no progress was being made. Then one student interjected: 'I devised a drug dispensing chart. It was very well thought of, and copied around the Trust'. He was thanked for his contribution with the comment 'Just think. If your Trust had approached a pharmaceutical company to publish and distribute the chart, bearing their logo, it would have benefited a greater number of patients, and might have generated some income for your Trust and you'. The second half of the class was immediately much livelier. Out of 32 students, 8 recalled innovations, or improvements that they had introduced on the wards.

N.B.1996 was several years prior to Government initiatives with regard to NHS Trusts capturing their intellectual property.

They will probably not have given much thought to the justification of intellectual property rights: that people whose hard work results in an inventive product or process are entitled to be rewarded for that work. Or that without such reward, there would be less incentive to innovate. For some, an intellectual property class will be the first time they have been expected to grapple with the meaning of property, in Lockean terms, for example, as the right to own the product of one's labour.[60] If the teachers preparation for a first IP class includes reflection on the students' core discipline requirements, suspicion and resentment can be replaced by confidence and enthusiasm.

There are examples of successful interdisciplinary learning projects, where science and technology students have had to study an aspect of the law [e.g. environmental law, labour law, contract or intellectual property], which is key, but not core, to their primary discipline studies.[61] But there are few, if any, initiatives that bring together creators of intellectual property rights with intellectual property practitioners and professional advisers. The closest many future inventors and innovators will get is an occasional 'one-off' lecture from a patent or trade mark professional, and many do not even have that.

Interdisciplinary education initiatives are, of necessity, far more advanced where lives, and property, depend on the ability of professionals from different disciplines working successfully together. Interdisplinarity is key in the education of surgeons and nurses, who work closely in an operating theatre, or builders and architects on a building site.[62] The Joint Education Board of the Chartered

[59] For example: John Hopkins University Whiting School of Engineering Intellectual Property Course, no. 551305, Spring 2004.
[60] Leeds & Koppelman see endnote 4
[61] Washington University 'students [from the different disciplines] can learn to communicate together, to maximise their respective skills, and to realise there are no clear dividing lines between the disciplines' Prof Maxine Lipeles, holder of a joint appointment in the School of Law and the School of Engineering, Washington University [http://news-info.wustl.edu/sb/page/normal/78.html]
[62] See Lave J & Wenger E writing on 'communities of practice', e.g. (1991) *Situated learning: legitimate peripheral participation* Cambridge: Cambridge University Press

Institute of Patent Agents and Institute of Trade Mark Attorneys is currently reviewing its foundation stage of training. More universities will be accredited to deliver their foundation units. Perhaps this will be a catalyst for exploring interdisciplinary dialogue between future intellectual property practitioners and their future clients.

Some engineering academics are deterred from including IPR in their syllabus because they suspect that students might experience learning difficulties with assessments in a subject from another discipline. They fear this would result in lower assessment grades, which would reflect negatively on the work of the engineering faculty within the institution. (Dodridge 1999)[63]. This has not been the case in Bournemouth, where the Design Engineering and Computing faculty has noted no disparity between marks scored for IPR exam questions and questions on other aspects of professional practice[64]. Law and non-law discipline units are successfully completed on interdisciplinary programmes at undergraduate and postgraduate levels.

Expecting graduates to wait until they start their careers to learn about how IPR operates in the workplace leaves them vulnerable.

Learning the hard way?

A few years ago an undergraduate final year furniture design student wrote to a well known international low price furniture manufacturer describing his innovative project, and invited the company's support. The company replied that they did not work with students. Six months later his item appeared in their catalogue. In four years of his course, no-one had flagged up to the student the importance of confidential disclosure. A patent agent recently commented: 'What I suspect is incontrovertible is that the more aware of the basics, the less likely engineers are either to throw away valuable assets for themselves or their employers.'[65]

The academic perspective

In 2003 I attended engineering education conferences in Europe, Australia and Japan. Once delegates discovered I was an intellectual property academic, rather than an engineer, they pursued me in the coffee breaks and offered me drinks in the bar. They were anxious to discuss the status of their own intellectual property, but, mostly, had not thought it worth mentioning IPRs to their students.

My paper asked why engineering undergraduates are NOT given the opportunity to learn about intellectual property', and included a short questionnaire[66] to provide feedback for further discussion.

Questions put to delegates at engineering education conferences in Japan, UK, and Australia 2002

Do your consider IPR awareness to be an enterprise skill? *85% yes 15% no*
Does IPR feature in your undergraduate engineering course content? *25% yes 57% no, 18% not sure*

If **YES**
in which module is IPR taught? *Management, Professional Practice, Innovation, Law*

at which level is it taught *Level I or Level H*

Who teaches IPR awareness? *Specialists, Law Faculty, Engineers, not sure*

[63] Dodridge M, (1999) *Learning outcomes and their assessment in higher education* IEE Engineering Science & Education Journal, Aug 1999 Vol 8, No. 4 pp. 162-68
[64] Soetendorp, R (2002) unpublished at Bournemouth University
[65] Gallafent R, in an unpublished email to the author 8.10.03
[66] Soetendorp, R (2002) *Intellectual Property Rights Awareness – A Business Enterprise Skill for Undergraduate Engineers,* 2002 Australasian Association for Engineering Education 13th Annual Conference, Canberra.

How many hours are students expected to spend on IPR [contact]? *Responses ranged from 1hour – 30 hours*

What resources are used? *Government publications, lecturer's own, not sure*

Is IPR awareness assessed [formatively or summatively], and if so how? *Responses included: part of a written assignment, exam question, probably not*

If **NO**
Is it because
The syllabus is too crowded? *29% agreed*

Engineering academics are reluctant to teach an unfamiliar topic? *31% agreed*

IPR is not an explicit benchmark or accreditation requirement? *22% agreed*

Other reasons:

Qualitative reasons for not teaching intellectual property implied an aversion amongst engineering academics to get involved with teaching IPRs, and included:

- It is no one person's responsibility
- It would be seen as a 'soft' subject rather than 'hard' engineering
- Awareness is not there yet
- It's only a matter for those in industrially related research
- It's a subject that ought to be taught by experts
- If a colleague really wanted to teach it, maybe time would be found
- There are more important things engineers need to know about: standards, safety etc.

Most reasons given for not including IPR were grouped around the following, and bear out Hennessey's suggestions above:

- The syllabus is too crowded,
- Academics are reluctant to teach an unfamiliar topic.
- IPR is not an explicit benchmark or accreditation requirement.

Where the syllabus for a course is crowded, it is important to acknowledge the primacy of core strands. The prime intended learning outcome for a civil engineer must be to design a bridge that won't collapse. Safety and standards are the most important elements of an engineering programme. The 'crowded syllabus' might be employed as a device for avoiding devising ways that broaden student expertise that do not eat into precious classroom contact time. If the syllabus really is crowded, and there is no IPR specialist available, are there ways in which non-core aspects, like IPRs, can be shoe horned in to the students' learning experience?

Dr Rob McLaughlan is an engineering academic. He has been commissioned by the Australian National Occupational Health and Safety to work on a project to design an engineering resource package, which will integrate the non-core subject of occupational health and safety into the undergraduate syllabus[67]. He observes that there is no well established pedagogy for the diffuse integration of this non-specialist education into the engineering curriculum. The development of such a pedagogy would help higher education institutions develop student capacity in these fields in a more integrated and intentionally connected way than is currently done.[68]

Learning and Teaching initiatives

Styles of intellectual property law teaching:

[67] McLaughlan R et al (2004) *Review of the Engineering Resource Package* (CRO312) Australian National Occupational Health and Safety commission
[68] McLaughlan R l (2004) email correspondence with the author, 09.04,unpublished

Where an engineering faculty can be persuaded to accommodate a credit bearing unit, or part unit, in IPR, there are several ways in which material can be taught and assessed. Hennessey[69] identifies five styles of intellectual property law teaching:

- The case method
- The problem solving method
- The simulation model
- The clinical method
- The doctrinal method

Each may be appropriate, depending on the time available in which to deliver the unit, the background and level of the student, and the intended student learning outcome for the course.

The case method involves students considering an IPR issue through reading an actual decision in which legal principles have been applied. It is an appropriate method to use with a post graduate group taking a credit bearing unit, where the expectation is that the students will undertake additional IP law reading in support of classroom [or equivalent online] activity.

I have used the case method with a small group of postgraduates in a patent law unit on the MA Intellectual Property Management course at Bournemouth. Both the students and teacher were nervous as to how the group, with different undergraduate experience, would respond to the exercise. The group comprised a diverse range of disciplines including law, business, science and technology. In the early stages of discussing the case, the lawyers explained legal terminology, the science people could explain some aspects of the technological subject matter. The business oriented students could look from a business perspective at why the two parties were in dispute, rather than choosing to settle out of court. It was a refreshing encounter, from which all members of the group went on to engage with more confidence on the legal principles of the case.

The problem solving model provides opportunity for effective classroom activity which can be adapted for groups at any level, in credit bearing units or 'brief encounters'. I have enjoyed the feedback of students who, knowing nothing about IPRs, engage in animated discussion of why they think Windsurfer International and Tabur Marine[70] found themselves locked in courtroom battle. Asking the students would they have done if they had been in their place has led to thoughtful contributions. Once the students have considered the business problem aspects of the case, they are more receptive to learning about patent law aspects. [see the attached Windsurfer v Tabur Marine worked example].

[69] Hennessey (1999) op cit
[70] Windsurfing International Inc v Tabur Marine (Great Britain) Ltd 1985 RPC 59, CA

Windsurfing Inc v Tabur Marine
A business perspective

- Windsurfer international had identified an attractive and expanding market for windsurfing equipment. They developed, and patented, an inventive development, which was novel, took an inventive step from previous technology, and could be made industrially.
- Windsurfer International saw themselves in a position to dominate the market, and were not interested in granting a market share to any known or potential competitors. They had been granted the patent. It gave them the right to prevent others from doing what the state [UK] had given them the a monopoly right, as patent holders to do, as long as the patent was in existence.
- Tabur Marine [Great Britain] Ltd wanted a share of the market, because they saw the commercial potential in sailboards – but Windsurfer was not interested.

- Using the resources on the Patent website, www.patent.gov.uk what would you have done next?
- What factors would Tabur Marine need to take into account in deciding what to do next?

Tabur Marine's Choices

- Ask Windsurfer International for a licence
- **What would this involve?**
- **What would be the benefits?**
- **What would be the disadvantages?**

- Make and market windsurf sailboards anyway, without asking Windsurfer International
- **What would this involve?**
- **What would be the benefits?**
- **What would be the disadvantages?**

- Attack Windsurfers Patent, in the hope of getting it revoked
- **What would this involve?**
- **What would be the benefits?**
- **What would be the disadvantages?**

- Something else?

- Information to help answer the questions is available on the UK Patent Office website
- http://www.patent.gov.uk/patent/glossary/index.htm
- http://www.patent.gov.uk/patent/benefits/index.htm

- What would you have advised Tabur Marine to do next?

- What did Tabur Marine do next? As an alleged infringer, they challenged the Windsurfr patent on the basis of an earlier version made by a12 year old, filmed in action. Tabur won.

- see Windsurfing International Inc v Tabur Marine [Great Britain] Ltd [1985] RPC 59 .

The simulation method can be used effectively with non-law students, particularly if it relates directly to the core discipline content of their course. For example, students can be presented with a low tech, simple patent specification and encouraged to write a specification for their own innovation. Where

the tutor has patent expertise, she can mentor the student through the drafting process. Alternatively, a local patent attorney could be invited to play the mentoring role. Students who have had hands on experience of drafting their own patent application, however simple, learn the importance of being able to describe their work in the language that will make future encounters with patent advisers much easier, possibly shorter, and slightly cheaper.

I have used the clinical method to beneficial effect both for students of intellectual property law and technology students whose course does not include an IPR unit[71]. Intellectual property law students work with technology students to give 'professional' IPR advice on the technology students' project work. The technology students get practice in articulating their technical innovation in a way that makes sense to a professional adviser. They benefit from dialogue with the intellectual property student, and receive a copy of the law student's written assignment documenting their legal advice. The intellectual property student is encouraged to look holistically at the portfolio of IPR exploitation potential in their student's innovation, together with a simulated experience of client work.

Writing the advice letter, with supporting appendix of legal authority, is an important element of the law students summatively assessed assignment work. The participation of the technology students is formatively assessed.

The doctrinal method is least appropriate. It doesn't encourage the student to appreciate the continual evolution of intellectual property law, nor is it designed to equip the student to know where to access up to date information, at the appropriate level .

Two additional examples illustrate how different Universities have approached the design of effective learning experiences for non-law students, using traditional legal education tools.

At Hong Kong University of Science and Technology, engineering students use a standard law faculty teaching tool, 'The student moot court'[72] . Their moot court debates reinforce student understanding of intellectual property concepts, and reinforce analytic, verbal and reasoning skills.

At Massachusetts Institute of Technology a licence negotiation role play gives computer science students at the start of their course the opportunity to participate in a role play simulation of an intellectual property licence negotiation.

In all of these examples, the non-law students are presented with a learning activity that relates to their core discipline, and offers meaningful engagement with IPR principles and concepts. They have all been designed by academics with intellectual property expertise, and delivered on courses that have acknowledged the importance of IPR sufficient to allocate it some resource of time. Hopefully, such courses will become more widely available.

Self managed learning opportunities

A crowded syllabus may mean there is not much time in which to *teach* the students about IPR. It does not follow that there will not be any time for students to *learn* about IPR.

Engineers, like most academics, justifiably express a reluctance to stand in front of their students to teach unfamiliar topics. But is it essential to be an expert to create an effective student learning experience? It is easy to use ignorance as justification for keeping rigidly within disciplinary guidelines, when ignorance can in fact be a valid starting point for facilitating learning.

Kerwyn, Witte and colleagues (1993)[73] identified the importance of starting from ignorance in the context of medical education, where the information explosion in medicine demanded an alternative to 'rote-memorization'. They have used the 'ignorance paradigm' to promote a questioning approach in their students, rather than the student tendency to receive knowledge uncritically, assuming

[71] Soetendorp R, World Patent Information, vol 18 No 4 pp 219-226, 1996

[72] Lee, O, (2002) *Engineering Students' Moot Court Debates the Question: 'Is Software Patentable?'*, Journal of Information Technology & Law, http://elj.warwick.ac.uk/jilt/02-1/lee.html

[73] Kerwin, A. (1993). *None too solid: Medical ignorance*. Knowledge: Creation, Diffusion, Utilisation, 15(2), 166-185.

professional performance involves mastery of what is known of the subject. Samuel Johnson said 'Knowledge is of two kinds. We know a subject ourselves, or we know where we can find information on it'.
Witte explains that the response to the 'ignorance paradigm' from professional philosophers has been lukewarm. 'They're too busy working on epistemology, the theory of knowledge, when really ignorance is much more interesting'[74]. We are frequently challenged to learn from our ignorance.

When a client requested the Law School to provide a short course on IPR for their staff working on embedded software, the request was accepted, even though none of the IPR team was exactly sure what embedded software was. Before proceeding to design the short course, the IPR team commissioned a one-hour tutorial from an expert in electronic engineering. He was able to pass on sufficient understanding of the rudiments of embedded software, for the team to contextualise their IPR teaching. The staff participants enjoyed the course sufficiently to commission a second one.[75]

Albert Einstein, amongst others, said 'education is what is left when you have forgotten everything you were taught'. Wherever intellectual property is taught, the student expectation will be the same: to retain an appropriate level of IP competence and awareness. This is so, irrespective of whether the education comes as part of a school citizenship programme, an accredited university programme, as an optional extra to non-legal university studies, or as part a continuing professional development or lifelong learning experience. How do you attempt to ensure that teaching becomes education?

Confucius is attributed with the saying 'I hear and I forget. I see and I remember. I do and I understand'. It underpins modern theories of the way in which adults learn, which are particularly appropriate when considering intellectual property education for non-lawyers.

Malcolm Knowles'[76] has developed theories of the way in which adults, as opposed to children, learn. He makes the following assumptions about adult learning:
1. Adults need to know **why** they need to learn something
2. they need to learn **experientially**,
3. they approach learning as **problem-solving**, and
4. they learn best when the topic is of **immediate value**.

Undergraduates are adults. They can appreciate **why** IPRs are relevant to their future careers, which gives them the motivation to learn more about them.[77] Getting students to undertake tasks that engage them with website resources will give them the necessary **experience**. Students' resourcefulness should not be underestimated. Students are well able to respond to IPR **problem-solving**, bringing skills from their core discipline. Integrating the students self managed IPR work into the assessment strategy of the course satisfies Knowles' requirement that the learning be of **immediate value**.

Kolb (1984) writing about the process of adults learning drew on Kurt Lewin's four stage learning cycle.[78] Starting with **active experimentation**, which produces a **concrete experience** for the student, she should engage in **observation and reflection**, from which she can produce an **abstract conceptualisation**, on which to base a further active experiment.

Asking engineering students to do a Quick Search on the European Patent Office's esp@cenet[79] database[80] using a key word from their own project work is an **active experiment**. What the Quick

[74] Witte, M (1994) http://wildcat.arizona.edu/papers/old-wildcats/fall95/December/December1,1995/05_2_m.html.
[75] Feedback from Delphi Automotive plc ipr shortcourses, held Bournemouth University 2003, 2004, unpublished

[76] Knowles, M. (1984). *The Adult Learner: A Neglected Species* (3rd Ed.). Houston, TX: Gulf Publishing.

[77] Patent Office research project 1995-1996, presented to PatLib 1996, Aberdeen.
[78] Smith,M.K (2001): *Kurt Lewin: Groups, experiential learning and action research*. The Encyclopedia of Informal Education, http://www.infed.org/thinkers/et-levin.htm
[79] European Patent Office Espacenet patent database http://ep.espacenet.com/search97cgi/s97_cgi.exe?Action=FormGen&Template=ep/EN/home.hts

Search produces gives the student a **concrete experience** of patents as a source of information, of the volume of information contained in patents, of what activity there is or has been in her area of technology etc. **Observation and reflection** can be evidenced by a report of the results of the Quick Search. **Abstract conceptualisation** would be demonstrated by use of information gleaned from the Quick Search to modify the project work brief .

UK Patent Office[81] and European Patent Office websites are intended to be used by IPR lay people. They are well designed to answer questions, and provide all the necessary information to understand how the IPR system works. They are user friendly, and 'free at the point of consumption'. They are only two of a growing number of interactive resources. Academics without intellectual property expertise can guide students to manage their own learning in this area. By linking independent learning outcomes with assessment strategies, using appropriate resource based learning activities, student motivation can be channelled.

Learning outcomes play an important part in shaping teaching, learning and assessment strategies. For courses where students are expected to gain an IP awareness in the absence of formal IP classes, independent student learning outcomes could be drafted to achieve that awareness[82]. Learning activities can be designed to give the student an opportunity to gain IP knowledge. Assessments can be designed to enable students to demonstrate, or evidence, what they have learned. If the engineering academic feels unqualified to assess that part of the report summatively, then it could be formatively assessed. Completion of the IPR evidence would be compulsory, and formatively assessed on a completed/not completed basis.

Kaplan (2003) acknowledges

> Engineering professors are known to give projects, but not many incorporate IP into their project requirements.

It does not require IPR expertise for an engineering student's project work assignment to require a brief report which includes:

- evidence of having searched the appropriate patent databases,
- retrieved the necessary information, and
- applied the findings to the project

Through preparing that brief section of the report, the student will have achieved intended learning outcomes, which could include the ability to

- locate and compare patent documents
- identify the stages of applying for a patent
- evaluate appropriate intellectual property protection

and more.

Simultaneously, the student acquires skills that are relevant to her future career. As engineering becomes more knowledge based, value will be placed on the active ability to acquire and apply knowledge, rather than the passive tendency to wait to receive it.

Learning outcomes, learning activity and assessment strategy should work in harmony. Setting the appropriate level of outcomes is a unique activity for each programme. It needs to be done, however in the context of the discipline, taking account of the prerequisite knowledge and skills of the students, the time allocated to delivery and the complexity of the topics being taught[83]. Where a course team lacks

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[80] Using espacenet has recently been made easier by the introduction of espacenet assistant. This is a well designed online, free, interactive self teaching programme that has broken the task of learning how espacenet searches work into very small, manageable chunks, typically from 2 – 4 minutes in length. Each is accompanied by a self-test at the end, with advice to repeat the module if the score is not sufficiently high. See the espacenet assistant at http://www.european-patent-office.org/wbt/espacenet/

[81] UK Patent Office www.patent.gov.uk

[82] See Rowntree, D (1981) *Developing Courses for Students*, McGraw-Hill, London and Ramsden, P (1992) *Learning to Teaching in Higher Education*, Routledge, London, [cited in Byles L &Soetendorp R, *Law teaching for other programmes*, in Effective Learning & Teaching in Law, ed R. Burridge, Kogan Page, 2002]for a fuller discussion

[83] Byles L and Soetendorp R, (2002) op cit

intellectual property expertise, it will be useful to call in the help of an intellectual property academic or practitioner to sit down with the technologists to draft outcomes and activities, and explore possibilities for assessment[84].

Different learning outcomes, learning activities and assessments are appropriate for different level of student. Here are three examples for use with non-law students, which relate to the three levels of undergraduate study. They use the UK Patent Office and European Patent Office espacenet websites as resource. They are designed to be used effectively on courses where there is no intellectual property academic to manage student learning of IPRs, and little time to devote to the subject.

Working with Level C [first year]

- **Learning outcome**:
- Students will be able to identify the potential intellectual property rights in their work

- **Learning activities**
- **read the sections** 'what is a patent/design/copyright/trademark' on the Patent Office web site
- **reflect on whether their work** is capable of achieving patent protection, design registration, trade mark registration, and copyright

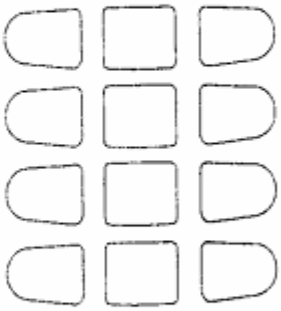
- **Assessment activities**
- **Prepare a memo identifying** which IPRs are appropriate to their work [n.b. remind the students that the rights are not mutually exclusive], including a relevant patent, design or trade mark registration
- **Write a report of** all the potential intellectual property rights in the mobile phone

[84] Byles L & Soetendorp R, (2002), op cit

Working with Level I [second year]

- **Learning Outcome**
- Students will be able to explain how to protect the intellectual property rights in their work

- **Learning Activities**
- Complete the Level C activities Select the most significant intellectual property rights relevant to their work
- List the steps recommended to patent, register a design, register a trade mark, using the relevant Patent Office web site page



- **Assessment**
- Choosing ONE registered right, **compute** how much it would cost to protect it in the UK for the full term.
- **Write a memo** advising what intellectual property protection is available cost free?
- **Write a review** of an everyday product e.g Dyson vacuum cleaner; Nokia phone etc and [in small groups?] **cataloguing** the patents, and/or design registrations and/or trade marks using 'Search our Records' sections of www.patent.gov.uk

Working with Level H [final year]

- **Learning Outcome**
- Students will be able to decide the appropriate procedures to ensure their intellectual property rights can be secured

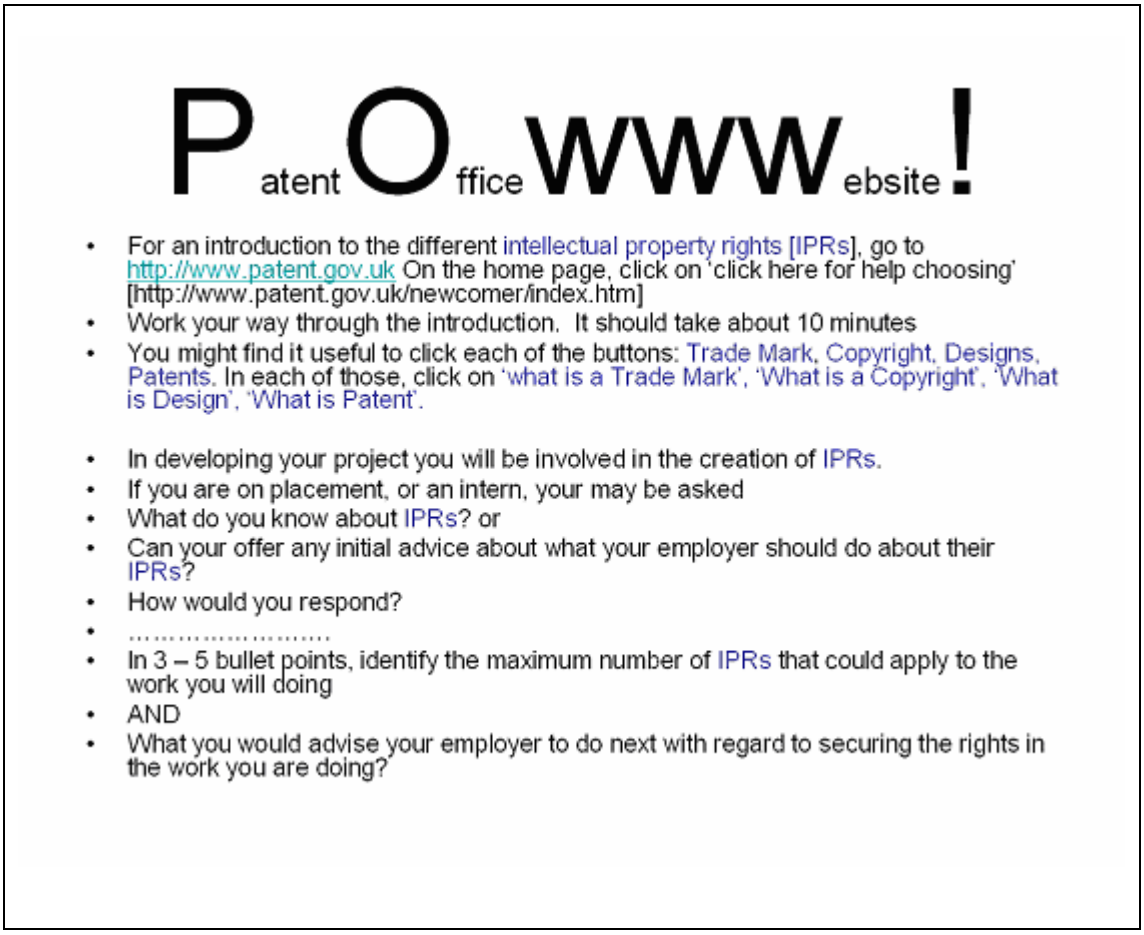
- **Learning activities**
- **complete** the level C learning activities
- **retrieve** examples of at least ONE patent application/design registration similar to their work, using 'Search Our Records' in the Patents, Designs and Trade Mark sections of the website

- **Assessment activities**
- **draft** 5 - 10 bullet points on 'confidentiality' in the laboratory/design studio/workshop (seeAURIL Handbook of Intellectual Property Management http://www.patent.gov.uk/about/notices/ipguide.pdf)

- **Write a memo** 5 – 10 bullet points detailing the procedures necessary to prepare a patent application.

The UK Patent Office web site has been acclaimed for its comprehensive content, and ease of access by lay people and IPR professionals alike. It has great potential as a resource for self-managed

learning activities and assessment exercises. The decision tree behind the 'click here for help choosing' on the UK Patent Office home page www.patent.gov.uk can be used to great effect with non-lawyers new to intellectual property, and engaged in innovative or creative work. Similar resources are provided by national patent offices, including the Australian Government's site IP Australia.[85]



POwww! is a self-contained exercise using the UK Patent Office website as resource. It has been used at Bournemouth as a stand alone introduction to IPR on courses where there has been no other IPR tuition, and the tutor knows little or nothing about IPRs. Sample feedback:
Students:
"By the way, this was very useful! Thank you!"
"I would advise the company to research into all the IPRs by going onto the Patent web site and also to take part in the exercise we have just doen, because many companies will be surprised with what is protected and what is not"
Tutor:
"I was asked a few questions which I could not answer –such as 'is such and such a design/trademark'. I never knew the answer, so was no help! I liked telling them to look it up!

Transdisciplinarity in intellectual property education, research and knowledge transfer

The final section of this paper suggests some ways in which intellectual property academics might look to collaborate across faculties to generate opportunities for cross disciplinary teaching, research and consultancy.

Internationally, Governments' higher education agendas are bringing radical changes to the University. These are having a significant impact on traditional approaches to academic research. The classical or

[85] http://www.ipaustralia.gov.au/

liberal model of the university, which was based on the transmission of a received body of knowledge from teacher to student[86]is disappearing. 'Massification and democratization mean that universities are no longer so intimately associated with the production of scientific and professional elites' (Delanty, 2000)[87]. These are significant changes that can be seen as an opportunity to forge collaborative cross faculty partnerships. Such partnerships might undertake applied, industry facing research that will produce transdisciplinary knowledge, which Gibbons (2000)[88] identified as Mode 2, in contrast to single disciplinary knowledge, which he labelled Mode 1.

Gibbons suggests Mode 1 knowledge may be produced as the result of research conducted in the absence of a practical goal, whilst Mode 2 knowledge is intended to be useful to someone, whether in industry, government or society. Mode 2 knowledge can be produced by coalitions of academics working across the disciplines - within the university, or with external partners in industry and commerce. Intellectual property would appear to lend itself particularly well to such transdisciplinary coalitions.

If intellectual property academics could appreciate the value of sharing their subject with non-lawyers, and engineers would welcome inclusion of IPR competence into their syllabus, there should be benefit to both disciplines.

- Engineers would know how to build safe bridges, AND how to exploit their innovative techniques of building bridges safely.

- Lawyers would have a clearer understanding of how the law impacts on their clients' business interests

- Law and Engineering academics would be able to develop opportunities, separately and together, to conduct transdisciplinary research, and pursue knowledge transfer opportunities, which would enrich their teaching.

Simulating inter-professional encounters in the real or virtual classroom would enhance the professional practice of the participants. Such encounters help break down the walls between traditional, highly specialised functions leading to more productive alliances. This is happening with increasing speed in the world of work. Research & development groups in large global enterprises can involve engineers working with different professions, each bringing their expertise to complex problem solving. But the fuzzying of disciplinary boundaries[89] is happening very slowly in universities.

Dr. Theodore Zeldin[90] is a contemporary philosopher and historian, who researches inter-disciplinary relations at work. He asked an engineer how long it would take to teach him to be an engineer. 'Three months' was the reply. Not to be a real engineer, but to understand an engineer's language and their problems, to learn the essence of the way they think. Zeldin (1998) suggests that the term 'social exclusion' includes all those whose mind-set is confined to a single profession[91], and asks 'what new kind of education or training will not just slot students into pigeon hole careers?' Employers want flexible, multiskilled graduates, open to learning, and equipped to respond to the rapidly changing nature of the workplace. The students don't have a problem with that.

It is not easy to set up transdisciplinary institutional structures within the academic community, where a sense of disciplinary identity is the norm. Engineers must be able to design a bridge that won't collapse, lawyers must have lawyering skills. But graduates from each discipline also need the capacity to co-operate with experts from other fields, to see problems in a complementary way. It is necessary to find a balance, to promote and manage both.[92]

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[86] Nowotny H, Scott P, and Gibbons M,(2002) *Re-thinking Science*, Polity p3
[87] Delanty, G. (2001) *Challenging Knowledge: The University in the Knowledge Society* Buckingham: Open University Press.
[88] Gibbons op cit p. 3
[89] Gibbons M, et al, 2000 *The New Production of Knowledge*, Sage p93
[90] Zeldin, T (1998) *Conversation*, Harvill Press p.53
[91] Zeldin T (1998) op cit p. 60
[92] Gibbons p.93

Conclusions

Students and academics are caught in the rapid change that is influencing academic course design and delivery. This is affecting intellectual property education for lawyers, as much as for non-law programmes wanting to offer intellectual property education to their students. Whilst IPRs are rooted in law, intellectual property education has branches which touch many areas of academic research and commercial activity, including: economics, finance, taxation, human rights, ethics, education, governance and management. Including intellectual property education in the non-law curriculum should be seen as an 'opportunity' to engage with a vital topic that links commercial, legal and technical disciplines. For the lawyer, teaching intellectual property to non-lawyers provides a different perspective, which can enhance design and delivery of the law course. For non-law academics, providing students with a level of intellectual property awareness and competence can be done using available resources, and a considered combination of learning outcomes and assessment strategies.

Intellectual property has traditionally been taught as a law subject to law students in law faculties. Suggesting intellectual property be introduced as an interdisclinary element of a science or technology programme challenges two preconceptions: that there could be insurmountable cognitive barriers, and that intellectual property has to be taught by lawyers.