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Designing Higher Education: Lessons for Law Schools

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Abstract

This literature review presents research published between 2018 and July 2023 relating to design thinking in higher education. It provides an overview of research themes and findings, while also having a particular interest in law education. The findings suggests that design thinking has been discussed across disciplines, including in the context of law education. Overall, design thinking is approached as a beneficial pedagogical method, while exploring its integration and effects or theoretical foundations in various settings. Based on the review, critical voices are few, including, however, discussion on the neoliberalist undertone linked to design thinking. In the context of law education, learning materials are discussed more often than in other fields included in the review. In integrating design thinking, law schools should draw from its benefits, such as the in-built student perspective and skills-based approach, while not forgetting its limitations

Keywords: design thinking, higher education, university pedagogy, legal education

Introduction

"Design thinking" refers to a popularized form of viewing and transforming various domains through the lens of design processes and methods.[1] As a concept it refers to an iterative and non-linear process to tackling complex contextual problems, whereby issues are approached with collaborative creativity and from a user-centric perspective.[2] As such, design thinking has

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[1] Melissa Warr and others, 'Complicating Design Thinking in Education. A University-School District Partnership to Design a School for the Future' in Karen L. Sanzo, Jay Paredes Scribner and Jason A. Wheeler (eds), *Design Thinking: Research, Innovation, and Implementation* (Information Age Publishing, 2021).

[2] See e.g., Fiona Boyle and others, 'REEdI Design Thinking for Developing Engineering Curricula' (2022) 12(3) Education Sciences, 206

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been a business buzzword for decades, while having been applied outside product development and extended to services and practices.[3] In this regard, the concept is not new but has roots in the 20th century.[4] With time, design thinking has found its way into many sectors of society, including education and law, and to the academia beyond design science, including in the way higher education is approached.[5] Nonetheless, no clear definition exists to this day.[6] Despite variations, some overall characteristics and principles have been identified for design thinking in that it accommodates various perspectives, disciplines, knowledge, and skills, while also necessitating active collaboration and repetition.[7] Largely *because* of its fluidity, design thinking can function across sectors and processes.[8]

Design thinking in higher education makes teachers the designers of learning, while a student perspective guides the process. As an educational approach, design thinking has been discussed for some decades, but increased

<https://doi.org/10.3390/educsci12030206>; Harah Chon and Joselyn Sim, 'From design thinking to design knowing: An educational perspective' (2019) 18(2) Art, Design & Communication in Higher Education, 187 <https://doi.org/10.1386/adch_00006_1>; Sharon Guaman-Quintanilla and others, 'Impact of design thinking in higher education: a multi-actor perspective on problem solving and creativity' (2023) 33 International Journal of Technology and Design Education, 217 <https://doi.org/10.1007/s10798-021-09724-z>; Ineta Luka (2019), 'Design thinking in pedagogy: Frameworks and uses' (2019) 54(4) European Journal of Education, 499 <https://doi.org/10.1111/ejed.12367>; Fanke Peng and Christopher Kueh, 'Integration of Design Thinking with Cultural Intelligence in Higher Education for a Socially Complex Environment' (2022) 41 International Journal of Art and Design Education, 341 <https://doi.org/10.1111/jade.12402>.

[3] Rachel Hews, Gnanaharsha Beligatamulla and Judith McNamara, 'Creative confidence and thinking skills for lawyers: Making sense of design thinking pedagogy in law education' (2023) 49 Thinking Skills and Creativity, 10152 <https://doi.org/10.1016/j.tsc.2023.101352>; Peng and Kueh (n 2).

[4] See e.g., Boyle and others (n 2); Luka (n 2) with references to Herbert A. Simon, *The sciences of the artificial* (1st edn, MIT Press 1969). See also Peter G. Rowe, *Design Thinking* (MIT Press 1991).

[5] Kate Catterall, Julia Mickenberg and Richard Reddick, 'Design Thinking, Collaborative Innovation, and Neoliberal Disappointment: Cruel Optimism in the History and Future of Higher Education' (2019) 114 Radical Teacher 34, 35 <https://doi.org/10.5195/rt.2019.548>; Chon and Sim (n 2), 188; Guaman-Quintanille and others (n 2); Hews and others (n 3); Joyce Hwee Ling Koh and others, *Design Thinking for Education* (Springer 2015); Timm Krohn and Christoph Meinel, 'Introduction: Design Thinking in the Field of Education' in Christoph Meinel and Timm Krohn (eds), *Design Thinking in Education* (Springer 2022).

[6] Boyle and others (n 2).

[7] Boyle and others (n 2); Guaman-Quintanille and others (n 2); Luka (n 2).

[8] Chon and Sim (n 2); Guaman-Quintanille and others (n 2).

connections between theory and practice are called for across disciplines despite a growing body of literature.[9]

Design thinking entering law schools: the research task

Against this fluid background, it is challenging to identify the exact developmental path of design thinking.[10] Moreover, "design" has been viewed as essential for human activity in general.[11] In terms of education, tracking the historical roots of design thinking also depends on how the relationship to and elements in common with constructivism and other contemporary theories and tools are conceived. As such, design thinking and constructivism can largely be seen to align and share synergies in their emphasis on knowledge-creation, interaction, and team work to tackle problems,[12] but there are also some unclarities or discrepancies in the relationship, while the importance of student activation and participation may also be linked to more critical views on democratic education.[13]

To accompany the spread and popularity of design thinking applications throughout society and its move towards academia, a more rigorous theoretical examination and systematic analysis alongside piece-meal literature has become necessary – not least in enabling meaningful reflection.[14] Indeed, terminology is proliferating also in the field of education: anyone interested in the topic runs into terms, such as "educational design", "instructional design",

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[9] See e.g., Koh and others (n 5); Yishay Mor, Brock Craft and Marcelo Maina, 'Introduction' in Marcelo Maina, Brock Craft and Yishay Mor (eds), *The Art & Science of Learning Design* (Sense Publishers 2015).

[10] See e.g., Sk Mamun Mostofa and others, 'A Comprehensive Framework of Design Thinking Approach in Knowledge Management: A Review in Academic Context' (2020) 11(2) Journal of Education Culture and Society 281 <https://doi.org/10.15503/jecs2020.2.281.294>.

[11] See e.g., Warr and others (n 1).

[12] Mandaar Pande and S. Vijayakumar Bharathi, 'Theoretical Foundations of Design Thinking—A Constructivism Learning Approach to Design Thinking' (2020) Thinking Skills and Creativity, 36 <https://doi.org/10.1016/j.tsc.2020.100637>.

[13] Pande and Bharathi (n 12); Guaman-Quintanille and others (n 2); Ian D. Marder and others, 'Enabling student participation in course review and redesign: piloting restorative practices and design thinking in an undergraduate criminology programme' (2022) 33(4) Journal of Criminal Justice Education 526 <https://doi.org/10.1080/10511253.2021.2010781>.

[14] Chon and Sim (n 2); Claudio Dell'Era and others, 'Four kinds of design thinking: From ideating to making, engaging, and criticizing' (2020) 29 Creativity and Innovation Management 324 <https://doi.org/10.1111/caim.12353>; Guaman-Quintanille and others (n 2).

"pedagogical design", and "learning design", as well as "designing for learning".[15] The terminology covers partly overlapping concepts and perspectives, but distinct terms also have their own roots and partly differing implications. There are no absolute lines to be drawn between these concepts.

For their part, Beetham and Sharpe use the term "design for learning", while being aware of "learning design" as a separate discipline originating from instructional design.[16] The approach inherent in "instructional design" builds on the central role of the instructor or teacher, while "learning design" has developed to accommodate the learner or student perspective and changes in theoretical underpinnings.[17] In terms of background theories, learning design has also been linked to technology-enhanced learning (TEL).[18] Conceptualization is not uniform.[19] Learning design may, however, be understood as a methodology for planning learning activities, but also to the outcomes of such a process, such as course plans or curricula.[20] Moreover, "learning design research" (LDR) and "design-based research" (DBR) are used with the former referring to research which informs design knowledge or which is conducted via design and with the latter referring to testing educational approaches and tools in life-like contexts.[21]

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[15] See e.g., Shirley Agostinho, 'Learning Design Representations to Document, Model, and Share Teaching Practice' in Lori Lockyer and others (eds). *Handbook of Research on Learning Design and Learning Objects: Issues, Applications, and Technologies* (IGI Global 2009); Beetham & Sharpe, 2013.

[16] Helen Beetham and Rhona Sharpe, 'An Introduction to Rethinking Pedagogy' in Helen Beetham and Rhona Sharpe (eds), *Rethinking pedagogy for a digital age: Designing for 21st century learning* (Taylor & Francis 2013).

[17] Beetham and Sharpe (n 16); Katerina Mangaroska and Michail Giannakos, Learning Analytics for Learning Design: A Systematic Literature Review of Analytics-Driven Design to Enhance Learning (2019) 12(4) IEEE Transactions on Learning Technologies 516, doi: 10.1109/TLT.2018.2868673; Sabine Walsh, 'Setting out across the sea of monsters: bringing learning design into mediator training' (2019) 37(1) Conflict Resolution Quarterly 79 <https://doi.org/10.1002/crq.21255>.

[18] Mangaroska and Giannakos (n 17).

[19] Mangaroska and Giannakos (n 17); Walsh (n 17).

[20] Agostinho (n 15); Mangaroska & Giannakos (n 17).

[21] See Stine Ejsing-Duun and Helle Skovbjerg, 'Design as a Mode of Inquiry in Design Pedagogy and Design Thinking' (2019) 38(2) International Journal of Art & Design Education 445 <https://doi.org/10.1111/jade.12214>; Sasha A. Barab and Kurt Squire, 'Design-based research: putting a stake in the ground' (2004) 13(1) Journal of the Learning Sciences 1; Gaoxia Zhu and others, 'Curriculum Design for Social, Cognitive and Emotional Engagement in Knowledge Building' (2021) 18 International Journal of Educational Technology in Higher Education 1.

There are thus many ways for design thinking to be integrated in education. Indeed, according to Beetham and Sharpe, the fundamental synergy between pedagogy and design is that they both aim to bind together theory and practice, while teaching always includes "design".[22] Design thinking as a specific approach challenges teacher-centric models and promotes the role of teacher as a facilitator.[23] More recently, the concept of "design" has increasingly featured with developments related to digitalization in the field of education,[24] while online teaching requires the role of a designer, as identified by Martin and others.[25] However, design thinking in education is not limited to such technological contexts. More recent societal developments imply that higher education should accommodate contemporary and future needs of the society and labour markets.[26] Indeed, the background for increased integration of design thinking to university education lies partly in societal and generational changes and in the subsequent need to accommodate 21st century skills and (working) life capabilities, such as problem-solving, critical thinking, and creativity, which design thinking has been conceived to support.[27] The synergy of pedagogy and design noted above further explains the call for design thinking amidst the increased professionalization of teaching activities.[28] Finally, design thinking accommodates Generation Z students in their tech-

[22] Beetham and Sharpe (n 16).
[23] Guaman-Quintanille and others (n 2); Mangaroska and Giannakos (n 17).
[24] See e.g., Mangaroska and Giannakos (n 17); Lockyer and others (n 15).
[25] Florence Martin and others, 'Award-winning faculty online teaching practices: Course design, assessment and evaluation, and facilitation' (2019) 42 The Internet and Higher Education 34 <https://doi.org/10.1016/j.iheduc.2019.04.001>.
[26] Lisbeth Claus, 'HR Disruption—Time Already to Reinvent Talent Management' (2019) 22(3) BRQ Business Research Quarterly 207 <https://doi.org/10.1016/j.brq.2019.04.002>; Guaman-Quintanille and others (n 2); Peng and Kueh (n 2).
[27] Chon and Sim (n 2); Benjamin Gleason and Nadia Jaramillo Cherrez, 'Design Thinking Approach to Global Collaboration and Empowered Learning: Virtual Exchange as Innovation in a Teacher Education Course' (2021) 65 TechTrends 348 <https://doi.org/10.1007/s11528-020-00573-6>; Koh and others (n 5); Luka (n 2); Rebecca McLaughlan and Jason Lodge, 'Facilitating epistemic fluency through design thinking: a strategy for the broader application of studio pedagogy within higher education' (2019) 24(1) Teaching in Higher Education 81 <https://doi.org/10.1080/13562517.2018.1461621>; Cara Wrigley, Genevieve Mosely and Martin Tomitsch, 'Design thinking education: A comparison of Massive Open Online Courses' (2018) 4 The Journal of Design, Economics, and Innovation 275 <https://doi.org/10.1016/j.sheji.2018.06.002>; Gamze Yilmaz, 'Revitalizing the communication classroom: A case of design thinking' (2022) 36(3) Communication Teacher 216 <https://doi.org/10.1080/17404622.2021.1962934>.
[28] Beetham and Sharpe (n 16).

savviness and the complexity they face in the form of cross-disciplinary challenges, such as sustainability.[29]

Similarly, the legal profession and law education are faced with increased demands for interdisciplinarity, while lawyers should also be equipped with highly sophisticated skill sets and new ways of thinking, such as human-centred problem-solving and emphatic thinking.[30] Indeed, design thinking has found its way to the legal sector in the form of "legal design"[31] the aim of which is to render legal institutions, documents and systems more human-centric.[32] While legal design enters law schools, design thinking in law education is not limited to that.[33] Indeed, Hews and others note the increasing integration of design thinking into law school curricula worldwide, while highlighting the need for bridging theory and practice.[34] Inspired by the apparent need for an up-to-date literature review, this article addresses the following research questions:

- Which elements of design thinking have been addressed in pedagogical research for higher education, including law education, during the last 5 years and what are the main research findings?
- Based on the findings, what are the main factors to be considered in designing higher education especially in law schools?

First, the methods and materials are described. Then, the main findings of the review are presented, followed by highlighting some lessons for law schools. The article ends with discussion.

[29] Sadaf Taimur and Motoharu Onuki, Design thinking as digital transformative pedagogy in higher sustainability education: Cases from Japan and Germany (2022) 114 International Journal of Educational Research 101994 <https://doi.org/10.1016/j.ijer.2022.101994>; Wrigley and others (n 27); Yilmaz (n 27).
[30] Hews and others (n 3).
[31] See e.g., Emily Allbon and Amanda Perry-Kessaris, *Design in Legal Education* (Routledge 2022); Marcelo Corrales Compagnucci and others (eds), *Legal Design. Integrating Business, Design and Legal Thinking with Technology* (Edward Elgar Publishing 2021).
[32] See also Hews and others (n 3).
[33] See also Michael Hunter Schwartz, Sophie M. Sparrow and Gerald F. Hess, T*eaching Law by Design. Engaging Students from the Syllabus to the Final Exam* (2nd edn, Carolina Academic Press 2017).
[34] Hews and others (n 3).

Materials and methods

The following databases and search tools were used to search materials for the review: Ebsco Academic Search Ultimate,[35] HeinOnline's Law Journal Library,[36] University of Helsinki Library Helka search,[37] and Google Scholar.[38] The searches were conducted with restrictions concerning publication date so that searches covered only research published between 2018–2023 (with the search dates situating in July 2023). Law specific research was assumed to fall under research on higher education, but one law specific search tool was also used. The key words vary somewhat due to the specific nature and structure of the search tools. Regarding key words, Ebsco was searched using key words "design thinking" AND "higher education" OR "university". The search covered refereed articles only, and the 200 most relevant results were covered. HeinOnline was searched with the following terms: "pedagogy" AND "design" AND "university", also covering the 200 most relevant results here. Helka was searched to provide more coverage, but also one search result ended up supplementing the previous results. Finally, Google Scholar was searched with the key words "design thinking" AND "higher education", similarly going through the 200 most relevant results. Relevance was assessed by examining titles and abstracts. In addition, the search was extended to the bibliography of previously selected articles and citing articles that met the criteria.

Inclusion criteria were applied so that only peer-reviewed review articles and original research articles in English with a clear learning design focus were selected if not already excluded in the search tool itself. This means that conference papers were excluded, while books and manuals also remained outside the scope. However, with regard to law-specific research also faculty-run journals or law reviews were included following the tradition of scholarly publishing especially in North America. In terms of substance, only research addressing learning design in general or in higher education or university education in particular was selected. No criteria for educational fields (or law) were applied. Search results were excluded if they were other type of publications or used the concept of design in some other meaning than "design thinking" or in some other context than higher education (other levels of education may be discussed alongside higher education). In this vein, research

[35] See <https://www.ebsco.com/products/research-databases/academic-search-ultimate>.
[36] See <https://home.heinonline.org/content/law-journal-library/>.
[37] See <https://helka.helsinki.fi/discovery/search?vid=358UOH_INST:VU1&lang=en>.
[38] See <https://scholar.google.com/>.

targeting only technology or design was excluded as was research addressing legal design outside pedagogy was excluded, acknowledging that such themes may overlap with the focus of this review and that the use of terminology is not necessarily consistent. Research from faculty-run journals was only included after careful consideration and provided the author(s) were professors or tenure track. Moreover, Covid-19 specific research was not included. Research on educational practices *during* the pandemic, such as "emergency remote teaching" (ERT),[39] rather represents disruption. Finally, all duplicates were removed from the results.

In total 35 articles were included in the review, of which 5 articles explicitly discussed law education. Information was extracted from the selected articles following the research questions. Therefore, the research task, the approach or methodology, and the main findings in each article were documented. A summary of the review process is presented in Figure 1.

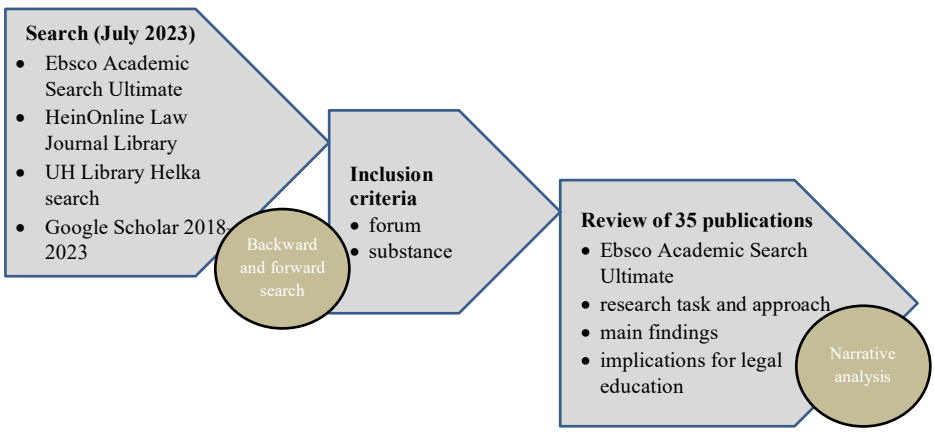

Figure 1

Due to the topic covering previous research and findings from several disciplines, the material was approached via a narrative literature review. This literature review presents a synthesis of selected previously published research, while being unsystematic in its coverage of several disciplines and in its brief

[39] David I. C. Thomson, 'Elements of effective online instruction in law' (2021) 65(3) Saint Louis University Law Journal 703; David Sandomierski and Stephanie Ben-Ishai, 'Modular legal learning: revitalizing the law classroom' (2022) 45(2) Dalhousie Law Journal 591.

descriptions of the reviewed literature.[40] However, it also has the task of providing new information and insights for law education in particular. The narrative analysis was conducted by mapping common themes and by collecting the core results from the perspective of design thinking. The relevance for law education was analysed in light of its specific characteristics, as highlighted in this review. This review does not aim at providing a comparison of design thinking models in the field of education (or that of law education) and other fields of application.

Results: Design thinking in higher education from 2018 to July 2023

The purpose of the literature review is to provide a selection of design thinking research in the context of higher education during the past five years and to enable a synthesis of the main findings especially from the perspective of law education. A summary of the review results is presented in the appendix.

Based on the review, the last five years has seen design thinking being addressed from many different angles, utilizing both qualitative and quantitative methods. Research includes both more generally applicable theory and empirical studies in specific contexts (with more limited generalizability). To some extent, the previously reported trend of a piecemeal approach continues (partly due to the approach adopted in this review), and most of the articles encouraged further research. In the case of theoretical research approaches include in the review, calls for experiences and validation are made.[41] Whereas research exploring student experiences may lack the dimensions related to actual learning results (including the effect of evaluation

[40] See also Hannah Snyder, 'Literature review as a research methodology: An overview and guidelines' (2019) 104 Journal of Business Research 333 <https://doi.org/10.1016/j.jbusres.2019.07.039>.
[41] Wrigley and others (n 27).

to students' feelings),[42] other type of research also shows increased quality of learning results with the use of design thinking methods.[43]

One recurring approach is the identification of problems with traditional higher education and then contrasting it with some of the benefits of design thinking: higher education is critiqued for its emphasis on lecturing and educating "about",[44] as well as for the focus on reason to the detriment of emotion,[45] and structures based on academic constraints, including semesters.[46]

The main findings include on one hand very concrete examples of course design or individual tools as well as suggestions for (best) practices and methods to deliver teaching. These include workshops with context-setting elements,[47] empathy maps,[48] online role-play activities,[49] toolkits,[50] and prototyping.[51] The design studio model includes a project and weekly feedback sessions.[52] Design thinking could also take the form of module-based structures and modularity.[53]

On the other hand, the findings offer both theoretical and empirical support for the views that design thinking in higher education supports the development of 21st century skills.[54] The human-centric perspective, interdisciplinary teams,

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[42] Chao-Ming Yang and Tzu-Fan Hsu, Integrating Design Thinking into a Packaging Design Course to Improve Students' Creative Self-Efficacy and Flow Experience (2020) 12(15) Sustainability 5929 <http://dx.doi.org/10.3390/su12155929>.
[43] See Javier de la Fuente, Irene Carbonell and Mary LaPorte, 'Design Thinking as a Framework for Teaching Packaging Innovation' (2019) 11(1) Journal of Applied Packaging Research 39 <https://scholarworks.rit.edu/japr/vol11/iss1/4>; G. Suresh Kumar, 'Design Thinking as An Innovative Teaching Method for Media and Communication Courses' (2022) 3(2) ShodhKosh: Journal of Visual and Performing Arts 176 <https://doi.org/10.29121/shodhkosh.v3.i2.2022.123>; Gabriel Linton and Markus Klinton, 'University entrepreneurship education: a design thinking approach to learning' (2019) 8(3) Journal of Innovation and Entrepreneurship 1 <https://doi.org/10.1186/s13731-018-0098-z>; Peng and Kueh (n 2).
[44] Linton and Klinton (n 42).
[45] Hews and others (n 3).
[46] Boyle and others (n 2) 11; Marder and others (n 13).
[47] Pande and Bharathi (n 12).
[48] Peng and Kueh (n 2); Yang and Hsu (n 42)
[49] Walsh (n 17).
[50] Jaana Kärnä-Behm, 'Learning generative design methods: Higher education students developing toolkits' (2022) 41(4) International Journal of Art & Design Education 577 <https://doi.org/10.1111/jade.12433>.
[51] Pande and Bharathi (n 12).
[52] McLaughlan and Lodge (n 27).
[53] Sandomierski and Ben-Ishai (n 39).
[54] See e.g., Luka (n 2).

and inquiry of stakeholder views all contribute to the development of empathy and multiple perspectives.[55] Design thinking promotes collaboration, interaction and communications skills, as well as entrepreneurial skills, co-creation, and student participation.[56] It also contributes to practical knowledge and working life skills by helping to make sense of learning and creating links between studies and out-of-classroom manifestations of the subject or bridging theory and practice, thinking and doing.[57] At the same time, however, the importance of regulation and reflection is highlighted.[58] Design thinking also enables facing uncertainty, risks, and imperfect circumstances, as well as different epistemologies and conflicting stakeholder views.[59] Indeed, as today's complex challenges may be approached by design thinking in that it helps limiting the available options and manage the messiness,[60] this may also in some cases receive critique from students for "artificially" narrowing down complex real-life problems.[61]

Based on the review, there are some specific issues that should be considered when integrating design thinking into higher education. Many of the issues may certainly be relevant in other contexts and theoretical frameworks as well, but here, the focus is on the design thinking approach as covered in the reviewed articles.

Firstly, one core element of co-productive learning process is interaction and bringing the students and teachers closer to each other also in hierarchical terms and by abandoning titles.[62] For its part, the joint effort of group work and brainstorming supports creativity especially in students who are otherwise not inclined to creativity,[63] while heterogenous group formation contributes to

[55] Chon and Sim (n 2); Kumar (n 43); Pande and Bharathi (n 12); Peng and Kueh (n 2).
[56] See e.g., Emily Allbon, 'Changing Mindsets: Encouraging Law Teachers to Think beyond Text' (2019) 7(1) Journal of Open Access to Law; Lisa Bosman, 'From Doing to Thinking: Developing the Entrepreneurial Mindset through Scaffold Assignments and Self-Regulated Learning Reflection' (2019) 1(1) Open Education Studies 106 <https://doi.org/10.1515/edu-2019-0007>; Marder and others (n 13); Yilmaz (n 27).
[57] See e.g., Allbon (n 56); Bosman (n 56); Boyle and others (n 2); Luka (n 2); Yilmaz (n 27).
[58] See e.g., Bosman (n 56); Chon and Sim (n 2); Ejsing-Duun and Skovbjerg (n 21).
[59] See e.g., Catterall and others (n 5); Chon and Sim (n 2); Hews and others (n 3); McLaughlan and Lodge (n 27); Peng and Kueh (n 2).
[60] See e.g., Yilmaz (n 27).
[61] Taimur and Onuki (n 29).
[62] Catterall and others (n 5); Marder and others (n 13); McLaughlan and Lodge (n 27).
[63] Yang and Hsu (n 42).

innovation.[64] In terms of classroom hours, time should be allocated primarily to cognitively demanding tasks and group discussion, while basics and preparation could be done online or at home.[65] The importance of various skills and knowledge across disciplines was noted not only as an element of the student teams,[66] but also with more complex educational design projects.[67] For its part, technology should be the quality and form most suitable for the particular educational activity.[68] Indeed, the pedagogical dimensions of design thinking extend to educational technology,[69] as well as to space and interior design.[70]

The criteria for assessment as well as timelines for assignments are to be clear.[71] Alongside content-related aspects, process must be included.[72] At the same time evaluating creative group assignments and executing the skills development side especially in online learning environments were considered challenging.[73] Teamwork may be assessed so that the group gets a grade alongside the impact of individual performance, which also contributes to accountability.[74] Feedback is also essential, including from and among the students themselves and from outside stakeholders.[75] Within an interdisciplinary setting, feedback may be provided across disciplines even if grading was discipline-specific.[76] The development of reflective skills requires

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[64] Pande and Bharathi (n 12).
[65] See e.g., Thomson (n 39); Wrigley and others (n 27); Zhu and others (n 21).
[66] Chon and Sim (n 2).
[67] Allbon (n 56); Bosman (n 56); Catterall and others (n 5); Chon and Sim (n 2); de la Fuente and others (n 43); Martin and others (n 25); Peng and Kueh (n 2); Wrigley and others (n 27).
[68] Taimur and Onuki (n 29); Thomson (n 39).
[69] Gleason and Cherrez (n 27).
[70] See e.g., Jeffrey Alstete and Nicholas Beutell, 'Designing learning spaces for management education: a mixed methods research approach' (2018) 37(2) Journal of Management Development' 201 <https://doi.org/10.1108/JMD-08-2017-0247>; Martin Schwemmle, 'Walls, Furniture, People—Theoretical and Practical Aspects of Space in Design Thinking' in Christoph Meinel and Timm Krohn (eds), *Design Thinking in Education* (Springer 2022).
[71] Ina Blau, Tamar Shamir-Inbal and Orit Avdiel, 'How does the pedagogical design of a technology-enhanced collaborative academic course promote digital literacies, self-regulation, and perceived learning of students?' (2020) 45 The internet and higher education 100722 <https://doi.org/10.1016/j.iheduc.2019.100722>.
[72] Hews and others (n 3).
[73] See e.g., Luka (n 2); Walsh (n 17).
[74] de la Fuente and others (n 43).
[75] de la Fuente and others (n 43); Marder and others (n 13); Pande & Bharathi (n 12).
[76] de la Fuente and others (n 43).

that students review and remedy their knowledge and practices based on the evaluation and feedback that they get.[77]

With design thinking methods, careful planning and structure, as well as instructions and guidance are important,[78] however, support for creative skills development also requires flexibility and openness, for example, when it comes to performing collaborative tasks and tools chosen by the students.[79] Indeed, despite some anxiety, including students in the design process on a course, program, or institutional level may contribute to increased ownership, while rendering the process more meaningful than traditional student feedback mechanisms.[80] Students can be involved in choices concerning not only content but also course materials and learning activities, among others, which also enables the teacher to meet the needs of students in a timely manner and increases the students' understanding of the teacher's efforts.[81] McLaughlan and Lodge use the concept of "epistemic environment" to refer to students being able to make choices concerning the resources they use.[82] Moreover, stakeholder participation in curriculum design could also provide additional benefits in terms of better communication and engagement as well as support in identifying key competences and authentic problems.[83]

A design thinking approach also places emphasis on the importance of accepting failure and error,[84] while still involving "systematic experimentation"[85]. Also at institutional level and in curriculum development failures could be shared and utilized in reforms – not only best practices.[86]

In terms of gaps, the material shows quite scant research on designing *learning materials* in higher education (even if online environments often include this

[77] See e.g., Rebecca Flanagan, 'Better by design: implementing meaningful change for the next generation of law students' (2018) 71(1) Maine Law Review 103; Marder and others (n 13); Taimur and Onuki (n 29).
[78] See e.g., Bosman (n 56); Ejsing-Duun and Skovbjerg (n 21); Kumar (n 43); Kärnä-Behm (n 50); Pande and Barathi (n 12).
[79] Guaman-Quintanille and others (n 2); Hews and others (n 3); McLaughlan and Lodge (n 27).
[80] Marder and others (n 13); McLaughlan and Lodge (n 27).
[81] Marder and others (n 13); McLaughlan and Lodge (n 27); Zhu and others (n 21).
[82] McLaughlan and Lodge (n 27).
[83] Boyle and others (n 2); Flanagan (n 77); Hews and others (n 3); Luka (n 2); Mostofa and others (n 10).
[84] Catterall and others (n 5); Chon and Sim (n 2); McLaughlan and Lodge (n 27).
[85] Ejsing-Duun and Skovbjerg (n 21) 448.
[86] Catterall and others (n 5); Mostofa and others (n 10).

as well). For their part, Marder and others note the changes implemented in course materials during a pilot project whereby lecture slides were modified towards more visual content, while information was also condensed, and podcasts enabled students to study outside of the classroom.[87] Moreover, content design, especially online, requires the teacher to adopt a systematic approach,[88] while a connection to the physical world is also advised for an authentic learning experience.[89] Organizing the materials in more or less independent modules or components accommodates various types of uses and needs.[90] Indeed, a platform might also support the sharing of resources between teachers and increase the collective dimensions of higher education.[91]

One interesting dimension in the reviewed literature concerns the use of data in educational decision-making. Indeed, a theoretical grounding, such as design thinking, is necessary to interpret and define the educational objectives and pedagogical approaches in the context of such analytics, while data enables a more personalized learning.[92]

Most of the reviewed research takes a positive stance towards design thinking approaches in higher education and highlights the benefits thereof, whereas fundamentally critical voices were few.[93] However, challenges relating to the time and effort required for design thinking approaches is mentioned in several articles: design thinking approaches are time-consuming both for teachers and students due to the iterative and collaborative process and slowly developing mindset and skills.[94] Time is of the essence to any "design-driven transformation",[95] as noted by Catterall and others. For their part, McLaughlin and others propose also small-scale alternatives to prototyping and testing to be developed.[96] Similarly, the design studio offers opportunities to fail fast but in a productive manner.[97] Indeed, design thinking suits from basics to more

[87] Marder and others (n 13).
[88] Martin and others (n 25).
[89] Taimur and Onuki (n 29).
[90] Sandomierski and Ben-Ishai, (n 39); Thomson (n 39).
[91] Sandomierski and Ben-Ishai (n 39).
[92] Mangaroska and Giannakos (n 17).
[93] Cf. Koh and others (n 5).
[94] Bosman (n 56); Chon and Sim (n 2); de la Fuente and others (n 43); Gleason and Cherrez (n 27); Kumar (n 43); Luka (n 2); Wrigley and others (n 27).
[95] Catterall and others (n 5) 44; see also Chon and Sim (n 2).
[96] Jacqueline E. McLaughlin and others, 'Design thinking teaching and learning in higher education: Experiences across four universities' (2022) 17(3) PLoS ONE 1 <https://doi.org/10.1371/journal.pone.0265902>.
[97] McLaughlan and Lodge (n 27).

advanced contexts.[98] This type of gradual approach is important for motivating teachers,[99] while design thinking skills and training was deemed necessary for teachers.[100]

The most powerful critique stems from seeing design thinking as part of the move towards corporate models in higher education, including "innovation talk" which is apt to disrupt tradition and the non-corporate tasks of universities.[101] In a similar vein, the push from universities to more vocational types of institutions is connected to design thinking.[102] However, this approach to design thinking reduces it to its neoliberal aspects instead of embracing the radical potential of the approach when its limitations and highlighting critical reflection.[103] Design thinking in this regard may support the *forming* of issues (including political dimensions), giving voice to stakeholders, challenging assumptions, and imagining of alternative futures – rather than (only) providing handy tools for speedy solutions.[104] This is in line with providing students with the ability to see beyond professional tools and practices as well as their "disciplinary frameworks"[105]. Finally, from a sustainability perspective, the concept of human-centrism in design thinking may also be questioned.[106] Indeed, there are machines, other life forms, and environmental concerns to consider alongside narrowly defined human-centrism and beyond the anthropocentrism of legal systems.[107] Moreover, the empathy employed in legal design might not even be all-inclusive for humans, especially when it comes to marginalized groups or people with disabilities: "Decentering the human" in relation to the Other (whether human or not) can, however, be

[98] Wrigley and others (n 27).
[99] Jill Kickul and others, 'Designing With Purpose: Advocating Innovation, Impact, Sustainability, and Scale in Social Entrepreneurship Education' (2018) 1(2) Entrepreneurship Education and Pedagogy 205 <https://doi.org/10.1177/2515127418772177>.
[100] Hews and others (n 3); Luka (n 2); Marder and others (n 13); Sandomierski and Ben-Ishai (n 39); Walsh (n 17).
[101] Catterall and others (n 5); see also Ejsing-Duun and Skovbjerg (n 21).
[102] Catterall and others (n 5).
[103] Catterall and others (n 5); Ejsing-Duun and Skovbjerg (n 21).
[104] Ejsing-Duun and Skovbjerg (n 21).
[105] McLaughlan and Lodge (n 27) 83.
[106] Catterall and others (n 5).
[107] See e.g., Maneesha Deckha, 'Animalization and dehumanization concerns: Another psychological barrier to animal law reform' (2023) 2 Psychology of Human-Animal Intergroup Relations <https://doi.org/10.5964/phair.10147>.

supported by questioning the attempts at symmetry and affective relationships with others, thereby contributing to more accountable engagement.[108]

What are the implications for law education?

Design thinking is not one-size-fit-for-all as its applications differ in specific contexts.[109] This is why it is also important to address law education as a specific area of application. Moreover, many of the reviewed articles expressly tackle the applicability of generalizability of the results outside the specific field or setting, either in terms of limitations thereof or by encouraging towards wider application or further experimentation.[110] Many of the findings in non-legal and legal contexts do, however, support each other. For their part, the law-specific articles included in the review are all from the Anglo-Saxon framework, partly perhaps due to the search being conducted in English.

A common feature for law specific articles is the emphasis on the downsides of traditional law education and a critical stance towards the institutionalized way of educating lawyers amidst societal, technological, and generational changes.[111] The law school tradition of teacher-centric classroom lectures coupled with reading assignments and written doctrinal materials is noted, while pointing out that the need for reforms had been identified prior to the Covid-19 crisis.[112] For example, the dichotomy between theory and practice, including doctrine-centric teaching and concern for the breadth of substantive coverage, are deemed unfruitful alongside the role of teaching materials for course design.[113] Indeed, a particular epistemology and strong focus on content alongside the aim of teaching students to "think like a lawyer" are highlighted

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[108] Bennett and Rosner, 'Make text Black, The Promise of Empathy: Design, Disability, and Knowing the "Other"' in 2019 CHI Conference on Human Factors in Computing Systems Proceedings, May 4–9, 2019 (Glasgow, New York), paper 298 <https://doi.org/10.1145/3290605.3300528> referring (p. 10) to Laura Forlano, 'Decentering the Human in the Design of Collaborative Cities' (2016) 32(3) Design Issues 42 <https://doi.org/10.1162/DESI_a_00398>. See also Laura Forlano, 'Hacking the feminist disabled body' (2016) 8 Journal of Peer Production <http://peerproduction.net/issues/issue-8-feminism-and-unhacking/peer-reviewed-papers/hacking-the-feminist-disabled-body/>.

[109] See e.g., Wrigley and others (n 27).

[110] Bosman (n 56); Chon & Sim (n 2); de la Fuente and others (n 43); Luka (n 2).

[111] Allbon (n 56); Hews and others (n 3); see also Flanagan (n 77); Sandomierski and Ben-Ishai (n 39).

[112] See e.g., Sandomierski and Ben-Ishai (n 39); Thomson (n 39).

[113] Flanagan (n 77); Kris Franklin, 'Method lawyering: immersion teaching illustrated' (2020) 69(2) Journal of Legal Education 334.

in the research.[114] Then again, it is pointed out that the concept of lawyerly thinking does not have to be limited to legal reasoning but may extend to other types of problem-solving, critical perspectives, and policy analysis, among others.[115] The absence of affective dimensions in law education with an emphasis on reason may end up leaving law students without this form of support and producing lawyers without the 21st century skills in terms of the emotional dimensions.[116] Law specific articles seem to address the design of learning materials more often than other articles, which may be related to the role of written materials in law studies.

As for designing law education, research suggests that content and doctrine should be reconceived as tools to higher-level cognitive competencies, while also adopting modular learning materials that stimulate contextualization.[117] Moreover, law education would benefit from the inclusion of some more visual and multimodal elements, such as audiovisual content in the form of videos.[118] What is more, law school curricula could include cross-disciplinary courses and be geared towards different epistemologies.[119]

Design thinking also supports the development of empathy, critical thinking, and problem-solving and interpersonal skills outside strict legal reasoning.[120] Indeed, face-to-face interaction between law students and teachers is an important element here, including from a well-being perspective.[121] Design thinking opens the door for alternative futures or "what the law could be"[122]. It also counters lawyerly "perfectionism" by providing an experimental environment that allows for failures, while promoting non-adversarial approaches and collaboration over competition and aggressive advocacy.[123] Alongside traditional "serious" pedagogy, Hews and others point to the importance of creativity and playful methods in promoting alternative ways of

[114] e.g., Hews and others (n 3); Sandomierski and Ben-Ishai (n 39).
[115] Sandomierski and Ben-Ishai (n 39)
[116] Hews and others (n 3); Sandomierski and Ben-Ishai (n 39).
[117] Sandomierski and Ben-Ishai (n 39); Thomson (n 39).
[118] Allbon (n 56); Bosman (n 56); Catterall and others (n 5); Chon and Sim (n 2) 193; Ejsing-Duun and Skovbjerk (n 21); Luka (n 2); Sandomierski and Ben-Ishai (n 39); Thomson (n 39); Peng and Kueh (n 2).
[119] See Hews and others (n 3) and Flanagan (n 77) respectively.
[120] Hews and others (n 3); Sandomierski and Ben-Ishai (n 39).
[121] Sandomierski and Ben-Ishai (n 39).
[122] Hews and others (n 3) 6.
[123] Hews and others (n 3).

thinking and entrepreneurial mindsets.[124] To this end, evaluation should also cover processual and skills-based aspects alongside content.[125]

Importantly, legal contents and educational design could be used and structured progressively from foundational to professional levels.[126] Education would progress from core competencies instead of focusing on a widest possible coverage of contents.[127] Moreover, the concepts and doctrine could be brought to life by utilizing storytelling and dramatization, which would also contribute to linking different fields of law and crossing their boundaries.[128] Some of the individual tools addressed in the non-legal articles might be challenging for law school curricula where the student group is often very large.[129] However, this challenge applies to design thinking pedagogy in general due to its characteristics and modus operandi.

As a synthesis, one might say that design thinking in law education is not about substitution but rather about responsiveness to societal changes and alternative ways of educating lawyers.[130] Design thinking pedagogy would thus have both horizontal and vertical effects ranging from lawyerly skills and substance-knowledge to empathy, creative problem-solving, and critical reflection, including the societal underpinnings and assumptions in law.

Limitations

The search process described above (Figure 1) has its limitations in terms of selected databases, variety of key words, and language choice, as well as the selection criteria applied to the search results. While the possibility of bias and subjective elements has been noted, the search has limitations content-wise. For instance, articles addressing individual components within the umbrella of design thinking in education but *without an explicit* link are not covered. The search situates on a more general level.

There are also differences in legal systems and legal thinking, which must be considered when interpreting and utilizing the results of this review. The focus

[124] Hews and others (n 3).
[125] Flanagan (n 77); Hews and others (n 3).
[126] Hews and others (n 3); Wrigley and others (n 27).
[127] Flanagan (n 77).
[128] Allbon (n 56).
[129] de la Fuente and others (n 43); Flanagan (n 77).
[130] Hews and others (n 3).

on Anglo-Saxon framework must be translated into the specific context when developing, for example, law education in the Nordic countries.[131] Indeed, the higher education systems also have different national backgrounds concerning politics and funding, tuition fees, and consumerist thinking, among others.[132] Nonetheless, the "big picture" in terms of educating future professionals and legal experts is in many ways global, and the need to rethink law education covers both civil and common law systems even if concrete applications and models might differ.[133]

These limitations have been taken into account in analysing the findings and in drawing conclusions: the results are not interpreted as a comprehensive framework. The review rather provides a collection of still frames that not only contributes to the big picture but the individual elements of which also need to be contextualized.

Discussion

Based on the review, the message seems to be that while many traditional academic educational practices, contents, and disciplines should not be discarded, reforms are needed.[134] For its part, design thinking in higher education has many promising dimensions, but it must be handled with reflection and critique.[135] Indeed, the focus on 21st century skills and employability are not to be reduced to a demand for universities to turn into quasi-vocational institutions. Nonetheless, the societal benefits and critical potential of design thinking should not be ignored in the context of higher education. Indeed, economic research around the potential return for investments is encouraged.[136] In any case, integration of design thinking in an academic setting also calls for legitimacy due to the pragmatism and experiential methods involved in the approach.[137] In a similar vein, developing law education in tangent with societal developments cannot lead to abandoning

[131] For the Nordic legal mind, see Pia Letto-Vanamo and Ditlev Tamm, 'Nordic Legal Mind' in Pia Letto-Vanamo, Ditlev Tamm and Bent Ole Gram Mortensen (eds), *Nordic Law in European Context* (Ius Gentium: Comparative Perspectives on Law and Justice, vol. 73, Springer Cham 2019).
[132] See e.g., Allbon (n 56).
[133] Richard Grimes (ed), Re-thinking Law education under the Civil and Common Law. A Road Map for Constructive Change (1st edn, Routledge 2018).
[134] Boyle and others (n 2); Hews and others (n 3).
[135] Catterall and others (n 5).
[136] de la Fuente and others (n 43).
[137] Ejsing-Duun and Skovbjerg (n 21).

academic values and intellectual endeavours on the overall systems level.[138] Doctrine, content, argumentation skills, and legal thinking continue to be at the core of law education and the profession, much like reading will most likely remain an essential part thereof.[139] However, considering the potential of design thinking pedagogy, law schools should examine the ways in which it could be integrated on various levels from individual courses to curricula and institutional practices. In this regard, this literature review constitutes one step in the path of redesigning law education based on previous research, while further research continues to be necessary.[140]

Declaration of interest statement

No potential conflict of interest was reported by the author.

[138] See also Flanagan (n 70).
[139] Hews and others (n 3); Sandomierski and Ben-Ishai (n 39).
[140] See also Hews and others (n 3).

Appendix: Summary of the search results

SOURCE	PURPOSE/ TASK	APPROACH/ METHODS	FINDINGS/ RESULTS
ALLBON (n 56)	Analyzing the use of visualization in law education	Presenting resource-sites and tools; examples	A new epistemology; student engagement; teacher's competence
BLAU AND OTHERS (n 71)	Exploring effects of pedagogical design to student self-regulation and psychological ownership	Qualitative analysis; longitudinal view; building on the Digital Literacy Framework (DLF)	Importance of addressing communication and teamwork; need to include self-regulation skills and technical literacies
BOSMAN (n 56)	Presenting one approach to developing an entrepreneurial mindset in students	Qualitative analysis; pre/post surveys	Differences pre/post incl. realistic and open views of learning; mindset development requires curriculum planning, iteration, and collaboration
BOYLE AND OTHERS (n 2)	Describing a project rethinking engineering education	Literature review; analyzing the process of curriculum development	Importance of embedding soft skills; towards more experiential and applied learning
CATTERALL AND OTHERS (n 5)	Critical approach to customer-service model in education; radical pedagogy promoting positive change	Theorizing around a collaborative interdisciplinary course experiment; critical and speculative design	Disrupting pedagogy is time consuming and risky; resistance and disincentives, both potential and limitations of design thinking
CHON AND SIM (n 2)	Introducing design thinking methodology to design education; framework for knowledge generation	Reviewing epistemology against methodology; examining a case study	Design as non-linear process; clear objectives; reflection; possibility of failing; limitations of design thinking

DE LA FUENTE AND OTHERS (n 43)	Evaluating innovation education; implementing design thinking (2015-2018)	Measuring and comparing the number of awards in several student design competitions by pedagogical approach	Statistically significant differences between pedagogical approaches; design thinking in promoting creative and professional skills, collaboration, stakeholder needs; iteration; time consuming
EJSING-DUUN AND SKOVBJERG (n 21)	Providing a theoretical framework for design thinking and practice in education (design course)	Empirical study and implementations in teaching; observations, questionnaires, and interviews; three modes of inquiry	Importance of combining design processes in education; fourth meta-mode of inquiry; language and legitimization of the design process in academic contexts
FLANAGAN (n 77)	Providing a utopian model for law education; building on learning sciences instead of tradition alone	Description and analysis of a utopian ideal type based on literature	Guiding principles for the future of law education; iterative revisiting instead of coverage; group work; authentic tasks and client experiences; crossing doctrinal boundaries
FRANKLIN (n 113)	Introducing immersion method for law education	Description and analysis of immersive elements and course examples	Profession as a process; bridging theory and practice; analytical skills; professional skills
GLEASON AND CHERREZ (n 27)	Discussing and testing design thinking in virtual exchange and educational technology	Qualitative case study between two countries (virtual exchange); pre/post surveys; data analysis	Developed competencies in educational technology and understanding of foreign educational systems; iterative time-consuming process

GUAMAN-QUINTANILLA AND OTHERS (n 2)	Measuring the effects of design thinking to students' problem-solving and creativity skills	Evaluating of a university course; data analysis in three phases; self-, peer- and teacher's evaluation; a field experiment; correlation analysis	Results show statistically significant increases; improvement in skills; support for design thinking in higher education curriculum
HEWS AND OTHERS (n 3)	Exploring how law educators relate to design thinking	Literature review; case; interviews; interpretative phenomenological analysis	Encouraging law schools towards design thinking pedagogy; one+five themes; alternative approach; not a substitute
KICKUL AND OTHERS (n 99)	Exploring ways to integrate design thinking to social entrepreneurship education	Literature/theory; analysis of four mega-themes; examples	Augmenting systems thinking with design thinking supports understanding; time-consuming
KUMAR (n 43)	Presenting and analyzing implementation of design thinking pedagogy in media and communications	Literature review; actions research in four phases	Support for design thinking as an innovative teaching method; supporting 21st century skills; time-consuming; holistic approach
KÄRNÄ-BEHM (n 50)	Introducing toolkits as a design method in design education and analyzing a case study	Literature review and empirical study	Usefulness of toolkits in developing empathy; virtual toolkits in facilitating teacher´s work; laborious
LINTON AND KLINTON (n 42)	Conceptualizing entrepreneurial learning via design approach; theoretical links	Literature/theory; analysis of example course developed based on pilots	The role of skills, competence and mindset; towards student-centered education; improvement in outcome; more entrepreneurial

LUKA (n 2)	Describing design thinking in higher education and an international study	Literature/theory; survey with questionnaire; quantitative and qualitative data; statistical analysis	Benefits to the development of skills; impact of course content and layout; technical challenges with learning platforms; challenges of assessment
MANGAROSKA AND GIANNAKOS (n 17)	Reviewing empirical evidence on the relations of learning analytics and learning design; classified indicators; synthesis of approaches	Systematic review	A conceptual model on learning analytics for learning design taxonomy; alignment to improve and inform decisions
MARDER AND OTHERS (n 13)	Outlining a pilot project with design thinking in criminology	Literature; analysis of a pilot project	Student participation in feedback process; enabling teacher to reflect and adjust support; wider understanding of the object of feedback
MARTIN AND OTHERS (n 25)	Examining award-winning online faculty to identify online practices	Literature review; interviews	Conceptual framework for online course design, evaluation, assessment, and facilitation; strong support from literature
MCLAUGHLAN AND LODGE (n 27)	Drawing parallels between epistemic fluency and design thinking; guidance for design studio	Literature/theory; analysis of the design studio concept; examples of two cohorts	Making the process visible; enabling reconfiguration of learning environments; cognitively demanding

MCLAUGHLIN AND OTHERS (n 96)	Exploring faculty and student experiences of design thinking in higher education (humanities and social sciences)	Surveys at four universities; factor analyses	Better understanding of design thinking practices and outcomes; statistically significant differences in terms of discipline and student type
MOSTOFA AND OTHERS (n 10)	Reviewing knowledge management for design thinking in academic context	Literature review	Organizational and human factors; intuitive model for educational institutions
PANDE AND BHARATHI (n 12)	Identifying constructivist principles in educational design thinking	Literature; qualitative research; taxonomy; fine-tuning a course	Close relationship between constructivism and design thinking; dashboard
PENG AND KUEH (n 2)	Integrating design thinking with cross-cultural empathy	Theoretically based experiential approach; multicultural teams; workshops; reflective practice	Students increased cultural intelligence via cross-cultural design approach
SANDOMIERSKI AND BEN-ISHAI (n 39)	Introducing and analyzing modular legal learning	Literature/theory	Principles of modular teaching; model for applying the principles (platform)
TAIMUR AND ONUKI (n 29)	Exploring design thinking as digital transformative pedagogy in sustainability education	Literature; analysis of two courses (hybrid and digital); case study	Transformative learning experiences; disorienting dilemmas; critical reflection
THOMSON (n 39)	Discussing hybrid and online course design in law education	Literature/theory; emerging best practices	Optimal design; maximization of in-person time; clear and regular communication; state-of-the-art technology
WALSH (n 17)	Investigating online mediation training	Literature review	Suggestions for effective learning design; online role-play activity

WRIGLEY AND OTHERS (n 27)	Comparing design thinking MOOC courses in English (June 2017)	Search for MOOCs; inductive content analysis	Seven key themes; five steps in design thinking education; progressive increase in content and skills
YANG AND HSU (n 42)	Analyzing integration of design thinking in a packaging course	Literature review; statistical analysis; experimental approach (pre/post); questionnaire	Students' improved creative self-efficacy in low-creativity tendency group; increased flow experience
YILMAZ (n 27)	Examining effects of design thinking on student's learning experience	Exploratory case-study; thematic analysis	Four themes; positive student experience; knowledge creation; motivation
ZHU AND OTHERS (n 21)	Investigating the effect of student input in course design to student engagement	Design-based research; iteration; social network analysis; content analysis	Increased student engagement; decrease in negative affect