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Do we need to use a *Best Appropriate Technology* standard for Technology Enhanced Learning in legal education?

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Abstract

This paper identifies that technology is often used in an educational context for non-pedagogical reasons. These reasons include the novelty factor, a drive for more and continual innovation, cost saving and the belief that technology is the solution to all the education world's ills. The paper then identifies a new approach which could be used to model the Best Appropriate Technology for any given task, and outlines a worked example of the model. The conclusion is that this model, and an accompanying database, have the potential to be of great use across Legal Education in specific circumstances, as well as the HE Sector more widely.

Keywords: Technology, Appropriate, BAT, Pedagogy, Legal Education

Introduction

Despite the acknowledged growth in Technology Enhanced Learning (TEL) it is, as Kirkwood and Price rightly identify 'rare to find explicit statements about what TEL actually means'[1] and this has knock-on effects on those implementing or researching TEL.

However, whatever the lack of specificity, one of the key elements of TEL is, of course, technology. Since almost everything we use in teaching, and life, has been manufactured, from pencils and pens through paper, chalkboards, interactive whiteboards and smartphones, they can all be regarded as

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[1] Kirkwood, A., and Price, L. Technology-enhanced learning and teaching in higher education: what is 'enhanced' and how do we know? A critical literature review, *Learning, Media and Technology*, (2013), 39:1, 6–36, @9
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technology. Indeed, the OED cites the roots of the word as early 17th Century, and says that it means the 'application of scientific knowledge for practical purposes, especially in industry.' If one were to take a literal (and pedantic) stance on TEL therefore, one could apply it to the printing press, the overhead projector or the fountain pen. The approach of this work, however, is that references to technology and current technology are limited to electronic devices and the software and applications that are used by such devices. AccessHE says 'TEL is often used as a synonym for e-learning but can also be used to refer to technology enhanced classrooms and learning *with* technology, rather than just through technology.'[2]

TEL is often portrayed as the way to make the student experience "better" and, in some cases, this is undeniable. The JISC-funded TRAFFIC project (*TRansforming Assessment and Feedback For Institutional Change*) led by Manchester Metropolitan University, for example, clearly showed that the use of technology for practical issues (timetabling, avoiding assessment bunching, revising feedback processes) has a beneficial impact on the student experience.[3] These results were echoed by JISC's "Digital Student" project which found that students are entering HE with expectations about the level of technological features such as Wi-Fi access, online library catalogues, and connectability with their own device(s).[4]

In terms of the delivery of teaching and learning (T&L), Bennett *et al*[5] write about the impact of technology on assessment design, and found that 'the desire to achieve greater efficiencies and to be contemporary and innovative [were] key drivers of technology adoption for assessment.'[6] The efficiency aspect of TEL is clear, as the ability to achieve more with less is an attractive proposition

[2] AccessHE. (2018). Technology enhanced learning, https://www.heacademy.ac.uk/individuals/strategic-priorities/technology-enhanced-learning (emphasis in original)
[3] Forsyth, R., Cullen, R., Ringan, N., and Stubbs, M. Supporting the development of assessment literacy of staff through institutional process change, *London Review of Education*, (2015) 13 (3) 34-41, https://doi.org/10.18546/LRE.13.3.05
[4] Beethan, H., White, D., and Wild, J. (2013). Students' expectations and experiences of the digital environment literature review, JISC, http://repository.jisc.ac.uk/5573/1/JR0005_STUDENTS_EXPECTATIONS_LITERATURE_REVIEW_2.0.pdf
[5] Bennett, S., Dawson, P., Bearman, M., Molloy, E., and Boud, D. How technology shapes assessment design: Findings from a study of university teachers. *British Journal of Educational Technology*, (2017) 48, p 672-682. https://doi.org/10.1111/bjet.12439
[6] *Ibid*, 672

to HEI management teams in the current economic climate. This should not be the primary driver for the use of TEL however, as will be explored below.

One recurrent issue in current discussions about technology is the impact it is having on users. Grandner *at al*[7] looked at the impact of the use of "devices" (tv, smart phone, tablet etc.) on sleep patterns, and reported that 'the more types of devices used, the more individuals reported difficulty falling asleep and maintaining sleep, especially if the use of technology was active.'[8] Chang *et al*[9] linked the light emitted by devices such as e-readers with the time it took participants to go to sleep, and with their sleep quality. Vernon *et al*[10] found similar results in a study of over 1,100 13-16-year-olds who used their mobile phones late in the evening. The evidence suggests that using "devices" late in the evening leads to poorer sleep, regardless of the user's age.

Lim and Dinges showed that 'the link between sleep and the capacity to attend to external stimuli is both intimate and inextricable'[11] and this link was further demonstrated by Nir *et al* who showed that 'sleep deprivation had a marked effect on cognitive lapses.'[12] Furthermore, as early as GCSE level, Dunne *et al* show that students in poorer-performing groups identify poor concentration as one of the contributory factors, saying that 'teachers and pupils… highlighted

[7] Grandner, M. A., Gallagher, R. A. L., and Gooneratne, N. S. The use of technology at night: impact on sleep and health. *Journal of Clinical Sleep Medicine* (2013) 9(12): 1301-1302.
[8] *Ibid* 1301
[9] Chang, A-M., Aeschbach, D., Duffy, J., and Czeisler, C. Evening use of light-emitting eReaders negatively affects sleep, circadian timing, and next-morning alertness, *Proceedings of the National Academy of Sciences of the United States of America*, (2015) 112 (4): 1232-1237, https://doi.org/10.1073/pnas.1418490112
[10] Vernon, L., Modecki, K., and Barber, B. Mobile Phones in the Bedroom: Trajectories of Sleep Habits and Subsequent Adolescent Psychosocial Development, *Child Development*, (2017) 89(1), 66-77 https://doi.org/10.1111/cdev.12836
[11] Lim, J and Dinges, D. Sleep Deprivation and Vigilant attention, *Annals of the New York Academy of Sciences* (2008) 1129: 305–322 @305 http://dx.doi.org/10.1196/annals.1417.002
[12] Nir, Y., Andrillon, T., Marmelshtein, A., Suthana, N., Cirelli, C., Tononi, G., and Fried, I. Selective neuronal lapses precede human cognitive lapses following sleep deprivation, *Nature Medicine*, (2017) 23, 1474–1480http://dx.doi.org/10.1038/nm.4433

poor concentration in class as a major barrier to learning'[13] and a 'common view across schools is that lower attainers have difficulty with concentration.'[14]

Swain points out that to improve the experience of their students, 'some universities are … introducing innovations around assessment to help students understand how they can progress from an average 2.1 to a first'[15] thus drawing a clear correlation between levels of student attainment and levels of student satisfaction. There is plenty of research to suggest that happier students get higher grades (see for example, Bahrami *et al,*[16] Jones,[17] Schiller and Hinton[18] and Göksoy[19]). Most of these studies suggest that happier students perform better, but the cyclical nature of this relationship is identified by Göksoy, who also points out that 'since the educational system is based on examinations and grades, students become happy when they get higher grades and they become unhappy for low grades.'[20]

Three things are therefore relatively clear:

- The use of technology can have a negative impact on sleep patterns;
- Disrupted sleep patterns can impact negatively on a person's ability to concentrate on tasks, and thus likelihood of good attainment; and

[13] Dunne, M., Humphries, S., Sebba, J., Ayson, A., Gallanaugh, F and Mujis, D. (2007). Effective Teaching and Learning for Pupils in Low Attaining Groups, *Department for Children, Schools and Families, Research Report No DSCF-RR011*, 84 http://dera.ioe.ac.uk/6622/1/DCSF-RR011.pdf
[14] *Ibid*, Appendix e, 33
[15] Swain, H. How can universities ensure their students are satisfied? The Guardian, 11 September 2017, https://www.theguardian.com/higher-education-network/2017/sep/11/how-can-universities-ensure-their-students-are-satisfied
[16] Bahrami, S., Rajaeepour, S., Rizi, H., Zahmatkesh, M., and Nematolahi, Z. The relationship between students' study habits, happiness and depression, *Iranian journal of Nursing and Midwifery Research*, (2011) 16(3) 217-222
[17] Jones, V. (2015). Because I'm Happy, *Harvard Graduate School of Education*, https://www.gse.harvard.edu/news/uk/15/03/because-i%E2%80%99m-happy
[18] Schiller, L., and Hinton, C.. It's true: Happier students get higher grades, *The Conversation*, July 30, 2015, https://theconversation.com/its-true-happier-students-get-higher-grades-41488
[19] Göksoy, S. Situations that Make Students Happy and Unhappy in Schools, *Universal Journal of Educational Research* (2017) 5(12A): 77-83 https://doi.org/10.13189/ujer.2017.051312
[20] *Ibid* p77

- Lower levels of attainment contribute to a less satisfactory student experience.

There are caveats to this, of course, notably that the simplistic 'poor grades = unhappy students' equation does not account for any of the issues around added value, on which topic Simkovic writes 'Education can add substantial value even while producing unappealing outcomes, because those outcomes may still be better than realistic alternatives after considering heterogeneity in student populations. Conversely, education can fail even while producing attractive outcomes if a realistic alternative could have added more value.'[21]

However, despite the caveats, the argument can be made that *inappropriate* use of technology may well contribute towards poor student experience, which seems counter to the push for ever-wider adoption of technology in T&L, at all levels. As an example, Carter *et al*[22] demonstrated that 'permitting computers or laptops in a classroom lowers overall exam grades.'[23] However, this is not to say that technology is bad, and T&L should adopt a luddite approach to technological advances. When used correctly, and appropriately, Taradi *et al*[24] and Al-Hariri & Al-Hattami[25] suggest that the use of technology has a positive impact on student attainment.

As a piece of analysis of an ongoing action research project, this paper will not directly address the issue of attainment by students (for the rationale outlined by Simkovic, above), but will instead focus on the experience of students. How

[21] Simkovic, M. A Value-Added perspective on Higher Education, *UC Irvine Law Review*, (2017) 17(1) 123-132 123
[22] Carter, S., Greenberg, K., and Walker, M. (2016). The Impact of Computer Usage on Academic Performance: Evidence from a Randomized Trial at the United States Military Academy, *SEII Discussion Paper #2016.02*, https://seii.mit.edu/wp-content/uploads/2016/05/SEII-Discussion-Paper-2016.02-Payne-Carter-Greenberg-and-Walker-2.pdf
[23] *Ibid*, 25
[24] Taradi, S., Taradi, M., Radic, K., and Pokrajac, N. Blending problem based learning with web technology positively impacts student learning outcomes in acid-base physiology. *Advances in Physiology Education*; (2005) 29(1): 35-39. https://doi.10.1152/advan.00026.2004
[25] Al-Haridi, M., and Al-Hattami, A. Impact of students' use of technology on their learning achievements in physiology courses at the University of Dammam, *Journal of Taibah University Medical Sciences*, (2017) 12, 82-85 https://doi.org/10.1016/j.jtumed.2016.07.004

law students feel about the use of a particular aspect of technology will give an indication as to whether its continued use is likely to be beneficial.

Although the work falls in the sphere of TEL this is, as identified above, a wide and rather nebulous sphere. The specific intervention focuses upon Blackboard Collaborate Ultra (Collaborate). This is an online platform which allows students to interact with the material being delivered. There are other, similar, platforms (Adobe Connect, Skype and so on) and analogous parallels can be drawn from the literature on Adobe (see for example Karabulat & Correia[26] Cappiccie & Desrosiers[27] Martin & Parker[28]). It is important to note at this stage that the conclusions presented in this paper do not imply that Collaborate is better than any of the other technologies. Collaborate was chosen as the example of this type of platform for the pragmatic reason that the University uses the technology. Collaborate therefore is a cipher for all platforms of this type. Cramer *et al*[29] are among those who have experimented with a 'Virtual Lecture Hall' (voice-over recordings of PowerPoint™ slides), discovering that the students were in favour of such an innovation, and concluded that 'this tool enhances learning, improves grades, and should be an option in other courses.'[30] This project went beyond that approach, as the live nature of the sessions allowed for and encouraged contemporaneous student interactivity.

It is important to identify that this is not an objective observation of teaching carried out by someone else. There are my Level 5 LLB students, on a designated module (Organised Crime) which I designed and wrote, and have delivered for the last decade. The student module evaluation has been consistently positive, and so the impact of changes may be muted compared to other modules where this intervention could be tried.

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[26] Karabulat, A., & Correia, A. (2008). Skype, Elluminate, Adobe Connect, Ivisit: A comparison of Web-Based Video Conferencing Systems for Learning and Teaching, Society for Information Technology & Teacher Education International Conference, Mar 03, 2008 in Las Vegas, Nevada, USA ISBN 978-1-880094-64-8.

[27] Cappiccie, A., & Desrosiers, P. Lessons Learned from using Adobe Connect in the Social Work Classroom, *Journal of Technology in Human Services*, (2011) 29(4) https://doi.org/10.1080/15228835.2011.638239

[28] Martin, F., & Parker, M. Use of Synchronous Virtual Classrooms: Why, Who, and How? *MERLOT Journal of Online Learning and Teaching* (2014) 10(2)

[29] Cramer, K., Collins, K., Snider, D., and Fawcett, G. Virtual Lecture Hall for In-Class and Online Sections: A Comparison of Utilization, Perceptions, and Benefits, *Journal of Research on Technology in Education*, (2006) 38(4), 371-381 https://doi.org/10.1080/15391523.2006.10782465

[30] *Ibid* 376

The conclusions from the research will be of potential use to those who already use, or are considering which type of platform to use for a particular type of module. The *BAT in TEL* model will also be useful for those interested in the impact of technology more widely.

This paper has two linked research questions:

- Is TEL fit for purpose? This requires both clarification of the purpose of TEL, and assessment of the extent to which the use of TEL meets that purpose.

- Is a framework of Best Appropriate Technology (BAT) needed? This will be done by outlining the BAT model from environmental law, and applying it to TEL. These are not two spheres of research that traditionally have a large overlap. However, in environmental law, BAT allowed standards to improve across the board. Since the argument raised here is that *inappropriate* use of technology is worse than *no* use of technology, a model which can suggest the most appropriate technology to achieve a particular T&L goal will be useful.

Existing Literature

By looking at BAT through the lens of TEL, an initial model is designed to incorporate the two elements in a way which has not been attempted previously.

The body of literature on T&L and technology is undeniably vast. The decision was made to focus the project quite specifically on two areas – technological interventions in HE, and the BAT standard used in industrial emissions control.

Young[31] argues that smart classrooms are not the whole answer, and that without training teachers and students how to get the most from the technology, it is not effective. Students, he suggests, believe that a teacher using technology badly is worse than one who is not using it at all. This is backed up by Guess who says that 'good teachers are good with or without IT and … poor teachers

[31] Young, J. R. When Good Technology Means Bad Teaching, *The Chronicle of Higher Education*, (2004) 51 (12), A31 at http://www.chronicle.com/article/When-Good-Technology-Means-Bad/10922

are poor with or without IT.'[32] IT therefore, and by extension TEL, can be regarded as a tool, an enabler, or a means to an end (the *end* being better teaching and enhanced student experience) rather than the end itself. It is not a novel approach – Laurillard[33] posed the provocative question 'what is the problem for which MOOCs are the solution' and concluded that for her purposes there is a problem (global lack of teachers in primary level education) and that 'MOOCs could be *part* of the solution.'[34]

Cuban rather archly observed two unexpected outcomes of a study into e-learning in California in the early 21st century, namely that 'the overwhelming majority of teachers employed the technology to sustain existing patterns of teaching rather than to innovate … [and] … only a tiny percentage of high school and university teachers used the new technologies to accelerate student-centred and project-based teaching practices.'[35] The issue of innovation is a tricky one, and Armellini and Padilla suggest that even 'MOOCs cannot be described as inherently pedagogically innovative.'[36]

The problem with a constant demand that technological interventions in T&L are innovative, and the dismissal of those which are not deemed to be innovative, is that there is no consensus on what innovative means. Serdyukov[37] undertook a review of educational innovation in the United States, and discovered that much of the innovative practice had been adopted for pragmatic, rather than pedagogic reasons, and that 'more disquieting than even the lack of pedagogical foundation for technology-enhanced education is the sincere belief of many educators that technology will fix all the problems they encounter in the classroom, be they live or virtual.'[38]

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[32] Guess, A. (2007). Students 'Evolving' Use of Technology. *Inside Higher Ed*. http://www.insidehighered.com/news/2007/09/17/it.
[33] Laurillard, D. (2014). What is the problem for which MOOCs are the solution? *IOE London Blog*, https://ioelondonblog.wordpress.com/2014/05/14/what-is-the-problem-for-which-moocs-are-the-solution/
[34] *Ibid*, my emphasis
[35] Cuban, L. *Oversold and underused: computers in the classroom*. (Harvard University Press, 2001)
[36] Armellini, A., and Padilla, B. Are Massive Open Online Courses (MOOCs) pedagogically innovative? *Journal of Interactive Online Learning*, (2016) 14(1), 17-28 @p25 http://www.ncolr.org/jiol/issues/pdf/14.1.2.pdf
[37] Serdyukov, P. Innovation in education: what works, what doesn't, and what to do about it? *Journal of Research in Innovative Teaching & Learning*, (2017) 10(1) 4-33, https://doi.org/10.1108/JRIT-10-2016-0007
[38] Ibid p14

Students, however, have been shown to approve of new, innovative interventions even if it is just for a short period of time, and just because they are new and different. McLeod and Latheef say of the interactive whiteboard, for example, that 'there may have been an increase in excitement, enthusiasm and engagement as the shiny new toy was brought out to play, [but] there is little evidence that learning was improved.'[39]

Teachers too, are impressed by new technologies in the classroom. Belshaw says that 'new, free and shiny technologies are like catnip to educators'[40] and Guinan adds that 'the biggest danger when choosing technology for your classes is the novelty factor for the teacher.'[41]

In addition to the transient nature of *newness* in technology, some argue that the preponderance of new technologies which were adopted simply because they were new, has left a legacy in education. Mishra and Koehler for example, argue that the 'advent of digital technology has dramatically changed routines and practices in most arenas of human work. Advocates of technology in education often envisage similar dramatic changes in the T&L process. It has become clear, however, that in education the reality has lagged far behind the vision.'[42] Perhaps the reason for that lag is that academics are constantly trying to keep programmes, courses and modules "fresh" by adopting technology, rather than updating curricula.

Roberts makes the point about "appropriateness" explicitly and argues for 'the sequential transition of the format from traditional to electronic, allowing each faculty member to develop competency over time as their workload

[39] McLeod, A., and Latheef, I. (2017). Transforming education through technology: Vision vs Reality, *Australian Association for Research in Education, EduResearch Matters*, http://www.aare.edu.au/blog/?p=2640
[40] Belshaw, D. (2011). The perils of shiny shiny educational technology, *Open Educational Thinkering*, https://dougbelshaw.com/blog/2011/02/26/perils-of-shiny-edtech/
[41] Guinan, S. (2017). Classroom Technology: Tool or Toy? *IATEFL LTSIG*, https://ltsig.iatefl.org/classroom-technology-tool-or-toy/
[42] Mishra, P., and Koehler, M. (2006). Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge, Teachers College Record Volume 108, Number 6, June 2006, pp. 1017–1054 https://doi.org/10.1111/j.1467-9620.2006.00684.x 1017-8

permitted.'[43] Fastiggi[44] and Mishra & Koehler[45] both argue that one aspect of appropriateness is the "transparency" of the technology – in other words, the focus of the students and academics should be on the task in hand, rather than the software or hardware which is allowing it to happen. The adoption of several TEL innovations in a short time period is likely to be overwhelming both for academics and for students, and so this study kept the basic structure of the module unchanged (one hour-long seminar and one hour-long lecture/Collaborate session per week) and kept the content very similar. This had the added benefit that it allowed for the change in delivery style to be analysed without other changes influencing the students' responses. Serdyukov suggests that before academics start to use any new technology in their T&L practice, 'we have to ask first, "[w]hat technology tools will help our students to learn […] better, and how to use them efficiently to improve the learning outcomes?"'[46]

Mueller and Oppenheimer[47] showed, unsurprisingly, that students who took more notes in sessions performed better in terms of their recall of the information covered in the session. What is relevant here is that students who took these notes on a laptop underperformed against those who wrote them longhand, and so we are beginning to see a picture showing that it would be mistaken to assume that more use of technology makes for better students. Sana *et al*[48] showed that the negative impact of laptop use in class was not just on the students themselves, but also on their classmates.

If we are moving towards a stance where "technology for the sake of technology" is not the best approach (and we should be), then fitness for

[43] Roberts, C. Implementing Educational Technology in Higher Education: A Strategic Approach, *Journal of Educators Online* (2008) 5(1), 13 http://dx.doi.org/10.9743/JEO.2008.1.1
[44] Fastiggi, W. (2013). Appropriate Technology in Education, *Technology for Learners*, https://technologyforlearners.com/appropriate-technology-in-education/
[45] Mishra, P., and Koehler, M. *op cit* n42
[46] Serdyukov, P. (2017) *op cit*, n37, 13
[47] Mueller, P. & Oppenheimer, D. The Pen Is Mightier Than the Keyboard: Advantages of Longhand Over Laptop Note Taking, *Psychological Science*, (2014) 25 (6) 1159-1168 https://doi.org/10.1177/0956797614524581
[48] Sana, F., Weston, T., and Cepeda, N. Laptop Multitasking Hinders Classroom Learning for Both Users and Nearby Peers, *Computers & Education*, (2013) 62, 24-31, https://doi.org/10.1016/j.compedu.2012.10.003

purpose, or appropriateness, becomes the most viable lens through which to look at technology.

Legal education is not exempt from this move towards an increasingly technological approach, and even though it is frequently taught in a silo[49] there are lessons which can be learned from other disciplines. Legal education is as broadly defined as TEL, with arguments being put forward that the primary purpose of legal education is to prepare students for legal practice, or to include specific content[50] or to develop graduate skills. Equally, there are those who take a doctrinal approach,[51] a socio-legal approach,[52] an interdisciplinary approach[53] or a critical legal studies approach.[54] All of these arguments and approaches are equally valid, but it leaves us with a loosely defined concept, with overlaps to other areas of education. This is the approach which will be taken in this paper – legal education has some elements which are not common to other disciplines, but there is nothing pedagogically unique about legal education, and we should fill in that silo and move on.

The BAT model

The idea of "appropriate technology" almost certainly has its roots with Schumacher's seminal economics text 'Small is Beautiful'[55] in which he argues, without defining the term specifically that there is a 'need for appropriate technology'[56] and that a '"regional" or "district" approach has no chance of success unless it is based on the employment of a suitable

[49] Codling, A.R., Thinking Critically about Law: a student's guide, London: Routledge (2018), 76
[50] For example, see recent discussions on the inclusion of EU law post-Brexit. See for example Cotter, J., & Dewhurst, E., Lessons from Roman law: EU law in England and Wales after Brexit, *The Law Teacher*, 2019, Vol 53 Issue 2, 173-188 https://doi.org/10.1080/03069400.2019.1585074
[51] Posner, R., Legal Formalism, Legal Realism, and the Interpretation of Statutes and the Constitution (1986) 37 *Case Western Reserve Law Review* 179, 182
[52] Cownie, F. & Bradney A, *Socio-legal studies: A challenge to the doctrinal approach*, in Watkins, D. & Burton, M., (eds), Research Methods in Law. Abingdon: Routledge, 2011) 34.
[53] Siems, M., the taxonomy of interdisciplinary legal research: finding the way out of the desert, *Journal of Commonwealth Law and Legal Education*, Vol 7 No 1 (2009) 5-17 https://doi.org/10.1080/14760400903195090
[54] Hunt, A., 1986, The Theory of Critical Legal Studies, *Oxford Journal of Legal Studies*, Volume 6, Issue 1, SPRING 1986, Pages 1–45, https://doi.org/10.1093/ojls/6.1.1
[55] Schumacher, E. *Small is Beautiful: A Study of Economics as if People Mattered* (Blond & Briggs, 1973)
[56] *Ibid* 147

technology.'[57] For 'regional' or 'district' we can substitute 'subject' or 'task specific' approach to allow for the adaptation of the ideas to a T&L context.

The key question is how to identify the suitable technology or technologies for each task, or at the very least to identify a range of unsuitable technologies. This is where an adaptation of the BAT model could be useful.

The BAT model is now firmly ensconced in environmental law as part of the process for allowing large industrial processes to be constructed and operated. This does not, at first glance appear to have much (if any), overlap with the T&L and to outline the potential for adaptation of this model, it is first necessary to give a brief background to its development and operation within the environmental legal sphere.

The conceptual origins of the BAT model started with the introduction of *best practicable means* in the Salmon Fisheries Act 1861. The term was used as a defence in court, and allowed the accused to demonstrate that they had used the "best practicable means" to mitigate the impact of pollution.[58] This remained the standard for avoiding prosecution for pollution for more than a century, until the introduction of a new standard – the Best Available Technique Not Entailing Excessive Costs by EEC Directive 84/360/EEC in June 1984. This new standard was not actually defined by the Directive itself, and by the nature of the Directive was only applicable to air pollution emissions from larger industrial plants.

The idea for this standard, say Pearce and Brisson[59] was to reduce emissions from industrial plant as far as possible, while keeping in mind that some technological fixes are experimental or prohibitively expensive. Cripps confirms this, adding that 'Where technically and economically feasible, designing to eliminate harmful discharges is the preferred approach to process pollution control.'[60]

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[57] *Ibid*
[58] Higgins, C. *A Treatise on the Law Relating to the Pollution & Obstruction of Watercourses*, (Stevens & Haynes, 1877) 175
[59] Pearce, D., & Brisson, I. BATNEEC: the economics of technology-based environmental standards with a UK case illustration, *Oxford Review of Economic Policy*, (1993) 9 (4), 24-40 https://doi.org/10.1093/oxrep/9.4.24
[60] Cripps, H. BATNEEC III, *Process Safety and Environmental Protection*, (1996) 74 (4), Pages 295-296, 296

In England and Wales, the responsibility for deciding on the "BAT" element for a particular industry was delegated, initially to HM Inspectorate of Pollution, and then to the Environment Agency. The strength of the model was also part of its inherent weakness. Since the "excessive cost" element was not defined in the Directive, it left those covered by its reach to argue that in their specific instance, the costs were excessive.

In 1996, the BATNEEC standard was replaced by the Best Available Techniques (BAT) standard, introduced by EC Directive 96/61/EC on Integrated Pollution Prevention and Control. Unlike its predecessor, the 1996 Directive set out what was meant in general terms by BAT, in Article 2:

'"best available techniques" shall mean the most effective and advanced stage in the development of activities and their methods of operation which indicate the practical suitability of particular techniques for providing in principle the basis for emission limit values designed to prevent and, where that is not practicable, generally to reduce emissions and the impact on the environment as a whole:

- "techniques" shall include both the technology used and the way in which the installation is designed, built, maintained, operated and decommissioned,
- "available" techniques shall mean those developed on a scale which allows implementation in the relevant industrial sector, under economically and technically viable conditions, taking into consideration the costs and advantages, whether or not the techniques are used or produced inside the Member State in question, as long as they are reasonably accessible to the operator,
- "best" shall mean most effective in achieving a high general level of protection of the environment as a whole.'

In order to set out what the BAT is for a particular industry, Article 11 of Directive 2010/75/EU developed the idea of BAT Reference (BREF) Documents which are the reference points created by a combination of experts from government, industry and NGOs. The advantage of the BREF documents is that they are standard across the EU, and are updated regularly, so with the five-yearly licence renewal cycle, the standards are raised across the EU.

Table 1: Proposed definition of a TEL BAT, and an explanation of each stage.

Definition	Explanation
BAT: The most effective and advanced stage in the development of activities and their methods of operation which indicate the practical suitability of particular technologies for providing the basis for the enhancement of student experience and attainment.	Innovation which is adopted for its own sake will never be BAT-compliant. However, innovation which is adopted as a pilot, in order to understand its pedagogic implications and applicability, could become the BAT of the future.
'Techniques' includes both the technology used and the way in which the teaching space is designed, built, and operated	This satisfies the points discussed above regarding appropriate use of smart classrooms, the IT provision and the ability to develop competency.
'Appropriate' techniques are those developed on a scale which allows implementation in the relevant sector, under technically viable conditions, as long as they are accessible to the institution	For large-scale adoption of an aspect of technology, and the way in which it is used, the approach would have to have a proven track history of pedagogic value. It would not include, for example, techniques that have not been previously applied in a T&L context, but would allow for innovations which have been used in one subject area, or for one particular task, to be used in a different subject area, or a different task.
'Best' shall mean most effective in achieving a high general level of student enhancement	As with the 1996 BAT, and notwithstanding the grammatical problems, there can be more than one "best" in each sector, and across sectors.

It is the approach of the 1996 model of BAT which it is proposed could be adopted for TEL purposes. Taking the four elements outlined in the Directive, each can be amended to fit a new role, based on the literature which has been identified above, resulting in the series of definitions (and accompanying explanations) in Table 1 (above).

What this table demonstrates is that mapping the pollution control BAT onto a TEL BAT is possible. In addition to the basic framework, which could be adopted at subject, faculty, institutional or sectoral level, further guidance could be provided by subject centres and AdvanceHE, in the form of BREF Documents.

These would need to be a central repository for research into the use and effectiveness of different technological interventions. Whether this is classed as 'dwarves perched on the shoulders of giants' (Bernard of Chartres, c1100),[61] 'sharing best practice,'[62] or even 'avoiding worst practice'[63] is purely a matter of semantics. The important aspect is that such a database, which is already starting to emerge in a fragmentary way (for example the HEA / Paul Hamlyn Foundation / Action on Access "What Works" programme), would allow T&L practitioners to assess the viability of different approaches to their own teaching, their own subject areas, their own expertise and their own students.

There would still be space for those at the cutting edge of technological T&L research – as Sharma puts it 'what is normal today will soon be obsolete, and what is innovative today will soon be normal. Adoption and keeping pace with new technology is not an option but is core.'[64]

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[61] Troyan, S. *Medieval Rhetoric*, (Routledge, 2004)
[62] McCarthy, J., & Bagaeen, S. (2014). *Sharing Good Practice in Planning Education*, York: Higher Education Academy, https://www.heacademy.ac.uk/system/files/resources/sharing-good-practice-in-planning-education1.pdf
[63] Felder, R., & Brent, R. (2015). *Teaching Blunders to Avoid: Ten Worst Teaching Mistakes*, Iowa State University, Centre for Excellence in Learning and Teaching, http://www.celt.iastate.edu/teaching/effective-teaching-practices/teaching-blunders-to-avoid-ten-worst-teaching-mistakes
[64] Sharma, A. (2017). If you are not innovating today, you won't be around tomorrow, *forge Autodesk*, https://forge.autodesk.com/blog/if-you-are-not-innovating-today-you-wont-be-around-tomorrow

Methods and Results

Methodologically, the research fell within the Action Research classification. It started in the 2016/17 academic year, when the impact of introducing new technology in the delivery of lessons was assessed. The information gained from these questionnaires has been evaluated and was used to plan the revised use of TEL in the second iteration of the cycle. This cycle will be used to make changes to the third cycle of the model.

Rowland says that an action research process is one 'in which individuals seek to improve their practice of teaching by subjecting it to scrutiny and development.'[65] and by improving practice in an iterative process, Roberts' concerns about the 'sequential transition'[66] towards TEL are mitigated.

In the context of this project, the original intervention was triggered by an institutional move, both of geographical location, and of pedagogic approach to T&L. The institution has adopted a pedagogic approach it calls "Active Blended Learning" (ABL) and defines as being 'taught through student-centred activities that support the development of subject knowledge and understanding, independent learning and digital fluency.'[67]

The project replaced the one-hour in-class lecture with a one-hour online session using Blackboard's Collaborate Ultra webinar system. The timetabled slots and content of each session remained the same. In the old lectures, students could ask questions whenever they wanted. In the Collaborate sessions the "chat" function was available throughout the session, so students could ask live questions, and there were two additional "time outs" when students could ask, or answer questions using the "chat" function. The sessions were recorded, and remained on the VLE for the duration of the module. The seminar sessions remained unchanged.

The students' views were gained by two questionnaires, one in each year / stage of the AR cycle. The sample of students was taken pragmatically using the

[65] Rowland, S. (2000). The Enquiring University Teacher, Buckingham, SRHE and the Open University Press 31
[66] Roberts, C. (2008), *op cit*, n43
[67] UoN, 2016, Learning and Teaching, University of Northampton Institute of Learning and Teaching, https://www.northampton.ac.uk/wp-content/uploads/sites/2/2016/06/Defining-Active-Blended-Learning.pdf

students who attended the module. Convenience sampling[68] has its limitations, and will provide a sample that is not necessarily generalizable to a wider context.

McMillan suggests that this method may skew the results of the research, suggesting as an illustration 'if the available sample for studying the impact of college is the group of alumni who return on alumni day, their responses would probably be quite different from those of all alumni.'[69] This potential for bias would also apply for a self-selecting group, however, such as those who complete the National Student Survey and, as the results of the first series of questionnaires will be tested with the second series of questionnaire, they become more robust.

Farrokhi and Mahmoudi-Hamidabad fight something of a rear-guard action for this type of sampling however, arguing that 'in humanities and particularly in educational field we are not dealing with static materials or consistent states'[70] and, as such, provided the circumstances in which the research was conducted are precisely reported, it can be wholly valid.

This approach, of clearly and overtly stating how the research was carried out, suggests that this work is taking more of an interpretive or interpretivist approach to research. Holloway and Galvin suggests that 'the interpretivist view can be linked back to Weber's *Verstehen* approach'[71] which emphasised that *understanding* was the Social sciences' equivalent to the natural sciences' *explaining*.

The questionnaires were kept as simple as possible. This was for two reasons:

- It allowed for quick completion, without distraction from elaborate phrasing or complex scenarios.

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[68] Etikan, I., Musa, S., Alkassim, R.. Comparison of Convenience Sampling and Purposive Sampling. *American Journal of Theoretical and Applied Statistics*. (2016) 5 (1). 1-4. https://doi.org/10.11648/j.ajtas.20160501.11. P1

[69] McMillan, J.H. *Educational Research: Fundamentals for the Consumer* (2nd edition, HarperCollins, 1996) 91

[70] Farrokhi, F., & Mahmoudi-Hamidabad, A. Rethinking Convenience Sampling: Defining Quality Criteria, *Theory and Practice in Language Studies*, (2012) 2 (4), 784-792, @p792 https://doi.org.10.4304/tpls.2.4.784-792

[71] Holloway I., & Galvin, A. (2017). Qualitative Research in Nursing and Healthcare, 4th Edition, Chichester, Wiley Blackwell 25

- The less the questions related to specific aspects of the specific module, the higher the chance of replication of the results – this was important for Stage 2 of the project.

The results from the two questionnaires can be regarded as being fairly reliable. The proportion of the cohort of students who responded was high, and repeating the questionnaire over two academic years controlled for differences arising from the makeup of a specific cohort of students. Nulty[72] looked at literature around response rates to paper-based and online surveys, and contrasted the two methods. Table 2 (below) extracts the part of Nulty's results which relates to paper-based questionnaires and it is clear that the response rate to this survey is at an acceptable level. There will inevitably be gaps and omissions, and this is always the case with student-based surveys. There is, for example, no way of knowing accurately what the responses might have been from the students who did not attend the sessions in which the questionnaires were distributed. Likewise, the extent to which students truly believed that the information would remain anonymous cannot be ascertained. However, the high response rates for the Questionnaires does strongly suggest that the results can be taken as being indicative of the group as a whole.

Although a study of precisely this nature has not been carried out before, the results will be discussed below in the wider context of TEL, experiences of using Collaborate, and Legal Education. This will help to locate the results within an existing framework of research and knowledge, and plug a gap which previously existed.

The generalisability of the results to a wider group of students is difficult to ascertain at this stage, and the third iteration of the project will involve the application of the approach to a different subject area, and comparing the results across a wider data set.

[72] Nulty, D. The adequacy of response rates to online and paper surveys: what can be done? *Assessment & Evaluation in Higher Education*, (2008) 33 (3), 301–314. https://doi.org/10.1080/02602930701293231

Table 2: Response rates to paper based surveys (adapted from Nulty)

Source	Response Rate (%)
Cook et al[73]	55.6
Dommeyer, et al[74]	75
Ballantyne[75]	55
Ogier[76]	65
Nair et al[77]	56
Watt et al[78]	32.6
Questionnaire Round 1	87
Questionnaire Round 2	86

[73] Cook, C., Heath, F., & Thompson, R. A meta-analysis of response rates in web or internet-based surveys. *Educational and Psychological Measurement* (2000) 60, no. 6: 821–836

[74] Dommeyer, C., Baum, P., Hanna, R., & Chapman, K., Gathering faculty teaching evaluations by in-class and online surveys: their effects on response rates and evaluations. *Assessment & Evaluation in Higher Education* (2004) 29, no. 5: 611–623.

[75] Ballantyne, C., *Moving student evaluation of teaching online: reporting pilot outcomes and issues with a focus on how to increase student response rate*. Paper presented at the 2005 Australasian Evaluations Forum: University Learning and Reaching: Evaluating and Enhancing the Experience, UNSW, Sydney, 28–29 November 2005

[76] Ogier, J., *The response rates for online surveys—a hit and miss affair*. Paper presented at the 2005 Australasian Evaluations Forum: University Learning and Teaching: Evaluating and Enhancing the Experience, UNSW, Sydney. 28–29 November 2005

[77] Nair, C., Wayland, C., Soediro, S., *Evaluating the student experience: a leap into the future*. Paper presented at the 2005 Australasian Evaluations Forum: University Learning and Teaching: Evaluating and Enhancing the Experience, UNSW, Sydney, 28–29 November 2005

[78] Watt, S., Simpson, C., McKillop, C., & Nunn, V., Electronic course surveys: does automating feedback and reporting give better results? *Assessment & Evaluation in Higher Education* (2002) 27, no. 4: 325–337.

The basis for the ethics section of this work has been the British Educational Research Association's Ethical Guidelines for Educational Research.[79] Busher clarifies that 'ultimately it is the researcher who has to decide how to carry out research as ethically as possible to minimise the intrusion to other people's working and social lives that social and educational research implies'[80] and that is true to an extent, although there are processes and procedures in place to support that decision-making process.

The questionnaires were part of a project funded by Institute of Learning and Teaching's Learning Enhancement and Innovation Fund and the funding was contingent on successful ethics approval from the University ethics committee.

The questionnaires were completed by Level 5 undergraduate students on a designated law module. Since its inception in 2001, the module has consistently received positive feedback from students, and has run with a weekly hour-long lecture and hour-long seminar. In the first cycle of this project, the existing delivery style (lecture/seminar) was maintained for Term 1, but for Term 2 the face to face lecture was replaced with either a podcast lecture with an embedded quiz (using Kaltura) or a live broadcast online lecture (using Collaborate).

The students were asked to indicate, using a 3-part Likert scale, whether they liked, disliked or felt neutral about different aspects of the delivery style. None of these aspects were further defined, and it was left to the respondents to interpret them as they saw fit:

- *The content of the session*. This was a control question, as the content of the sessions would have been the same regardless of the way in which it was delivered.

- *The ease of accessing the sessions / recordings*. Coy states that the online learning environment is proving attractive to parents of children with disabilities in the United States, partly because of 'the advantage

[79] BERA, 2018, *Ethical Guidelines for Education Research* 4th Ed, British Educational Research Association https://www.bera.ac.uk/publication/ethical-guidelines-for-educational-research-2018-online
[80] Busher, H. 'Ethics of research in education' in Coleman, M. and Briggs, A. (eds) *Research Methods in Educational Leadership and Management*. (Sage, 2011), 87

of remaining [at] home.'[81] Many HEIs identify the ability to access recordings of sessions, or live online sessions which were being recorded, had great advantages for students with a range of SpLD (Specific Learning Difficulties or Differences). An additional comment from a student (#1-56) was that "Collaborate allowed me to take part even when I could not come to uni"

- *The speed of delivery*. The content and length of the sessions remained unchanged, thus the speed of delivery should not have changed. The two fixed "time out" slots during the session may have compromised the timings a little. However, the difficulty for those delivering the session is the absence of live visual cues from the audience. Foster *et al*[82] point out (in the context of guidance for students presenting to a judge in court) that it is crucial to 'watch the judge's pen as you are speaking and make sure he or she has time to note down what you are saying.'[83] In the context of an online session, there is no pen to watch, and so the rationale for this question was to inform the speed at which future sessions were planned.

- *The live or recorded nature of the session*. This question was used to distinguish between the use of Collaborate (live) and Kaltura (recorded). Although the Collaborate sessions were recorded in both rounds of the research, the primary focus was to ascertain students' feelings towards the live sessions.

- *The ability to ask questions*. Interactivity is at the heart of the institution's ABL model, and there is some evidence that students who do not feel sufficiently confident or empowered to ask questions in front of their peers, are more willing to do so online (see for example, Sullivan[84], Wang *et al*[85]). One of the students (#2-29) commented that

[81] Coy, K. Special educators' roles as virtual teachers. *Teaching Exceptional Children*, (2014) 46(5), 110–116. http://doi.org/10.1177/0040059914530100 , 110
[82] Foster, C., Gilliatt, J., Bourne, C., and Popat, P. *Civil Advocacy: A Practical Guide*, (Cavendish, 2011, 2nd Ed
[83] Ibid, 11
[84] Sullivan, P. "It's Easier to Be Yourself When You Are Invisible": Female College Students Discuss Their Online Classroom Experiences, *Innovative Higher Education*, (2002) 27 (2), 129–144
[85] Wang, M., Sheng, R., Novak, D., and Pan, X. The impact of mobile learning on students' learning behaviours and performance: Report from a large blended classroom,

even though the "chat box" was not anonymous, and they were still identifiable "I felt more confident asking a question in that environment than I did in the lecture theatre."

Table 3: Round 1 Respondents' views (by percentage) of the sessions (n=69)

Method	Content		Access		Speed		Nature		Questions	
	L	D	L	D	L	D	L	D	L	D
Kaltura	36	25	42	29	31	31	32	31	n/a	
Collaborate	55	20	39	30	49	24	38	22	49	30
Face to face	34	30	23	42	39	30	28	32	20	41

L = Like, D = Dislike

Table 4: Round 2 Respondents' views of Collaborate (n=51)

Method	Content		Access		Speed		Nature		Questions	
	L	D	L	D	L	D	L	D	L	D
Collaborate	60	12	52	17	62	12	72	19	68	2

L = Like, D = Dislike

The surprising result here is that there was a difference in the students' reactions to the content, depending on the medium of delivery. Collaborate scored more highly on "content" than the other methods of delivery. This could relate to the week-by-week coverage, as one student (#1-18) noted "I really like the environmental crime sessions [delivered using Kaltura] but found the session on gun crime [delivered using Collaborate] quite boring." This premise is reinforced by Round 2 of the questionnaire, where Collaborate was the only delivery mechanism, and 60 per cent of students liked the content aspect.

The students' responses to the Ease of Access question was less surprising, as the literature had predicted that students are generally in favour of recorded sessions. The Collaborate sessions scored slightly less well, and part of the rationale for this is explained by the student comments. Student #1-35 said "I like it, but the Wi-Fi is awful and I keep being logged out" and student #1-56 said "I am giving up trying to access the sessions live as the Wi-Fi is so [poor]." This has resonance as to the "techniques" defined above, which "include both the technology used and the way in which the teaching space is designed, built, and operated." Without viable institutional infrastructure to support it, this suggested that Collaborate would never become suitable as a BAT standard. By Round 2, the issue of accessibility scored reasonably high levels of student satisfaction, despite the recurring issue of Wi-Fi accessibility.

The responses to the question about speed of delivery were among the most evenly distributed, and again there was a marked increase in the percentage of students liking this aspect between rounds.

Initially, students did not seem to be particularly concerned about the live or recorded nature of the delivery. This is slightly at odds with the comments of the students about accessibility, as recorded and online sessions are often regarded as being more accessible than face to face sessions. In Round 2, more than 70 per cent of students liked the nature of delivery. This cohort of students had experienced occasional sessions using Collaborate in their compulsory Level 4 modules, and so they were not coming to the technology as a new experience. This is analogous to Roberts's point, above, about the benefits of a "sequential transition"[86] to technology, and that experience leads to competence which leads to contentment.

Nearly half of the students "liked" the ability to ask questions in the Collaborate sessions, and only one fifth in the face-to-face sessions. This fits with the literature discussed above, which suggests that the pseudo-anonymity afforded by online chat functions makes students feel more emboldened. However, despite the high numbers saying they liked the ability to ask questions in the Collaborate sessions, very few did so, which leads to an interesting conclusion that it is the *possibility* of doing things which students like, rather than the reality of actually doing them. By Round 2, engagement had improved, partly

[86] Roberts, C. Implementing Educational Technology in Higher Education: A Strategic Approach, Journal of Educators Online (2008) 5(1), 13 http://dx.doi.org/10.9743/JEO.2008.1.1

because the "time out" sessions were more discursive – if students did not ask questions, they were asked questions so they could demonstrate their understanding of the topic.

On the whole, it is clear that while the use of Collaborate is no silver bullet, and is not popular with all students, it does seem broadly popular. Anonymised headline data on the students' achievement has been logged as part of the standard institutional annual module review process, but more longitudinal data will need to be collected before this can be assessed.[87]

Discussion and Conclusion

If the use of Collaborate within the context of this module can be categorised as broadly successful (ie the students felt they gained more in comparison to the other options offered), the next step is to look at whether such technology will fit within the draft BAT in TEL model developed earlier (Table 1). There are three components to this criterion which need to be addressed in turn:

Firstly, is Collaborate the most effective technique (of those tested) in terms of its activities and method of operation? In isolation is it difficult to assess whether Collaborate is the most effective at doing this, but the results from the Round 1 questionnaires show that more students were positive about Collaborate than about Kaltura or the face-to -face delivery, which goes a long way towards satisfying this aspect. Round 2 results showed that as users become more familiar with the technology, mistakes which might have detracted from its overall suitability are avoided.

Secondly, does Collaborate provide the basis for enhancing the student experience? The students are generally happy with the use of Collaborate, and the Student Module Evaluation for 2017/18 shows that 77 per cent of students are "satisfied with the quality of the module." This means that we can clearly see that the Student Experience element of this criterion has been met.

Thirdly, does Collaborate provide the basis for enhancing student attainment? This aspect was assessed using data from the University Boards, which showed

[87] In March 2020, in common with HEIs across the world, delivery of this module moved online as a result of the Coronavirus pandemic, and so the use of Blackboard became the norm rather than the exception. The latest round of this ongoing project which was due to take place in October 2021 has therefore been postponed until the Autumn of 2022.

a slight increase in average grade. Longer term data will need to be collected to analyse this in more detail.

Collaborate, as it is used in this module, does therefore broadly fit the BAT in TEL model, and with further work on the use of the technology in the third cycle of the research, the fit will be stronger.

Serdyukov[88] set out the question which *should* be at the forefront of the minds of those adopting new technology, but it appears that enhancing student experience is the driver for many HEI policy interventions, particularly in those which are subjected to the annual National Student Survey. This is a pragmatic reason for introducing technology, and pragmatism may be a stronger force than pedagogy when it comes to introducing new technology.[89] Once a body of research had started to show that happier students got higher grades and vice versa (see section 2 above), it was inevitable HEIs would start to introduce technological innovations to 'help students… progress from a 2:1 to a first.'[90]

What has been demonstrated here though is that the stated purpose for adopting TEL may not be the real purpose. We have seen strong arguments (see section 2 above) that the novelty factor of a piece of technology or an application is what tends to underlie its adoption.

Some aspects of TEL have the potential to change the very fabric of society and, by extension, education. Sir Tim Berners-Lee's work on the World Wide Web, for example, has had an incalculable impact on T&L. Some of it (for example, the ability to teach students remotely in areas where education is sparse) has been extremely positive. Some of it has been extremely negative (for example the ease with which students are able to buy completed essays online), but since the objective of the WWW was to democratise information, it has achieved that aim, and is largely fit for purpose.

Having outlined the operation of the BAT model in the IPPC sphere of environmental law, the model was exploded and reconfigured to apply to L&T, and then tested by applying the results from the two cycles of the case study research project to it, and the results were promising. The use of Collaborate in

[88] Serdyukov, P. (2017) *op cit*, n37
[89] *Ibid*.
[90] Swain, H. 2017, *op cit* n15

this fashion fits almost all the parameters of the model already and, when the final data from the resit assessments is added, it is likely to fit it completely.

With further research, and engagement from practitioners across disciplines, a BREF repository held by AccessHE would start to contain richer data on the use of different types of technology for different purposes in different subject areas. A willingness to share best (and worst, and mediocre) results is key here. There are too many T&L researchers who are reticent about publicising their non-successes, the "What didn't Work" projects.

Such a model, were it to be widely adopted, would allow for the sharing of information about successful and unsuccessful interventions and help lead to an overall improvement in student experience.

The BAT in TEL model needs further testing, as it is currently just a prototype. Other technological interventions will be sought from the literature (they will, for reasons identified above, almost all be reporting positive outcomes) and will be plugged in to the model to see if they fit.

The surveys which form the basis of this paper predated the 2020/1 COVID-19 Pandemic which affected learning and teaching for legal (and all) education to a unprecedented level. As Rapanta et al put it "teachers have, almost overnight, been asked to become both designers and tutors, using tools which few have fluently mastered."[91] It was not just a case of more and more teaching moving online, however. Within, and between HEIs, the range of platforms being used by HEIs exploded – within the University which forms the basis of this study, at different stages between March 2020 and March 2021, Zoom, Microsoft's Teams, Blackboard's Collaborate and Collaborate Ultra, Cisco's Webex and Jabber and LogMeIn's GoToMeeting were all used either for student sessions or meetings.

This paper has demonstrated that within the limited context of the application discussed (a Level 5 designated module) we can use the model to make an assessment that the "best" technology is Collaborate. We can pull out from this the conclusion that live, interactive sessions are "better" than pre-recorded

[91] Rapanta, C., Botturi, L., Goodyear, P., Guàrdia, L., and Koole, M., Online University Teaching During and After the Covid-19 Crisis: Refocusing Teacher Presence and Learning Activity, Postdigital Science and Education, (2020) 2: 923-945 https://dx.doi.org/10.1007/s42438-020-00155-y

broadcasts. This may not be the "best" approach when covering different aspects of the law curriculum – what works for application of vicarious liability in Tort may not work for clinical legal education or mooting.

Clearly, the massive growth in online teaching will not be maintained at quite the same levels once the pandemic ends and increasing numbers of students return to campus life, but it is likely that increased use of TEL will become part of the "new normal." The need for a model such as this will therefore become more pressing, and the model will gain enhanced richness from inclusion of the different methods and systems which have been successfully used over the pandemic.

As suggested above, in order for a model such as that proposed here to be successful, legal and other academics need to have a willingness to share best (and worst, and mediocre) results. What this paper has demonstrated is that before the pandemic we *could* make a BAT out of TEL model for legal education. However, in the post-pandemic world, the need for such a model becomes paramount, to ensure that academics don't simply repeat mistakes and dead-ends (Second Life?) and students are given the highest-quality legal education.