

MAKING CONNECTIONS: INCORPORATING VISUAL LEARNING IN LAW SUBJECTS THROUGH MIND MAPPING AND FLOWCHARTS

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ABSTRACT

Visual learning in law subjects can assist students in forming stronger connections between legal concepts, legislation and practical applications. Although higher education text books make frequent use of tables and flowcharts, the use of these tools can have pedagogical application in classroom teaching of law subjects. This article explores the way in which flowcharts and mind mapping techniques can assist learning in law subjects, including statute-based law subjects. By using the Personal Property Securities Act 2009 (Cth) (PPSA) as a case study for implementing a visual learning experience in the form of an applied flowchart, it further proposes a model for integrating mind mapping techniques into the teaching of law subjects.

I. INTRODUCTION

The benefits of using visual learning as a teaching aid have been long established. Visual learning techniques act “as an organizer for ideas, improve comprehension, and function as an aid to memory”.¹ In teaching law subjects, especially those that are statute-based, educators face ongoing challenges in effectively communicating subject content in ways that are imaginative and inspiring, whilst being underpinned by teaching scholarship and learning fundamentals. Visual learning techniques, such as the use of flowcharts and mind mapping, are a beneficial and convenient tool to help students make connections between subject content and practical application, i.e. between the substance of the law, legal precedent and practice. In this way, visual aids can assist with the practice-based approach² in law subjects favoured in many law schools, and which is evident in the move towards more skills integration and problem-based application in law subjects.

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1 Angela Passalacqua “Using Visual Techniques to Teach Legal Analysis and Synthesis” (1997) 3 Legal Writing 203, at 206.

2 Brook Baker “Practice-Based Learning: Emphasizing Practice and Offering Critical Perspectives on the Dangers of “Co-OP”ation” (2011/12) 56 NYLSLR 619.

This article proposes: first, to examine the benefits of visual learning in law subjects, with a focus on mind mapping and flowcharts; second, to discuss how a flowchart may be employed in teaching statute-based law subjects, by using the Personal Property Securities Act 2009 (Cth) (PPSA) as a case study; and third, to provide a model for integrating mind mapping techniques into the teaching of law subjects to promote effective learning and teaching. The article considers the use of these visual techniques in the context of both *teaching* benefits for educators, and *learning* advantages for students.

II. VISUAL LEARNING: THE BASICS OF MIND MAPPING AND FLOWCHARTS

As research has demonstrated that students are more likely to retain information they learn through visuals than information learned verbally,³ flowcharts and mind maps are useful tools to promote learning. One study has found that 98 per cent of students increased their learning by using text and visual aids instead of text alone, with 85 per cent of students yielding statistically significantly improved results.⁴ In a law school context, visuals can help students remember rules, apply rules to slightly modified hypothetical situations during class participation, and apply rules to completely novel situations in exam situations.⁵ It has also been noted that graphics:⁶

... help students understand the “big picture” as well as relationships between individual elements of a concept. Visuals also explicitly articulate implicit textual relationships. Specifically, visuals assist students in seeing the hierarchical and coordinate relationships between elements of a concept.

Furthermore, research has demonstrated that students understood the relationship between concepts better from studying graphic organisers than from studying outlines.⁷ It has also been observed that flowcharts and concept

3 Stephan J Bera and Daniel H Robinson “Exploring the Boundary Conditions of the Delay Hypothesis with Adjunct Displays” (2004) 96 *Journal of Educational Psychology* 381 at 381.

4 Hillary Burgess “Deepening the disclosure using the Legal Mind’s Eye: Lessons from Neuroscience and Psychology that Optimize Law School Learning” 29 *Quinnipiac Law Review* 1 at 47; W Howard Levie & Richard Lentz “Effects of Text Illustrations: A Review of Research” 30 *ECTJ* 195 at 213.

5 At 49.

6 At 49.

7 At 49; Bera and Robinson, above n 3, at 381.

maps are well suited to help students “understand and internalize the research process” because of the iterative nature of legal research.⁸

Additionally, these techniques can also assist educators in organising and presenting teaching materials, to manage subject organisation and improve time management.⁹ By taking a comprehensive visual approach to organising subject content, instead of the linear approach evidenced in chronological documentation of teaching materials, a teacher is better able to maintain an overview of the subject, as well as access to content detail, throughout the semester.

In Part III of this article, we will attempt to explain how these concepts can be applied in the teaching of property law subjects and provide some practical examples of a flowchart and mind map, illustrating how these may be used in practice.

A. Mind-mapping in education

The idea of mind mapping in education was first conceived by Tony Buzan in the early 1970s¹⁰ and is applied extensively in modern education. The foundational concept relies on the range of skills available to students, namely *language* (including words and symbols), *number, logic* (which includes sequence, listing, linearity, analysis, time and association), *rhythm, colour, imagery* (which includes daydreaming and visualisation and *spatial awareness* (including dimension and “whole picture” perception). It involves both “left brain” (dominant in the first three skills) and “right brain” thinking (dominant in the last four skills),¹¹ which, used in combination, promotes learning in teaching. In particular, it helps students to remember what they have been taught, through association and emphasis of items from the beginning of the learning period, items from the end of the learning period, things or patterns already stored and items of a particular interest to the student.¹² This graphic technique facilitates the metacognitive process, and clarifies the connections

8 Karen L Koch “What Did I Just Do?” Using Student-Created Concept Maps or Flowcharts to Add a Reflective Visual Component to Legal Research Assignments” (2010) 18 (Winter/Spring) Perspectives: Teaching Legal Research and Writing 120; see also Conference attendees at the Conference on Legal Information: Scholarship and Teaching “The Boulder Statement on Legal Research Education” (2009) <law.utexas.edu>.

9 Barry Buzan and Tony Buzan *The Mind Map Book: Radiant Thinking* (BBC Books, London, 1993) at 224.

10 At 12.

11 At 32-34.

12 At 34.

among substantive concepts; it also helps students with the organising of information and involves students in their own learning.¹³

Mind mapping can also assist students with writing essays, preparing presentations and completing assignments or writing tasks, and can be used in preparing for examinations.¹⁴ Law subjects in particular lend themselves to mind mapping due to the nature of the material, which often involves a central problem or piece/s of legislation, various case precedents and conflicting interpretations. A mind map is a useful tool to obtain a “bird’s eye view” of the problem and possible solutions, and can help students to structure a logical answer, taking into account relevant details as well as being cognisant of the “whole picture”.

Buzan identifies six specific benefits of teaching with mind maps, namely:

1. They inspire interest in students and make them more receptive and co-operative in the classroom;
2. They improve spontaneity and creativity in the classroom, making presentations more enjoyable;
3. The teacher’s notes are more flexible and adaptable instead of rigid;
4. Examination results tend to improve due to the clear and memorable nature of mind maps;
5. Mind maps show the relationship between facts, unlike linear text, giving students a deeper understanding of the material; and
6. The physical volume of lecture notes is drastically reduced.¹⁵

B. Teaching with mind maps: A creative approach

Educators can use mind maps in teaching in a number of ways, including lecture preparation; subject curriculum preparation; and yearly, monthly and weekly planning.

The use of mind mapping in lecture/seminar preparation allows educators to approach the task of communicating information to students in a creative and interesting way. Not only does it provide the educator with an overview of the lecture content, but it can also be utilised to keep an overview of the whole subject at all times.¹⁶ This method of teaching preparation allows for easy revision and updating of notes, serves as a framework for lecturing and

13 Linda Edwards and Paula Lustbader “Teaching Legal analysis” (1994) 52 *Perspectives: Teaching Legal Res and Writing* 52 at 53; Metacognition refers to awareness of one’s own knowledge—what one does and does not know—and one’s ability to understand, control, and manipulate one’s cognitive processes: Donald Meichenbaum “Teaching Thinking: A cognitive-behavioral perspective” Susan F Chipman, Judith W Segal and Robert Glaser (ed) *Thinking and Learning Skills: Volume 2: Research and Open Questions* (Lawrence Erlbaum Associates, New Jersey, 1985) 407.

14 Ibid.

15 Buzan and Buzan, above n 9, at 232-233.

16 At 223.

allows the speaker to adjust content and manage time effectively.¹⁷ Because of the mnemonic nature of the mind map (aided by colour coding, pictures and connections), it not only assists the memory of the lecturer in preparing, memorising and delivering content, but also ensures effective communication of the subject content. In addition, mind maps can assist with subject planning on a yearly, monthly and weekly basis.¹⁸

Clearly, there is a substantial value in using mind maps as *teaching* tools for educators.

Additionally, there are ways in which mind mapping can be utilised by students to enhance the learning process, complete assignments and prepare for examinations.¹⁹

C. Mind maps for effective learning

Mind mapping can trigger a number of cognitive benefits – these have been identified as: firstly, engaging the student in “whole brain thinking” through using written and visual material; secondly, helping the student to create their own “schema” for their legal research; and thirdly, assisting students with memorising through their physical involvement in drawing the process (by hand or digitally).²⁰ The following steps have been proposed for students to implement mind mapping techniques:²¹

(a) Essays/Assignments

Drawing a mind map helps the student to identify the essential elements of the subject, and then to use the “mind map notes” to build a linear essay structure. In doing so, the central image in the mind map represents the subject of the essay.²² Buzan suggests that the mind map will serve as an outline or framework for the essay, by allowing the student to order their ideas as “major branches” and then using “sub-branches” to fill in the details or points under each main category.²³ It thus allows the student to think creatively and associate ideas and concepts relevant to the task at hand, whilst considering all possible outcomes.

The use of a mind map is also conducive to legal writing structures favoured in law schools when answering problem questions, such as the IRAT, IRAC

17 At 224.

18 At 224-225. The yearly map provides an overview of the entire year’s study program, the monthly program is a sub-division of that mind map, and then further broken down into weekly maps.

19 At 211.

20 Karen L Koch, above n 8.

21 Buzan and Buzan, above n 9, at 211-217.

22 At 211.

23 At 212.

or MIRAT structures.²⁴ These approaches generally require students to, first, identify the *issue* they are dealing with; second, consider the applicable *rule/law*; third, *apply* the law to the facts; and finally, to draw a tentative *conclusion*. A mind map can be used in conjunction with these methods of problem solving, to centralise the idea in the context of the applicable law and surrounding facts, in order to provide an overview of the problem, issues which impact on the problem, and possible solutions for the problem.

(b) Examinations

If familiarised with the mind map concept throughout the course of study, these tools can significantly aid students in the exam room, where time is limited. Buzan suggests that students use “mini-mind maps” when reading through the exam paper, to note down any thoughts that immediately come to mind on reading the questions.²⁵ Next, the student decides in which order questions should be answered and how much time to spend on each question, including quick “mind map bursts” on each question.²⁶ This procedure then enables the student’s mind to explore the ramifications or implications of each question throughout the examination, even when working on other questions, and also be aware of time constraints whilst working. The initial “mind map bursts” then act as a framework for answering the question – the central image providing an introduction, the major branches providing a sub-heading or section of the answer, which can then be expanded to write the paragraphs.²⁷ This approach allows for cross-referencing, associations and conclusions to be drawn, taking into account the broader picture, which will show the examiner comprehensive knowledge, an ability to analyse and interpret the question, and original thought on the part of the student.²⁸ Significantly, from a mental perspective, it may also give the student a sense of control and increase confidence knowing that he/she has a reliable process in place to complete the examination effectively.

D. Flowcharts in education

Flowcharts are valuable learning tools for higher education courses which require a logical approach and structured thinking, and can simplify the teaching of difficult subjects by providing students with a visual connection to the material. Unsurprising to many legal academics, research has found that those students learning under “traditional teaching methods” forget 40 per cent of what they learn within six months of the final exams and 60 per

24 As applied in Bobette Wolski *Skills Ethics & Values for Legal Practice*, (Thomson Reuters Australia, Sydney, 2008).

25 Buzan and Buzan, above n 9, at 213.

26 At 213.

27 At 216.

28 At 216.

cent after three years.²⁹ It is, therefore, the educator's task to find ways to improve these statistics. To do so, we need to consider modern psychology, neuroscience and cognitive learning skills in order to complement our traditional methods. Research in these fields has found that students retain information better when they are exposed to visual learning techniques rather than merely verbal inputs.³⁰ This is not limited to just those students who identify as "visual learners".³¹

This is especially true for areas of learning where an appreciation of the "big picture" is required as well as the steps that get us there. Specifically, the use of mind mapping and flowcharts assist in identifying key principles of law and understanding their interaction with one and other.³² So if we, as teachers of complex legal concepts, can assist by mapping or charting the process then this will assist in the learning experience for our students.

Recent articles on pedagogical methodology for the teaching/learning of law suggest that, by incorporating visual aids and techniques in our teaching, legal academics can cover more topics at a deeper level.³³ This results in students having a better retention level and improves their higher order thinking. Furthermore, it enhances the learning experience especially in subjects that are historically seen as statute heavy and thereby "dry" in nature. This paper proposes that the injection of the concepts discussed here into the teaching rubicon will enhance the learning experience while at the same time preserving if not improving the scholarship and teaching fundamentals.

Karen Koch in her paper suggests that having students visually map the process triggers the following of cognitive benefits:

1. It engages students in "whole brain" thinking;
2. It assists in students' creation of their own schema for complex legal concepts;
3. By following the evolution of the process, it will assist students "internalise and remember the process".³⁴

This is especially true where the subject matter is such that the whole is truly the sum of its parts. Flowcharts, in effect can provide a "helicopter view" to assist students to understand the interrelationships between concepts (especially in legislation heavy subjects). As we have outlined above, this is

29 Moshe Naveb-Benjamin, Hagit Lavi, Wilbert J McKeachie and Yi-Guang Lin, "Individual Differences in Students' Retention of Knowledge and Conceptual Structures Learned in University and High School Courses: The Case of Test Anxiety" (1997) 11 *Applied Cognitive Psychology* 507 at 516 tbl.3; quoted in Burgess, above n 4.

30 Bera and Robinson, above n 3, at 381.

31 Brian Glassman "In the Mind's Eye: Visual Lessons for Law Students" (2014) 23 *Perspectives: Teaching Legal Research and Writing* 25 at 26; M.H. Sam Jacobson, "A Primer on Learning Styles: Reaching Every Student" (2001-2002) 25 *Seattle UL Rev* 139.

32 Cheah You Sum "The use of visual aids and story-telling for effective teaching of Company Law to non-law students" at 6 <www.sunway.edu.my>.

33 Burgess, above n 4, at 6.

34 Koch, above n 8, at 120.

true when mind mapping is used and the same can be said for the use of flowcharting in delivering content.

Flowcharts can have a number of uses in varying areas of legal scholarship. As an example of their usefulness, this paper will look at their operation in the analysis of a regulatory regime (see section III below).

Of further assistance is the fact that, when a fact pattern is overlaid, there are a number of decision points, in effect the use of a forced decision tree flowchart. Such charts, we suggest, assist students in their analysis of a legal problem and helps to distinguish relevant from irrelevant issues. To do so we will use the PPSA.

III. THE PPSA CASE STUDY: EFFECTIVE LEARNING THROUGH FLOWCHARTS

The resolution of legal problems requires an analytical and structured approach, and nowhere is this more evident than in dealing with of statute-based subjects. Teaching students the scope and application of the PPSA can be simplified by using visual aids such as flowcharts. We have utilised flowcharts in the delivery of the compulsory Personal Property Transactions (PPT) course at Bond University, which is focused on teaching and applying the PPSA.

Since the implementation of the PPSA in January 2012, the landscape in this area of law has changed significantly, requiring law students and practitioners to be introduced to new concepts and principles.³⁵ In particular, it has been challenging for students to reconcile past applications of traditional common law concepts, such as retention of title agreements, with the current impact of the PPSA.³⁶ From a teaching perspective, it has required a major overhaul of the curriculum and course materials. When rewriting the curriculum for the PPT subject (prior to the implementation of the PPSA) we found that our understanding of the new legislation was enhanced by a visual depiction of how the jigsaw pieces of the new legislation fit together, a helicopter view if you will. The resulting flowcharts used in the subject were an amalgam of *decision tree* and *process based* flowcharts.

A. *Decision tree based flowcharts*

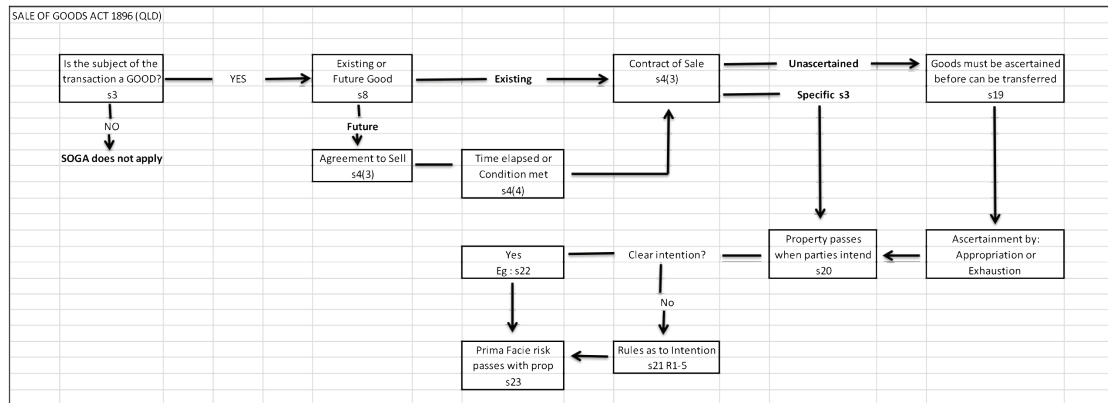
The decision tree flowchart is a tool to simplify and track decision-making processes. In a legal context, they can be especially helpful in dealing with complex issues, for example, as described below.

35 Francina Cantatore and Ian Stevens “Romancing the PPSA: Challenges for Teaching and Reconciling New Concepts with Traditional Norms” 2015 2 CLTR 1.

36 At 4.

In the context of teaching the first module of the PPT course (the sale of personal property) model translates as follows, for 6th semester Law students:

Figure 1: Flowchart – Sale of Goods Act – transfer of property ³⁷



Thus, at each stage of the flowchart, a decision is made which determines the path forward, for example in deciding whether you are dealing with “existing” or “future” goods, each require a different approach going forward.

This form of chart assists students in understanding the decision-making process and the importance of correctly identifying the elements (including their attributes) in that process.

B. Process based flowcharts

These charts provide a chronological path, rather than requiring a decision. In this case flowcharts are able to be compartmentalised and in effect tell the “story” of the legislation, while at the same time demonstrating the interrelationships within the Act. It enables the educator to add to the “story” from week to week, building the “big picture” to facilitate understanding.

Similarly, there is a place where both types of flowcharts may be combined, where within the “story” of a piece of legislation there are decisions to be made. We have found this assists the students in processing a fact-based problem, especially in the application.

An example of our discussion of the PPSA over a period of eight weeks follows below:

The lecture in the first week covers two introductory, but vitally important, areas within the PPSA:

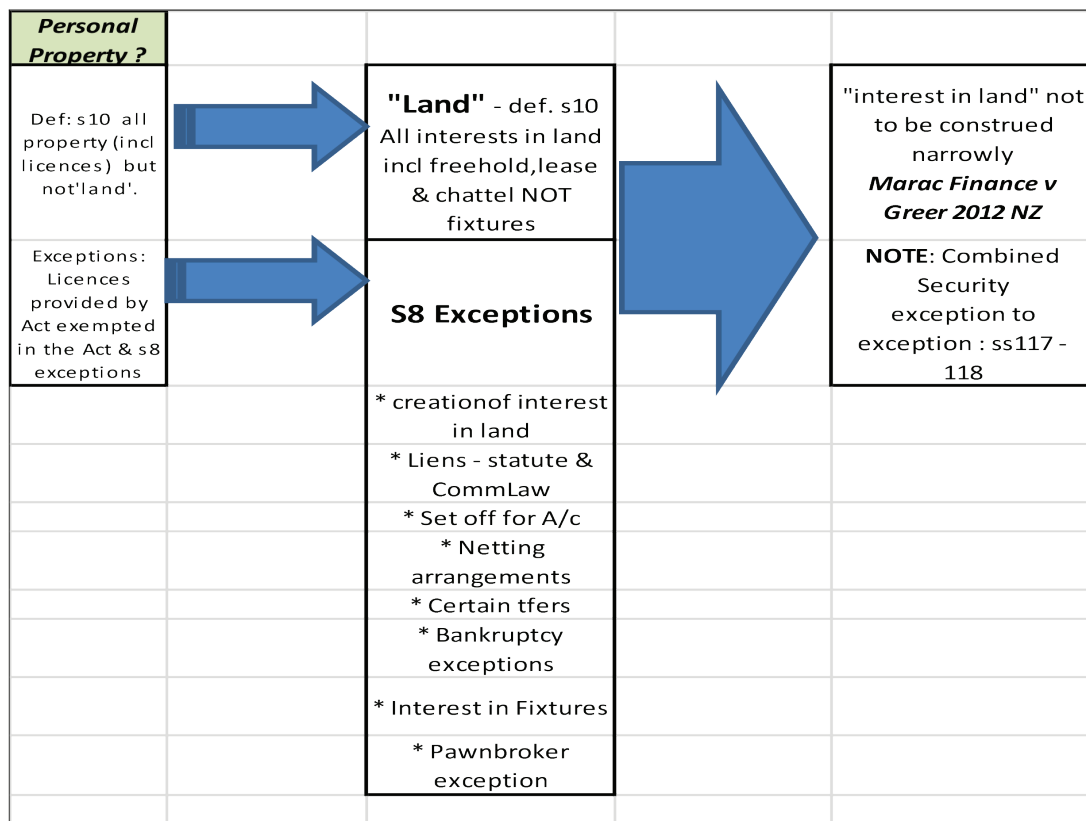
Module #1 - Are we dealing with Personal Property? If the answer to that question is yes, then;

Module #2 - Does the relationship between the parties in relation to that Personal Property give rise to a security interest under the Act?

37 Summary flowchart utilised by Ian Stevens in the Personal Property Transactions Course, Bond University Law Faculty, September 2015.

These base concepts have been depicted in a combination of decision tree and process-based flowcharts for students.

Figure 2: PPSA flowchart – Module #1 – Personal Property?³⁸

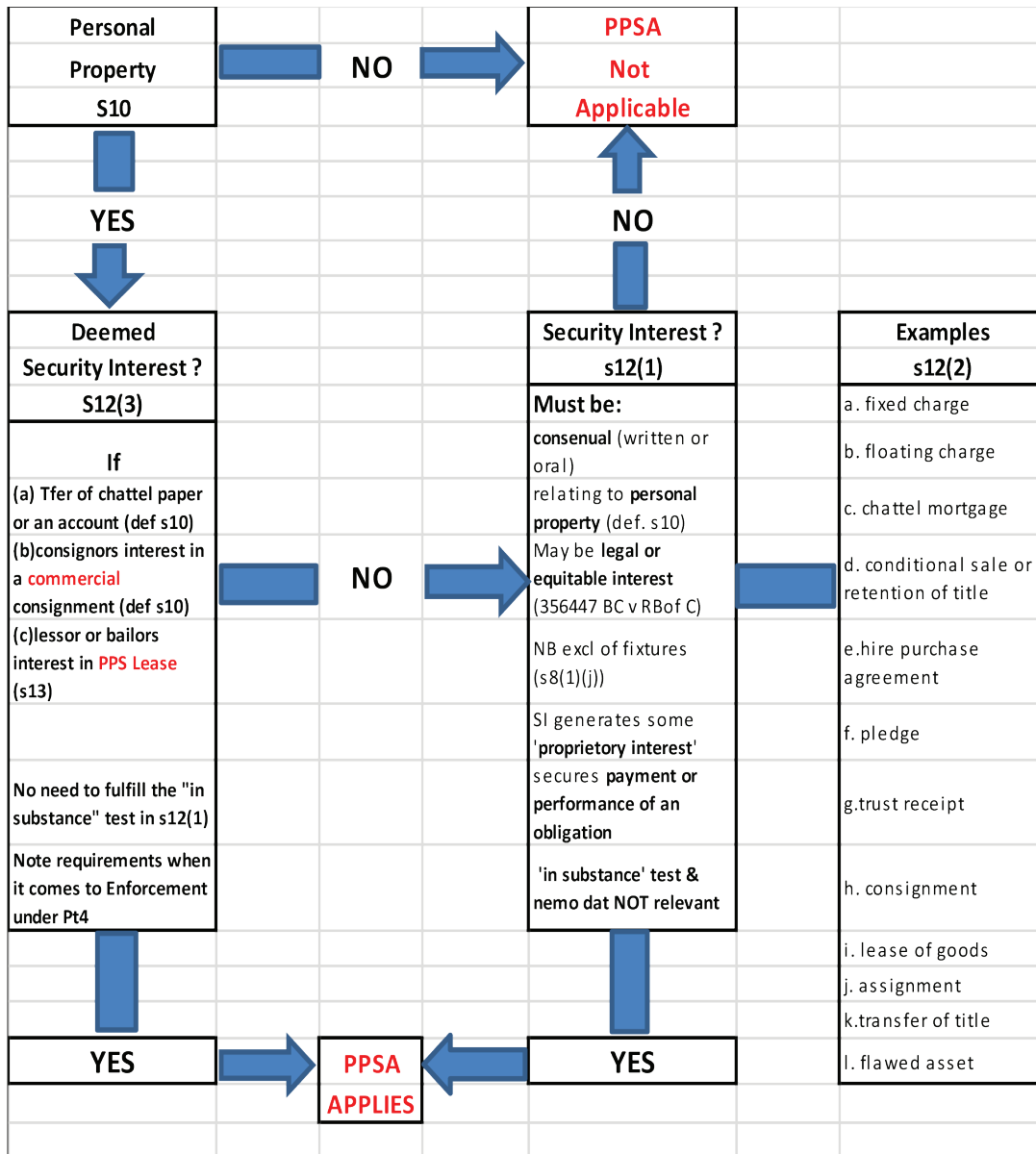


As indicated, the second module in Week 1 involves a detailed discussion of “Security Interest”, which again is summarised in a flowchart for students. That chart is then combined with the first module to provide a study tool from the first week’s lectures. This chart uses both decision tree and process flowcharts.

In this way, we start to build our map (flowchart) for the PPSA that involves decisions to be made:

38 Module #1 - PPSA – Flowchart utilised in Personal Property Transactions course by Ian Stevens, Bond University Law Faculty, September 2015.

Figure 3: PPSA flowchart - Modules #1 & #2 combined³⁹

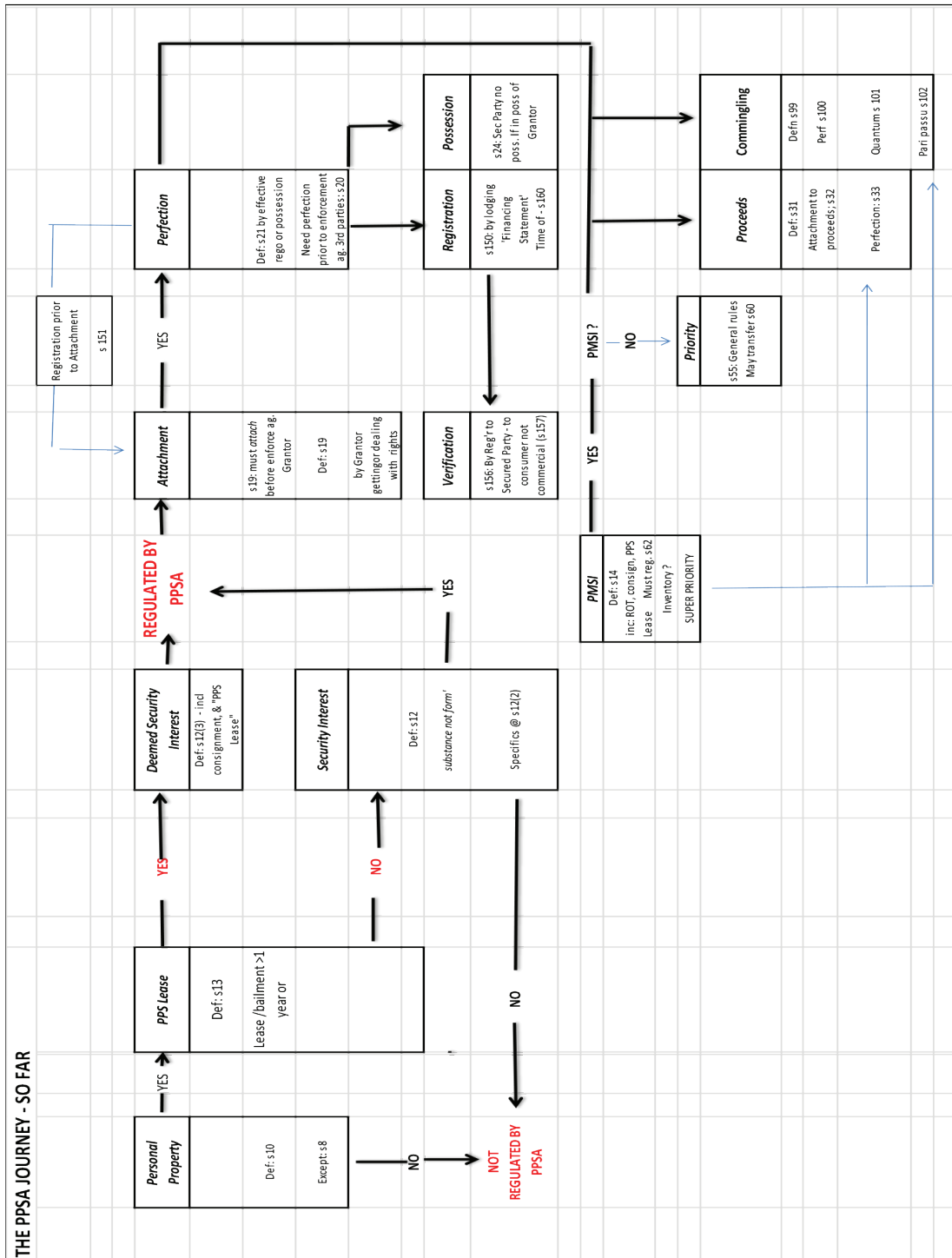


Over a number of weeks, students will have a summary flowchart of PPSA concepts and provisions, together with a number of detailed individual topic charts from each week’s lectures. Each module flowchart as demonstrated above will be more detailed.

Approximately midway through the course the flowchart will present as follows:

39 Module #2 - PPSA – Flowchart utilised in Personal Property Transactions course by Ian Stevens, Bond University Law Faculty, September 2015.

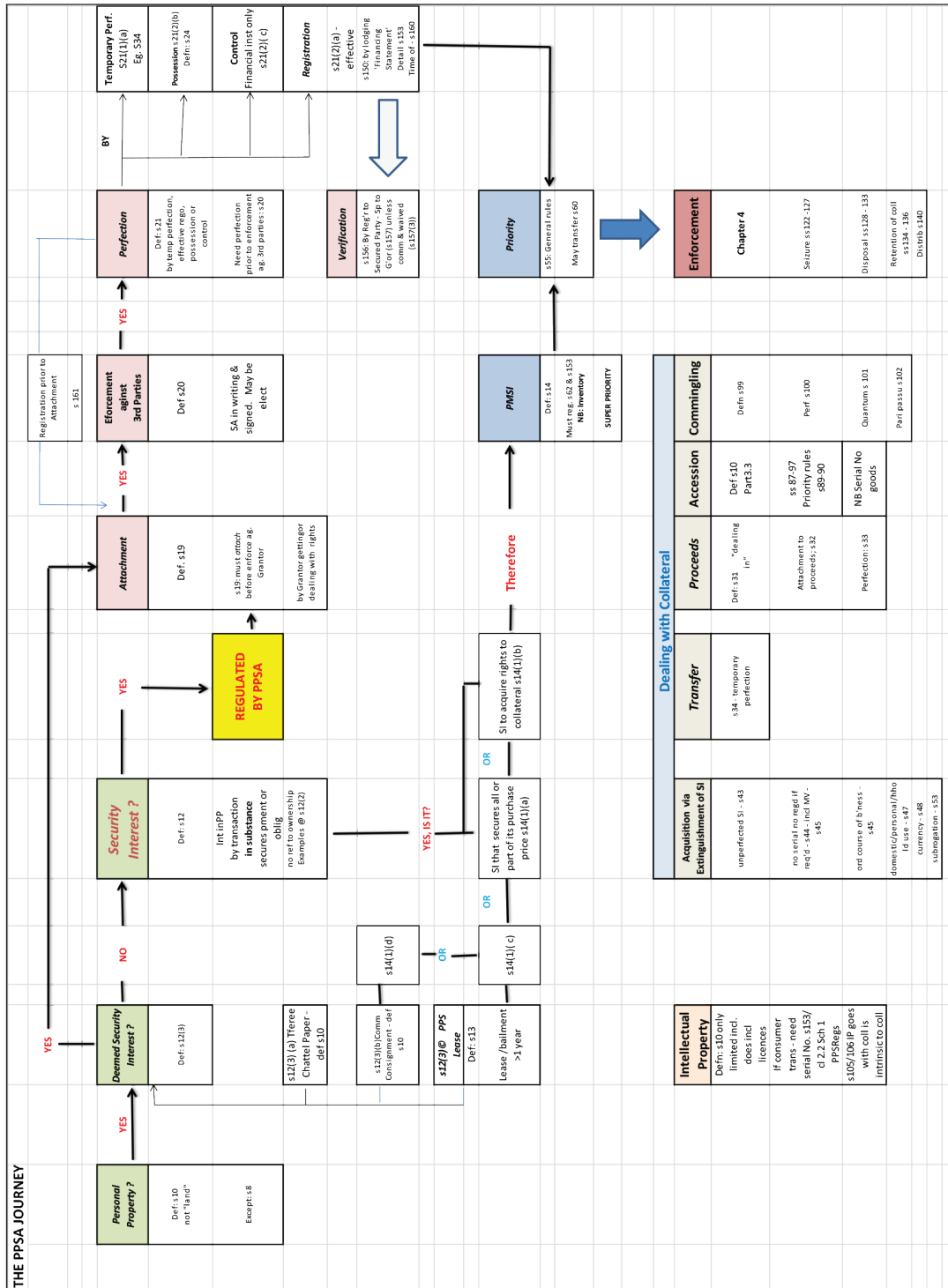
Figure 4: PPSA flowchart – Mid term⁴⁰



40 Mid-term - PPSA – Flowchart utilised in Personal Property Transactions course by Ian Stevens, Bond University Law Faculty, September 2015.

By the end of the course, students will have a comprehensive summary of the material covered in relation to the PPSA, which is depicted as set out below:

Figure 5: Final PPSA flowchart⁴¹



41 Final - PPSA – Flowchart utilised in Personal Property Transactions course by Ian Stevens, Bond University Law Faculty, September 2015.

As a teaching tool, the use of “cumulative flowcharts” following the week to week evolution of the subject has been found to be useful for students to understand the interrelationship between sections of the PPSA, while also providing them with a visual summary of the content of the course. This then leads to understanding the “big picture” as it evolves. Flowcharts are thus an accessible and useful tool for law teachers to enable them to provide a structured and easily comprehended curriculum in complex areas of the law.

IV. MIND MAPPING MODELS FOR LAW SUBJECTS

As noted earlier, mind mapping can be applied effectively in law subjects due to the nature of the subject material, which often involves a central legal problem which may require consideration of legislation, case precedents and conflicting interpretations by the courts. The mind map is thus a useful tool to obtain a “bird’s eye” perspective of the problem and possible solutions, and can help law students in analysing the problem and issues, applying the law and finding solutions.

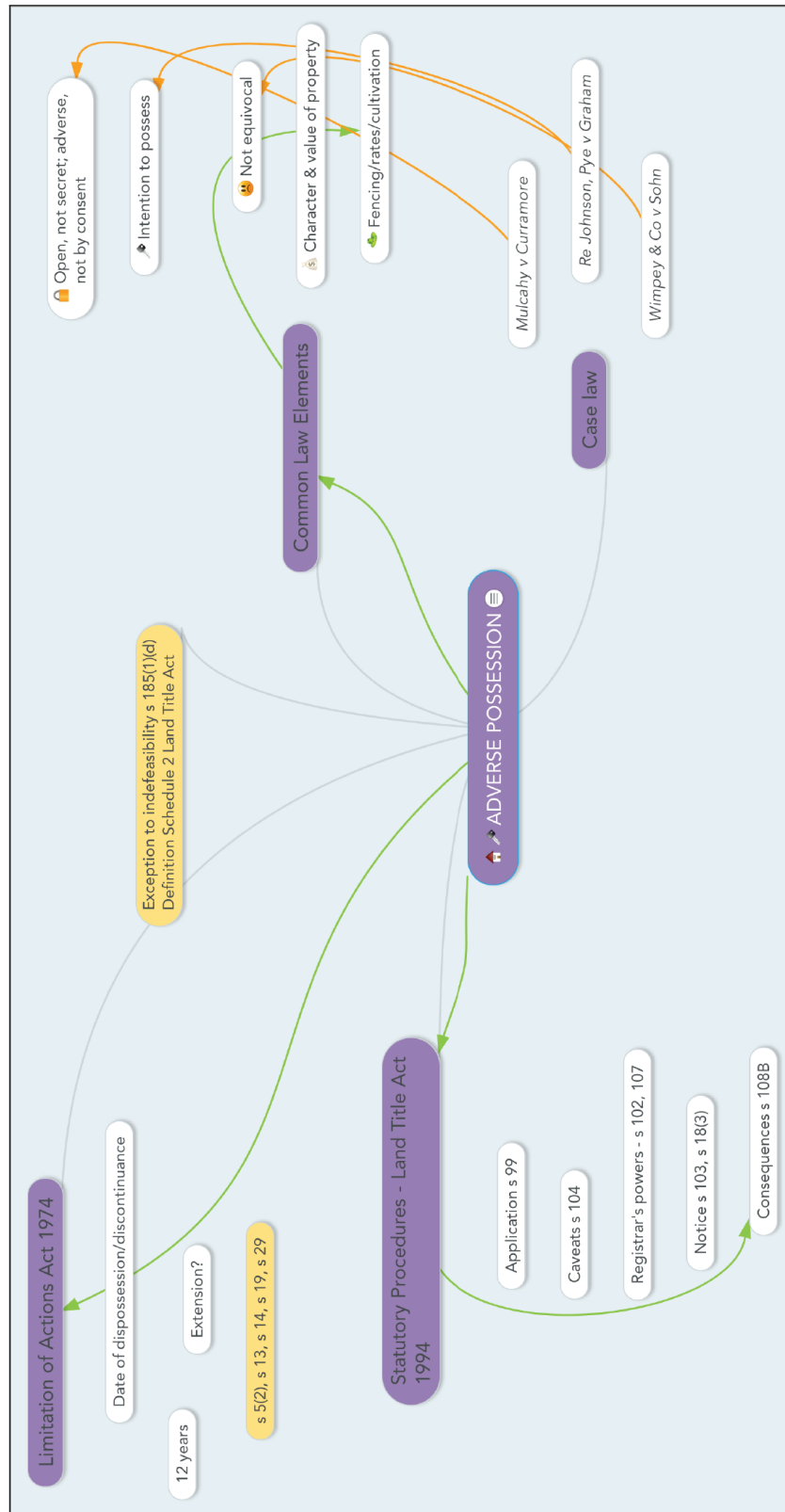
The mind mapping approach also ties in well with existing methods used to resolve legal problems, such as the IRAC⁴² and MIRAT⁴³ methodologies favoured by many educators and legal education scholars.⁴⁴ The IRAC approach, for example, requires the student to consider a legal problem in a structured way, namely, identifying the *issues*, analysing the *rules* (or law), *applying* the law to the facts and finally reaching a *conclusion*. An example of a mind map to resolve a legal problem in an essay format may present as follows:

42 Meaning a discussion of the: Issues, Rules (Law), Application and Conclusion.

43 Meaning a discussion of the: Material facts, Issues of law and policy, Rules and resources, Arguments or application, and Tentative conclusion (Devised by John Wade, Bond University as per Andrew Crockett and Damian Knowles “Legal Skills: a Practical Guide for Students” (2006) 32(2) Mon LR at 424.

44 Gary Munneke *How to Succeed in Law School* (4th ed, Barron’s Educational Series, New York, 2008) at 103.

Figure 6: Example of a mind map of a legal essay on “Adverse Possession”⁴⁵



45 Example of a digital mind map created by Francina Cantatore (2016), Property Law course, free online resource: <www.mindmeister.com>.

This approach allows the student to organise his/her thoughts in a way that is visual, constructive and logical, whilst considering possible links and connections between concepts and outcomes. At the same time, it provides students with main subdivisions of their essay, key points to be mentioned in each, and the way those points relate to each other.⁴⁶

Added benefits of using this visual approach is that it helps the student with “writer’s block” due to the brain’s infinite capacity for association⁴⁷ and creativity.

In an examination setting, it was suggested that “mini mind maps” could be used during the perusal period of the exam.⁴⁸ These “mind map bursts” can serve as a framework for answering the question, each “burst” relating to an element that needs discussion. The sum of all bursts then provides the “big picture.” Using a question relating to the PPSA as an example, the first central question (mini mind map) would be “Is it personal property?”, the second question “Is it a security interest?”, and so forth. The answers and surrounding facts to these questions will provide the outline and details of the answer.

Additionally, it has been noted that mind mapping helps educators to plan curricula and engage with students in a creative and interesting way. It can provide the educator and students with an overview of the lecture and subject content, as in the example below,⁴⁹ and assist in explaining and linking concepts in the course effectively.

46 Buzan and Buzan, above n 9, at 212.

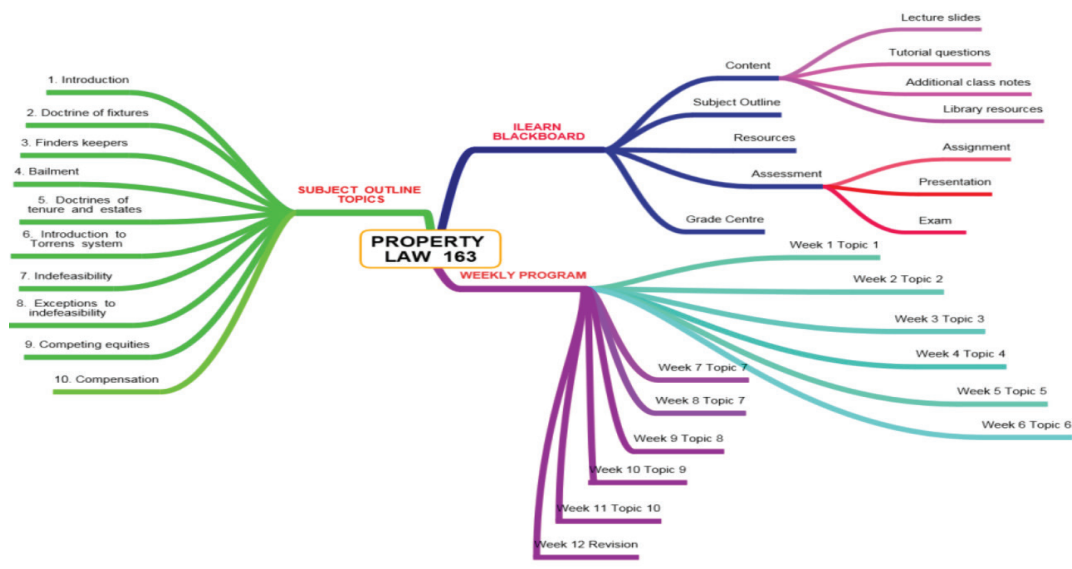
47 At 212.

48 At 213.

49 At 223.

In addition to this basic application, a mind map can be used for lecture planning and weekly subject planning, to explain to students the interrelationship between various concepts and aspects of the course, for example, under the Torrens System of land registration, the topic of indefeasibility can be used as a central concept with branches explaining the exceptions to indefeasibility being added on a weekly basis, to form a cohesive whole at the end.

Figure 7: Example of a simple mind map as a teaching aid for educators: Property Law course⁵⁰



V. CONCLUSION

We have shown that mind mapping and flowcharts are valuable educational tools in legal education, and that flowcharts have been effectively applied in teaching the dynamics of the PPSA to law students. The values of applying these techniques in learning is not limited to statute-based subjects, and as law subjects may sometimes tend to be perceived as “dry” by students, using visual aids such as mind mapping and flowcharts have additional benefits for students in, and out of the classroom, for example:

- they provide students with visual stimuli which allow them to internalise the concepts taught in a different way from mere use of text/statute;
- students are encouraged to think creatively and gain confidence in their own ability to make associations and participate in the learning process;

50 Example of a digital mind map created by Francina Cantatore (2016), Property Law course, free online resource: <mindmapfree.com>.

- students can apply mind mapping techniques in writing essays based on the application of statutes to legal problems;
- they can use these techniques to prepare presentations and complete law assignments; and
- students can apply mind mapping and flowcharts in preparation for examinations.⁵¹

These aids to visual learning provide a methodology of understanding the law, its elements and their interrelationships in such a way that the information imparted will be retained by students and able to be applied in the future. They also allow students to think in a lateral and creative manner, thereby significantly enhancing their enjoyment of, and autonomy over challenging law subjects such as property law.

51 For mind maps see Buzan and Buzan, above n 11, at 211. For flowcharts see our discussion above of the use of the flowcharts in the teaching of the PPSA.