

## The impact of student-generated digital flashcards on student learning of constitutional law

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### ABSTRACT

This article describes, evaluates and reflects upon student creation of cloud-based digital flashcards as an authentic formative and summative assessment task designed for the deep learning of constitutional law. The usefulness of digital flashcards in online legal education is explored. The undergraduate law student participants in the study responded differently to the assessment task depending upon the constitutional law topic they were assigned, the perceived relevance of constructing digital flashcards to professional practice and how they reacted to this creative task. Building digital flashcards provides a potentially powerful authentic assessment task for the study of constitutional law provided it is designed to support semester long creation, validation and sharing of digital flashcards that students perceive as professionally relevant and educationally useful. Student recommendations for designing an assessment task involving the creation of digital flashcards are evaluated.

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### Introduction

Authentic learning provides an opportunity for students to engage in realistic tasks that provide opportunities for collaboration<sup>1</sup> and a deep approach to learning. We believe that assessment for learning tasks<sup>2</sup> that help students to develop capabilities to make judgements related to their profession,<sup>3</sup> particularly through learning-by-doing, is a very

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<sup>1</sup>Jan Herrington, Thomas Reeves and Ron Oliver, *A Guide to Authentic e-Learning* (London, Routledge, 2010).

<sup>2</sup>Chan Fook and Gurnam Sidhu, "Authentic Assessment and Pedagogical Strategies in Higher Education" (2010) 6(2) *Journal of Social Sciences* 153–161; Mike Sharples, Patrick McAndrew, Martin Weller, Rebecca Ferguson, Elizabeth FitzGerald, Tony Hirst, Yishay Mor, Mark Gaved and Denise Whitelock, *Innovating Pedagogy 2012: Exploring New Forms of Teaching, Learning and Assessment, to Guide Educators and Policy Makers*, Open University Report 1 (Milton Keynes, The Open University, 2012), p. 13.

<sup>3</sup>David Boud and Associates, *Assessment 2020: Seven Propositions for Assessment Reform in Higher Education* (Australian Learning and Teaching Council, 2010), [http://www.uts.edu.au/sites/default/files/Assessment-2020\\_propositions\\_final.pdf](http://www.uts.edu.au/sites/default/files/Assessment-2020_propositions_final.pdf) (accessed 11 February 2015).

effective pedagogy.<sup>4</sup> Authentic learning is meaningful for students. Authenticity is aided by relevance of the task in connecting with an outside group or community,<sup>5</sup> such as legal professionals.

Recent reports concerning student university experiences also suggest that student engagement with on-campus life is in decline<sup>6</sup> whether studying on campus, in blended or online modes. Engaging assessment activities is one of the key factors for promoting student engagement with their studies, teachers and other students.<sup>7</sup> Authentic assessment, a form of assessment in which students are asked to perform real-world tasks that demonstrate meaningful application of essential knowledge and skills<sup>8</sup> is one method to engage students.

Authentic learning has its roots in situated cognition or situated learning<sup>9</sup> which may be defined as learning knowledge and skills in contexts that reflect the way the knowledge will be useful in real life.<sup>10</sup> According to Bransford, Pellegrino and Donovan<sup>11</sup> authentic learning is a pedagogical approach that allows students to explore, discuss and meaningfully construct concepts and relationships in contexts that involve real-world problems and projects that are relevant to the learner.

In order to achieve rich or authentic learning experiences, law students are often presented with complex problems and challenges to resolve. The process of authentic learning or authentic assessment allows students to act on a desire to dig deeply into the course content. Frey, after producing extensive tabulations of definitions, argues that providing a single and simple definition for an “authentic” learning experience or assessment task is problematic.<sup>12</sup> Similarly Stein *et al.*, after considering numerous definitions of authenticity observe,

The word “authenticity” is used in a number of ways in current literature about learning and curriculum. While all uses refer in some way to certain aspects of reality, be it reality in terms of what it is like in the world of work, or how real workers understand and perform their various practices, each is used in the context of the need to explore the nature of learning in order to assist students to become independent contributors to some field or discipline.<sup>13</sup>

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<sup>4</sup>Marilyn Lombardi, “Authentic Learning for the 21st Century: An Overview” (2007), <http://www.educause.edu/library/resources/authentic-learning-21st-century-overview> (accessed 1 October 2014).

<sup>5</sup>Dayna Laur, *Authentic Learning Experiences: A Real-World Approach to Project-Based Learning* (Hoboken, Taylor & Francis, 2013).

<sup>6</sup>Richard James, Kerri-Lee Krause and Claire Jennings, *The First Year Experience in Australian Universities: Findings from 1994 to 2009* (Brisbane, Griffith University, 2010); Ali Radloff and Hamish Coates (eds), “Doing More for Learning: Enhancing Engagement and Outcomes”, Australasian Survey of Student Engagement (AUSSE) (Camberwell, Victoria, Australian Council for Educational Research, 2010).

<sup>7</sup>Caroline Hart, Sara Hammer, Pauline Collins and Toni Chardon, “The Real Deal: Using Authentic Assessment to Promote Student Engagement in the First and Second Years of a Regional Law Program” (2011) 21(1) *Legal Education Review* 97–121.

<sup>8</sup>Jonathan Mueller, “Authentic Assessment Toolbox” (2011), <http://jonathan.mueller.faculty.noctrl.edu/toolbox/whatisit.htm#looklike> (accessed 1 October 2014).

<sup>9</sup>John Brown, Allan Collins and Paul Duguid, “Situated Cognition and the Culture of Learning” (1989) 18(1) *Educational Researcher* 32–42.

<sup>10</sup>Allan Collins, *Cognitive Apprenticeship and Instructional Technology* (Defense Technical Information Center, 1988).

<sup>11</sup>John Bransford, James Pellegrino and Suzanne Donovan, *How People Learn: Bridging Research and Practice* (Washington, DC, National Academy Press, 1999).

<sup>12</sup>Bruce Frey, Vicki Schmitt and Justin Allen, “Defining Authentic Classroom Assessment” (2012) 17(2) *Practical Assessment, Research & Evaluation* 1–18.

<sup>13</sup>Sarah Stein, Geoff Isaacs and Trish Andrews, “Incorporating Authentic Learning Experiences within a University Course” (2004) 29(2) *Studies in Higher Education* 239, at p. 239.

This article describes how students become independent contributors to the field of constitutional law, by creating their own digital flashcards.

Teachers and assessment researchers often go beyond semantic definitions by using a range of criteria for what they may see as critical elements on which to design a learning activity or assessment task.<sup>14</sup> In this study, we used a framework developed by Herrington<sup>15</sup> to both inform and assist our judgement of the design and use of a digital flashcard assessment task in a constitutional law subject.

The latest developments in information and communication technologies (ICT) can facilitate more authentic learning experiences based on experimentation and actions.<sup>16</sup> This in turn may result in a deeper rather than surface approach to learning and a more “real life” learning experience whereby students take responsibility for their learning and strive for creative solutions. Educators are trying to address the demands of twenty-first century students with new approaches to learning. For example, Laur describes her experience of teaching appellate court systems and using real-world examples or authentic learning in her classroom in the following terms:

The authentic learning experience had me relinquish much of my control of the classroom, turning it over to the students. I became the facilitator of my students’ learning, while my students became the directors of their own learning experience. Learning in my classroom is no longer categorised as a “one size fits all” model.<sup>17</sup>

Herrington and Parker<sup>18</sup> observe that:

Employing emerging technologies in learning is becoming increasingly important as a means to support the development of digital media literacy ... Emerging technologies have not yet been widely embraced within higher education courses. Personal use of mobile technologies is continuing to rise. The use of Web 2.0 technologies has the potential to transform the teacher-learner relationship, [but] harnessing the potential of technological affordances is a challenge for teachers.

Herrington and Parker<sup>19</sup> suggest three implications for practice and/or policy, all of which are evident in this study:

- Complex and overarching authentic tasks can be designed that require significant effort by students in collaboration with others.
- Emerging technologies can be used by students as cognitive tools.
- Students can be supported to take responsibility for their learning through scaffolding and guidance for a significant task, rather than direct instructions on lesser activities.

Many law academics incorporate authentic learning experiences into legal education and consider how ICT supports these initiatives. One example concerns the

<sup>14</sup>For example, Kevin Ashford-Rowe, Janice Herrington and Christine Brown, “Establishing the Critical Elements that Determine Authentic Assessment” (2014) 39(2) *Assessment & Evaluation in Higher Education* 205–222.

<sup>15</sup>Jan Herrington, Thomas Reeves and Ron Oliver, *A Guide to Authentic e-Learning* (New York, Routledge, 2010), Table 4, pp. 76–78.

<sup>16</sup>Marilyn Lombardi, “Authentic Learning for the 21st Century: An Overview” (2007), <http://www.educause.edu/library/resources/authentic-learning-21st-century-overview> (accessed 1 October 2014); Jan Herrington and Jenni Parker, “Emerging Technologies as Cognitive Tools for Authentic Learning” (2013) 44(4) *British Journal of Educational Technology* 607–615.

<sup>17</sup>Dayna Laur, *Authentic Learning Experiences: A Real-World Approach to Project-Based Learning* (Hoboken, Taylor & Francis, 2013), p. 22.

<sup>18</sup>Jan Herrington and Jenni Parker, “Emerging Technologies as Cognitive Tools for Authentic Learning” (2013) 44(4) *British Journal of Educational Technology* 607, at p. 607.

<sup>19</sup>*Ibid.*

use of simulations in authentic law activities such as mock legal firms and moots in a postgraduate law degree at Murdoch University. The simulations were aimed at providing students with experience of legal practice and were assisted by the use of videos to scaffold learning. The feedback provided by students and law practitioners resulted in the production of teaching videos to improve student learning.<sup>20</sup>

Another example of authentic learning using ICT concerns the use of online videos, simulation software and the multi-user virtual environment *Second Life* to teach negotiation skills in Contracts A and Contracts B at the Queensland University of Technology.<sup>21</sup> The *Gondwana Airlines* project used Authorware software to present a range of real-world fact scenarios (e.g., commissioning of a new wardrobe for cabin staff or maintenance contracts and recovery of outstanding freight charges) involving the airline. The text and images of these scenarios were created using *Second Life* and Microsoft *Flight Simulator X* video game. The vast majority of participating students expressed that they would prefer this form of instruction as compared to lecture and role-plays and felt that their learning experience was engaging, interesting and entertaining.

Flashcard technologies also provide an opportunity to revisit old learning activities from a new perspective. The traditional flashcard is a printed two-sided document – a question on one side, an answer on the other. Digital flashcards extend this by incorporating multimedia, data analytics, and spaced repetition systems that time the repeat access to cards so as to maximise memory retention. A study on the effectiveness of flashcards reports that flashcards help active recall, spaced repetition, metacognition, self-directed study, and help students gauge their progress.<sup>22</sup> Another study suggests that developing and studying flashcards with friends or a group could be more advantageous as students can collaborate with their peers on information, quiz each other, make social groups or communities and become more literate.<sup>23</sup> Aside from these studies there is next to no research on digital flashcards.

This study explored the use of digital flashcards as a formative and summative assessment task in constitutional law. The assessment task, assessed by the course coordinator, involved either an individual student or self-selected teams of two students. The students were enrolled in a second year undergraduate online law course taught by an accredited Australian law school.

The digital flashcards cards were based on a taxonomy of 15 types of cards for an assigned topic in constitutional law. The assessment was learner rather than teacher-focused<sup>24</sup> and was designed to encourage deep learning approaches by relating new information to existing knowledge and personal experience and relating theoretical

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<sup>20</sup>Linda Kam, Michele Ruyters, Claire Coburn and Mary Toohy, "Get Real! A Case Study of Authentic Learning Activities in Legal Education" (2012) 19(2) *Murdoch University Law Review* 17–32.

<sup>21</sup>Des Butler, "Air Gondwana: Using ICT to Create an Authentic Learning Environment to Teach Basic Negotiation Skills" (2009) 32 *The Student Experience* 52–63.

<sup>22</sup><https://voxy.com/blog/index.php/2011/05/are-flashcards-an-effective-learning-tool-infographic/> (accessed 2 September 2015).

<sup>23</sup>Isabella Rosse, "History of Flashcards", <http://isabellarosse.wordpress.com/history-of-flashcards> (accessed 1 October 2014).

<sup>24</sup>Paul Ramsden, "Improving the Quality of Higher Education: Lessons from Research on Student Learning and Educational Leadership" (1995) 6(1) *Legal Education Review* 3–19; Diana Henriss-Anderssen, "Teaching Note. Using Interactive Teaching Strategies in Large Lectures: Some Personal Reflections" (2003–2004) 14 *Legal Education Review* 181.

ideas to everyday experience.<sup>25</sup> Students were also given the opportunity to seek formative feedback from the course coordinator on their draft flashcards, before they were submitted for summative assessment. The approach is unlike traditional constitutional law instruction, which may involve theoretical lectures and tutorials, or practical approaches that involve presentation of films of virtual or staged environments,<sup>26</sup> followed by discussion.

The assessment task was initially designed to address the characteristics of authentic tasks identified in the following framework created by Herrington:<sup>27</sup>

- (1) Provide authentic contexts that reflect the way the knowledge will be used in real life.
- (2) Provide authentic activities.
- (3) Provide access to expert performances and the modelling of processes.
- (4) Provide multiple roles and perspectives.
- (5) Support collaborative construction of knowledge.
- (6) Promote reflection to enable abstractions to be formed.
- (7) Promote articulation to enable tacit knowledge to be made explicit.
- (8) Provide coaching and scaffolding by the teacher at critical times.
- (9) Provide for authentic assessment of learning within the tasks.

In part, this investigation was designed to explore how successful we were at providing a more authentic learning task designed to encourage students to use a deep learning approach in their study of constitutional law. There is no reason to suggest that the approach adopted in this study could not be applied to other law students studying in other modes, assuming that they have access to a computer or mobile phone. The approach is both content and jurisdiction independent.

### A taxonomy of flashcards

The first three authors<sup>28</sup> have previously reported a taxonomy of 23 types of digital flashcards. This is the only taxonomy of digital flashcards in the literature. The digital flashcards developed by students for the study of constitutional law were limited to 13 basic card types from the expanded set of 23:

**Case card** – details the facts, points of law and outcomes of a case. The card includes the full reference and a link to full text where available.

**Legislation card** – details legislation, subordinate legislation, rules, or practice directions. The point of law is clearly stated. Links are provided to the legislation and any relevant case cards.

**Flowchart card** – visually depicts a series of events or processes. Flowchart cards may take several forms: a diagram with links to other cards; a series or stack of

<sup>25</sup>Marlene Le Brun and Richard Johnstone, *The Quiet (R)evolution: Improving Student Learning in Law* (Law Book Co., 1994); Paul Ramsden, "Improving the Quality of Higher Education: Lessons from Research on Student Learning and Educational Leadership" (1995) 6(1) *Legal Education Review* 3–19.

<sup>26</sup>Des Butler, "Air Gondwana: Using ICT to Create an Authentic Learning Environment to Teach Basic Negotiation Skills" (2009) 32 *The Student Experience* 52–63.

<sup>27</sup>Jan Herrington, Thomas Reeves and Ron Oliver, *A Guide to Authentic e-Learning* (London, Routledge, 2010), Table 4, pp. 76–78.

<sup>28</sup>Stephen Colbran, Anthony Gilding and Samuel Colbran, "The Role of Digital Flashcards in Legal Education: Theory and Potential" (2014) 5(1) *European Journal of Law and Technology*, <http://ejlt.org/article/view/320> (accessed 1 October 2014).

cards enabling a process to be followed. Links are provided to any supporting materials.

**Principle card** – identifies a key legal principle, along with its primary authority.

**Review card** – asks a question requiring a response. This may be a multiple-choice question, short answer question, reflection, etc.

**Audio-visual card** – this card requires the embedding of a link to a dynamic element such as an animation, film, YouTube film, interactive reveal of additional information, etc. The audio-visual card may also identify the legal principle and link to any supporting materials.

**Conundrum card** – presents a legal dilemma, or a point of law, which seems unreasonable or otherwise noteworthy. The student may simply choose to use the conundrum as food for thought, or they can tap the link and link through to a discussion board where the issue can be discussed. A conundrum card may raise a complex question requiring research or extended thought or group discussion. There may be no right or wrong answer.

**Secondary source card** – contains information or issues arising from a secondary source such as a book, article, newspaper clipping, report, conference paper, etc. Links should be provided to the secondary source where available.

**Comparative card** – explores comparisons of the laws or legal systems, or both, between different jurisdictions or cultures.

**Reform card** – explores issues for law reform.

**Practical application card** – shows a real-world application of the relevant legal principle. Links are provided to any supporting materials.

**Discussion card** – is similar to a conundrum card, but the topics for discussion are more about analysing the operating of the law (as opposed to discussing its quirks and difficulties). Again, the student may simply use the card as food for thought, or alternatively they may link through to a discussion forum to share in the discussion with others.

**Role-play card** – this card is designed to allow students who are studying together to work through simple problem-style issues, which call into question the legal principles discussed elsewhere in the stack. These role-play situations may be quite simple (as in this one) or very complex, and the students may decide how “legalistic” their responses are to be.

The following types of digital flashcards were not discussed in this study: Reflection card, Timeline card, Polling card, Gaming card, Social networking card, Mosaic card, Mind mapping card and Wiki card. These digital flashcard types were considered too complex for inexperienced users to develop in a short timeframe.

## Student-generated digital flashcards

This study sought to determine whether the creation of digital flashcards by 71 second year undergraduate law students enrolled in constitutional law enhanced their learning. The course is part of the Priestley 11 (a set of 11 core law disciplines that must be successfully completed by students for admission into practice as a legal practitioner in Australia).<sup>29</sup> The course was delivered fully online as part of Central

<sup>29</sup>Law Council of Australia, “Prescribed Areas of Knowledge”, <http://www1.lawcouncil.asn.au/LACC/images/pdfs/LACCPrescribedAcademicAreasofKnowledge-June2008.pdf> (accessed 31 July 2015).

Queensland University's accredited online LLB programme. Learning resources are stored and accessible via both Moodle (see <https://moodle.org/>) and iTunes U, an online platform used by leading universities worldwide for online access to their educational content.

For the digital flashcard assessment, students were randomly assigned a weekly topic and asked to create 12 to 20 digital flashcards covering an aspect of constitutional law for that assigned week. The assessment instructions and marking rubric appear in Appendix B. Students were also provided with a FAQ instruction manual on how to use FlashCram – see Appendix C (Figure C1) and <http://www.flashcram.com>. There were no formal training sessions in using the software. Students had a choice of working individually or in self-selected pairs and were instructed to use at least six different types of digital flashcards from the taxonomy of digital flashcards developed by the researchers. The digital flashcards were to be assessed according to a marking rubric (Appendix B, Table B1) which used the following criteria: overall content, evidence and argument (40%), overall creativity (15%), overall interpretation and evidence (15%), organisation (10%), style and format of flashcards (10%), use of at least six types of flashcards (5%) and referencing (5%).

Notably the assessment emphasised overall content, evidence and argument (40%) and specified that in order for students to achieve a high distinction all the flashcards must:

- address key aspects of the assigned topic;
- include all key and relevant information;
- analyse and interpret information correctly;
- demonstrate very strong evidence of extensive critical appraisal of the law and secondary literature;
- demonstrate strong, cohesive arguments; and
- contain original and/or novel observations.

Hence, unlike traditional flashcards which tend to be simple and focus on a drill-and-grill approach by rote memorisation and repetition, the digital flashcard assessment was designed to encourage deep learning by encouraging students to relate “new information to existing knowledge and personal experience”, “relating theoretical ideas to everyday experience”.<sup>30</sup> The student's approach to learning may depend on how he or she interacts with the learning task. According to Marton and Säljö this may take a surface or deep approach<sup>31</sup> and may lead to qualitatively different and distinct types of learning outcomes. Prosser and Trigwell suggest that students who experience surface learning are unlikely to develop personal capabilities.<sup>32</sup> Hence a surface approach to the creation of digital flashcards involving memorisation, clear-cut factual summaries, storing knowledge as isolated, unconnected items,<sup>33</sup> with the absence of personal reflection may not result in any improvement in personal capabilities or the achievement of student learning outcomes. A deep approach to the use of digital

<sup>30</sup>Diana Henriss-Anderssen, “Teaching Note. Using Interactive Teaching Strategies in Large Lectures: Some Personal Reflections” (2003–2004) 14 *Legal Education Review* 181, p. 183.

<sup>31</sup>F. Marton and R. Säljö, “On Qualitative Differences in Learning – 1: Outcome and Process” (1976) 46 *British Journal of Educational Psychology* 4–11.

<sup>32</sup>M. Prosser and K. Trigwell, *Teaching for Learning in Higher Education* (Buckingham, Society for Research in Higher Education and Open University Press, 1998).

<sup>33</sup>John Loughran, *What Expert Teachers Do: Enhancing Professional Knowledge for Classroom Practice* (Australia, Allen & Unwin, 2010), p. 30.

flashcards may see students integrating their flashcards into the pre-existing course content provided by the course coordinator, engaging in personal reflection that impacts on their perception of constitutional law. The literature suggests that making the transition to deeper learning may require reinforcement of the relevance<sup>34</sup> of the learning activity and motivation<sup>35</sup> within a particular discipline.<sup>36</sup>

Several strategies outlined by Loughran<sup>37</sup> were adopted to encourage deep learning using digital flashcards. The relevance of flashcards was highlighted as a creative activity designed to help build and retain information on constitutional law. Making the task both formatively and summatively assessable potentially motivated students. The task was set within a particular discipline – constitutional law. Students were provided with appropriate background knowledge of the subject by the course coordinator, who was enthusiastic in his support of the learning task. The flashcards were an extension exercise requiring students to relate new materials to what they already knew and understood. The use of a formative review of draft flashcards enabled students to make mistakes without penalty about the structure of the subject. Construction of the flashcards required thought and required related ideas to be used together. Amended flashcards were assessed formatively enabling the course coordinator to identify and overcome student misconceptions. Students had plenty of time to complete the flashcards exercise. The final summative assessment of amended flashcards rewarded students for their efforts. The sharing of student created flashcards may also improve collaboration amongst the student cohort.

Since the flashcards were student-generated, they were also learner rather than teacher-focused.<sup>38</sup> The generation of digital flashcards by students was viewed as a logical extension of the fully online instructional environment of the LLB programme and was aimed at motivating students in their study of constitutional law in the sense described by Jenkins of “inner processes that determine whether learners will engage in a task, the amount of effort they will expend, the length of time that they will persevere and the persistence they will show when obstacles are encountered”.<sup>39</sup> It was envisaged that students would not be mere passive consumers of content,<sup>40</sup> but be actively engaged in the development of learning artefacts and reflection on their learning. The digital flashcards were also meant to comprise new learning resources that could be used by other students to study for the course and prepare for the final examination. The assessment approach, being creative of

<sup>34</sup>F. Marton and S. Booth, *Learning and Awareness* (New Jersey, L. Erlbaum Associates, 1997).

<sup>35</sup>F. Marton and R. Säljö, “Approaches to Learning”, in F. Marton, D. Hounsell and N. Entwistle (eds), *The Experience of Learning: Implications for Teaching and Studying in Higher Education* (2nd ed., Edinburgh, Scottish Academic Press, 1997) Chapter 3, pp. 39–58.

<sup>36</sup>U. Lucas and R. Mladenovic, “Approaches to Learning in Accounting Education” (2004) 13(4) *Accounting Education: An International Journal* 399–407.

<sup>37</sup>John Loughran, *What Expert Teachers Do: Enhancing Professional Knowledge for Classroom Practice* (Australia, Allen & Unwin, 2010), p. 31.

<sup>38</sup>Marlene Le Brun and Richard Johnstone, *The Quiet (R)evolution: Improving Student Learning in Law* (Law Book Co., 1994); Paul Ramsden, “Improving the Quality of Higher Education: Lessons from Research on Student Learning and Educational Leadership” (1995) 6(1) *Legal Education Review* 3–19.

<sup>39</sup>Alan Jenkins, Rosanna Breen and Roger Lindsay, *Reshaping Teaching in Higher Education: Linking Teaching with Research* (Kogan Page, 2003), p. 31.

<sup>40</sup>Nancy Falchikov, *Improving Assessment through Student Involvement: Practical Solutions for Aiding Learning in Higher and Further Education* (Abingdon, RoutledgeFalmer, 2005); Lisa Claydon, “Engaging and Motivating Students: Assessment to Aid Student Learning on a First Year Core Law Module” (2009) 43(3) *Law Teacher* 269–283.



learning artefacts, expository, and inductive, departs from traditional law course assessments such as legal memorandums, moots and examinations, which focus on problem-solving and deductive thinking. It also enables audio-visual elements to be combined with text to enhance digital literacy among students who are often viewed as “digital natives”.<sup>41</sup>

To develop their digital flashcards, students used FlashCram, a free online software initially designed and created by Sam Colbran for this study after existing free online flashcard platforms were seen to have limited features and functionalities (see [www.flashcram.com](http://www.flashcram.com)). For consistency, students were only allowed to use the FlashCram software and save their digital flashcards on the FlashCram website where they could be viewed, shared and assessed.

Because of the open-endedness of the digital flashcard assessment students had autonomy to choose which aspects of a topic to focus on and the type of digital flashcards to develop. It was theorised that the assessment was less complex than the legal memorandum assessment and the final examination which dealt with specific and complex case problems and that students would earn better marks in the flashcard assessment.

The development of digital flashcards by the students was one of four assessments in the constitutional law course being worth 20% of the total course grade. The other course assessments included an online group discussion (10%), a legal memorandum (30%), and a final examination (40%). Some may argue that there may have been a degree of over-assessment and that this may have placed some strain on students to complete a novel assessment task such as constructing flashcards. The assessment in constitutional law was well spread throughout the 12-week duration of the course. It was not uncommon for students in the degree to have numerous items of continuous assessment in various subjects. In hindsight reducing the amount of assessment may have freed up time for students to more fully engage with the flashcards assessment. Others may question whether the amount of work involved in the flashcards assessment was worth it. There is no doubt a considerable amount of work was involved in working with the software developers of FlashCram, creating sample cards and other supporting scaffolding such as FAQs and formative comments on student flashcards and their summative assessment. There was also a considerable amount of work involved with students learning to use new technology. In our view, research into new technologies is necessary to judge whether the benefits to student learning outweigh the costs. Without original research of this nature we have no idea of the impact that new technologies may make and whether they are worthy of rolling out on a larger scale.

The digital flashcards were due on 23 May being in the final week of a 12-week constitutional law course. Perhaps unsurprisingly, user statistics showed that students accessed the FlashCram website more frequently on the first week of May or after the submission of their legal memorandum, three weeks before the flashcard assessment was due. The number of students who used FlashCram increased a few days before 9 May, the day when students could submit their draft digital flashcards for formative feedback (see [Figure 1](#)). Student activity dropped dramatically by 10 May, but started to rise again on the days closer to the submission date.

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<sup>41</sup>Marc Prensky, “Digital Natives, Digital Immigrants Part 1” (2001) 9(5) *On the Horizon* 1–6.

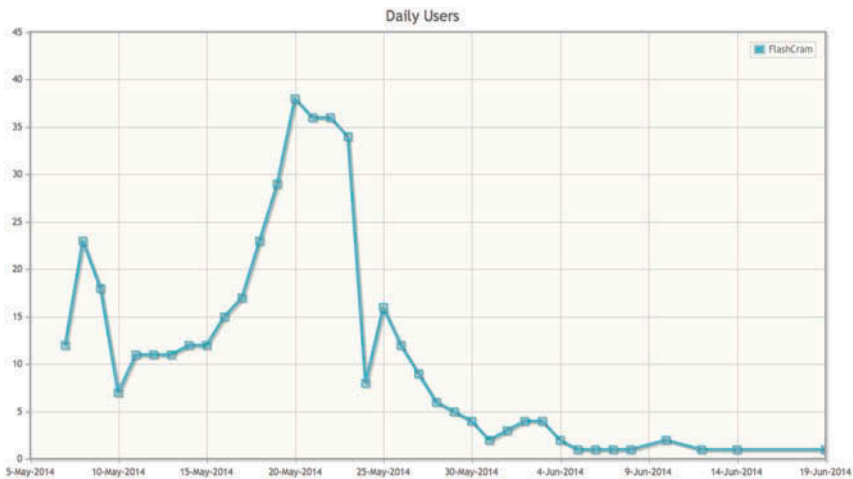


Figure 1. FlashCram usage.

Examples of student digital flashcards are reproduced in [Appendix A](#). The examples include sample student case card ([Figure A1](#)), sample student question and answer card ([Figure A2](#)), sample student flowchart card ([Figure A3](#)) and sample student audio-visual card ([Figure A4](#)). Sixty-three students (89%) submitted their digital flashcard assignment. This was the same number as those who submitted their legal memorandum and sat for the final examinations. [Table 1](#) reveals that there were more students who earned high distinctions in their digital flashcard assessment (22.5%) than in both the legal memorandum assessment (15.5%) and the final examination (15.5%). More students failed the digital flashcard assessment (16.9%) than the legal memorandum (11.3%). The digital flashcard assessment had an equal number of students with fail marks as the final examination, perhaps suggesting an unanticipated high level of mental and task complexity in the digital flashcard assessment.

Significant scaffolding was provided for students to complete the exercise. This included example digital flashcards, detailed descriptions of the types of flashcards, an online manual on how to use FlashCram to create the flashcards, a detailed assessment rubric and an opportunity for formative comments prior to the final summative submission. Given the extent of assistance provided it is questionable whether better guidance could have improved the final examination pass rate. One possible avenue for improvement would be to consider whether students were over-assessed and the recognition that this exercise was different from previous assessments students had

Table 1. Assessment and grade results of all students.

Grades	Digital flashcard	Legal memorandum	Final examination	Final grade
High distinction	16 (22.5%)	11 (15.5%)	11 (15.5%)	8 (11.3%)
Distinction	10 (14.1%)	9 (12.7%)	9 (12.75%)	15 (21.1%)
Credit	9 (12.7%)	10 (14.1%)	13 (18.3%)	13 (18.3%)
Pass	14 (19.7%)	25 (35.2%)	18 (25.3%)	21 (29.6%)
Fail	12 (16.9%)	8 (11.3%)	12 (16.9%)	6 (8.4%)
No submission	8 (11.3%)	8 (11.3%)	8 (11.3%)	8 (11.3%)
Total	71 (100%)	71 (100%)	71 (100%)	71 (100%)

**Table 2.** Assessment and grade results of students who submitted draft digital flashcards for formative assessment.

Grades	Digital flashcard	Legal memorandum	Final examination	Final grade
High distinction	8 (42.1%)	4 (21.0%)	5 (26.3%)	5 (26.3%)
Distinction	1 (5.3%)	3 (15.8%)	4 (21.0%)	4 (21.0%)
Credit	2 (10.5%)	1 (5.3%)	0 (0%)	0 (0%)
Pass	2 (10.5%)	9 (47.4%)	5 (26.3%)	7 (36.8%)
Fail	6 (31.6%)	2 (10.5%)	4 (21.0%)	3 (15.8%)

experienced and that the technical demands may have overloaded some students in the mature age online cohort. It may be possible that the IT skills that mature age students possessed were not well suited to this assessment task and hence why 58.5% of students agreed the assessment task was challenging. We should not assume that, just because people grow up surrounded by technology, they actually have any knowledge or aptitude on how to use it. Indeed students may well be at different levels of digital literacy, as Sharpe and Beetham suggest ranging from mere *access*, through acquiring initial *skills* applying technology to their learning, developing *practices* on how to use technology in their discipline and at the top level *attributes*, where students have a strongly developed understanding of the value and possibilities of using technology to support their learning.<sup>42</sup>

Of the 19 students (27%) who submitted their draft digital flashcards for formative feedback, 47% earned high distinctions and distinctions in their three key assessments and final grades (Table 2). Six students (31.6%) failed in the digital flashcard assessment despite submitting their draft digital flashcards for formative feedback. Of those, two also failed the legal memorandum assessment, four failed the final examination, and three failed the course.

The flashcard component of the course assessment constituted 20% of the overall course assessment. Upon reflection the course may have been over-assessed. Given the considerable effort involved in creating the assessment it may be queried whether it was worth it for such a small percentage of the overall assessment in the course. The assessment proved to stretch both staff and student digital capabilities.

The challenges of this assessment were considerable. These included:

- Creating a taxonomy of digital flashcards
- Sample flashcards providing guidance to assist students
- Creation of a cloud-based digital flashcard system, known as FlashCram
- Creation of a detailed assessment rubric
- Formative marking of student sample cards
- Summative marking and commentary on final student cards
- Creation of a survey instrument and focus group questions

<sup>42</sup>Rhonda Sharpe and Helen Beetham, "Understanding Students' Uses of Technology for Learning: Towards Creative Appropriation", in R. Sharpe, H. Beetham and S. de Freitas (eds), *Rethinking Learning for the Digital Age: How Learners Shape Their Experiences* (London and New York, RoutledgeFalmer, 2010), pp. 85–99. See also Liz Bennett, "Learning from the Early Adopters: Developing the Digital Practitioner" (2014) 22 *Research in Learning Technology*, <http://www.researchinlearningtechnology.net/index.php/rlt/article/view/21453> - CIT0029\_21453 (accessed 24 July 2015).

## Methodology

An online survey instrument was prepared and distributed using Qualtrics ([www.qualtrics.com](http://www.qualtrics.com)) to 71 students who completed the assignment in constitutional law at Central Queensland University in Term 1, 2014. Constitutional law is a second year course in a fully online undergraduate accredited law degree. Ethics approval was granted to conduct the study (H14/02-028).

Survey instruments are a widely used method of collecting and analysing factual information about populations used in academic research.<sup>43</sup> The survey provides an efficient structured dataset for descriptive and inferential statistics. It also provides opportunities for open-ended comments useful for qualitative analysis. Given that the survey participants were studying online from disbursed locations, an online survey was administered.

The survey used in this article was designed to yield both quantitative and qualitative data. Student comments were analysed and an online focus group with five volunteers was conducted to follow up on some of the significant themes identified in the survey data. It proved difficult to obtain volunteers for the focus group despite numerous attempts, which undermines the representativeness of the focus group.

The survey data was analysed to provide descriptive statistics for each of the questions. The Pearson correlation coefficient was used to identify any dependence between variables identified through the questions in the survey (for example whether the results were influenced by demographic variables, such as age and gender). A *t*-test was used to identify any significant variation between the neutral value and the mean results that cannot be explained by chance.

## Survey results and discussion

The response rate for the survey was 45 or 63.4% (20 male, 25 female) of the 71 students enrolled in the constitutional law course. The student cohort consisted mainly of mature age students. The age profile appears in [Figure 2](#).

Participants rated the overall value of creating flashcards in constitutional law, using a five-point Likert scale of the perceived value of the assessment (1 Excellent value, 2 Above average value, 3 Average value (take it or leave it), 4 Below average

#	Answer	Response	%	Statistic	Value
1	< 20	4	9%	Min Value	1
2	21 - 30	13	29%	Max Value	5
3	31 - 40	17	38%	Mean	2.87
4	41 - 50	7	16%	Variance	1.16
5	51 - 60	4	9%	Standard Deviation	1.08
6	61 - 70	0	0%	Total Responses	45
7	> 70	0	0%		
	Total	45	100%		

Figure 2. Age profile of students.

<sup>43</sup>M. Lewis-Beck, A. Bryman and T. Jiao, *The SAGE Encyclopaedia of Social Science Research Methods* (Volume 3) (Sage, 2014), p. 1102.

#	Answer	Response	%	Statistic	Value
1	Excellent value	2	5%	Min Value	1
2	Above average value	5	12%	Max Value	5
3	Average value (Take it or leave it)	10	24%	Mean	3.61
4	Below average value (don't actually see the value)	14	34%	Variance	1.29
5	Poor (not interested)	10	24%	Standard Deviation	1.14
Total		41	100%	Total Responses	41

Figure 3. Overall value of the digital flashcards.

value (don't actually see the value), 5 Poor (not interested)). The mean of 3.61 was statistically significant (Sig. (two-tailed  $t$ -test) = .001) compared with the test value of 3. The complete profile appears in Figure 3. Pearson correlation coefficients did not reveal any significant gender or age correlations, except that age and gender were inversely correlated (Pearson correlation coefficient =  $-.363$ , Sig. two-tailed = .014). This suggested older respondents were associated with more negative responses to all questions in this study.

This cohort of students perceived their construction of flashcards as between average and below average value. This was an unexpected and somewhat disappointing outcome.

### Relevance of flashcards to student learning

Participants rated their level of agreement with several statements concerning their experience in creating flashcards in constitutional law using a five-point Likert agreement scale (1 Strongly disagree, 2 Disagree, 3 Neutral, 4 Agree, 5 Strongly agree). Pearson correlation coefficients did not reveal any significant gender or age correlations, except for the inverse relationship between age and gender reported above (see Table 3).

Table 3. Questions and one-sample  $t$ -test (two-tailed).

Question	1	2	3	4	5	Total	Mean	Sig.
Creating flashcards made constitutional law more interesting to learn.	16.6%	42.9%	19.5%	16.6%	4.8%	42	2.50	.006
Creating flashcards helped me understand constitutional law.	16.2%	35.7%	14.3%	26.2%	4.8%	42	2.62	.048
Creating flashcards did NOT assist my learning of constitutional law.	10%	20%	25%	30%	15%	40	3.2	.308
The flashcards I developed helped me retain knowledge of constitutional law.	12.2%	26.8%	26.8%	24.4%	9.8%	41	2.93	.696
Creating flashcards did NOT assist my exam preparation.	4.9%	19.5%	14.6%	34.1%	26.8%	41	3.59	.004*
The assignment task was challenging.	2.4%	0%	12.2%	58.5%	26.8%	41	4.07	.000*
The assignment task enabled me to be creative in my learning of constitutional law.	12.2%	43.9%	19.5%	17.1%	7.3%	41	2.63	.046
I prefer a problem-based assessment rather than creating flashcards.	2.4%	14.6%	12.2%	34.1%	36.6%	41	3.88	.000*
The example flashcards provided assisted me in developing my own flashcards.	9.8%	24.4%	22%	34.1%	9.8%	41	3.10	.599
The assessment rubric provided assisted me in judging the quality of my flashcards.	12.2%	26.8%	29.3%	26.8%	4.9%	41	2.85	.403

Note: \*Indicates a significant result at the .005 level of significance.

There were three student responses significantly different from neutral. Students did not find their creation of flashcards assisted them with exam preparation. They found the production of flashcards to be a challenging exercise and expressed a preference for problem-based assessment rather than creating flashcards.

### Flashcards produced by other students

Table 4 summarises how participants rated their experience with flashcards developed by other students in creating the various types of flashcards using a five-point Likert agreement scale (1 Strongly disagree, 2 Disagree, 3 Neutral, 4 Agree, 5 Strongly agree).

Pearson correlation coefficients did not reveal any significant gender or age correlations, except that age and gender are inversely correlated (Pearson correlation coefficient =  $-.363$ , Sig. two-tailed =  $.014$ ). This suggested older respondents were associated with more negative responses to all questions.

It is quite clear that this cohort of students did not value flashcards produced by other students. The peer flashcards did not assist in understanding the subject or make it more interesting to learn. The peer flashcards did not assist in knowledge retention, assist with learning the subject, or with exam preparation.

### Qualitative comments and focus group discussions

There were opportunities for students to provide additional comments for the following survey questions:

- Rate the level of difficulty in creating the following types of flashcards. Leave blank those types of flashcards you did not create ( $n = 23$ ).
- Rate your experience using the cards of others ( $n = 23$ ).
- Outline the positive aspects of creating flashcards ( $n = 23$ ).
- Outline the negative aspects of creating flashcards ( $n = 24$ ).
- Outline the positive aspects of using flashcards created by other students ( $n = 24$ ).

**Table 4.** Other students' flashcards and one-sample  $t$ -test (two-tailed).

Question	1	2	3	4	5	Total	Mean	Sig.
Using flashcards developed by other students made constitutional law more interesting to learn.	31.7% 13	31.7% 13	22% 9	12.2% 5	2.4% 1	41	2.22	.000*
Using flashcards developed by other students helped me understand constitutional law.	34.1% 14	24.4% 10	24.4% 10	14.6% 6	2.4% 1	41	2.27	.000*
Using flashcards developed by others did NOT assist my learning of constitutional law.	2.5% 1	10% 4	12.5% 5	42.5% 17	32.5% 13	40	3.93	.000*
Using flashcards developed by others helped me retain knowledge of constitutional law.	34.1% 14	24.4% 10	26.8% 11	12.2% 5	2.4% 1	41	2.24	.000*
Using flashcards developed by others did NOT assist my exam preparation.	2.4% 1	9.8% 4	19.5% 8	31.7% 13	36.6% 15	41	3.90	.000*

Note: \*Indicates a significant result at the .005 level of significance.

- Outline the negative aspects of using flashcards created by other students (n = 22).

An informal focus group was also scheduled which five students attended. The main focus was on the assessment task for the subject. The questions included:

- What did you feel about the assignment? How useful was it to you?
- Did anyone explore the other cards, e.g. Video cards? How did you select your card type?
- Which particular legal topics are better suited for this flashcard assignment? What advice would you give us on selecting legal topics for this flashcard assignment?
- What advice would you give the lecturer on redesigning this assessment task so it is more useful to the students?

The survey comments were analysed by identifying specific issues and observations concerning the assessment. Owing to the small number of students interviewed, the analysis centred upon how the focus group comments may have elaborated/extended particular issues, particularly those related to the assessment design and observed learning outcomes for students. The richness of data provided in the survey comments, focus group and lecturer interview provided a number of possible directions for further analysis. In this article, the analysis is restricted to an evaluation of this assessment and methods for improvement.

### Was the flashcard assessment authentic?

It is useful to reflect on the findings of this study compared with the characteristics guiding the design of an authentic task identified by Herrington *et al.*<sup>44</sup> In Table 5, we highlight our results and/or observations of the students in this study with each characteristic for an authentic assessment task.

### Student suggestions to improve the assessment task

Twenty-three students made suggestions on how to improve the flashcard assessment. The suggestions are summarised as follows:

- The purpose and relevance of digital flashcards need to be clearly established.
- Creation of cards should run throughout the semester.
- Students should have the opportunity to deal with a range or all of the topics specified for representation as digital flashcards.
- Develop cards for several topics or threshold concepts across the entire or significant proportion of the subject.
- Use groups comprising four or five students in preference to two students.
- Select significant topics or concepts rather than topics chronologically.
- Topics that are aligned with the different types of cards should be made available to the students.

Many of these suggestions are consistent with the analysis of the assessment task provided in this article.

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<sup>44</sup>Jan Herrington, Thomas Reeves and Ron Oliver, *A Guide to Authentic e-Learning* (London and New York, Routledge, 2010).

**Table 5.** Authenticity.

Specified feature	Observations, conclusions and implications	Relevant student comments (focus group and survey)
Provide authentic contexts that reflect the way the knowledge will be used in real life	<p>While the legal problems had real-world relevance, older, male and/or students who adopted a “surface” conception of the assessment task did not see the relevance of constructing digital flashcards.</p> <p>Building digital flashcards had limited professional relevance for some students. Pedagogical relevance was also not immediately obvious to students.</p> <p>The project’s “deep” conception for learning supported pedagogical relevance and greater authenticity of the assessment task.</p>	<p>Typical of a surface conception of the assessment task ...</p> <p><i>The assignment said we had to do six cards, so we went for the six cards of least resistance. ... There was no way in the world we were going to explore video cards.</i></p> <p>Alternatively ...</p> <p><i>The flashcards allowed you to fly free, to use critical thinking and to explore the subject matter from a theoretical and ethical perspective. Other assignments can be more constrained. The flashcards were very creative. Feedback and being referred to the rubric helped to improve the cards and final marks.</i></p>
Provide authentic activities	<p>The topics identified real-world problems for students to analyse and represent in the form of digital flashcards. All topics were authentic, but with different levels of alignment with the curriculum and assessment for the subject. Students did not consider all topics equally important.</p>	<p><i>The other thing I find, and I think &lt;name of other student&gt;, alluded to this too, is that while you have got so many choices of cards, not every topic disposes itself to be able to pick 6 types of cards. If you get a topic where it's hard to do to find six types of cards you are at a disadvantage to someone else who has a topic. So maybe later on in the course when you are talking about, ah, powers between the states and the commonwealth and things like that where there is reasonable case law etc. So to answer your question, “is there a legal area where I would recommend to use FlashCram as a means of assessment well?” The answer is well, no I don't.</i></p>
Provide access to expert performances and the modelling of processes	<p>Examples of high quality flashcards were provided as exemplars but not all the different types of cards were represented.</p> <p>Rubrics were provided to assist students to understand the assessment of the digital flashcards.</p> <p>A better approach may have been to provide small video vignettes of the development of each type of digital flashcard together with reasons why the legal topic lends itself to representation with the chosen type of digital flashcard.</p>	<p><i>... having no disrespect for other students, when their material was made available, you are that close to the exam that you really don't want to take a chance on them being right. You really want to rely on what's in the notes what's in everything else.</i></p>
Provide multiple roles and perspectives	<p>Within the context of constitutional law, students had the opportunity to examine the task from different perspectives. The range of digital cards provided scope for production of a variety of resources, but most students produced simple textual representations demonstrating a surface treatment of the assessment task.</p> <p>Students did not take advantage of the work of other students as the study notes provided by the lecturer were seen as a more important source for study and exam preparation purposes.</p>	<p><i>Interesting interpretation by others was refreshing.</i></p> <p><i>See a different perspective ...</i></p> <p><i>Unable to be relied upon without verifying the information contained in them. COULD BE WRONG, FLAWED, MISLEADING, UNSUPPORTED.</i></p>

(Continued)



Table 5. (Continued).

Specified feature	Observations, conclusions and implications	Relevant student comments (focus group and survey)
Support collaborative construction of knowledge	<p>The software provided an opportunity to collaborate, but aspects of the user interface and the cloud environment (for some students) limited navigation and collaboration. Furthermore, the assessment task encouraged collaboration, but it was not a requirement. People tended to work on their own rather than as a study/project team. In future the assessment design may need to include more collaborative (and peer review) tasks.</p> <p>Training videos and a less complex user manual may help overcome user issues. Developing student digital literacy using the Sharpe and Beetham<sup>a</sup> (2010) framework may also be useful.</p>	<p><i>I do catch up with a couple of ladies here on a Sunday afternoon and I know they were both in the card group. I never actually ever saw any of the cards so I did not know what was on them all but I have the links Anthony left in the forum but they don't work ...</i></p> <p><i>Instead of groups of 2, maybe groups of 3 or 4 working on the key areas so that the body of work that was developed was more relevant to the main areas of common law.</i></p>
Promote reflection to enable abstractions to be formed	<p>The task and digital flashcard environment provides an opportunity to reflect, but students who saw little professional relevance, little pedagogical value, or who simply lacked creative ability, were unlikely to be reflective in any deep meaningful sense. Different student comments pointed to deep, surface and assessment oriented conceptions of the task.</p>	<p><i>The assignment said we had to do six cards, so we went for the six cards of least resistance.</i></p> <p><i>I found that other students interpreted the material differently and reading through other flashcards allowed to me understand how the same principles can be applied in different situations.</i></p>
Promote articulation to enable tacit knowledge to be made explicit	<p>Students indicated that building digital flashcards could be used in different subjects across the law curriculum. However, not all the different digital flashcards types were explored. Text representation of questions and answers is generic and easily applied in different subject areas.</p> <p>The representation of tacit knowledge was not evident but may potentially increase if the assessment task involves much greater sharing and discussion of digital flashcards as they are being developed.</p>	<p><i>The flashcards allowed you to fly free, to use critical thinking and to explore the subject matter from a theoretical and ethical perspective. Other assignments can be more constrained. The flashcards were very creative. Feedback and being referred to the rubric helped to improve the cards and final marks.</i></p> <p><i>Some really interesting points and arguments were made by other students. I often hoped that they took the subject matter further. Some of the cards raised some important constitutional law principles, that I had missed.</i></p>
Provide coaching and scaffolding by the teacher at critical times	<p>The exemplars did not provide sufficient information to students about the construction of digital flashcards and their value in representing law topics in constitutional law.</p> <p>Formative feedback was provided but needed to be earlier in the semester. More regular and ongoing feedback from the lecturer may be required for this type of assessment task to have greater impact on the students' analysis and representation of the law topics.</p>	<p><i>The confusion of how much is enough information.</i></p> <p><i>Not enough example work was provided.</i></p> <p><i>(in reference to a distinction card) ... as I said, it was a essay on one side and an essay on the other side.</i></p> <p><i>I chose not to make a flowchart because that was beyond me. It was too hard. I looked at it from what I thought I could do and went from there.</i></p>

(Continued)

**Table 5.** (Continued).

Specified feature	Observations, conclusions and implications	Relevant student comments (focus group and survey)
Provide for authentic assessment of learning within the tasks	The digital flashcards allow students to create “polished products” of varying complexity and purpose, as long as the design meets the basic design requirements of a “flashcard”, i.e. two sides usually question/problem and answer. The value of the flashcards depends on how students relate to them. Students tend to reject home grown digital flashcards in that they are perceived to lack authority and validation. There were inaccuracies in some student cards. Feedback was provided too close to exam. Students had no confidence in the contributions of other students to exam preparation.	<i>I joined up to study law not IT, or be a Lab rat in an e-learning project. I could have achieved as good a product with PowerPoint ... at what point are we ever going to be asked to produce flashcards in the workplace?</i>

Note: <sup>a</sup>R. Sharpe and H. Beetham, “Understanding Students’ Uses of Technology for Learning: Towards Creative Appropriation”, in R. Sharpe, H. Beetham and S. de Freitas (eds), *Rethinking Learning for the Digital Age: How Learners Shape Their Experiences* (London and New York, RoutledgeFalmer, 2010), pp. 85–99. See also <http://jiscdesignstudio.pbworks.com/w/page/46740204/Digital%20literacy%20framework> (accessed 3 September 2015).

### Software related issues

Students made the following comments in relation to FlashCram:

- FlashCram has some bugs in formatting.
- There was no spell check which made it hard.
- Being online, you need to backup your work just in case it disappeared, etc. I kept my content in a word file.
- Learning to use a software program that was not user friendly.

To these student observations we may add:

- There appeared to be some incompatibility with some Web browsers.
- Word styles were imported into FlashCram. The translation of the Word styles to HTML styles had unexpected results. Students may become anxious about how format changes may impact on assessment grades.
- Multiple windows containing different FlashCram cards were unavailable. Opening and closing windows for each card was seen as tedious. Having multiple cards open simultaneously aids the development of connections between cards within a pack.

### Conclusion

This article describes, evaluates and reflects upon student creation of cloud-based digital flashcards as an authentic formative and summative assessment task designed for the deep learning of constitutional law. It was clear that student perceptions of what is “authentic” goes beyond the legal content or scenario students are involved with. A case for professional relevance or pedagogical relevance of digital flashcards may need to be made for both authentic and deep learning to be effective.

The usefulness of digital flashcards in online legal education was explored. The key findings of this study are that undergraduate law student participants respond differently to the digital flashcard assessment task depending upon the constitutional law topic they were assigned, the perceived relevance of building digital flashcards to professional practice and how they personally reacted to this creative task.

This cohort of students perceived their construction of flashcards as between average and below average value. For many students the relevance of the exercise to students' future legal professional careers was not apparent. This undermined one of the three main requirements of deep learning identified by Marton and Booth<sup>45</sup> – reinforcement of relevance.

Another requirement, motivation, may have also been lacking. Apart from summative assessment as a motivating factor, it was anticipated that flashcard preparation would assist students with preparation for their final exam. However the results indicated that students did not find their creation of flashcards assisted them with exam preparation.

There was a considerable absence of students' engagement, deep learning or authentic learning despite having implemented many of Loughran's suggestions to encourage this.<sup>46</sup> This cohort of students did not value flashcards produced by other students. The results indicated that peer created flashcards did not assist in understanding the subject or make it more interesting to learn. The peer flashcards did not assist in knowledge retention, assist with learning the subject, or with exam preparation.

Designing effective, fair and transparent assessment has numerous challenges. Students in this study did not immediately build complex digital flashcards even if the type of card may have been appropriate for the law topic students had been assigned. Consequently, many students did not undertake the higher cognitive analysis associated with digital flashcard designs at the higher end of the Biggs and Tang SOLO model or engage in deep learning as described by Marton and Säljö.<sup>47</sup> The surface approach to the construction of flashcards adopted by some students may be a result of several issues identified by Loughran.<sup>48</sup> Some students may be studying for the qualification rather than being interested in constitutional law, particularly as this was a mandatory core course. The background knowledge provided by the course coordinator may have been insufficient for students to understand the material. Some students may have a cynical view of education believing that factual recall is all that is required. Some may have had an uninterested or even negative attitude to the exercise. There may have also been a level of anxiety associated with a novel task outside their comfort zone linked to formative assessment. Students expressed a preference for more familiar problem-based assessment rather than creating flashcards. Students found the production of flashcards to be a challenging exercise. Some students may have taken a formulaic approach of choosing simple cards to complete the exercise as quickly and easily as possible. They may not have distinguished principles from examples, may have failed to recognise new materials as building on previous work. Some may have seen flashcards as simply material to be assembled for a formative assessment. It is clear that influencing students' towards deep learning is a complex process.<sup>49</sup> These observations may provide some insight as to why more students failed the flashcard assessment

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<sup>45</sup>F. Marton and R. Säljö, "Approaches to Learning", in F. Marton, D. Hounsell and N. Entwistle (eds), *The Experience of Learning: Implications for Teaching and Studying in Higher Education* (2nd ed., Scottish Academic Press, 1997), p. 41.

<sup>46</sup>John Loughran, *What Expert Teachers Do: Enhancing Professional Knowledge for Classroom Practice* (Australia, Allen & Unwin, 2010), p. 31.

<sup>47</sup>John Biggs and Catherine Tang, *Teaching for Quality Learning at University* (3rd ed., Milton Keynes, Open University Press, 2007); F. Marton and R. Säljö, "On Qualitative Differences in Learning – 1: Outcome and Process" (1976) 46 *British Journal of Educational Psychology* 4–11.

<sup>48</sup>John Loughran, *What Expert Teachers Do: Enhancing Professional Knowledge for Classroom Practice* (Australia, Allen & Unwin, 2010), pp. 30, 31.

<sup>49</sup>M. Baeten, E. Kyndt, K. Struyven and F. Dochy, "Using Student-Centred Learning Environments to Stimulate Deep Approaches to Learning: Factors Encouraging or Discouraging Their Effectiveness" (2010) 5(3) *Educational Research Review* 243–260.

(16.9%) compared with a more traditional assessment, the legal memorandum (11.3%), also included in the constitutional law assessment regime.

Professional relevance and a student's approach to the assessment task may be aligned as suggested by Martin and Booth.<sup>50</sup> Hence those students who failed to appreciate the relevance of the task to professional practice and their future career may not have pursued a deep learning approach. Professional relevance is a key aspect of authentic assessment as described by Herrington.<sup>51</sup>

Students who provided descriptions of their work consistent with deep or surface approaches to learning built digital flashcards in ways consistent with these approaches.

Table 5 compared student responses with Herrington's characteristics of authenticity with detailed observations, conclusions and implications. While considerable scaffolding was provided to support authentic learning it was apparent that older, male students and students who adopted a "surface" conception of the assessment task did not see the relevance of constructing digital flashcards. Students were generally sceptical of flashcards produced by other students. Student peer flashcards were seen as potentially wrong, flawed, misleading, unsupported and carried significant risk. This could potentially be overcome with the course coordinator verifying the correctness of student cards. While the software provided an opportunity to collaborate, for some students, aspects of the user interface and the cloud environment limited navigation and collaboration. Refinements to the software interface may overcome this hurdle. Further scaffolding in the form of improved exemplars and early formative feedback may also improve the outcomes.

Enabling students to build digital flashcards has potential in the law curriculum, but only if assessment designs carefully scaffold learning and overcome weaknesses of this form of assessment through:

- (1) Adopting an authentic assessment pedagogy as outlined in the framework developed by Herrington *et al.*<sup>52</sup> in the introduction to this article.
- (2) Academic validation and sharing of digital flashcards such that students perceive them as correct, professionally relevant and educationally useful.
- (3) Reinforcing the relevance of the flashcard exercise at regular intervals.
- (4) Motivating students to explore this avenue of learning.
- (5) Provision of background knowledge not only of course content, but also of how the flashcard software operates.
- (6) Better integration of IT platforms, tools and training.
- (7) Spreading the creation of flashcards across an extended period, such as a whole semester.

Future research may consider exploring:

- Whether changes to the implementation of flashcards, described above, will result in different outcomes.
- Whether flashcards have different levels of relevance to student learning comparing mature age student cohorts with school leaver cohorts.
- Whether it is more or less beneficial for students to construct and share their own flashcards compared with flashcards produced by a course coordinator.
- Whether the same results hold true for other disciplines.
- Whether introduction of a staged repetition system for flashcards will improve the grades of law students.

<sup>50</sup>F. Marton and S. Booth, *Learning and Awareness* (New Jersey, L. Erlbaum Associates, 1997).

<sup>51</sup>Herrington *et al.*, *supra* n. 27, p. 44.

<sup>52</sup>Herrington *et al.*, *supra* n. 27.

## Disclosure statement

No potential conflict of interest was reported by the authors.

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## Appendix A: Sample student flashcards

### 5. Universal right of suffrage?



#### *R v Pearson; Ex parte Sipka* (1983) 152 CLR 254

**Facts:** An enrolment to vote was received after the date of issue of writ for election and was not registered.

**Legal issue:** One of the legal issues that was raised was the right to vote and the prevention of that right by Commonwealth law.

**Excerpts:** In the joint judgment by Brennan, Deane and Dawson JJ, they commented [at 12] "By providing that other provisions of the Act do not prevail over s. 39B [of the *Commonwealth Electoral Act 1918* (Cth)], the Parliament has done no more than to ensure that no statutory disqualification excludes a person to whom s. 41 applies from the statutory entitlement to be enrolled and to vote which s. 39B confers upon him."

And at [13]:

It follows, of course, that the practical effect of s. 41 is spent. Most of the electors who acquired a right to vote at federal elections under ss. 39 and 8 of the *Constitution* would have died. Since 12 June 1902, when the *Commonwealth Franchise Act* came into force, no person has acquired a right to vote the exercise of which is protected by s. 41. None of the present applicants is a person to whom s. 41 applies. None of them is therefore entitled to enrol or to vote by reason of s. 39B of the Act.<sup>1</sup>

Therefore, after the passing of the *Commonwealth Franchise Act 1902* (Cth), no elector could acquire a qualification to vote at Commonwealth elections under ss 30 and 8 of the *Constitution*.

The decision effectively nullified the *Constitution's* most explicit protection of the right to vote in federal elections.

This is an interesting point considering "the right to vote" it is often referred to by people in society. Perhaps this is something that the *Australian Government* wants us to believe in order to feel better about the world we live in?

1. *R v Pearson; Ex parte Sipka* (1983) 152 CLR 254, Brennan, Deane and Dawson JJ at [13].

### 5. Universal right of suffrage?



The *Constitution* does not offer a guarantee of universal suffrage although s 41 contains a limited guarantee of suffrage. *Section 25* outlines that Parliament can enact legislation that prohibits certain races from voting. However, Parliament have instead chosen to enact *Section 93* of the *Commonwealth Electoral Act 1918* (Cth), which does not disqualify any adults from voting based on race. Questions regarding universal suffrage have also been brought to the High Court.

*Section 41* of the *Constitution* states:

No adult person who has or acquires a right to vote at elections for the more numerous House of the Parliament of a State shall, while the right continues, be prevented by any law of the Commonwealth from voting at elections for either House of the Parliament of the Commonwealth.

**s 8 states:**

The qualification of electors of senators shall be in each State that which is prescribed by this *Constitution*, or by the Parliament, as the qualification for electors of members of the House of Representatives; but in the choosing of senators each elector shall vote only once.

**s 30 states:**

Until the Parliament otherwise provides, the qualification of electors of members of the House of Representatives shall be in each State that which is prescribed by the law of the State as the qualification of electors of the more numerous House of Parliament of the State; but in the choosing of members each elector shall vote only once.

**Analysis:** In the High Court's interpretation of the above sections of the *Constitution*, the Court has left it up to the Parliament in regards to franchise. These cases are explored on the flip side and on the next card.



Figure A1. Sample student case card.

### 3. The Australian Federal Parliament - Question 1



Now that we have reviewed the composition of the Australian Parliament, answer the following question:

#### Question 1

When is the difference between the number of members in the **Senate** and the **House of Representatives** significant and why?



(Source: <[http://upload.wikimedia.org/wikipedia/commons/thumb/6/61/Parliament\\_House\\_Canberra\\_Dusk\\_Panorama.jpg/240px-Parliament\\_House\\_Canberra\\_Dusk\\_Panorama.jpg](http://upload.wikimedia.org/wikipedia/commons/thumb/6/61/Parliament_House_Canberra_Dusk_Panorama.jpg/240px-Parliament_House_Canberra_Dusk_Panorama.jpg)>)

### 3. The Australian Federal Parliament - Question 1



#### Answer

**Section 57 of the Constitution** outlines the process to follow when there is a disagreement between Houses. It is at this time when the lesser numbers of the Senate is a disadvantage for the Senate in having a "voice".

As per s 57, when the two Houses cannot agree on legislation, a dissolution may occur. Section 57 states:

If after such dissolution in the House of Representatives again passes the proposed law, with or without any amendments which have been made, suggested, or agreed to by the Senate, and the Senate rejects or fails to pass it, or passes it with amendments to which the House of Representatives will not agree, the Governor-General may convene a joint sitting of the members of the Senate and of the House of Representatives.

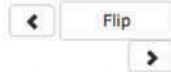
Therefore, upon a joint sitting, the Senate only has (approximately) half the number of votes as the House of Representatives. Therefore the vote will more than likely pass in the favour of the House of Representatives.

**Analysis:** Perhaps this is a good example of where media coverage of politics works in the favour of "the people". Although the House of Representatives have the numbers to have a good chance at winning at a joint sitting, it is highly unlikely the Government will risk the support of "the people" and lose the next election.

Figure A2. Sample student question and answer card.

Downloaded by [University of Nebraska, Lincoln] at 08:41 03 November 2015

Representative Principle in Australian Constitutionalism - Overview of Flashcards



Welcome to the flashcards that explore the topic of the Representative Principle in Australian Constitutionalism.

We will look at a number of aspects in order to explore the question "Is the Australian Federal Parliament a true representation of "the people"?". The sub-topics to be explored include:

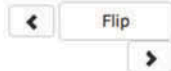
1. The Australian Federal Parliament.
2. The composition of the Senate.
3. The composition of the House of Representatives.
4. Who is "the people" that choose the Legislative section of government?
5. Is there a universal right of suffrage?



(Source: <<http://www.springercreative.com/uploads/preview/Representative.gif>>)



Representative Principle in Australian Constitutionalism - Overview of Flashcards



1. The Australian Federal Parliament

2. The Senate

Is the Australian Parliament a true representation of "the people"?

5. Is there a universal right of suffrage?

3. The House of Representatives

4. Who is "the people"?

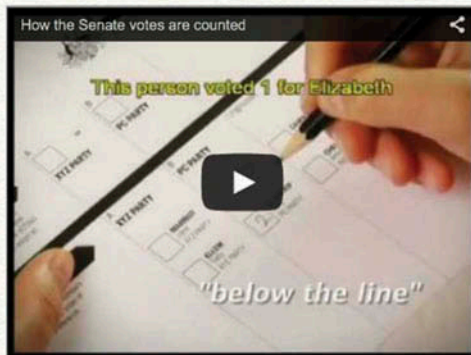


Figure A3. Sample student flowchart card.

## 2. How the Senate votes are counted



The following video gives an example of how votes are counted for the **Senate** at election time.



(source: YouTube, <<https://www.youtube.com/watch?v=VKswlvpgMws>>)

## 2. How the Senate votes are counted



## Senate Responsibilities

The **Senate** has a number of responsibilities to ensure their role as the "final check" for the Parliament is carried out. These include:

- A committee scrutinises delegated legislation, laws made by the executive government, with independent advice and in accordance with criteria related to civil liberties and proper legislative principles.
- A comprehensive standing committee system allows regular inquiries into, and the hearing of public evidence on, matters of public concern, including proposed legislation.
- The Scrutiny of Bills Committee looks at all proposed laws, using the criteria applied to delegated legislation.
- Legislation is frequently amended in the Senate to include provisions for the appropriate disclosure of information (in this category is the Freedom of **Information Act** itself, which was extensively amended in the Senate).
- Procedures allow the regular referral of Bills to committees, so that any Bill may be the subject of a public inquiry with opportunity for public comment. (The current government initially resisted the reference of the GST legislation to committees, even though, as was pointed out, such a complex legislative change merited close scrutiny and public comment.)<sup>1</sup>

For further accountabilities, refer to **Evans, Harry "The role of the Senate" [2001] ALRCRef:Jl 4; (2001) 78 Australian Law Reform Commission Reform Journal 16.**

**Analysis:** Without the clear roles and responsibilities set out for the Senate, there would be confusion as to what representative role the senators play. The responsibility of scrutinising all proposed laws made by the House of Representatives ensures it is given a "fresh set of eyes", and hopefully with views and opinions more widely representative of the people of the States than just those represented by the party with the majority in the House of Representatives.



1. Evans, Harry "The role of the Senate" [2001] ALRCRef:Jl 4; (2001) 78 Australian Law Reform Commission Reform Journal 16

Figure A4. Sample student audio-visual card.

## Appendix B: Digital flashcard assignment and rubric



Digital Flashcard Assigned Topics File

**Digital Flashcards Assignment** This assessment involves students working individually or in pairs to develop a set of flashcards that summarises key principles of Constitutional Law. The initial due date of each set of flashcards varies and corresponds with a weekly topic, but is not earlier than the third week of Term 1. Flashcards shall be marked and given feedback throughout the term. Please note that the amount of work may appear onerous. It actually isn't. You can view examples of digital flashcards on the following link: [http://www.flashcram.com/view\\_card.php?t=Bt14xglqRw](http://www.flashcram.com/view_card.php?t=Bt14xglqRw) Note that the examples



are *basic* digital flashcards that would merit Credit or Pass grades only. They are not exemplars of High Distinction or Distinction flashcards. To achieve a High Distinction or Distinction grade, you need to specifically address the marking rubric on overall creativity (3), overall interpretation and evidence (3), overall content and argument (8), organisation (2), presence of six types of flashcards (1), and style and format of flashcards (2).

**Due date (Draft):** 9 May 2014 (Week 10)

**Due date (Final):** 23 May 2014 (Week 12) Weight: 20%

Quantity: 12-20 flashcards, i.e. anywhere between 12 and 20 flashcards is okay

Please note that you will no longer be required to submit a PDF but only the FlashCram link to your digital flashcards.

At the end of week 1, unless you wish to work on this activity *individually or be paired specifically with another student*, you will be paired randomly with another student who will be your partner in completing this assessment. You will then be assigned a specific weekly topic.

For this assignment, you will need to prepare and submit a set of 12 - 20 digital flashcards covering an aspect of the assigned weekly topic. More flashcards submitted, such as submitting 20 instead of 12, do not attract more marks. The focus of this assessment is on the quality instead of quantity of flashcards.

It is not necessary for you to cover the entire weekly topic but only an aspect of it. These flashcards are to be used by you and your fellow students in studying for the course and preparing for the final exam.

### What is a digital flashcard?

There are at least thirteen different types of digital flashcards. For this assessment, you are required to develop and submit 12-20 digital flashcards that use at least six (of the thirteen) types. You may use FlashCram (<http://flashcram.com>) or Ediscio ([www.ediscio.com](http://www.ediscio.com)) – free web-based platforms – to develop these flashcards. You will likely find FlashCram to be a better platform for this activity. Hence I recommend its use. You will need to create an account in FlashCram, which allows you to:

- Add images
- Add video and audio files
- Link to other cards for the flowchart cards
- Do full text editing including tables etc

At the bottom of the Moodle site section on the Digital Flashcard assignment, you can download and read the *FlashCram FAQ*.

**Types of digital flashcards** The thirteen types of digital flashcards are the following:

- **Case card** – details the facts, points of law and outcomes of a case. The card should include the full reference and a link to full text where available.
- **Legislation card** – details legislation, subordinate legislation, rules, or practice directions. The point of law should be stated. Links should be provided to the legislation and any relevant case cards.
- **Flowchart card** – visually depicts a series of events or processes. It may take several forms: A diagram with links to other cards; A series or stack of cards enabling a process to be followed. Links should be provided to any supporting materials.
- **Legal Principle card** – identifies a key legal principle, along with its primary authority.
- **Review card** – Asks a question requiring a response. This may be a multiple-choice question, short answer question, reflection etc.
- **Audio-visual card** – this card requires the embedding or a link to a dynamic element such as an animation, film, YouTube film, interactive reveal etc. The audio-visual card should also identify the legal principal and link to any supporting materials.
- **Conundrum card** – presents a legal dilemma, or something within the law, which seems unreasonable or otherwise noteworthy. The student may simply choose to use the conundrum as food for thought, or they can tap the link and link through to a discussion board where the issue can be discussed. A conundrum card may raise a complex question

requiring research or extended thought or group discussion. There may be no right or wrong answer.

- **Secondary source card** – contains information or issues arising from a secondary source such as a book, article, newspaper clipping, report, conference paper etc. Links should be provided to the secondary source where available.
- **Comparative card** – explores comparisons between different jurisdictions or cultures.
- **Reform card** – explores issues for law reform.
- **Practical application card** – shows a real-world application of the relevant legal principle. Links should be provided to any supporting materials.
- **Discussion card** – is similar to a conundrum card, but the topics for discussion are more about analysing the operating of the law (as opposed to discussing its quirks and difficulties). Again, the student may simply use the card as food for thought, or alternatively they may link through to a bulletin board to share in the discussion with others.
- **Role-play card** – is designed to allow students who are studying together to work through simple problem-style issues, which call into question the legal principles discussed elsewhere in the stack. These role-play situations may be quite simple (as in this one) or very complex, and the students may decide how “legalistic” their responses are to be.

**Assessment submission Formative submission:** You are encouraged to submit a draft of each of the six types of digital flashcards that you intend to include in your final submission. These will not be marked but will receive formative feedback. This E-submission is due on or before 11.45pm Friday, 9 May 2014 (week 10). Formative feedback will be given to you on 16 May (Friday).

**Summative (final) submission:** The final version of your flashcards must be submitted by sending to me the FlashCram link to your digital flashcards, using ‘E-Submission’ not later than 11.45 pm (AEST) on 23 May 2014 (week 12). You will no longer be required to submit a PDF. In addition, no consideration will be given to extra flashcards in excess of the 20- flashcards limit.

Note that all digital flashcards on FlashCram must be available for viewing by your fellow students so they can learn from you as well.

### Marking rubric

The flashcards will be assessed according to the marking rubric found in the PDF below.



[Digital Flashcard Assessment Marking Rubric File](#)

Digital Flashcard Assigned Topics

### FlashCram FAQ



[FlashCram FAQ File](#)

**Post your preference: Work individually or in a pair**



I would like to do the digital flashcard assessment on my own Forum



We would like to work together

Table B1. Marking rubric.

	HD	D	C	P	F
<b>Overall creativity 3</b>	All the flashcards demonstrate numerous fresh, original and inventive ideas.	Most of the flashcards are moderately creative and demonstrate some novel ideas.	Many of the flashcards display some evidence of originality and inventiveness.	Some of the flashcards display little evidence of thought or inventiveness.	Very few of the flashcards display creativity and are a rehash of others' ideas. No evidence or new thought.
<b>Overall interpretation and evidence 3</b>	All flashcards offer correct interpretations of materials supported by proper evidence (e.g. from readings, cases, legislation).	Most of the flashcards offer correct interpretations of materials supported by proper evidence (e.g. from readings, cases, legislation).	Many of the flashcards offer correct interpretations of materials supported by proper evidence (e.g. from readings, cases, legislation).	Some of the flashcards offer correct interpretations of materials supported by proper evidence (e.g. from readings, cases, legislation).	Very few of the flashcards offer correct interpretations of materials supported by proper evidence (e.g. from readings, cases, legislation).
<b>Overall content and argument 8</b>	All the flashcards address key aspects of assigned topics. All key and relevant information are included. Information is analysed well and interpreted correctly. There is also very strong evidence of extensive critical appraisal of the law and secondary literature, and strong, cohesive arguments.	Most of the flashcards address key aspects of assigned topics. There are few omissions in information or misinterpretations of the law or secondary literature. There is strong evidence of critical analysis and strong arguments that are backed up by evidence. Most flashcards contain original and/or novel observations.	Many of the flashcards address key aspects of assigned topics. There are some minor omissions in information and misinterpretation of the law. There is some evidence of critical analysis and strong arguments that are backed up by evidence. Many flashcards contain original and/or novel observations.	Some of the flashcards address key aspects of various topics. Some major omissions in information and misinterpretation of the law or secondary literature. Some errors in deduction. Some cohesive argument. Some flashcards contain original and/or novel observations.	Very few of the flashcards address key aspects of various topics. Crucial omissions in information. Serious misinterpretation of the law or secondary sources. Serious errors in deduction. Argument is weak or non-existent. Very few flashcards contain original and/or novel observations.
<b>Organisation 2</b>	The flow of each flashcard is logical and very coherent.	Information is well organised and logical.	Most information is well organised and generally logical.	Some information is poorly organised and at times does not flow logically.	Information is poorly organised and does not flow logically.

*(Continued)*


**Table B1.** (Continued).

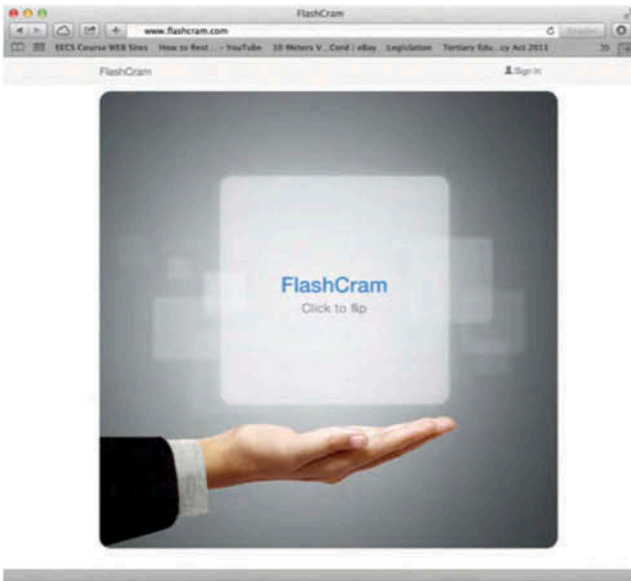
Marking Rubric for Digital Flashcards Assessment (20%)		HD	D	C	P	F
<b>Presence of six types of flashcards 1</b>	Includes six types of flashcards.					Failure to include six types of flashcards
<b>Style and format of flashcards 2</b>	All the flashcards are cohesively written, use a clear format, and bear the proper icon. There is no grammatical, spelling or punctuation error. The layout and use of English are excellent.	Most of the flashcards are cohesively written, use a clear format, and bear the proper icon. There are very few grammatical, spelling and/or punctuation errors. The layout and use of English are good.	Many of the flashcards are cohesively written, use a clear format, and bear the proper icon. There are few grammatical, spelling and/or punctuation errors. The layout and use of English are adequate.	Some of the flashcards are cohesively written, use a clear format, and bear the proper icon. There are many grammatical, spelling and/or punctuation errors. The layout and use of English are inadequate.		Very few of the flashcards are cohesively written, use a clear format, and bear the proper icon. There are too many grammatical, spelling and/or punctuation errors. The layout and use of English are poor.
<b>References 1</b>	The use of referencing conventions contains no error.	The use of referencing conventions is very good and consistent.	The use of referencing conventions is good and consistent.	The use of referencing conventions is poor and inconsistent.		The use of referencing conventions is very poor and inconsistent.

## Appendix C: FlashCram FAQ

### Flashcram FAQ V1.02

#### Where do I get Flashcram?

Access Flashcram from [www.flashcram.com](http://www.flashcram.com). Click to flip then Signup for free.



#### What does Flashcram run on?

Flashcram runs in Firefox, Chrome, Safari, Internet Explorer v 11, iPad and iPhone.

#### How do I create a New User account?

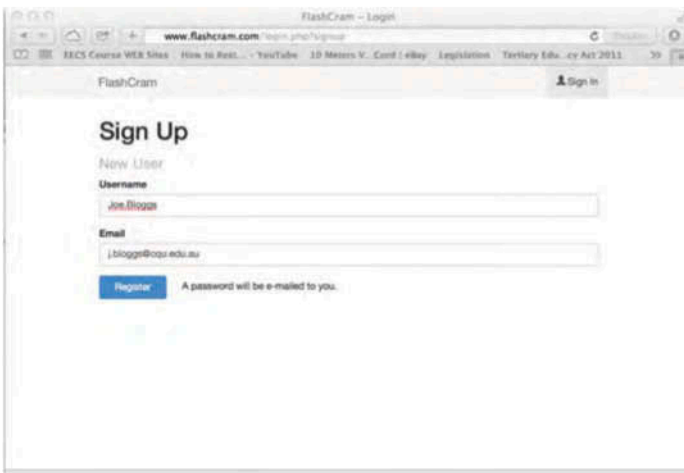


Figure C1. FlashCram FAQ.