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CODING FOR CRITICAL THINKING: A CASE STUDY IN EMBEDDING COMPLEMENTARY SKILLS IN LEGAL EDUCATION

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I INTRODUCTION

Few would disagree that a law school should ensure that students graduate with skills. Nor is it controversial that 'skills' here includes a broad range of competencies ranging from the technical (such as legal drafting) to the abstract (critical thinking, legal reasoning, and emotional intelligence, for example).[1] What is hotly debated is the balance between these two loose categories of skills. While guidance is provided by industry and regulatory bodies,[2] it is typically left to faculties, schools, and individual academics to decide how they are to be taught. Within these parameters, there remain difficult practical and ideological choices. Might a 'vocational' exercise such as a negotiation simulation be placed in a critical context to foster acquisition of both categories of skills in an engaging way? Or is this capitulating to a neoliberal view that seeks to crowd out deep critique with lower-order

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1 See Cindy L James, 'Exploring Changes in the Emotional Intelligence of Law Students' (2018) 28(1) *Legal Education Review* 1.

2 See, eg, The Australian Qualifications Framework: https://www.aqf.edu.au/aqf-levels; Australian Law School Standards prepared by the Council of Australian Law Deans ('CALD') and its Australian Law School Standards Committee: <https://cald.asn.au/wp-content/uploads/2020/07/Australian-Law-School-Standards-v1.3-30-Jul-2020.pdf>; Law school accreditation and admission requirements, such as those in the *Legal Profession Act 2006* (ACT) and the *Court Procedure Rules 2006* (ACT); Law Admissions Consultative Committee standards, including: Accreditation Standards for Australian Law Courses: <https://www.legalservicescouncil.org.au/Documents/accreditation-standards-for-australian-law-courses.pdf>; Model Admission Rules ; Revised Prescribed Areas of Knowledge: <https:/www.legalservicescouncil.org.au/Documents/redrafting-the-academic-requirements-for-admission.pdfcademic-requirements-for-admission.pdf>; Threshold Learning Outcomes (TLOs) in the Learning and Teaching Academic Standards (LTAS) Project: <https://cald.asn.au/wp-content/uploads/2017/11/KiftetalLTASStandardsStatement2010.pdf>; and the Good Practice Guides developed by the Law Associate Deans' Network: <http://www.lawteachnetwork.org/resources.html>.

skills,[3] which may soon become redundant or be irrelevant to graduates who choose not to practise law? Is technical skills training therefore best left to the practical legal training ('PLT') that Australian graduates of law must complete before admission as lawyers? Should educators incorporate a new technical skill that industry deems essential? Or by rushing headlong into the latest innovation to stay 'job-relevant', does this risk overwhelming students (and educators) by trying to be all things to all stakeholders?

As a case in point, some law schools have begun to offer optional lessons in coding[4] as a response to the increasing use in the legal profession of new technologies such as artificial intelligence, online legal services, and cryptocurrency. But is the 'technical' skill of coding useful for the general student body? Coding remains at the margins of the law curriculum and its coverage is highly dependent on the interests and abilities of individual academics and institutional fit. There are legitimate concerns that a focus on coding would overcrowd the curriculum, be excessively vocational, or worse, a branding gimmick. Nevertheless, there is an argument for including content in the law curriculum that encourages students to understand and critique trends in law and technology, which may require some familiarity with the principles of coding.[5] Graduates who go on to contribute to the formulation of algorithms and apps for specific workplaces or legal issues would likely benefit.[6] More likely, graduates will need greater project management skills that require understanding of the abilities, vocabularies, and mindsets of other more technologically oriented members of interdisciplinary teams.[7] Indeed, some of the abuses of artificial intelligence that lawyers have challenged, such as automation in administrative decision-making,[8] may be pre-empted through inculcating among law students an understanding of the impact of bad data or problematic algorithms. An understanding of the logic of coding, algorithms and data processing can open students' eyes to creative solutions that they had not considered. National Legal Aid's Amica app, for example, is a platform that (among many other things)

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3 Nickolas John James, 'Why has Vocationalism Propagated so Successfully within Australian Law Schools?' (2004) 6 *The University of Notre Dame Australia Law Review* 41, 62.

4 See University of Melbourne, <https://law.unimelb.edu.au/about/technology-innovation-and-the-law/coding-classes>.

5 Educators at Minnesota Law School, for example, have documented its course on coding for lawyers, which teaches basic programming techniques and concepts such as machine language, natural language, and automated information retrieval in a critical context: Alfredo Contreras and Joe McGrath, 'Law, Technology, and Pedagogy: Teaching Coding to Build a "Future-Proof" Lawyer' (2020) 21(2) *Minnesota Journal of Law, Science & Technology* 297, 311. In Australia, Bond University has a similar elective offering in Coding, Cybersecurity & Cryptoliteracy for Lawyers: see <https://bond.edu.au/subject/laws13-581-coding-cybersecurity-cryptoliteracy-lawyers>.

6 Contreras and McGrath (n 5).

7 Ibid 313.

8 See Jack Snape, 'How the Robodebt Settlement Softens Five Years of Pain for Welfare Recipients', *ABC News* (Online, 16 November 2020), <https://www.abc.net.au/news/2020-11-16/robodebt-settlement-explained/12888178 >.

prevents parties in family law disputes from using 'unproductive' language.[9] Similarly, some exposure to coding might help make sense of the transformations to contract formation and enforcement brought about by Blockchain. For these reasons, coding is certainly compatible with common university-level graduate attributes such as 'currency of knowledge and skills' and 'creative use of technology'.

But is the argument for including coding strong enough to allay concerns about crowding out the 'abstract' skills of the curriculum, such as mastery of legal reasoning and critical thinking, which are ubiquitous in industry and regulatory guidance for law schools?[10] There is, after all, evidence of a decline in critical thinking skills among law students,[11] attributed variously to vocationalism and 'credentialism' in tertiary education, the impact of information technology on the brain, the 'millennial zeitgeist', and other factors.[12] There is much at stake in resisting this decline, namely to 'reclaim untapped human potential and harness valuable intellectual resources for the betterment of individuals and society'[13] and (less ambitiously, but equally important from a pastoral care perspective) to equip students with a basic requirement for success in future learning.[14]

As a return to a supposed pre-vocationalist golden age seems unrealistic, it is beneficial to consider whether the decline in critical thinking skills can be offset by teaching both sets of skills in a complementary way. This article offers analysis using a case study in embedding coding skills into a class on legal philosophy to complement scaffolded instruction in critical thinking skills. Part II explains the methodology of the case study and design of the model, including its development from the pedagogical literature on critical thinking, student centred and online learning, scaffolding, and reading strategies. It then reveals how coding is incorporated into the subject to complement and strengthen critical thinking skills and ends with a discussion on how these skills are to be measured. Part III describes the implementation of the case study. Part IV presents the results of the case study in relation to the criteria established in Part II (in summary,

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9 See National Legal Aid, <https://amica.gov.au>.

10 See, eg, Australian Qualifications Framework: 'Graduates at [a bachelor degree] level will have well-developed cognitive, technical and communication skills to select and apply methods and technologies to: analyse and evaluate information to complete a range of activities.'; Accreditation Standards for Australian Law Courses 4.5(a), <https://www.legalservicescouncil.org.au/Documents/accreditation-standards-for-australian-law-courses.pdf>; Australian Law School Standards 2.2.2; Learning and Teaching Academic Standards, TLO 3: <https://cald.asn.au/wp-content/uploads/2017/11/KiftetalLTASStandardsStatement2010.pdf>.

11 Brett A Brosseit, 'Charting the Course: An Empirically Based Theory of the Development of Critical Thinking in Law Students' (2016) 26(2) *Albany Law Journal of Science & Technology* 143, 148–49; Allan Ardill, 'Critique in Legal Education: Another Journey' (2016) 26(1) *Legal Education Review* 137, 138; Barbara A Kalinowskia, 'Logic *Ab Initio*: A Functional Approach to Improve Law Students' Critical Thinking Skills' (2018) 22 *Legal Writing: The Journal of the Legal Writing Institute* 109, 113–124; Law Associate Deans' Network Good Practice Guides 13: <http://www.lawteachnetwork.org/resources/gpg-thinking.pdf>.

12 Kalinowskia (n 11) 113–124.

13 Brosseit (n 11) 155.

14 Ibid 158.

acquisition of these skills without increasing the total learning burden) and offers suggestions for improvements. The article concludes that, while there is no simple answer to locating the proper balance between types of skill in the law curriculum, 'technical' skills such as coding can complement higher order reasoning skills without overburdening students through careful scaffolding and other strategies.

II WHAT IS CRITICAL THINKING AND HOW SHOULD IT BE TAUGHT AND MEASURED?

To reiterate, the question posed by this article is whether introducing 'technical' skills, in this case coding, necessarily displaces coverage of the 'abstract' skills that have predominated in legal education since its transition to a university-based model. The methodology here is to investigate this question using a class at the University of Canberra, namely Legal Theory as an undergraduate offering and its substantially co-taught Juris Doctor equivalent,[15] as a 'bounded' case study.[16] The teaching model in the case study combines training in basic coding principles with reading strategies and James and Burton's scaffolding model to impart critical thinking skills in law, albeit in one subject rather than the broader curriculum in their model.[17] The criteria for answering the research question in the context of a class in legal philosophy within a broader law curriculum are as follows. Upon completion of the class, did students (1) strengthen critical thinking skills, (2) learn basic coding skills, and (3) achieve these without a decrease in content coverage or an increase in the learning and assessment burden?

As for determining whether these criteria have been met, the methodology for this case study adopts a qualitative approach relying

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15 Legal Theory is a compulsory, non-Priestley 'unit' in the third year of a standard Bachelor of Laws degree at the University of Canberra taught over a semester. The postgraduate version was replaced in a redesigned online JD in 2022. In summary form, the learning outcomes are the ability to: interpret and evaluate major theories of law; critique case law, legislation and legal processes toward ethically minded career development; apply critical thinking and problem-solving skills to current legal issues; and establish strong theoretical foundations for further study. Subjects covered include the nature and purpose of law; the importance of the rule of law; the relationship between law and morality; the duty to obey law; the determinacy of law; and perspectives of gender, sexuality, race, and class. The graduate attributes associated with the unit include professionalism in communication, organisation, currency of knowledge and skills, integrity, creativity, critical thinking, and teamwork; global citizenship through creative use of technology; ethical, culturally respectful, sustainable behaviour; and a contextualised perspective of the (legal) profession. In addition, all units at the University of Canberra emphasise acquisition of skills in critical thinking, problem-solving, teamwork, independent learning, written and spoken communication and other work-related skills.

16 See Bedrettin Yazan, 'Three Approaches to Case Study Methods in Education: Yin, Merriam, and Stake' (2015) 20(2) *The Qualitative Report* 134, 139.

17 Nick James and Kelley Burton, 'Measuring the Critical Thinking Skills of Law Students Using a Whole-of-Curriculum Approach' (2017) 27(1) *Legal Education Review* 1, 6–9.

on the direct observation of this educator[18] and, to ensure multiple sources of data, evidence from a university-conducted anonymised student feedback survey.[19] Limitations from this survey arise from the broad wording of the question in its qualitative component ('Please provide any further comments on your learning experience in this unit'); its function as an internal improvement mechanism rather than a rigorous empirical research tool; and a small sample size (10 undergraduate students of 95 enrolled and 2 postgraduate students of 9 enrolled responded with written feedback). The research plan was open to 'progressive focusing', whereby conducting the research reveals nuances that require a re-evaluation of what is being measured or observed and how.[20] For example, as explained below, the approach from the outset was to adopt only provisionally the view that critical thinking should be conceptualised and taught as a process-oriented set of skills.[21]

This debate in the pedagogical literature on critical thinking includes three distinct perspectives.[22] First, the 'skills perspective' is rooted in logic, emphasising 'skills of reasoned argument and analysis'.[23] Critical thinking here is a 'process that emphasises a rational basis for beliefs and provides a set of standards and procedures for analysing, testing, and evaluating them'.[24] Other perspectives on critical thinking look beyond the ostensibly objective 'standards and procedures' of the first perspective. A second 'criticality perspective' advocates an open mind as a larger project towards ethical engagement with the world and, to this end, an active constructivist role in interpretation.[25] Third, the 'critical pedagogy perspective', extends this engagement towards explicit activism through 'critique of propaganda and hegemonic institutions'.[26]

The main reason this case study provisionally adopts the 'skills perspective' on teaching critical thinking is its potential to make the traditional domain of legal philosophy more accessible to students in the following ways. First, students benefit from understanding the differences between factual, interpretive, normative disputes and how to reduce arguments to conclusions and premises. This assists students

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18 See Robert E Stake, *The Art of Case Study Research* (Thousand Oaks: SAGE Publications, 1995) 72 in Yazan (n 16) 145.

19 The University of Canberra's 'InterFace Student Experience Questionnaire' ('ISEQ') runs at three points during the semester. It is under review at the time of writing.

20 Yazan (n 16) 141.

21 The Law Associate Deans' Network Good Practice Guides on TLO 3 (Thinking skills) written by Nick James provides a useful bibliography and summary of texts on legal reasoning and critical thinking: <http://www.lawteachnetwork.org/resources/gpg-thinking.pdf>.

22 Kate Wilson, 'Critical Reading, Critical Thinking: Delicate Scaffolding in English for Academic Purposes' (2016) 22 *Thinking Skills and Creativity* 256, 258.

23 Ibid.

24 Joel Rudinow and Vincent E Barry, *Invitation to Critical Thinking* (Harcourt Brace College Publishers, 3rd ed, 1994) 9.

25 Ibid.

26 Ibid. Ardill terms this activity 'critique' as distinct from 'critical thinking', which is synonymous with the skills perspective: Ardill (n 11) 139.

in navigating disputes about what law is: factual (legal positivism[27]), intrinsically normative (natural law[28]), or combinations of these (eg Kelsen,[29] Fuller[30] and Dworkin[31]). Second, the concepts of definition, ambiguity, and vagueness help to illustrate competing views on the determinacy of law such as legal realism[32] and Hart's 'penumbra' theory of law.[33] Third, familiarity with deductive, inductive, and analogy-based reasoning also helps to analyse the model of law presented by legal positivism: induction through the (legal) case method, analogy through synthesising precedent, and deduction when combining the principle so derived (the major premise) with facts (the minor premise) to arrive at a conclusion to a legal problem.[34] This is equally so for legal realism and its scepticism of deductive reasoning in law and the way in which the 'real rules' (extra-legal motivations of judges) might instead be discovered by induction. Fourth, students benefit from learning how truth is conventionally established to investigate both the factual claims of theories of law, but also normative 'truths' relying on appeals to either principle or consequence (the right versus the good). An example of the latter is evaluating Ronald Dworkin's rejection of consequences (policy) in favour of principles of fairness and justice in his constructivist approach to legal interpretation. Fifth, students can learn the major formal and informal fallacies to test such claims: the 'is-ought', 'appeal to nature' and 'appeal to authority' fallacies pose challenges for traditional natural law, for example.[35]

Is overlaying the process-oriented 'skills perspective' upon Legal Theory an improvement on the traditional approach of lectures and tutorials employing Socratic dialogue? Does the traditional method not rely implicitly on these 'standards and procedures' for understanding and evaluation anyway? Direct instruction and structured practice in applying these standards and procedures may save students time and

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27 The theory that there is no necessary connection between law and morality.

28 A rejection of the separation of state law and a higher standard, which may come from religion, nature, reason, etc.

29 Kelsen regarded law to be a hierarchy of norms underpinned by a basic norm (*grundnorm*), which has no content other than that subordinate norms ought to be followed: see Hans Kelsen, *Pure Theory of Law*, tr Max Knight (University of California Press, 1967).

30 Fuller took the purpose of law to be that of subjecting human behaviour to governance by rules and thus rejected the validity of purported laws incapable of achieving this purpose: see Lon Fuller, 'Positivism and Fidelity to Law — A Reply to Professor Hart' (1958) 71(4) *Harvard Law Review* 630.

31 Dworkin considered law and legal institutions to be infused with moral principles so that law provides a verifiable standard even in the face of apparent judicial discretion, albeit requiring an interpretive role for the judge that involves normative reasoning.

32 A school of thought that emphasises the judge's discretion over any pre-existing standard of law.

33 Namely that, while most application of law is deductive, there are cases on the periphery that involve genuine ambiguity and can only be resolved through judicial discretion: see HLA Hart, *The Concept of Law* (Clarendon Press, 1961).

34 Kenneth Yin, 'Overcoming Flaws in the Deductive Legal Process by Mastery of Syllogistic Logic – Elementary!' (2017) 10 *Journal of the Australasian Law Teachers Association* 179, 181.

35 Though a more nuanced application of the fallacy may vindicate Lon Fuller's attempt to derive an objective set of criteria of what law ought to be from an equally objective goal (to guide rational beings).

effort absorbing novel and challenging ideas about law. And the 'skills perspective' may risk overburdening a subject that today must also cover deep critique — 'critical' in the sense of post-liberal perspectives such as radical feminism, critical race studies, critical legal studies and postmodernism. Yet it may be overly optimistic to assume that even Socratic dialogue in tutorials necessarily stimulates deep learning. Some commentators question whether passive participants in these discussions learn vicariously through the active engagement of an accomplished or vocal minority.[36] It may also herd students towards predetermined (and therefore uncritical) answers acceptable to the questioner.[37] New possibilities in online delivery have also changed the context for the debate over the place of the Socratic method in legal education.[38] Online discussions in randomised breakout groups and real-time collaboration on written exercises can facilitate broader participation and individualised monitoring and feedback, which allows for careful scaffolding.

A *Scaffolding for Critical Thinking*

A scaffolding approach facilitates instruction in the 'standards and procedures' of critical thinking and, in that it is responsive to class members of all abilities, also departs from a traditional Socratic approach. James and Burton describe a model of scaffolding critical thinking skills progressively across the entire law curriculum from interpretation and analysis (which delves deeper into unstated aspects of the argument)[39] toward the higher-order educational objectives of evaluation and synthesis (the culmination of the other stages in an original argument).[40] This model recognises that plausible interpretation and analysis are vital preliminary steps toward evaluation and often overlooked skills, even within the hermeneutic-oriented discipline of law.[41] The 'standards and procedures' approach to critical thinking allows students to skilfully cast arguments into express and implied premises and conclusions and identify other assumptions fairly attributable to the author. A possible objection is that interpretation and evaluation should occur simultaneously or even that interpretation in isolation displaces evaluation (indeed, a key criticism made of legal positivism). To address these concerns, the model used here is one of a progressive cycle of increasingly sophisticated interpretation *and* evaluation, albeit where the most intensive supports are provided at the interpretative stage.

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36 Michael Hunter Schwartz, 'Towards a Modality-Less Model for Excellence in Law School Teaching' (2020) 70(1) *Syracuse Law Review* 115, 117.

37 Ibid 119.

38 Learning materials in Legal Theory are completed both synchronously (using Blackboard Collaborate videoconferencing software) and asynchronously on forums on the university learning management system (Canvas).

39 James and Burton (n 17) 7.

40 Ibid 6–9.

41 Mark Van Hoecke, 'Legal Doctrine: Which Method(s) for What Kind of Discipline?' in Mark Van Hoecke (ed), *Methodologies of Legal Research: Which Kind of Method for What Kind of Discipline?* (Hart Publishing, 2011) 3.

This focus on the interpretative stage is also justified because students accustomed to viewing the educator primarily as subject-matter authority paradoxically need support to transition to an active role in discovering meaning for themselves. This is particularly so where meaning is implicit or ambiguous, especially for those who have had limited exposure to the humanities. Yet students must confront such interpretive disputes, differentiated from standard factual disputes in their layered complexity, disputability, and contextual nature.[42] The problem is how to bridge the gap between interpreting simple arguments and those in legal philosophy that are not merely more complex, but require a constant re-evaluation of the nature of interpretation itself.[43]

'Scaffolding' helps students navigate this complexity. The concept encapsulates more than just graduated complexity, and entails gradually removing supports to achieve greater student autonomy.[44] Other aspects of a scaffolding approach include working toward a major task through smaller set tasks, clear instructions, and prioritisation of participation as a learning opportunity over any predetermined output.[45] Scaffolding is an inherently social concept and tasks may begin with a hands-on role for educators and then peers before students are expected to work independently.[46] Scaffolding may be 'designed-in', in the sense of following a finely calibrated plan of work, or 'contingent' through spontaneous interactions between educator and student that elicit synthesis and evaluation and embed new knowledge in existing knowledge.[47] Asynchronous dialogue can also be shared more broadly and can provide clearer structure through checklists and rubrics. Students should also be encouraged to self-evaluate their own performance, a process that also benefits from structure and scaffolding.[48]

When cultivating the specific skill of interpretation, 'contingent' scaffolding includes monitoring students' comprehension, clarifying the meaning of words and phrases, providing context, and casting doubt on implausible interpretations within an encouraging, low-risk environment.[49] Support for interpretation here might entail modelling the reasoning process toward a plausible interpretation where students have been unable to arrive at this independently. These diminishing supports continue up until summative assessment, when the

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42 Rudinow and Barry (n 42) 44.

43 Examples include Ronald Dworkin's extended analogy of the chain novel to show the interpretive and moral choices underpinning the common law: see Ronald Dworkin, *Law's Empire* (Harvard University Press, 1986); radical theories that question the neutrality and determinacy of law; and HLA Hart's rebuttal, employing the core and penumbra schema to account for judicial discretion: see Hart (n 33).

44 Kate Wilson, 'Scaffolding Theory: High Challenge, High Support in Academic Language and Learning (ALL) Contexts' (2013) 8(3) *Journal of Academic Language & Learning* 91, 93 ('Scaffolding theory').

45 Ibid.

46 Ibid 93–4.

47 Ibid 95.

48 Ibid.

49 Ibid 95.

consequences of an implausible interpretation are misdirected critique and lost marks. Even at this stage, it may be appropriate to provide a rubric or a model reasoning process that students can adapt to future interpretive tasks. The balance here is crucial: while experience and qualifications justify the educator's role in setting the boundaries of plausible interpretation, there is a risk that any model answer received as canonical may perversely 'debilitate and disempower' students.[50]

Reading strategies are also invaluable for scaffolding for analysis and interpretation.[51] Scaffolding here might begin with direct instruction in the 'domain knowledge' (familiarity with the field)[52] and encouraging students to be reflective: to monitor for problems of motivation and comprehension, solicit opinions from peers, and be conscious of reading strategies and how to select one appropriate to the text.[53] The literature identifies at least three groups of reading strategies. Through study skills courses by way of induction to tertiary studies, many students will be familiar with 'default' strategies such as simple notetaking, highlighting, mental paraphrasing for meaning, and organising information in a logical, linear fashion.[54] At a higher level of abstraction, 'rhetorical' strategies involve thinking globally about the context of the text to identify its intended or actual social function and whether it is apt to achieve this.[55]

The method employed in this case study primarily belongs to a third group, 'problem-formation' strategies, which entail an actively analytical posture to the text by, for example, making predictions and hypotheses about the author's intended meaning in a passage and its contribution to the general meaning of the text.[56] Prompts for scaffolding this strategy into reading exercises include: What is the context for the proposition? What further information is needed and where is it available? What meanings can be hypothesized, and which are the most plausible or have superior explanatory power over other parts of the text? Are there unexpressed premises or conclusions? Is the interpretation too broad, narrow, or imprecise? Are there missed interpretations that are inconvenient, undesirable, or incompatible with the reader's own unstated assumptions? Are there underlying conventions of interpretation or stipulative definitions? How have others interpreted this or similar texts?

For some, this approach may seem too positivistic and artificially inductive in its search for intent. Yet it does not preclude the hermeneutic dialogue suited to the humanities if students understand their own part in attributing meaning to complex texts. Rather than

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50 Wilson, 'Scaffolding Theory' (n 44) 93.

51 Alex Steel et al, 'Critical Legal Reading: The Elements, Strategies and Dispositions Needed to Master This Essential Skill' (2016) 26(2) *Legal Education Review* 187, 197–8.

52 Ibid 195, 209–10.

53 Ibid 205.

54 Ibid.

55 Ibid.

56 Ibid. Needless to say, this strategy is premised upon the view that a legal text has some degree of determinacy of meaning, which is problematic in a class where this is a moot point.

simply transposing a scientific model on an interpretive exercise, soliciting hypotheses of meaning in this way is primarily a way of inoculating against the insularity, confirmation bias, haste, and sloppy thinking that a passive attitude to a text tends to breed. With these foundations, students can develop greater capacity to generate plausible readings of even the most complex text.

B *Coding*

Coding enters the model as a means of consolidating critical thinking skills and subject content. Students execute a program written by this educator in the Python language to collectively generate a database of structured arguments on topical issues covered in the second part of the course, which covers post-liberal critiques of law. An example of such an argument is 'Coercive control should be criminalised' in a module in which radical feminism was the focus. Students input the elements of an argument: conclusion, premises, sub-premises, objections, and rebuttals.[57] The program repackages this data into paragraphs with signposts such as 'There are three reasons', 'First,', 'Therefore,' etc. adapted to the data.[58]

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[57] See Google Colaboratory, <https://colab.research.google.com/drive/1GgOcP36W4W6DulpdsgZMSoMd6LY4h6cn?usp=sharing>.

[58] As a simple example:

Input

Welcome to the Legal Theory argument generator. Press enter to skip a step.
Enter conclusion: Legal Theory is fun
Enter a key term or background info (one sentence): Legal Theory is a course that explores the nature and purpose of law
…
Enter a premise: It is interesting to consider different perspectives on law.
Enter a subpremise: Understanding different perspectives makes you question your own views
…
Enter a premise: Debating ideas can be a sociable activity
Enter a subpremise: Some people get worked up in disagreements
Enter a subpremise: But everyone can learn to express disagreement respectfully
Enter a subpremise: This enhances your social skills
…
Enter an objection to one of the premises: Too much empathy with different perspectives can make you a relativist
Enter an objection to one of the premises: Sociable experiences can be sought elsewhere
…
Enter a rebuttal to one of the objections: It is better to be a relativist than intolerant
Enter a rebuttal to one of the objections: Sociability makes learning more effective

Output

This essay argues that Legal Theory is fun. By way of background, Legal Theory is a course that explores the nature and purpose of law. The reasons supporting the conclusion are as follows. First, it is interesting to consider different perspectives on law. Understanding different perspectives makes you question your own views. Besides, debating ideas can be a sociable activity. Some people get worked up in disagreements. But everyone can learn to express disagreement respectfully. This enhances your social skills. The following objections may be raised. First, too much empathy with different perspectives can make you a relativist. Additionally, sociable experiences can be sought elsewhere. However, the following rebuttals may be made.

To capitalise on the opportunity for students to learn the mentality and basic concepts of coding, the program is contextualised with a presentation on how it developed from one problem (how to encourage structure and signposting in arguments) into a set of smaller problems and solutions, such as a customisable number of premises using variables[59] and loops;[60] avoiding repetition in signposting using data structures[61] and a randomisation function;[62] and ensuring neat output using string[63] manipulation. Students are taken through a planning flowchart and actual code annotated in Google Colab, a free web-based application that displays an entire process from developing, documenting, and executing code.[64] Students are also provided an incentive to deepen this exposure through an informal competition to fix potential flaws in the existing code, for example that it is not as conducive to students thinking their way through to an undecided conclusion as a thesis-antithesis-synthesis structure or that the specific premises, objections, and rebuttals could be better aligned to each other.

C *Measuring Skills Alongside Substantive Learning Outcomes*

In summary, the approach in this case study in integrating skills into legal philosophy is to deploy and measure an explicit, scaffolded, 'skills perspective' approach to critical thinking with intensive supports for the interpretative stage and coding as a contextualised learning aid. The dual aims are to enhance students' ability to evaluate arguments in legal philosophy and facilitate acquisition of critical thinking skills. This is posited as a departure from traditional teaching methods that mainly serve a shrinking core of students with developed critical thinking skills. The methodology is a provisional one only, and open to evolution. To this it might be objected that the 'skills' and 'normative' perspectives in the pedagogical literature on critical thinking are incompatible, primarily in their epistemology. This mirrors competing positivist and constructivist methodologies of empirical research, and indeed theories of law, which range from analytical positivism through to its various situated critiques. In this case study, whether criterion (1) 'strengthen critical thinking skills' can be assessed independently of 'content coverage' in criterion (3) is dependent on what perspective is taken upon 'critical thinking'. In other words, if critical thinking *is* the critique intrinsic to a class on legal philosophy, then (1) and (2) should not be separate criteria. Nevertheless, this study maintains the separation provisionally for instrumental reasons, primarily ease of

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First, it is better to be a relativist than intolerant. What is more, sociability makes learning more effective.

59 A placeholder for a changeable data value.

60 A sequence of instructions repeated until a certain condition is met.

61 Python uses 'lists', 'dictionaries', and 'tuples' to store data, for example a list of names.

62 A function is reusable code that performs a single action, in this case choosing phrases randomly.

63 A sequence of characters.

64 See Google Colaboratory, <https://colab.research.google.com/?utm_source=scs-index>.

instruction, conceptualisation and measurement. It is not the only problematic distinction: the study is premised on a distinction between 'technical' and 'abstract' skills, yet the skills perspective on critical thinking has many technical elements, and coding can conversely be conceived of as an 'abstract' problem-solving skill. Again, the main purpose of this case study is not to interrogate this distinction, but instead to explore how the law curriculum can perform better in imparting relevant skills to today's law students, whether these skills are provisionally characterised as abstract or technical, academic or vocational.

When measuring the criteria, there is inevitably a subjective element to an educator's assessment of whether students demonstrate familiarity with coding principles and mastery of the standards and procedures of critical thinking. This subjectivity partly justifies the direct observation approach of the study. Other considerations such as whether students feel overburdened or alienated are better measured through student feedback. Matters of measurement will be revisited after the following explanation of how the model was implemented.

III THE CASE STUDY: INTEGRATING SKILLS INTO LEGAL PHILOSOPHY

In many respects, the implementation of Legal Theory in 2020 resembled previous iterations: short, pre-recorded lectures and (for students completing the class synchronously) a two-hour seminar with guided reading-based discussions and role plays (for example, a fictional court case testing Kelsen's grundnorm principle in a coup d'état). Other learning aids were used such as quizzes, a 'topical issues' podcast, and a flashcard app.[65] Other than using coding to generate a database of arguments, the main structural change was the comprehensive integration of critical thinking skills. The model begins with an introductory module on critical thinking adapted to legal themes.[66] In this module, students differentiate factual, semantic, interpretive and normative disputes;[67] critique and apply methods of 'truth testing' appropriate to the type of dispute (where normative, using appeals to principle or consequence); match short written arguments to diagrams indicating premises, sub-premises, counter-arguments and conclusions; spot fallacies and other barriers to critical thinking;[68] and finally, cast increasingly complex arguments into premises and conclusions as a procedural template to analysing and evaluating the substantive content of the unit.[69] The implied conclusion for the final exercise reproduced here was obfuscated by omitting signpost words (such

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[65] Co-designed by this educator. See Mnemo's Library, <https://mnemolibrary.com/discover/topic/Legal%20Theory>.

[66] Drawing from Rudinow and Barry (n 24).

[67] Such as 'We need stronger anti-terrorist laws' (normative) vs 'Anti-terror laws already deprive people of their civil rights' (interpretive, implied normative).

[68] Such as 'Battered women shouldn't complain if they don't leave their abusive husbands' (failure to see beyond one's own frame of reference, hasty generalisation) and 'Tax avoidance is legal so we should all do it' (is-ought fallacy, appeal to the majority).

[69] See Simon Bronitt and Bernadette McSherry, *Principles of Criminal Law* (Thomson Reuters, 3rd ed, 2010) 17–18.

> as 'because' and 'therefore'):A law student is unlikely to be asked to define utilitarianism in a job interview, nor wax lyrical on *grundnorm* theory with a client, and rarely spar with a judge on the differences between 'soft' and 'hard' legal positivism. And the idea of the university as the crucible of enlightened citizens is anachronistic, if it ever were true. If students go on to practise law, they must nonetheless understand that it is a profession, not a trade, and cannot be reduced to a set of vocational skills (though ethical reasoning is indeed a skill in itself). They must test their values against alternative political positions lest they uncritically import biases into the legal system as lawyers, prosecutors and judges. As honours or graduate research students, it would be remiss to merely describe without subjecting statute and case to critical appraisal. It would not be sufficient today to level this critique solely on liberal grounds of consistency, equality under the law, and economic efficiency, without subjecting these ideals themselves to critique. Those who go on to diverse careers in politics, government, business, civil society, the arts and communications will inhabit a realm seething with factual and ideological contestation that must be navigated by critique and persuasion, a task aided by a thorough understanding of law: what it is; what it is for; how it intersects with morality and social norms; who it serves; and, most importantly, how it can be improved.

The intent behind burying the argument in this convoluted text is to elicit contextual analysis, encourage signposting in students' own writing, and reinforce the interpretive nature of the exercise. That is, instead of viewing the argument as an artefact to be revealed through observation, students learn that judgement, knowledge, and experience is required to choose the level of abstraction at which to cast the argument; what *not* to cast as 'background information' or mere rhetoric; and the degree of charity afforded to the author in filling apparent gaps through implication and context. To build this capacity, the following is an example of how contingent scaffolding for a 'problem-formation' reading strategy through dialogue might unfold.[70] The immediate goal is to identify an implied conclusion:

> QUESTIONER: Before we start, what further information is needed and where is it available?
>
> STUDENT 1: I googled 'anachronistic'. It means out-of-date.
>
> QUESTIONER: What is your initial reading of the text?
>
> STUDENT 2: That lawyers should have a range of theoretical and practical skills.
>
> QUESTIONER: Are there other possible readings?

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[70] The intended argument structure was as follows:
Counterargument/objection
- University studies should be useful for employment, but legal theory is not practically useful for lawyers

Premises/rebuttals
- The legal profession requires higher-level thinking than a 'vocational' trade and lawyers should be aware of political biases in law
- Law students who do not practise law need to analyse, critique, and persuade
- Research students need to analyze and critique law
- Each of these is acquired through the study of legal theory

STUDENT 3: 'Lawyers *and other professionals* should have a range of theoretical and practical skills.' That would explain the reference to 'other professionals'.

QUESTIONER: Is that too broad? Too narrow?

STUDENT 3: Maybe too broad. The focus is on the theory of law, rather than just practical things. So a theoretical understanding of law is required for professionals because they will 'face factual and ideological contestation' in their careers.

QUESTIONER: *All* professionals?

STUDENT 3: There is a focus on law students. How about 'Law students benefit in their careers from a theoretical understanding of law'?

QUESTIONER: What is a 'theoretical understanding of law'?

STUDENT 3: From the context of the final passage, what law is and how it can be better.

QUESTIONER: What is the context for this text?

STUDENT 4: It looks like an editorial. The context could be that the author is arguing for reform.

QUESTIONER: What kind of reform?

STUDENT 4: To include the philosophy of law and a reformist perspective in legal education.

QUESTIONER: What about the reference to 'factual' contestation?

STUDENT 4: So add fact checking to the curriculum as well.

QUESTIONER: Can we summarise the conclusion now?

STUDENT 1: 'Legal education should include philosophy of law, including a reformist perspective, and fact checking'.

QUESTIONER: Can the conclusion be summarised any further?

STUDENT 1: Well, philosophy of law involves a reformist perspective and fact checking anyway so 'Legal education should include philosophy of law'.

In this dialogue, students are led through an adaptive checklist of generic and follow-up questions to hypothesise and clarify meaning and expose contradiction and anomaly without necessarily being herded toward a precise recital of the educator's casting of the argument. Indeed, in any text of significant complexity, even with clearer signposting, it should be expected that interpretive outcomes will differ (within a range of plausibility).[71] An objection might be raised that this

[71] Here is this educator's casting, which differs subtly from the one above:
Conclusion: law students should study legal philosophy
Counterargument/objection: legal philosophy is not useful for careers
Premises/rebuttals
1. Lawyers require higher-order cognitive skills
2. Lawyers require sensitivity to political bias in law
3. Non lawyer law graduates require higher-order cognitive skills
4. (Law) research students require higher-order cognitive skills

is simply an example of the very Socratic dialogue called into question in the preceding section. However, the model is structured around small reading groups of about five members in which the role of questioner can be devolved to a peer level and the students take turns answering upon natural inflection points in the dialogue. While the structure could be further flattened by rotating the questioner role at these points, the approach here recognises that not all students are always sufficiently prepared or confident to skilfully adapt a checklist of questions to an evolving dialogue.

In this manner, over several sessions, students are encouraged in groups (synchronously or asynchronously) to cast arguments written by the educator synthesising various readings on the nature of law. Participation in these exercises is a minor assessment item, with a focus on process rather than outcome. Students are given progressively less guidance leading up to the first major assessment item, which is an analysis in the form of an annotated casting of a dense, un-signposted argument concerning judicial discretion.[72]

The skills of evaluation and synthesis come to the fore as the substantive content of the remaining sessions shifts to contrasting liberalism with critical theories in various areas of law and policy. Here, the full spectrum of educational objectives in James and Burton's paradigm of teaching critical thinking are mastered progressively from interpretation and analysis toward the higher-order educational objectives of evaluation and synthesis.[73] The first exercise is one of basic interpretation and familiarises students with the argument database generated using the computer program described. Students are allocated one submission in the argument database as raw material to summarise and explain through contextualisation an explicit point in the submission. In parallel, students apply their knowledge of the

5. The study of legal philosophy imparts higher-order cognitive skills and sensitivity to political bias in law

[72] The text for this assessment item was as follows: 'It would be consistent with separation of powers theory for judges to voluntarily refer questions of legal meaning back to the originating legislature (in the 'corporate person' sense) if, in the judge's opinion, the tools of legal reasoning for reducing ambiguity or vagueness through statutory interpretation have been exhausted to no avail. This would justify the reintroduction of moral reasoning into the equation, but not on the part of the judge. A potential benefit includes better law making in the first place, but fundamentally, such a system would be compatible with the positivist notion of law as a matter of fact and bypass that vexed theoretical debate.' The intended conclusion is that judges should seek interpretative guidance from the legislature to resolve uncertainty in the application of law, is express, albeit obscurely conveyed. The premises could be cast as follows:

- the legislature is elected to engage in moral reasoning, but not the judiciary
- if referral is voluntary, it is consistent with separation of powers theory
- a legislature with responsibility to resolve disputes would make clearer laws in the first place
- there is no theoretical consensus on whether law is a social fact and therefore whether moral reasoning by judges is legitimate, but this would not matter if judges deferred on moral questions

[73] James and Burton (n 17) 6–9.

discipline-specific conventions of quotation, elision, and emphasis.[74] For example:

> Submission One argues that law is a profession at great risk of automation given the formulaic nature of transactions: 'Graduates must work with AI tools … *or be replaced by them*.' As a result, students must learn what additional value they can add to a workplace.

The second exercise is one of analysis and reinforces skills acquired in the first half of the unit. Students should first cast an allocated submission into its components, which is assisted by signposting inserted by the computer program described above. They then identify factual, interpretive and normative premises. If students are unable to identify any normative premises, they should indicate whether this is due to an implied premise, a non-normative conclusion, an is-ought fallacy, or merely defective expression. Take the conclusion, 'The university cannot be held liable to refund the accommodation fee as the students were not stopped from using the accommodation during the pandemic.' The missing implied normative premise could be that students should pay for a freely contracted service they could have used but chose not to. Or it could be that the universities should not be responsible for government decisions to lock down campuses. Or the conclusion might not be normative at all, in which case the implied interpretive premise might be 'The legal doctrine of frustration does not apply to these facts'. In this passage, even with signposting, the ambiguity caused by the unstated premise is compounded by imprecise terms and the passive voice, but contextual analysis may point toward one interpretation as the most plausible one.

It is not unusual, even at this stage of the unit, for submissions to leave normative premises unstated. Students are therefore required to draw from their knowledge of legal philosophy to consider what premises might be implied from the unstated assumptions of the author. As an example, in a submission supporting the passage of the *Meriba Omasker Kaziw Kazipa (Torres Strait Islander Traditional Child Rearing Practice) Act 2020* (Qld), a typical submission identified that the law recognizes Torres Strait culture (factual) and strengthens community bonds (interpretive). Having studied substantive legal theories in parallel to this exercise, students should be able to draw from Critical Race Theory to generate normative premises,[75] or alternatively, modern liberalism's departures from a formal equality standard.

The third exercise corresponds to evaluation. Students assess whether the premises in an allocated submission are true. How this is established depends on the type of premise and, as James and Burton note, the appropriateness of the criteria for evaluation may differ

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[74] Namely, that prescribed by the fourth edition of the *Australian Guide to Legal Citation*: see Melbourne University, <https://law.unimelb.edu.au/mulr/aglc/about>.

[75] For example, that past injustice justifies special measures or that diversity is inherently valuable.

according to context.[76] In general terms, students are familiar with, if not necessarily expert at, assessing factual claims. After the interpretive exercises of the first part of the class, they are also equipped to evaluate claims that attribute meaning to a text or state of affairs. However, some students struggle to evaluate normative premises and risk falling into radical relativism or dogmatic universalism. Given this, it may be sufficient to ensure that students are sceptical of normative positions that embrace appeals to principle or consequence simplistically without considering at least some of the critiques and concessions each of these branches of ethics has made to the other, which are covered in the introductory module to critical thinking. Students should also be encouraged to look beyond the 'truth' or otherwise of a normative premise toward how determinative it is when embedded in a complex argument with multiple factual and interpretive premises. In other words, students should consider how the normative proposition might need to be adapted to the 'real world'. The argument here is not for casuistry, rather that normative values such as fairness are often assessed more easily in concrete terms and can moderate ideological differences irreconcilable at an abstract level.

To illustrate this, the topic in 2020 for this exercise was the degree to which a developing country should be permitted to use public health exceptions (such as parallel imports and compulsory licences) in international patent agreements. Submissions included express or implied normative premises drawn from the weekly reading such as 'Scarce commodities should be privatised to encourage production and efficient allocation', 'Moral limitations should be placed on commodification', and 'Privatisation distributes wealth inequitably and corrupts politics'. The class readings provide ample defences and critiques of these positions. Rather than merely rehearse these in an abstract sense, students were asked to list factual and interpretive matters that might vitiate appeals to principle or consequence in the concrete dispute. For example, a consequentialist pro-privatisation argument (in favour of the nation representing the patent holder as against the developing country) may be less compelling where there are no alternative treatments for the specific disease; where the disease is overwhelming a nation's health system; where profits are already very high; where the treaty forms part of a broader hegemonic relationship between nations; where the exceptions are relied on within the spirit of the treaty (for genuine health reasons rather than merely economic ones, for example); or where the intellectual property was developed with significant public funding.

The fourth exercise is one of synthesis. It involves students working in groups to interpret, analyse, evaluate and synthesise a range of submissions into an original argument. For example, from submissions on 'Should coercive control in families be criminalised?', students might identify as sub-issues: 'What, if any, are the proper limits upon

[76] James and Burton (n 17) 8. They suggest accuracy, legality, reasonableness, persuasiveness, theoretical or ideological soundness, and fairness as examples of possible criteria in legal contexts.

state intervention in family relationships?', 'Can coercive control be defined adequately?', and 'What are the consequences of not criminalising it?'. Students plan out a paragraph or essay section that evaluates competing factual and normative premises to resolve each sub-issue in the form of a concise premise that would support an essay conclusion. As part of this synthesis, students are encouraged to develop originality and ingenuity by diarising insights and connections that arise spontaneously, including subsequent 'eureka' moments that often occur in subsequent quieter moments of reflection.[77]

By the final stage of this scaffolded model, students should require minimal support, though this will differ by individual and group. Up to this point, examples of support include providing real-time and subsequent feedback on student work, but also early monitoring to ensure that students understand the task and are generally on the right track. Upon completion of these four exercises, students better understand what is expected from the final assessment item, in this case an essay on a topical issue with legal theory dimensions. To summarise, the students must interpret and analyse arguments into their express and unstated component parts; evaluate factual, interpretive, and normative premises; and synthesise the results into a creative and persuasive original argument.

IV RESULTS AND ANALYSIS

A *Student feedback*

Beginning with student feedback in the university-administered ISEQ survey, the quantitative data suggests a mixed and even polarised reception. In response to the question 'Learning experiences in this unit will help with my work-related goals' three undergraduate students disagreed, eight agreed, and two strongly agreed. Of three Juris Doctor students, one strongly disagreed and two strongly agreed. In response to the question 'Overall I am satisfied with how the staff in the unit supported my learning', one undergraduate student strongly disagreed, five disagreed, seven agreed, and one strongly agreed. Of three Juris Doctor students, one strongly disagreed, one agreed, and one strongly agreed. In response to the question 'Overall I am satisfied with the quality of this unit', two undergraduate students strongly disagreed, three disagreed, nine agreed, and one strongly agreed. Of three Juris Doctor students, one strongly disagreed, one agreed, and one strongly agreed. It is difficult to derive conclusions from these data without first considering the qualitative data.

Those students with a positive experience of the subject welcomed attempts to make a highly theoretical and abstract subject more

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[77] Kylie Andrews, 'The Aha! Challenge: Using Brain Teasers to Understand Eureka Moments', *ABC News* (Online, 9 August 2019) <https://www.abc.net.au/news/science/2019-08-09/aha-challenge-measures-insight-aha-moments/11396746>.

engaging, particularly through innovative teaching techniques and technologies:

> I have really enjoyed [the teacher's] innovative ways of teaching including the use of the Podcast and the argument generating tool. Thanks! (UG, final survey)

> [The teacher] makes an incredibly dry unit interesting. (UG, mid-semester survey)

> I like how the unit is delivered and is very interactive. It is more than just delivery of content, but rather a use of multiple forms of media that help to reiterate important legal concepts. (UG, early-semester survey)

Most students were more ambivalent, however. In relation to one of the criteria of the case study, student burden, there are signs that some students found the workload excessive:

> [The teacher] is extremely knowledgeable and presents a very difficult unit in a logical way. The biggest issue is that there is too much content to be addressed over the time available. (PG, final survey)

It is unclear from this feedback whether the volume of work to be covered in seminars or the total content covered over the semester was perceived to be excessive. The following comment suggests the former, albeit as a grievance over expectations in the context of competing external burdens:

> I think the way [the teacher] designs the units [is] really good. …[but] I think [the teacher] is over prepared for the tutorials. Often we run out of time to do all of the activities for the allocated tutorial. … Especially when student[s] work full-time and have to take the time to prepare that work after going to work, take time out of their work day to attend a class, just to discover the work they did won't be covered. (UG, final survey)

These external burdens were evidently compounded by the pandemic:

> I can see the effort [the teacher] is putting into making this unit interactive and engaging, but unfortunately it is becoming a unit that feels unnecessarily confusing and onerous above what would be normally expected of law students trying to cope with studying during COVID. (UG, early-semester survey)

While anxiety about understanding concepts is not a sentiment confined to the 2020 iteration of Legal Theory, the following comments indicate a connection between the perception of burden or confusion and the approach of integrating critical thinking and reading strategies. In other words, the newly introduced lens of critical thinking (or at least, heavy contextual analysis) is perceived by some as a burden extraneous to the core content of the class and the law curriculum:

> This class should be titled 'advanced English' and probably the most stressful unit when it doesn't need to be … and it is due to the over complication of everything. (UG, final survey)

> The actual legal theories which we have learnt about (eg. Kant, Fuller, Dworkin etc) is very interesting although the assignments and class

> activities which include 'signposting' and outlining premises and conclusions to arguments is like an advanced English class rather than making the most of the legal theories we are learning about. I find it extremely hard to follow and understand, no matter how many classes I attend or how many things I read, a few other students I have spoken to have felt the same way. As a suggestion, it would be great, relevant and interesting to do an assignment comparing and evaluating the different theories (of our choice). I feel as though that's a much better way to learn and apply the theories to practise, rather than learning (what it feels to be like) advanced English. I don't really see the use of doing this kind of work in future legal practise and it sometimes feels like a waste of time. (UG, mid-semester survey)

> It appears that we are learning about the history and development of the theory behind the law, which is incredibly interesting, but also about creating an argument - better writing and English usage, again, incredibly interesting. [The teacher's] knowledge is undoubted on both topics. However, as interested in learning as I am, and keen to read and develop as best I can in the time available, I am finding that my feelings about the unit is that I am learning two separate subjects at the same time - using material from one to apply in learning another… (PG, final survey)

There are also hints in the feedback that students are not necessarily reassured when guided through interpretive exercises, perceiving 'answers' (presumably interpretations that unfold in class) to be removed from any process of reasoning accessible to them.

> I don't understand much of anything happening in this unit. The tute questions are convoluted and confusing — and I get that this is the point — but the answers seem to be so subjective and obscure that I cannot possibly work out how anyone could come to that conclusion. (UG, mid-semester survey)

Some students might be more open to the general approach, but express frustration that the connection between critical thinking skills and the theoretical knowledge of the subject was not communicated more effectively, at least midway through the subject as assessment items near:

> It is clear that [the teacher] has put a lot of effort into this unit, particularly in adapting it to an online environment. However, I have become increasingly frustrated with this unit, in particular the seminars/tutorials. Instead of using these sessions to consolidate content raised in the lectures and readings, I am becoming very displeased with the focus on signposting and casting arguments, without a clear explanation of how this relates to different legal theories. (UG, mid-semester survey)

> There is seemingly no reference to signposting, premises, conclusions or anything of the like in any of the readings or lectures we are doing and it is frustrating when this seems to be the basis upon which this unit is being taught. It is concerning to me that I have an unknown as to what is required or to what extent this kind of text-analysis will be needed to pass the unit. The 'legal theories' are taking a back seat to what seems to be an advanced English class kind of format. There has been a lack of explanation as to how the analysis content fits within the unit, in my opinion. (UG, mid-semester survey)

Some students focused instead on a perceived failure of contextual analysis to facilitate understanding of the subject in small, decentred groups:

> My biggest concern for this unit is the reliance on breakout groups. I understand how difficult it is teaching in the current learning environment — however, breakout groups are not helpful to my learning. Last week's session where we worked through the first problem together was the most I've learnt because we go through the whole variety of questions (rather than a select few) and can actually bounce ideas from each other. Breakout groups are so frustrating because contribution is so limited - working on problems as the whole group removes this issue. Other than that, excited for the unit! (UG, early-semester survey)

B *Educator Observations*

The student feedback above has the advantage of conveying the student experience and has important lessons for the educator, particularly where themes emerge across feedback. It would be a mistake to rely solely on this feedback, however, for the following reasons. First, even where themes do emerge (such as the 'advanced English' theme), this does not necessarily reflect the view of the majority who either did not participate in the survey or did not feel strongly negative or positive enough about the experience to contribute qualitative feedback. Second, while student feedback may express valid dissatisfaction with how pedagogical goals and methods are communicated, student views on these goals and methods are not necessarily informed by the literature and instead may merely reflect student expectations rooted in past experience or attitudes to their education. These attitudes may in turn be influenced by the vocationalism to which such goals and methods are designed to resist. The following observations of this educator combine objective and subjective measures of student success and to some degree triangulate the data from student feedback.

Assessment is the main tool for measuring the acquisition of skills such as critical thinking. In this model, critical thinking was not assessed independently of the three assessment items testing mastery of the unit content. However, interpretation, analysis, evaluation and synthesis were assessment criteria for each item at a standard corresponding to the intermediate level of James and Burton's marking rubric designed for progressive implementation across the entire law curriculum.[78] Because this did not have a comparator in earlier iterations of the subject, the main objective measure of assessing whether students benefited from the additional lens of critical thinking in mastering the subject is the grade distribution. In the 2019 iteration of the subject 15% of undergraduates failed or did not complete the unit, 52% received a pass, 24% a credit, 22% a distinction, and 3% a high distinction. In 2020, these figures were 12%, 9%, 40%, 30%, 4% respectively. The main change here is a dramatic increase in credits at

[78] James and Burton (n 17).

the expense of passes. While the assessment criteria differed across cohorts, the standard of marking applied was one that developed over 10 years of this educator teaching the subject and there were no obvious differences between the two cohorts that would explain the differences in grade distribution.

Turning to more subjective observations, students generally did not transition smoothly from simple to complex exercises in contextual analysis, including the first major assessment item, and struggled to cast arguments plausibly. A lack of genuine understanding was also reflected in a tendency to reproduce verbatim passages of the target text rather than summarise these into core premises and conclusions. Deficient calibration of difficulty level and time constraints in these exercises may have made comprehension difficult, but another apparent factor was insufficient domain knowledge, which relied on student self-study under a 'flipped classroom' model. There were also varying levels of preparation for later exercises involving argumentation and evaluation, where many students failed to support premises with sub premises and used rebuttals that were repetitive or did not genuinely address objections. With regard to coding, only two students submitted remixed code for the informal competition. The extent of application of coding for most students therefore was merely executing the program. On the other hand, most students performed noticeably better than previous cohorts on the final summative essay assessment applying the full range of critical thinking skills to a topical issue in Australian law.

C *Analysis*

Using the above data, it is possible to return to the criteria for whether the goals of the model were met: did students (1) strengthen critical thinking skills, (2) learn basic coding skills, and (3) achieve these without a decrease in content coverage or an increase in the learning and assessment burden? While the data do not provide clear answers to these questions, the following tentative conclusions are possible. First, any improvement to critical thinking skills was observable only indirectly, for example in superior analysis, evaluation, and argumentation in the final assessment item relative to previous cohorts. Second, very few students demonstrated applied coding skills. Third, student feedback suggests a higher learning burden. Nevertheless, as explained in Part II, the methodology is open to insights that emerge through the implementation of the case study. A revised model may therefore still have merit even if the criteria established at the outset have not clearly been met in this instance.

The first assumption requiring scrutiny is that it is necessary to measure critical thinking objectively, directly, or definitively. Recall that this case study adopts only provisionally the perspective that critical thinking is primarily a truth testing process (the 'skills perspective') separable from the substantive content of legal philosophy. Other perspectives differ in terms of function and epistemology, emphasising the situated role of the subject or the imperative to challenge hegemony. As indicated, it is not the intention

in a class that compares theories of law that map to these views to commit to any particular definition of critical thinking. The point is that this complicates evaluation of the criteria because, on the latter views, there can be no sensible distinction between legal philosophy and critical thinking so one cannot come at the expense of the other and each is measured subjectively. Conversely, even if critical thinking skills are primarily procedural and geared to understanding, evaluating and synthesising arguments, these are foundational skills that might be expected to become more refined with practice over a longer time period than one semester. It is also possible that the broader participation entailed in the de-centred model revealed an abundance of implausible interpretations and arguments that students would once not even have attempted to articulate for fear of failure or ridicule, but reflect an advance toward critical thinking nonetheless.

A second questionable assumption is that students must have applied their knowledge to meet the criteria of having learnt coding skills. On this view, coding in the model was not the object of instruction but applied instead by the educator for pedagogical purposes. Yet this does not quite capture how coding appears in the model, namely as a skill modelled and contextualised by the educator. It is therefore comparable to other skills that begin their life through observation of others at work including, incidentally, critical thinking. The model could be revised to incorporate some basic applied coding into assessment but this is ultimately unnecessary to achieve the objective of facilitating deeper understanding of the logic, strengths and pitfalls of algorithmic processes in the legal system.

A third questionable assumption is that additional learning burden is always undesirable. The student feedback above suggests that the felt burden is also shaped by perceptions of the importance of interpretation (downplayed as 'advanced English') to critical thinking, legal education, and careers. This is related to perceptions of the role of the teacher as 'explainer-in-chief', a view more likely to be held precisely by those students with a low grade point average who seemed from the grade distribution to have benefited in outcomes from a greater focus on independent critical thinking. While these perceptions may be difficult to shift in the face of structural changes such as vocationalism and credentialism, a potential compromise is to compensate for a perceived absence of the educator through a stronger indirect presence. This might be achieved without compromising pedagogical goals through strategies such as more carefully curated exercises such as interpretation checklists with a greater proportion of tailored questions; discussion leaders privy to a more accessible version of the text; shorter texts and more frequent check-ins with the wider group; and staged exercises where group interpretations and arguments are subjected to inter-group scrutiny.

Ultimately, the elevated levels of student frustration over interpretive exercises in particular did not necessarily translate into lower overall performance on assessments; indeed, the opposite may be true. Yet, even if the additional lens of critical thinking is responsible for stronger outcomes, multiple reports of student frustration cannot

simply be dismissed as the struggle intrinsic to interpretation and evaluation of challenging texts. Ideally, communicating competing interpretations and arguments should be a rewarding and social activity. As the approach becomes more experiential and the role of the student becomes more prominent, the cognitive load is invariably higher, but with concomitant rewards. If exercises and assessments are scaffolded poorly, repetitive, require more time than is allocated, or lack clearly communicated domain knowledge, goals, methods, and relevance, students will naturally feel disengaged and disoriented,[79] which is a discouraging cognitive burden of a different kind. This is an argument for refining these points rather than accepting that an embedded complementary skills model needs to maintain a constant (but ill-defined) 'learning burden'.

V CONCLUSION

There is no simple answer to locating the proper balance between academic/abstract and vocational/technical skills in the law curriculum. Nor are these categories stable: the focus areas in this paper, for example, entail both technical, applied aspects and abstract elements such as problem solving, argumentation and challenges to orthodoxy. It would be a mistake, however, to assume that every topical addition to the curriculum — skill or knowledge — necessarily displaces traditional areas or established abstract skills such as critical thinking and legal reasoning. This is because new skills and knowledge can enhance the existing curriculum through teaching methods grounded in the pedagogical literature, such as scaffolding and reading strategies, and other innovative ways of integrating and modelling new skills to students. This case study examined the potential of coding to complement critical thinking. Other possible combinations include generating and combining keywords for Boolean searches within a wider evaluation of research paradigms; active listening and note-taking skills within a reflective group exercise; or mooting and negotiation techniques as part of a legal problem-solving exercise. As this case study demonstrates, the first iteration of such a model is bound to be a learning experience in the subtleties of scaffolding, conceptualising and measuring the precise goals, and coordinating with colleagues and the broader law curriculum. In this, educator and student are alike in needing to build skills to navigate an unpredictable future.

[79] Wilson (n 22) 93.