

# Simulation and technology in legal education: a systematic review and future research programme

---

Paul Maharg  
Emma Nicol

## Introduction

This chapter is a systematic review of the literature on simulations and technology in legal education. To date, there has been no reasonably comprehensive summary of the research on simulation and technology in legal education – this in spite of a growing body of evidence that games and simulations not only have positive effects on student learning, but that there are significant correlations between the use of educational technology and student engagement.<sup>1</sup> The practice of systematic reviews generally is relatively rare in legal education, in common law jurisdictions at least. Indeed systematic reviews as a whole, such as that of Mearns *et al* on the effectiveness of online and blended learning in the field of education and technology, are not widely available in law as a discipline; nor are they evenly distributed in law's sub-domains.<sup>2</sup>

In the following review we shall describe our search strategies and the dataset that resulted from our search. We shall outline some of the main findings and comment on the robustness of the findings. Finally we shall outline a research programme for future studies in simulation and technology in legal education. At the outset we should note that because the dataset will be much larger than the normal collection of citations in this book we have, with the approval of the editors, adapted the house style, OSCOLA. Our dataset is referred to in Harvard (APA) style, with name and date in the body of the

---

<sup>1</sup> For positive effects see Vogel, J. J., Vogel, D. S., Cannon-Bowers, J., Bowers, C. A., Muse, K., & Wright, M. (2006). Computer Gaming and Interactive Simulations for Learning: a Meta-Analysis. *Journal of Educational Computing Research*, 34(3), 229–243; Connolly, T., Boyle, E., MacArthur, E., Hainey, T., & Boyle, J. M. (2012). A systematic literature review of empirical evidence on computer games and serious games. *Computers & Education*, 59(2), 661–686. For significant correlations between educational technology and student engagement see Higher Education Research Institute (2007) *College freshmen and online social networking sites*. Available at: <http://www.gseis.ucla.edu/heri/PDFs/pubs/briefs/brief-091107-SocialNetworking.pdf>; Heiberger G. & Harper R. (2008) Have you Facebooked Astin lately? Using technology to increase student involvement. In *Using Emerging Technologies to Enhance Student Engagement. New Directions for Student Services Issue #124* (eds R. Junco & D.M. Timm), pp. 19–35. Jossey-Bass, San Francisco, CA; and Chen P.S.D., Lambert A.D. & Guidry K.R. (2010) Engaging online learners: the impact of web-based learning technology on college student engagement. *Computers & Education* 54, 1222–1232.

<sup>2</sup> Mearns, B., Toyama, Y., Murphy, R., Bakia, M., Jones, K. (2010). *Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies*. US Department of Education; Office of Planning, Evaluation, and Policy Development; Policy and Program Studies Service. Available at: <http://eprints.cpkn.ca/7/1/finalreport.pdf>.

chapter and full references given in the reference section entitled 'Review dataset' at the end of the chapter. All other chapter references are set out as per the same format, but in footnotes in order to separate them from the dataset.

## Search and classification procedures

A systematic review requires an answerable question. We began the process intending that we would analyse the literature for the characteristics of good simulation practice, and that the analysis would take the form of a meta-review – effectively a statistical analysis of the data derived from the literature that would provide a standardized approach for analyzing prior findings.<sup>3</sup> However we quickly encountered a fundamental issue. The key challenge in writing this chapter has not been the quantity of the literature. Indeed for a specialized topic such as this there exists a relatively substantial body of literature. The main problems we encountered derived from the variation and quality of the literature. These included lack of relevant data, including statistical analyses, insufficient specificity on description and analysis of the educational intervention, wide variation in information on the quality of learning, and lack of detailed analysis of findings. Randomized clinical trials, including cluster-randomized trials, are generally recognized as providing the least-biased estimates of intervention effect<sup>4</sup> – there was not a single example of this in the literature under review; almost no reliable statistical studies, and within those items that had undertaken literature reviews, the general quality of them was not robust. A prior analysis was therefore necessary: we required to *investigate the quality of the literature on simulation and technology*. Our systematic review therefore focuses on this analysis.

Systematic reviews require explicit inclusion and exclusion criteria. Our timespan is 1970-2012 – effectively 42 years. We searched the following common law jurisdictions: England & Wales, N. Ireland, Ireland, Scotland, USA, Canada, Australia, New Zealand, Hong Kong. We searched only the literature published in English, including items translated into English and those in English in a foreign language publication (eg Maharg 2007 [Dutch] and 2009 [Japanese]). Where we came upon items from civilian jurisdictions in English that referenced simulations in civilian and common law jurisdictions, we included these where possible. Searches were conducted using the following keywords and phrases: legal simulation education; legal simulation; digital simulation; transactional learning; mock courts; moot courts; mock trials; hypotheticals; learning by doing. The following databases were searched: Westlaw, Lexis, SSRN, Heinonline, Legal Journals Index. Jurisdictional bibliographies were also searched, as were topic-specific bibliographies.<sup>5</sup> We reviewed items that were peer-reviewed (though it was often unclear, particularly for the first two decades of our timespan, to determine which items had undergone peer-

---

<sup>3</sup> A meta-review is often used to analyze the results of earlier systematic reviews in order to arrive at new conclusions or insights regard the data. We originally adopted guidelines for meta-review that would be based upon statistical approaches, eg those developed by the QUOROM Group, available at <http://www.consort-statement.org/QUOROM.pdf>. See also Moher D, Cook DJ, Eastwood S, et al. (1999). Improving the quality of reports of meta-analyses of randomized controlled trials: the QUOROM statement. Quality of reporting of meta-analyses. *Lancet*. 354, 1896–1900. Note that the term 'meta-review' is sometimes misused as a synonym for 'systematic review', where the review may include a meta-review. We discuss the effect of this in law in our final paragraphs below.

<sup>4</sup> Hughes, E.G. (1996). Systematic literature review and meta-analysis. *Seminars in Reproductive Endocrinology*, 14, 2, 161-9.

<sup>5</sup> For example Carrick, K., Walters, S., eds, (2003). *A Bibliography of United States Legal Education: From Litchfield to Lexis*. William S. Hein & Co, Buffalo, NY; Goldman, P. (2008). Legal education and technology II: An annotated bibliography. *Law Library Journal*, 100, 3, 415-528.

review), as well as those that appeared to have undergone no peer-review. Where we decided that a web-published item (eg on an author's webpage or on SSRN) was sufficiently within the parameters of our review we would include that, even if there were no formal publication. Where appropriate we used search engines such as Google Scholar.

A critical issue for us was the definition of our three main terms: 'simulation', 'technology' and 'legal education'. We construed our terms broadly, knowing that the field under analysis was fairly small, given the vectors of these three terms.

1. 'Simulation' was construed as any heuristic that involved the *simulation of any aspect of legal theory or practice within a legal education context and for an educational purpose*. Since our review covered theory as well as practice, we included work that discussed simulation as well as accounts of simulation interventions.
2. We defined 'legal education' widely as being *at tertiary education or beyond, and involving any legal matter*. It became quickly apparent that the vast majority of the items in the dataset described simulations that took place in tertiary education, with a minority having taken place in a workplace setting. We also included continuous professional development. The few secondary or high school studies that were found during searches were deleted. We took a broad view of the subject-matter included in this definition of legal education, including multi-disciplinary and interdisciplinary examples, eg legal studies embedded in or spliced with other subjects, such as Philosophy or Business.
3. 'Technology' was the most complex of the three terms to define. We defined it as *incorporating the practice and/or discussion of any form of digital technology used in the design, implementation, assessment or analysis of simulation; and essential to the functioning of the simulation*. Digital technologies could of course include video, photographs, maps and graphics as well as text. We excluded simulation studies where the only use of technology seemed to be the common use of everyday applications such as word processors to reproduce text and numbers. If these were included in our review, then the simplest word-processed hypothetical could claim a place. This was a matter of judgment, of course.

Clearly, given the chronological span of our search, we could not restrict our definition to online learning; and historically, in the period 1970-1988 or so, it could be argued that word processors were innovative technologies. We therefore defined the digital element as essential for the reported simulation, if a simulation were present in the item. In our definition of 'online learning', we were guided in part by the annual Sloan Consortium Reports which, since 2002, have defined online learning as learning that takes place entirely or in substantial portion over the Internet.<sup>6</sup>

Given these definitions and search vectors, it should be remembered that we are focusing on the intersection of all three search criteria. Thus useful collections of items such as the *US Journal of Legal Education's* Symposium on Simulations (Issue 4, 1995) are not included because there was no discussion of technology in the simulations under discussion.

---

<sup>6</sup> See Allen, E., Seaman, J. (2010) *Changing Course: Ten Years of Tracking Online Education in the United States*. Babson Survey Research Group and Quahog Research Group, LLC. Available at: <http://www.onlinelearningsurvey.com/reports/changingcourse.pdf>

Following initial searches, 238 items were identified as being potentially relevant from title and abstract descriptions. Full paper readings of each document then took place, and 38 were discarded as not relevant according to the search criteria. There were 20 items for which the full text could not be sourced (stemming largely from the first decade or so of our search). Items were then assessed for the presence of a digital element to the simulation discussion (107 items). Items that were from non-common law jurisdictions were generally discarded; but during the course of searching there were 11 publications referencing common law initiatives that we considered required to be included because they described important aspects of simulation activity or theory, or referenced simulation initiatives in common law jurisdictions; and therefore these have been included in the dataset. Five of these items originated from the Netherlands (Warmelink et al 2009, Fernhout et al 1987, Lodder and Verheij 1997, 1998, 1999), one from the republic of Georgia (Nakashidze 2012) and one from Japan (Shibasaki & Nitta 1997). The items in the sub-set of 107 were largely published in the proceedings of legal conferences and in legal (and very often legal education) journals. There were also several final project and institutional reports as well as a few articles from legal professional journal publications that we included. In addition to this we included five review articles, bringing the total in the dataset to 123 items.<sup>7</sup>

## Results

Around half of the dataset consists of what one might call 'overview' items, that is to say they outline possible uses for simulation in legal education, often dealing in detail with the use of simulation both in law and in other disciplines. They contain no specific description of a real example of the use of simulation in the classroom or elsewhere. A significant minority of the items found are descriptions of, sometimes merely announcements about, simulations that are about to take place in a particular institution and the educational technology invested in rather than any information about their success or otherwise, or the resulting outputs.

## Chronology

The graph below illustrates the chronological spread of items within our timespan of 1970-2012.

---

<sup>7</sup> Connolly & Davis (2002), Goldman (2008) and, on the subject of learning by doing, Duncan (1984) were especially useful. In some cases these reviews are merely bibliographical lists of references but others, notably that by Goldman (2008) helpfully provided short descriptive summaries of both the technology employed and subject area covered by the simulation. In all cases however, it has been necessary to read the items referenced themselves to uncover the finer detail of the simulation theory discussion or intervention(s) that took place.

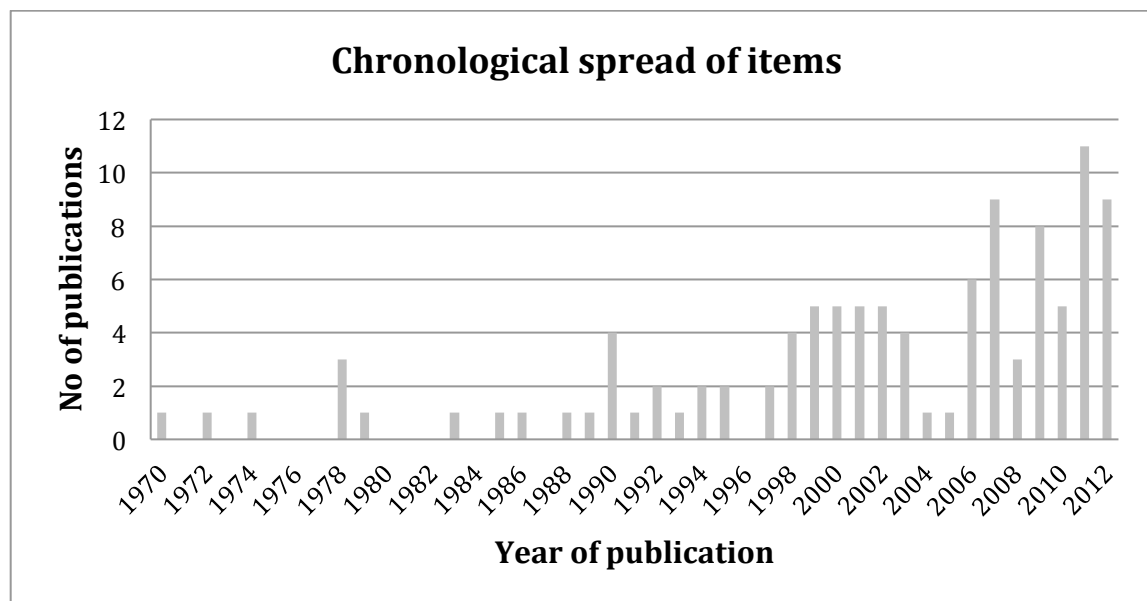


Figure 1: Chronological spread of items

The rate of publication remained fairly low during the 70s and 80s at a rate of several items per year with a small peak at the close of the 70s. Peaks can be observed in the late 90s and early 2000s a reflection of the rise in interest in the Internet following the establishment of the first widely available web browser in 1993 (*Mosaic*, and later *Netscape*). Another peak is seen in the mid-2000s when *Second Life* and other virtual communities began to make their presence felt. Publication numbers have continued to increase steadily ever since, reaching a high of 14 publications in 2011, though we cannot correlate an increase in publication with an increase in simulation activity within law schools. Interestingly, though, among the non-digital items found in our initial search, few were published much earlier than 1970. There may be a relationship between simulation and the use of innovative delivery technologies. The recent increase in the number of items corresponds with the predictions of more general reports such as the annual Horizon Reports, which describe simulation as a heuristic as becoming increasingly more visible.

### Geography

Geographically, items originate from six common law jurisdictions.<sup>8</sup> The greatest number of papers originated in the UK with 56, followed by the USA with 28. 15 papers originated from Australia, 2 from Canada, 2 from Hong Kong and one from the Republic of Ireland. Two items were cross-jurisdictional (eg UK/Aus) and another, falling under this category, was written from a pan-EU perspective (Petzold 1999). Figure 2 below illustrates the geographical spread:

<sup>8</sup> Here the jurisdictions of England, Scotland, Wales and Northern Ireland will be considered as one because of methodological problems in separating out simulations across the four jurisdictions.

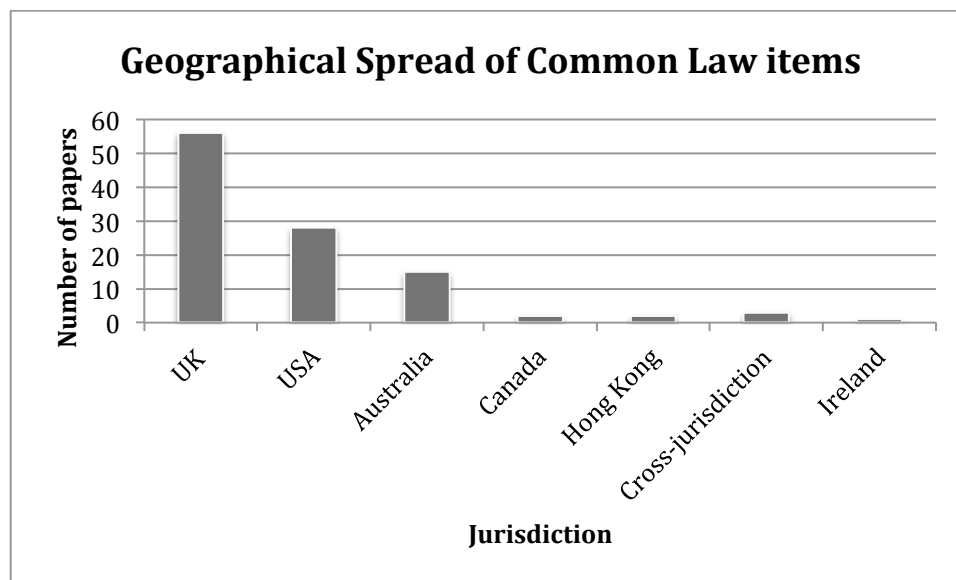


Figure 2: Geographical Spread of Common Law items

### Simulation data

A detailed summary of the information provided by the dataset on the structure of the simulations is set out below.

#### Year of study

32 of the items made specific reference to the year of study in which the simulation took place. The most commonly reported timeframe for a simulation to occur was during the year or years of postgraduate study. 21 of the items reported simulations that took place during those years – it would appear that they were designed or run on vocational or professional programmes. Four items referred to simulations that took place during the final year of undergraduate study. Five items described interventions that took place during the first year of study (Ashley 2000; Crellin et al 2011; Munro & Noah 1978; Vaughn 1995; Yule et al 2012) and a further two items described the use of simulations at various points of a degree-level programme (Garvey Zinkin 2009; Le Brun 2003).

#### Description of data subjects

A striking feature of the dataset is the near-absence of any data that describes the age, gender, ethnicity or native language(s) of the participants. There is also close to no discussion of accessibility issues for learners or staff in the simulations.

#### Simulation in different curricula

Simulation can often be used as a platform to enable learning in places or at a distance where conventional learning would be problematic. One item described a simulation that was specifically designed for distance learning (Barnett & McKeown 2012), three that were cross-jurisdictional (Bradlow & Finkelstein 2007; Maharg & Nicol 2009; Maharg & Paliwala 2004) and five described simulations that took place in the workplace among recent graduates of law schools (Hemming 2006 & 2007; Hutchinson 2006; Jabbari 2000; Macoustra 2004), with four of these items published in the last decade. Gould *et al* (2008) describe the development and evaluation of a simulation engine, the Simulated Professional Learning Environment (SIMPLE). The evaluations carried out in that project are the most extensive evaluations on simulation in legal education to date, involving a multi-disciplinary grouping across the UK (Architecture (1), Management Science (1), Law (5)). However statistical analysis of the quality of the

learning is lacking in all of these items, the studies often focusing on other aspects (eg in SIMPLE the key focus of the project was the analysis of the use of SIMPLE itself).

### **Duration**

In those items that reported the duration of the simulations that were run, the timescales reported ranged from three hours (Boyne 2012) to 2 semesters (Maharg et al 2007; Barton & Westwood 2006). It was not possible to accurately ascertain the duration of simulations in the vast majority of items.

### **Contact time**

Few of the items provided clear information as to the amount of contact time that students had with tutors or facilitators during, before or following the simulation. This included information on debrief times as well as in-simulation times. There is also a general lack of clarity about how much time students spent interacting with their peers while engaged in the simulation activity, either within simulation activities or beyond them. The true amount of contact time can be difficult to measure of course but some detail about scheduled class times or independent simulation times would have given insights into the nature of the simulations that is currently lacking in many simulation descriptions. There were two items that reported on intensive simulations that involved students having 100% contact time with staff over that period of time – Boyne (2012) at three hours, and Degnan & Haar (1970) at two days.

### **Facilitators**

In the vast majority of cases it was difficult to ascertain how many facilitators had been used during each of the simulations. Indeed it is sometimes difficult to decide from descriptions who among the participants was a student and who was a facilitator. Often students and tutors are playing traditional hierarchical roles such as lawyer and partner respectively with professionals and additional staff providing support by playing characters in the simulation. However students are often playing multiple roles, which makes the question of facilitation more difficult to define and disentangle. Where numbers of participants are reported these are in the range 1-150. The simulation activity described by Schaefer (2010), and Poustie (2001) for example involves only one facilitator, the author having carried out the simulation alone with no assistance from other teaching staff (this would seem to be a fairly common feature of much of the non-digital literature also). At the other end of the spectrum, the simulation activity carried out by Barton, Maharg and McKellar involved between 250 and 283 students that involved as many as 30 or more facilitators. These activities are described in items by Barton & Maharg (2006), Barton, Maharg & McKellar (2007) and Barton & Westwood (2006).

### **Student collaboration**

Of those items that referred specifically to the collaborative groupings in which students worked during simulations, eight items described, to a greater or lesser extent, the work that occurred in groups of four (Barton & Maharg 2006; Barton & McKellar 2007; Barton et al 2007; Barton & Westwood 2006; Billingham 2011; Ferguson & Lee 2012; Maharg & Owen 2007; Poustie 2001). One item mentioned groups of between two and four members (Barnett & McKeown 2012), and a further four items described the use of groups without specifying size (Babacan 2011; Boyne 2012; Bradlow & Finkelstein; 2008; Garvey & Zinkin 2009). The largest collaborative grouping reported was Serby (2011) where students worked in groups of 5-6. Students worked on their own as individuals in six items (Butler 2010; Degnan & Haar 1970; Lambiris & Oberem 1993; Munro & Noah 1978; Schaefer 2011; Yule et al 2012); and there was one instance of students working in pairs (Ashley 2000). Where group and pair activity is reported there was often little information regarding methods of group selection, for example whether they were self-selecting or formed by other means. There was also little comment on group function and dynamics, and the measures taken to enhance this aspect of learning from simulations.



### Subject and skills areas

As a heuristic, simulation has the unique potential to cross the boundaries of jurisdictions (Maharg & Paliwala 2002), as well as the boundaries between substantive subject areas. Given the diversity of degree programmes and jurisdictions that are represented in the dataset it is perhaps not surprising to find that a large range of subject areas within law have been taught using simulation activities. It has been difficult to divide these into meaningful categories, for reasons of diversity of jurisdictions and terminological diversity, and so we cannot specify this in graphical form. In addition, many simulations involved more than one substantive area of law, sometimes in a *matroshka* doll structure. Thus 11 items describe the use of simulations in areas of civil practice, with five referring to civil practice in general (Billingham 2011; Ferguson & Lee 2012; Munro & Noah 1978, Serby 2011; Vaughn 1995). Within this general category one specified the area of law being litigated as environmental law (Bradlow & Finkelstein 2008), another tax law (Cassidy 2009), another corporations (Evans & Howe 2007), while one used the civil practice simulation as an opportunity for client counselling (Zariski 2010). Other items focused on constitutional law (Smith 2012); two items focused on criminal law (Barnett & McKeown 2012; Boyne 2012); one dealt with criminology (Grenfell & Warren 2010); with one each on dispute resolution (Ponte 2011), one on ethics (Evans & Howe 2007), and EU law (Petzold 1999).

If subject areas are at times difficult to identify with certainty, this is even more the case with legal skills. Some items were clear on the types of skills and the standards to which the skills were practised (Barton & Westwood 2006, for instance, or Bloxham & Armitage 2003). Two items developed skills of professional practice (Pescod & Seagroves 2009) while one developed information literacy skills (Macoustra 2004). Three dealt with practice skills in general (Webb 1995; Woodley & Beattie 2011; Pescod & Seagreaves 2009). These skills were specified to a degree, though the context was quite different, with the first focusing on clinical experience, the second addressing issues of practice and identity in cyberspace more abstractly and the third developing a range of practice skills: advising a client, drafting legal documents and negotiation in the context of the case that is constructed. Another project developed legal research skills (Widdison 2002), another legal writing (Ashley 2000), another mooted competitions (Yule et al, 2012). One of the most frequent skills was that of negotiation (Clark 1990; Bloxham 1998; Barton & Maharg 2007).

### Interdisciplinary practice and theory

As we pointed out above, simulation as a heuristic has the potential to cross many boundaries between jurisdictions, institutions, subjects and sub-domains of knowledge acquisition and skill development. Simulation also has the potential to provide a means for students or professionals from a variety of disciplines to interact with each other. Indeed it is inherent in the three vectors of our search strategy – law, education and technology. In that sense, it could be said that there was to a significant degree a measure of hidden or invisible interdisciplinarity in all the items, and which surfaced in some items rather than others, often because such items focused on the process of simulation-building as well as describing the results. The work of Barton, Bloxham, Maharg, McKellar and Westwood was notable in this regard. In spite of this, however, it was remarkable that there were only two papers in the dataset (Boyne 2012; Maharg & Nicol 2009), describing a simulation that involved law students interacting with other professionals – the first social policy professionals in a terrorism response scenario, the second business law students facing an employment issue. In addition, Maharg & Nicol's example was a cross-jurisdictional instance, between the Netherlands and Scotland, in which the law students had to work within the framework of European law and international private law. There is clearly much more that can be done in this regard.



Interdisciplinary theory was more widely represented in the dataset. In the early 80s and 90s CAI was influential as a constellation of theories that explained how technology and teaching could be successfully implemented – Ashley (2000) and Alevan (2003) are examples of this approach, as is the work of Bench-Capon, Leng & Stanford (1998) and the work of the Jurimetrics group. In the new century, we see the emergence of a constructivist approach to learning and education. In many respects this reflected wider changes in educational theory: the move away from a focus on computer-based metaphors of memory and cognition to a broader conception of mind, and an understanding of learning as being more than knowledge acquisition and the cognitive ability to rehearse, recall and apply knowledge. The social and connectivist aspects of learning began to be explored in simulations, along with collaborative models of learning. The work of Barton, McKellar, Maharg and Westwood is representative in this regard. Much more could be said of the theoretical developments within the dataset. For now we should note the energy and focus of theory in the literature – we shall discuss this below.

### Proportion and type of simulation activity carried out in the digital context

Context matters in simulation, more so than in other forms of learning. The placing of resources and the availability of expert advice in the form of briefing and debriefing at the right moment, for instance, is important to the quality of learning that takes place in a simulation.<sup>9</sup> The extent to which a simulation is conducted in the digital domain, and the activities that learners carry out there, are telling factors also. It is therefore important to understand how much of a simulation takes place within the digital domain, and the type of activities carried out there. In our dataset it was impossible in many cases to classify the interventions described due to lack of detail. We comment on this below in the final section of our chapter.

### Media and simulations

Any form of media is a powerful determinant of learning. If a simulation is restricted to face-to-face and paper-based communications, then those contexts will affect what and how learners learn. If the affordances of the digital domain are used, the experience of learning becomes significantly different. We can understand why this might be so if we adopt Henry Jenkins' distinction, common amongst media analysts, between *media* and *delivery technologies* (Jenkins 2006, 13). A delivery technology is a tool by which we consume media – he cites the Betamax tape or 8-track audio as examples of defunct technologies. Media, on the other hand, is a more complex concept, and Jenkins cites Lisa Gitelman's two-level model of media.<sup>10</sup> First, 'a medium is a technology that enables communication'. Recorded sound is a typical example. But it is also 'a set of associated "protocols" or social and cultural practices that have grown up around that technology' (Jenkins 2006, 13-14). As Jenkins points out, a medium's content shifts according to the delivery technology (he cites the example of television displacing radio as a storytelling medium), and 'its social status may rise and fall', but 'once a medium establishes itself as satisfying some core human demand, it continues to function within the larger system of communication options' (14).

Over the period of the review the available delivery technologies have of course changed remarkably, and their enhanced functionalities have had an effect on the social and cultural practices that have grown up around them. Thus, there are nine items in the dataset that can be classified as using CAI

---

<sup>9</sup> Hays, R. T. (2005). *The Effectiveness of Instructional Games: A Literature Review and Discussion*. Orlando, FL, Naval Air Warfare Center Training Systems Division.

<sup>10</sup> Gitelman, L. (2006). *Always Already New: Media, History and the Data of Culture*. Cambridge, MASS, MIT Press.

(computer-aided instruction), and employing the use of AI (artificial intelligence) programs. These date mostly from the earlier period of our timespan, in the 1970s and 1980s. Three items from the 1990s describe interactive video (Killingley 1992; Hibbs & Vaughn 1994; Hogan et al 1989), and two describe the use of simulations that make much use of video conferencing (Boyne 2012; Bradlow & Finkelstein 2008). More recent items from 2000 onwards describe the use of transactional learning environments (TLEs). There are 19 such items. Five items refer to a 'virtual world' of some kind, four naming the multi-user virtual environment *Second Life* as being in use in whole or part of their simulation activity. One describes a virtual office (Ferguson & Lee 2012), one an electronic casebook (Ashley 2000) and there are several other studies that were conducted using custom-made interactive environments (eg Cassidy 2009).

### Statistical controls

Meaningful comparisons about the efficacy of pedagogic interventions requires, to some degree, a body of studies involving statistical controls. In the entire dataset there is only one item (Ashley 2000) that provided this. Ashley compared the pre- and post-test results from a first year cohort of learners who were divided into control (conventional methods of teaching) and experimental (use of the CATO CAI application) groups.

### Student evaluations

Data arising from student evaluation feedback is reported in only 15 of the 123 items. The chronological spread of the evaluation data is noteworthy. The earliest study (Degnan & Haar 1970) reported outcomes in detail with the next study to do the same dating from 1995 (Vaughn). It is only in the 2000s, in particular the late 2000s, that educators really begin to ask their students for formal feedback on the simulations in which they have participated. Australian institutions have been best at collecting and reporting student evaluation data, perhaps a reflection of their recent prominence in the area of simulation in education. Five of the US items reported student evaluation data, as did three of the items from England and one from the UK. In many items, however, student feedback data consists merely of a few quotations from a very small number of students. There are very few examples of pre-simulation and post-simulation evaluation taking place.

### Staff evaluations

Data on the experiences of staff taking part in simulation exercises in legal education is even thinner on the ground than is student evaluation data. Of the 123 items in the dataset, only eight report staff feedback in any detail. Once again Australia leads the way with four such items. Additionally, there are two items from the USA and England that provide any data of this nature. All of these items date from 2000 onwards with a peak occurring in the past few years.

The quality of staff feedback is variable. In many of the items the source of data is the author, who is often the person designing and/or running the simulation, detailing his or her observations about how well the intervention was liked or disliked by those students and others who participated. Where staff and student feedback exists it is often reported in such a way that it is difficult to isolate an author's opinions from the thoughts and feelings of the students or staff providing their feedback on the simulation.

## Emerging themes in simulation practice

Much of the data that emerges from our dataset is not reliable in a statistical sense for the reasons set out above. With the caution that self-reported learning data is notoriously unreliable, and with the

proviso that much basic statistical data and information is missing from the dataset it nevertheless may be useful to give some indication of learning and other effects that have been reported following the use of simulations.<sup>11</sup> The most commonly-mentioned effect is increased engagement, followed by a sense of authenticity and an appreciation of issues that might arise in the world of legal practice.<sup>12</sup> Several authors mention time management, enhanced class discussion, improved problem-solving skills, increased motivation, opportunity to practice and professionalism as further positive outcomes.

Authenticity of learning is described by several authors as being a positive effect of simulation i.e. learners can learn from errors, which do not have the same consequences as they might have in the real world. Other items, however, point to this aspect of realism being off-putting for those about to embark on career. Collaboration is a benefit also mentioned by a few authors as are the opportunities to practise drafting, counselling and interviewing skills. Not all authors employ the same language when describing these characteristics, which makes comparisons somewhat difficult. Tutor feedback, while thin on the ground, gave a sense of heavy initial workload for staff in many simulation activities but a few discuss the reusability of the learning resources as an advantage.

### Simulators as educators

Following on from the previous points, it is clear from many of the studies that simulation sits uneasily in the structure of most legal education curricula. To adopt the framework that Shulman developed, it remains a shadow pedagogy, challenging the orthodoxy of the hegemonic or 'signature' pedagogies in various common law jurisdictions.<sup>13</sup> One of the reasons why this is so is the lack of infrastructure for staff and staff positions that can enable an organization such as a law school to develop, explore and sustain the heuristic. Such a person would likely be experienced and trained in the intersections between disciplines and professions such as law and technology, or education and technology. In turn, this requires an infrastructure for such a new employment category, including the recognition of educational and technical expertise, and reward and career structures for this new category of personnel.

### Interdisciplinary theory and simulation in legal education

Looking back at the last 42 years of literature, simulation appears to be protean, chameleon-like. As we have seen above, it is capable of supporting many theoretical approaches and in particular two as different as jurimetrics and constructivism. This is in contrast to some other disciplines such as medical education, where simulation appears to be more uniform in approach and focused in outcome. The reasons why this is so have partly to do with the availability of more powerful and mobile computing, and the rise of the social and collaborative web – this undoubtedly fostered the rise of constructivist and connectivist approaches.

It also has to do with the nature of the discipline. Medical education simulation initiatives often use the approaches and evaluative instruments stemming from the scientific base of medicine and used in other areas of legal education, eg problem-based learning. By contrast, legal education is more porous, more open to other disciplines because its hegemonic pedagogies are articulated enough to ensure that

---

<sup>11</sup> Falchikov, N., & Boud, D. (1989). Student Self-Assessment in Higher Education: A Meta-Analysis. *Review of Educational Research*, 59(4), 395–430.

<sup>12</sup> The concept of authenticity is of course controversial, as Petraglia points out. Many authors ignore or avoid the issues he outlines. See Petraglia, J. (1998). *Reality By Design. The Rhetoric and Technology of Authenticity in Education*, New York: Routledge.

<sup>13</sup> Shulman, L. (2005). Signature pedagogies in the professions. *Daedalus*, Summer, 52-59.

simulation and other 'shadow' pedagogies remain shadow, but those dominant pedagogies are neither sufficiently well-researched and verified themselves; nor do they have a coherent scientific basis. There is an advantage to this weakness for simulation and other shadow pedagogies – interdisciplinary theory in legal education can more easily be adapted to legal educational practices such as simulation, in order to define and explain aspects of that practice. The disadvantage of this for simulation is a lack of coherence in method and particularly in evaluative methods, which this chapter evinces. It is perhaps significant that one of the most detailed recent literature reviews involving legal education was a multi-disciplinary endeavor, comprising Health, Social Sciences and Medicine.<sup>14</sup>

## A future research programme

It will by now be clear that the literature on simulation and technology is highly variable in quality, and in two areas particularly, namely granulated evidence of success in enhancing learning, and best practices in simulation. Few of the items about legal educational simulations have found their way into publications outside of the world of legal publication for example, in more general educational or technological journals. If the wider legal educational community is to be persuaded of the value of this experiential learning approach then wider publication is necessary. We would also propose that any future research should include the following data to improve the quality of scholarly literature in the field, set out in the next three points.

### 1. Core data for simulations

The following basic data should be available in each research item where specific implementations of simulations are discussed:

1. Number of legal educators involved and whether full- or part-time academic staff, administrators, technical staff, adjuncts, etc.
2. Year level of learner cohort
3. Number of learners
4. Learner profile: age, gender, socio-economic and ethnicity where appropriate to research aims
5. Description of the literature search undertaken and the educational approach taken by simulation designers
6. Year of implementation and duration of simulation under analysis
7. Subject domain(s) in law
8. Any interdisciplinary interventions
9. Media and platform descriptions
10. Activities undertaken by students and staff
11. Type of data analyses, eg controlled statistical study, qualitative study, etc
12. Wherever possible, the development of simulation resources as Open Education Resources (OER).

### 2. Extensible data

We also need:

---

<sup>14</sup> McKimm, J., Preston-Shoot, M. (2010). *Teaching, Learning and Assessment of Law in Medical Education*. Coventry and Newcastle: The UK Centre for Legal Education (UKCLE) and The Subject Centre for Medicine, Dentistry and Veterinary Medicine (MEDEV)

1. More reliable data on the quality of learning stemming, where possible, from correlative studies of learning. Baernstein et al, quoted in McKimm & Preston-Shoot, suggested that a rigorous methodology should contain the following characteristics:<sup>15</sup>
  - a. Greater number of participants;
  - b. Multi-institutional focus;
  - c. Control or comparison group;
  - d. Measure objective outcomes;
  - e. Measure validated outcomes;
  - f. Measure outcomes at least one month after the intervention;
  - g. Conduct the intervention more than once;
  - h. Estimate statistical power.
2. Analysis of the types of activities learners carry out, by means of data-tracking, self-reporting and where possible observation that can counter the biases of insider research.
3. Longitudinal cohort analysis, eg tracking a cohort of learners through a whole programme of study, and possibly beyond.

### 3. Central data-point and updating of information

There is a need for a central data-point that contains reliable information on educational innovation. In the College of Law at The Australian National University we have set up a Centre for Legal Education and its Regulation – CLEAR. The Centre will have a number of projects that it will develop, one of which will be a Simulation Project. This chapter’s systematic review dataset will be posted up as a public resource on our Centre site, and a dynamic reference list will be posted on Zotero, in a group library entitled ‘Simulation and technology in legal education’, which will be open. It will be updated quarterly with a summary of each item in the review. Researchers will have the option of signing up for regular updates from the CLEAR site or simply checking the public site on Zotero.

### Further implications

There are further implications for the whole question of research quality raised by this chapter, which should be addressed by those working in legal education. Medical research and information dissemination in many respects provides a gold standard to which we need to aspire. The Cochrane Collaboration, for instance ([www.cochrane.org](http://www.cochrane.org)), is an organization that in the 20 years since its foundation in 1993 has produced the Cochrane database of reviews – over 5,000 systematic reviews and meta-reviews of primary research in human health care and health policy, and published and freely accessible in The Cochrane Library (<http://www.thecochranelibrary.com/view/0/index.html>). While research analysis on this scale is well beyond our infrastructure and funding sources, it should be possible to collect data more systematically, on a global scale, and to start to build the research architecture that will enable a more rigorous analysis not just of simulation and technology in legal education, but of every heuristic in legal education, whether innovative or conventional. Nor need we

---

<sup>15</sup> Baernstein, A., Liss H, Carney, P., Elmore J. (2007), quoted in McKimm & Preston-Shoot (2010), *op cit*. Trends in study methods used in undergraduate medical education research, 1969-2007. *Journal American Medical Association*. 298(9), 1038-45. McKimm & Preston-Shoot comment in their own field, that of medicine and law, that ‘much published research focuses on local processes and relies on student satisfaction and short term acquisition of knowledge’ (2010, 14). They also mention the problem of ‘insider research’, namely that many effects were observed and recorded by staff who were already involved in the educational intervention, rather than by trained outsiders (2010, 14). This was problematic in our dataset too.

limit this to heuristics: it could be argued that almost every aspect of legal education requires systematic analysis.

Yet systematic data is not the only terminus of systematic review. Even researchers in medical education recognize this. Their research methods arose in part from the scientific method within the discipline; but recently there has been a growing movement that argues the 'gold standard' of controlled trials and psychometric discourse is insufficient. Researchers such as Bleakely for example have compare research based on acquisition metaphors to aspects of identity-formation, narration, the rhetorical strategies of practitioners, models of ethical awareness, the role of activity theory and much else, while others such as Lingard have emphasized the collective competences of teams.<sup>16</sup> These bodies of theory are not replacements for cognitive research or controlled trials. Rather, their explanatory and predictive power is appropriate to particular situations, particular purposes. As well as statistical studies, therefore, we need more sustained interdisciplinary analyses of why simulations work, under which conditions for learners, including the affective domain (Maharg 2011).

Within Law generally, the concern for systematic analyses has of course been a part of legal scholarship and jurisprudence. There are, however, terminological and conceptual differences with other disciplines. Discussing empirical studies of tort law for example, Schwartz describes the work of Saks and Galanter, mistakenly, as 'meta-reviews'.<sup>17</sup> In his article Galanter defines, explains, systematizes, presents new insights; it is a work of substantial scholarship, but his approach cannot be termed a meta-review, not least because of the nature of his subject matter, the nature of prior research he is gathering and analyzing, and the nature and method of his analysis. One can understand Schwartz's intention, however: while the work of Saks and Galanter may not be meta-review or systematic review, the articles do occupy a discussion space where there is a concern, at a high level, to analyze systems and rule-based regimes from their effects, and which is a central empirical function in legal research.

The situation is different for legal education however, caught as an interdiscipline between education and law and glancing to sister educational discourse in medicine and elsewhere. One of the critical problems of legal educational scholarship we are still faced with, as we have seen in this chapter, has been the lack of systematic research review summarizing the empirical research carried out, and the results obtained. We hope that this chapter is the first of many in the field.

## Review dataset

---

<sup>16</sup> Bleakley, A. (2006) Broadening the conception of learning in medical education: the message from teamworking, *Medical Education* 40(2), 150–57; Lingard, L. (2011). Beyond 'communication skills': research in team communication and implications for surgical education. In Heather Fry, Roger Kneebone (eds), *Surgical Education. Theorising an Emerging Domain*, Springer Netherlands, 199-213.

<sup>17</sup> Schwartz, G.T. (2002). Empiricism and tort law. *University of Illinois Law Review*, 1067-1082, 1067; Galanter, M. (1996). Real world torts: an antidote to anecdotes. *Maryland Law Review*, 55, 1093-1160; Saks, M.J. (1992). Do we really know anything about the behaviour of the tort litigation system – and why not? *University of Pennsylvania Law Review*, 140, 4, 1147-1292.



1. Agapiou, A., Maharg, P., & Nicol, E. (2010). Construction and constructivism: learning contract management and administration via simulated transactions. *Centre for Education in the Built Environment Transactions Journal*, 7(2), 37–54.
2. Aikenhead, M., Widdison, R., & Allen, T. (1999). Exploring law through computer simulation. *International Journal of Law and Information Technology*, 7(3), 191–217.
3. Aleven, V., & Ashley, K. D. (1997). Evaluating a learning environment for case-based argumentation skills. In *Proceedings of the 6th international conference on Artificial intelligence and Law*, 170–179. Retrieved from <http://dl.acm.org/citation.cfm?id=261650>
4. Allen, L. E., & Saxon, C. S. (1984). One use of computerized instructional gaming in legal education: to better understand the rich logical structure of legal rules and improve legal writing. *University of Michigan Journal of Law Reform*, 18, 383.
5. Allen, T., Aikenhead, M., & Widdison, R. (1998). Computer simulation of judicial behaviour. *Web Journal of Current Legal Issues*, 3. Retrieved from <http://webjcli.ncl.ac.uk/1998/issue3/allen3.html>
6. Ashley, K. D. (1999). Designing electronic casebooks that talk back: The CATO program. *Jurimetrics*, 40, 275.
7. Babacan, A. (2011). Teaching law to online law students at RMIT University. *Turkish Online Journal of Distance Education*, 12(2), 40–50.
8. Barnett, E., & McKeown, L. (2012). The student behind the avatar: using *Second Life* (virtual world) for legal advocacy skills development and assessment for external students – a critical evaluation. *Journal of Commonwealth Law and Legal Education*, 8(2), 41–63.
9. Barton, K., & Maharg, P. (2006). Simulations in the wild: interdisciplinary research, design and implementation. In C. Aldrich, D. Gibson, & M. Prensky (Eds.), *Games and Simulations in Online Learning* (pp. 115–148). Hershey, PA: Idea Group Ltd.
10. Barton, K., & McKellar, P. (2007). Transactional learning: Ardcalloch sheriff court is open for business. *Journal of Information, Law and Technology*, 2007(1). Retrieved from <http://strathprints.strath.ac.uk/29187/>
11. Barton, K., McKellar, P., & Maharg, P. (2000). Situated learning and the management of learning: a case study. *The Law Teacher*, 34(2), 141–163.
12. Barton, K., McKellar, P., & Maharg, P. (2007). Authentic fictions: simulation, professionalism and legal learning. *Clinical Law Review*, 14, 143.
13. Barton, K., & Westwood, F. (2006). From student to trainee practitioner—a study of team working as a learning experience. *Web Journal of Current Legal Issues*, 3, 1–15.
14. Bench-Capon, T. J., & Leng, P. H. (2000). Computer-mediated collaborative learning of legal argumentation. *Information & Communications Technology Law*, 9(2), 129–138.
15. Bench-Capon, T. J. M., Leng, P. H., & Staniford, G. (1998). A computer supported environment for the teaching of legal argument. *The Journal of Information, Law and Technology*, 3, 98–3.
16. Bigelow, R. P. (1972). The use of computers in the law, *Hastings Law Journal*, 24, 707.
17. Billingham, O., & Billingham, O. (2011). Investigating student engagement with an electronically delivered simulation of professional practice. Presented at the 10th European Conference on E-learning, 10th European Conference on E-learning, Brighton: Proceedings of ECEL 2011. Retrieved from <http://eprints.uwe.ac.uk/19463/>
18. Blackie, J., & Maharg, P. (1998). The Delict Game. In *BILETA Conference 1998*. Retrieved from <http://paulmaharg.com/wp-content/uploads/2011/05/Delict.doc>
19. Bloxham, S., & Armitage, S. (2003). What a LUVLE way to learn law. *International Review of Law, Computers & Technology*, 17(1), 39–50. doi:10.1080/1360086032000063101
20. Bloxham, S., Maharg, P., & McKellar, P. (2007). Summary Report on the UKCLE/BILETA VLE Project. *Journal of Information, Law & Technology*. Retrieved from <http://www.warwick.ac.uk/go/jilt>



21. Boardman-Weston, J. (1997). Ten tips for choosing the right case management system. *Computers and Law*, 8(4), 11–12.
22. Boon, A., & Jeeves, M. (1990). The common law in action simulation: reversing the burden of proof in skills education? *Law Teacher*, 24(1), 82–86.
23. Boyd, W. E. (1999). But what is it good for? Using interactive video in legal education and law practice. *Journal of Information, Law & Technology*, 3. Retrieved from [http://www2.warwick.ac.uk/fac/soc/law/elj/jilt/1999\\_3/boyd](http://www2.warwick.ac.uk/fac/soc/law/elj/jilt/1999_3/boyd)
24. Boyne, S. (2012). Crisis in the Classroom: Using Simulations to Enhance Decision-Making Skills. Available at SSRN 2103603. Retrieved from [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2103603](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2103603)
25. Bradlow, D. D., & Finkelstein, J. G. (2012). Training law students to be international transactional lawyers-using an extended simulation to educate law students about business transactions. *The Journal of Business, Entrepreneurship & the Law*, 1(1), 3.
26. Butler, D. (2010). Entry Into Valhalla: Contextualising the learning of legal ethics through the use of Second Life machinima. *Legal Education Review*, 20, 85.
27. Caplow, S. (2006). Clinical Legal Education in Hong Kong: A Time to Move Forward. *Hong Kong Law Journal*, 36, 229.
28. Cassidy, J. (2009). Client view. *Journal of the Australasian Tax Teachers Association*, 4(1), 55–69.
29. Cavanagh, E. D. (1988). Pretrial Discovery in the Law School Curriculum: An Analysis and a Suggested Approach. *Journal of Legal Education*, 38, 401.
30. Cecha, R. (2003). Simulations: the next generation of on-line learning for negotiation. *Interaction*, 16(3), 10–11.
31. Clark, A. (1990). Electronic negotiation: the international negotiation project. *BILETA Newsletter*, 2(4), 119–121.
32. Clemett, J. (2002). Sim firm. *Axiom*, (22), 1076–1077.
33. Connolly, K. D., & Davis, G. (2002). The role of clients in transforming the non-clinical curriculum: integrating “clients” into the classroom. Retrieved from <http://www.aals.org/profdev/clinical2002/connollybib.pdf>
34. Crellin, J., Adda, M., Duke-Williams, E., & Chandler, J. (2011). Simulation in computer forensics teaching: the student experience. Retrieved from <http://eprints.port.ac.uk/5519/>
35. De Freitas, S., & Maharg, P. (2011). Digital games and learning: modelling learning experiences in the digital age. In S. de Freitas & P. Maharg (Eds.), *Digital Games and Learning*. Continuum Press.
36. Degan, D. A., & Haar, C. M. (1970). Computer simulation in urban legal studies. *Journal of Legal Education*, 23, 353.
37. Drobak, J. N. (1971). Computer simulation and gaming: an interdisciplinary survey with a view toward legal applications. *Stanford Law Review*, 24, 712.
38. Duncan, R. M. (1984). Teaching legal skills for transfer of learning: is simulation the answer? *Journal of Professional Legal Education*, 2, 64.
39. Evans, A., & Howe, J. (2007). Enhancing Corporate Accountability through Contextual Ethical Exercises in Corporate Law Teaching. *Journal of Corporate Legal Studies*, 7, 337.
40. Falconer, L., & Frutos-Perez, M. (2009). Online Simulation of Real Life Experiences; the Educational Potential. In *World Conference on Educational Multimedia, Hypermedia and Telecommunications* (Vol. 2009, pp. 3564–3569). Retrieved from <http://www.editlib.org/p/31995/>
41. Ferguson, A., & Lee, E. (2012). Desperately seeking... relevant assessment? A case study on the potential for using online simulated group based learning to create sustainable assessment practices. *Legal Education Review*, 22(1/2), 121.
42. Fernhout, F. J., Cohen, M. J., Crombag, H. F. M., Pinckaers, R., & Temme, W. (1987). OBLIGATIO: computer simulation of legal cases. *Leren Studeren in het Hoger Onderwijs*, 204–209.

43. Friedland, S. I. (2011). Trumpeting Change: Replacing Tradition with Engaged Legal Education. *Elon Law Review.*, 3, 93.
44. Garvey, J. B. (2009). Making law students client-ready: A new model in legal education. *Duke FL & Social Change*, 1, 101.
45. Gibbons, L., Molyneaux Kennedy, R., & Gibbs, J. (2002). Cyber-mediation: computer-mediated communications medium massaging the message. *New Mexico Law Review*, 32. Retrieved from [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=315964](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=315964)
46. Gilbert, N., & Doran, J. (1994). Simulating Societies. The computer simulation of social phenomena. Retrieved from <http://www.citeulike.org/group/2740/article/2030191>
47. Goldman, P. (2008). Legal education and technology II: an annotated bibliography. *Law Library Journal*, 100, 415.
48. Gould, H., Hughes, M., Maharg, P., & Nicol, E. (2009). The narrative event diagram (NED): a tool for designing professional simulations. In D. Gibson (Ed.), *Digital Simulations for Improving Education: Learning Through Artificial Teaching Environments*. Hershey, PA: IGI Global Books.
49. Gould, H., Hughes, M., McKellar, P., & Nicol, E. (2008). *SIMulated Professional Learning Environment (SIMPLE). Final Programme Report*. Retrieved from <http://simplecommunity.org>
50. Grenfell, J., & Warren, I. (2010). Virtual worlds to enhance student engagement. *The International Journal of Technology, Knowledge And Society*, 6(1), 25–40.
51. Hannibal, M., & Pope, A. (2005). Developing practical legal research skills on the legal practice course. *Legal Information Management*, 5(4), 237–239.
52. Hazen, M. M., & Hazen, T. L. (1983). Simulation of legal analysis and instruction on the computer. *Industrial Law Journal*, 59, 195.
53. Hemming, A. (2006). As inevitable as the internet? *Legal Technology Journal*, 1, 26–29.
54. Hemming, A. (2008). E-Learning in a world with too much information. *Legal Information Management*.
55. Hession, R. (2012). Trainee Perspectives of the Effectiveness of Active Learning in a Legal Education Context. *Irish Journal of Academic Practice*, 1(1). Retrieved from <http://arrow.dit.ie/ijap/vol1/iss1/9>
56. Hibbs, M., & Vaughn, R. G. (1994). Interactive video in legal education. *New Law Journal*, 144, 172–173.
57. Hoelscher, K. J. (1990). Bridging the classroom and the real world: A videodisc implementation study at Harvard Law School. *Journal of Computing in Higher Education*, 2(1), 32–77.
58. Hogan, K., Cooke, T., & Sharman, F. (1989). Interactive video in law teaching. *International Review of Law, Computers & Technology*, 4(1), 104–126.
59. Hollander, P. A. (1977). Simulated Law Firm and Other Contemporary Law Simulations, The. *Journal of Legal Education*, 29, 311.
60. Hutchinson, S. (2006). Learning by doing. *New Law Journal*, 156(7249), 1751–1752.
61. Jabbari, D. (2000). Show me the money. *Axiom*, (14), viii–ix.
62. James, S. (1999). All aboard the fast track. *Axiom*, 1(8), 460–461.
63. James, S. (2000). It's yours to sort: enjoy it. *Axiom*, (12), 650–652.
64. Jeeves, M., & Boon, A. (1990). The common law in action simulation: Reversing the burden of proof in skills education? *The Law Teacher*, 24(4), 82–86.
65. Jones, C., & Bloxham, S. (2001). Networked Legal Learning: An Evaluation of the Student Learning Experience. *International Review of Law, Computers & Technology*, 15(3), 317–329. doi:10.1080/13600860220108111
66. Kennedy, A., & Winn, S. (2011). Using Technology to Increase Support for Rural and Regional Legal Professionals. *Deakin Law Review*, 16, 209.
67. Killingley, J. (1992). Building on the Paper Case. *Law Technology Journal*, 24.

68. Kirriemuir, J., & McFarlane, A. (2004). Report 8: Literature review in games and learning. Bristol, *Nesta Futurelab*. Retrieved from [http://www.coulthard.com/library/\(kirriemuir%20&%20mcfarlane,%202004\).html](http://www.coulthard.com/library/(kirriemuir%20&%20mcfarlane,%202004).html)
69. Lambiris, M., & Oberem, G. (1993). Natural language techniques in computer-assisted legal instruction: a comparison of alternative approaches. *Journal of Legal Education*, 43, 60.
70. LeBrun, M. (2003). Gaming contract law: creating pleasurable ways to learn the law of contract. *Murdoch University Electronic Journal of Law*, 10, 1.
71. Lettieri, N., Fabiani, E., Faro, S., & De Chiara, R. (2011). Transmedial patterns and design of legal serious games: a case study. *IIMC International Information Management Corporation, 2011*, ISBN: 978-1-905824-27-4. Retrieved from <http://www.ittig.cnr.it/Ricerca/Testi/lettieri-fabiani-faro-dechiara2011.pdf>
72. Lettieri, N., Faro, S., & D'Elia, V. (2007). *Interactive Simulations for Legal Education: A Software Simulating Civil Trial as Educational Device*. Expanding the Knowledge Economy: Issues, Applications, Case Studies (Eds. P. Cunningham and M. Cunningham).
73. Lettieri, Nicola, Fabiani, E., Polcini, A. T., De Chiara, R., Scarano, V., & Benevento, P. A. I. (2011). Emerging Paradigms in Legal Education: A Learning Environment to Teach Law through Online Role Playing Games. *Handbook of Research on Improving Learning and Motivation through Educational Games: Multidisciplinary Approaches*, IGI Global, Hershey PA, USA. Retrieved from <http://www.dechiara.eu/papers/BookChapter.pdf>
74. Lettieri, Nicola, & Faro, S. (2011). Seeking models of interaction for legal serious games: the transmedia paradigm. *Serious Games on the Move*, 8, 23–24.
75. Line, C., & Hemming, A. (2007). Business simulations for legal training. *Internet Newsletter for Lawyers, Sep/Oct*, 7–8.
76. Lodder, A. R., & Verheij, B. (1998). Opportunities of computer-mediated legal argument in education. In *Proceedings of the BILETA-conference* (pp. 27–28). Retrieved from [http://www.researchgate.net/publication/228943626\\_Opportunities\\_of\\_computer-mediated\\_legal\\_argument\\_in\\_education/file/79e4150c1dc50b7cd4.pdf](http://www.researchgate.net/publication/228943626_Opportunities_of_computer-mediated_legal_argument_in_education/file/79e4150c1dc50b7cd4.pdf)
77. Lodder, A., & Verheij, B. (1999). Computer-mediated legal argument: towards new opportunities in education. *The Journal of Information, Law and Technology*, 99–2. Retrieved from [http://www2.warwick.ac.uk/fac/soc/law/elj/jilt/1999\\_2/lodder](http://www2.warwick.ac.uk/fac/soc/law/elj/jilt/1999_2/lodder)
78. Macoustra, J. (2004). Information literacy: organisational and law firm perspectives. *Legal Information Management*, 4(02), 130–135.
79. Maharg, P. (2001). Negotiating the web: legal skills learning in a virtual community. *International Review of Law, Computers & Technology*, 15(3), 345–360.
80. Maharg, P. (2002). IT's progress: the gradual revolution. *The Legal Executive*, 2002(2), 8–13.
81. Maharg, P. (2006). Authenticity and professionalism: transactional learning in virtual communities. In *Innovating E-Learning Practice* (Vol. 6, pp. 33–42). Presented at the JISC Online Conference, Innovating E-Learning 2006, Minshull, G., Mole, J. Retrieved from [http://www.jisc.ac.uk/media/documents/programmes/elearning\\_pedagogy/webook\\_theme3\\_a4.pdf](http://www.jisc.ac.uk/media/documents/programmes/elearning_pedagogy/webook_theme3_a4.pdf)
82. Maharg, P. (2007a). Epilogue: Future directions for gaming and simulation. In I. Mayer, K. Stegers-Jäger, & G. Bekebrede (Eds.), *Spelend Leren in Virtuele Werelden. Bouwstenen voor Online Gaming in het Hoger Onderwijs* (pp. 235–237). Groningen/Houten: Wolters-Hoordhoff.
83. Maharg, P. (2007b). SIMPLE: Simulation Learning and Professional Practic. In *Organizing and Learning through Gaming and Simulation* Mayer, I. & Mastik, H., eds. Presented at the ISAGA 2007, Delft.

84. Maharg, P. (2009). Simulation, technology and professionalism. In *New Currents in Law School Education: The Use of Simulation and Web-Based Approaches* (pp. 15–42). Osaka: Kwansai Gakuin University Press.
85. Maharg, P. (2011). Space, absence, silence: the intimate dimensions of legal learning. In P. Maharg & C. Maughan (Eds.), *Affect and Legal Education: The Impact of Emotion on Learning and Teaching the Law*. Aldershot: Ashgate Publishing.
86. Maharg, P. (2012). Simulation: a pedagogy emerging from the shadows. In O. Goodenough (Ed.), *Educating the Digital Lawyer*. New Providence, NJ: Matthew Bender.
87. Maharg, P., & Nicol, E. (2009). Cyberdam and SIMPLE: a study in divergent developments and convergent aims. In I. Mayer & H. Warmelink (Eds.), *Learning in a Virtual World: Reflections on the Cyberdam Research and Development Project*. Nijmegen: Wolf Publishers.
88. Maharg, P., & Owen, M. (2007). Simulations, learning and the metaverse: changing cultures in legal education. *UK Centre for Legal Education*. Retrieved from [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=999541](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=999541)
89. Maharg, P., & Paliwala, A. (2002). Negotiating the learning process with electronic resources. In R. Burridge, K. Hinett, A. Paliwala, & T. Varnava (Eds.), *Effective Learning and Teaching in Law*. London: Kogan Page.
90. Mayer, I., Bekebrede, G., & Warmelink, H. (2009). Learning in a virtual world: an introduction. *Learning in a Virtual World*, 1.
91. Moles, R. (1991). 'Logic programming' - an assessment for its potential for artificial intelligence applications in law. *Journal of Law and Information Science*, 137.
92. Munro, R. J., & Noah, D. (1978). Plato, Educom, and Legal Education. *Computer/Law Journal*, 1, 545.
93. Munro, R. J., & Noah, D. (1979). Plato, Educom, and Legal Education. *Journal of Legal Education*., 30, 582.
94. Nakashidze, M. (2012). A "moot court" - an extracurricular activity in a constitutional justice course for master's program. *Literacy and Computer Education Journal*, 1(1). Retrieved from <http://infonomics-society.org/LICEJ/A%20Moot%20Court%20An%20Extracurricular%20Activity%20in%20Constitutional%20Justice%20Course%20for%20Masters%20Program.pdf>
95. Paliwala, A. (2000). The seductive serendipity of theories: information technology in legal theory education. *International Journal of the Legal Profession*, 7(3), 307–324.
96. Paliwala, A. (2001). Learning in cyberspace. *Journal of Information, Law & Technology*, 1. Retrieved from [http://www2.warwick.ac.uk/fac/soc/law/elj/jilt/2001\\_1/paliwala](http://www2.warwick.ac.uk/fac/soc/law/elj/jilt/2001_1/paliwala)
97. Park, R., & Burris, R. (1978). Computer-Aided Instruction in Law: Theories, Techniques, and Trepidations. *Law & Social Inquiry*, 3(1), 1–50.
98. Pescod, V., & Seagreaves, E. (2009, April 7). *E-Learning for legal professionals in the "virtual" workplace: the use of authentic activities*. Conference presented at the 44th Annual Conference of the Association of Law Teachers, Legal Education: Extending the Boundaries, Royal Tropical Institute, Amsterdam, Netherlands. Retrieved from <http://www.lawteacher.ac.uk/events/?id=15#about>
99. Petzold, W. (1999). European Union information developments: the challenge of virtual mobility: using information technologies in European studies. *European Access*, 3, 20–21.
100. Ponte, L. (2012). Levelling up to immersive dispute resolution (IDR) in 3-D virtual worlds: learning and employing key IDR skills to resolve in-world developer-participant conflicts. Available at SSRN 1984748. Retrieved from [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1984748](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1984748)
101. Poustie, M. R. (2001). Engaging students and enhancing skills: lessons from the development of a web-supported international environmental law conference simulation. *International Review of*

- Law, Computers & Technology*, 15(3), 331-44. Retrieved from <http://www.tandfonline.com/doi/abs/10.1080/13600860220108120>
102. Priddle, J., Maharg, P., McKellar, P., & Lysaght, D. (2010). Project Final Report. Retrieved from [http://www-new1.heacademy.ac.uk/assets/documents/oer/OER\\_1\\_UCKLE\\_final\\_report.pdf](http://www-new1.heacademy.ac.uk/assets/documents/oer/OER_1_UCKLE_final_report.pdf)
  103. Schaefer, P. (2010). Injecting law student drama into the classroom: transforming an e-discovery class (or any law school class) with a complex, student-generated simulation. SSRN Scholarly Paper No. ID 1676976. Rochester, NY: Social Science Research Network. Retrieved from <http://papers.ssrn.com/abstract=1676976>
  104. Seielstad, A. M. (2009). Resolving legal disputes in the metaverse: a meditation on teaching mediation skills and perspectives in virtual worlds. Retrieved from [http://works.bepress.com/andrea\\_seielstad/1/](http://works.bepress.com/andrea_seielstad/1/)
  105. Serby, T. (2011). Willing suspension of disbelief: a study in online learning through simulation, and its potential for deeper learning in higher education. *Liverpool Law Review*, 32(2), 181–195. doi:10.1007/s10991-011-9095-z
  106. Shibasaki, M., & Nitta, K. (1997). Defeasible reasoning in Japanese criminal jurisprudence. *Artificial Intelligence and Law*, 5(1/2), 139–159.
  107. Smith, D. E. (2012). *Incourt: Using a Virtual Supreme Court to Enhance the Traditional Simulation Experience* (SSRN Scholarly Paper No. ID 1997660). Rochester, NY: Social Science Research Network. Retrieved from <http://papers.ssrn.com/abstract=1997660>
  108. Torres, A. L., & Harwood, K. E. (1993). Moving Beyond Langdell: An Annotated Bibliography of Current Methods for Law Teaching. *Gonzales Law Review*, 1, 1–48.
  109. Trautman, D. (1990). The Computer in American Legal Education. *Law Technology Centre and BILETA newsletter*, 2(3), 95.
  110. Vaughan, R. G. (1995). Use of Simulations in a First-Year Civil Procedure Class. *Journal of Legal Education*, 45, 480.
  111. Verheij, B., Hage, J., & Lodder, A. R. (1997). Logical tools for legal argument: a practical assessment in the domain of tort. In *Proceedings of the 6th International Conference on Artificial Intelligence and Law* (pp. 243–249). Retrieved from <http://dl.acm.org/citation.cfm?id=261659>
  112. Webb, J. (1995). Where the action is: Developing artistry in legal education. *International Journal of the Legal Profession*, 2(2-3), 187–216. doi:10.1080/09695958.1995.9960402
  113. Widdison, R. (2002a). Computerising legal education what next? Presented at the 14th BILETA Conference: “CYBERSPACE 1999: Crime, Criminal Justice and the Internet, York, England. Retrieved from <http://www.bileta.ac.uk/content/files/conference%20papers/1999/Computerising%20Legal%20Education%20-%20What%20Next.pdf>
  114. Widdison, R. (2002b). 'Iolis Authoring in a Web Environment'. *The Journal of Information, Law and Technology*, 2, 02–2.
  115. Widdison, R., Aikenhead, M., & Allen, T. (1997). Computer simulation in legal education. *International Journal of Law and Information Technology*, 5(3), 279–307.
  116. Wills, S. (2009). A taxonomy for simulation learning designs: implications for repositories. *The Future of Learning Design Conference*. Retrieved from <http://ro.uow.edu.au/fld/09/Program/6>
  117. Wills, S. (2012). Role-based e-learning for university students : a comparison of Australian, American, British and Singapore designs. *Journal of Comparative Education*. Retrieved from <http://ro.uow.edu.au/asdpapers/256>
  118. Winsor, K. (1986). Towards the Design Specification for Computer Assisted Instruction in Criminal Law and Advocacy at the College of Law. *Journal of Professional Legal Education*, 4, 22.
  119. Woodley, C., & Beattie, S. (2011). Communal reflections on the workplace: Locating learning for the legal professional. *Asia-Pacific Journal of Cooperative Education*, 12(1), 19–30.

120. Woods, R. H. (2001). "Order in the virtual law classroom...order in the virtual law classroom" - a closer look at American law schools in cyberspace: constructing multiple instructional strategies for effective internet-based legal education. *The Journal of Information, Law and Technology (JILT)*, 01–3. Retrieved from [http://www2.warwick.ac.uk/fac/soc/law/elj/jilt/2001\\_3/woods/](http://www2.warwick.ac.uk/fac/soc/law/elj/jilt/2001_3/woods/)
121. Wright, R. (1998). Using expert systems to teach law and legal reasoning. Presented at the Subtech 98: International Conference on Substantive Technology in Legal Education and Practice, Stockholm.
122. Yule, J., McNamara, J., & Thomas, M. (2010). Mooting and technology: to what extent does using technology improve the mootng experience for students. *Legal Education Review*, 20, 137.
123. Zariski, A. (2010). Avatars go to Law School: Digital Standardized (and not so Standard) Clients for Law School Teaching (Working Paper). Retrieved from <http://auspace.athabascau.ca/handle/2149/2875>