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## Conceptual and evidence based research article

# Using Concept Maps in Law Schools to Foster Meaningful Learning: Evidence from a Pilot Study

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## Abstract

Despite its many applications in various higher education settings, concept mapping is not used for teaching predominantly theoretical subjects like Law. Given the peculiarities of learning legal subjects, this article discusses the benefits of using concept maps as a core component of an undergraduate curriculum in Law. Specifically, it presents evidence from a pilot study aimed at assessing the impact of concept mapping as a tool for enhancing deep learning on students enrolled on the compulsory Constitutional and Administrative Law module. An argument is made that utilising concept maps as an integral part of small group teaching activities may be effective in helping students shift the balance from predominantly rote learning to predominantly meaningful learning.

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**Keywords:** Law, Concept Maps, Learning Techniques, Teaching Activities, Group Teaching

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## Introduction

The idea of concept mapping as a facilitative tool for achieving meaningful, as opposed to rote, learning was introduced in the educational setting by Joseph Novak in 1972 (Novak, 1990). Based on Ausubel's theory of assimilation, concept mapping now stands as a theory of education of its own (Novak, 2010). However, despite its wide application in various fields of higher education, it is not used for teaching predominantly theoretical subjects like Law. This report discusses the benefits of using concept maps as a core component of small group teaching activities of an undergraduate

curriculum in Law with a view to encouraging students to engage more actively, and think more critically, about their disciplinary subject matter rather than simply memorize a number of propositions.

Over the past two years, I have been involved in delivering compulsory tutorials as part of the Constitutional and Administrative Law module (undergraduate, first year core module). I have noticed that there are certain tutorial questions students systematically misunderstand or fail to answer altogether. Such questions are essay questions relating to some of the most abstract concepts of Constitutional Law, such as the idea of constitution or the principle of separation of powers, which underpin the structure and content of the entire module. I have also realized that most students simply try to memorize concepts and ideas taken word by word from the textbook or handouts available on BlackBoard, thus failing to appreciate the importance and implications for the discipline of those concepts and ideas. I therefore decided to help students increase their ability to learn more deeply.

I chose to utilise concept maps to achieve my goal for four main reasons. Firstly, developing a higher level of understanding of the subject matter can significantly improve the students' experience in general, and boost their confidence to participate more actively in the tutorial activities in particular (Entwistle & Peterson, 2004). Secondly, concept mapping is an inclusive technique that facilitates the interaction between the teacher and the students (Hay, Kinchin, & Lygo-Baker, 2008). Thirdly, utilising concept maps supplements the content of lectures (Conradty & Bogner, 2012), thus retaining the rather informal and interactive character of small group tutorials. Finally, no pedagogic research has been so far undertaken on the usefulness and effectiveness of utilising concept maps in Law Schools.

The report presents evidence from a pilot study conducted in the first semester of the current academic year. Section 2 provides a literature review of concept mapping as an educational tool in higher education institutions. Section 3 explains the methodology adopted to conduct the pilot study. Section 4 discusses the findings of the study while Section 5 elaborates on the impact of the study on my teaching practice. Section 6 summarises the findings and concludes by arguing that concept mapping has the potential to improve the students' ability to learn meaningfully in context of small group teaching.

## Background

It is widely accepted that learning at university entails a personal change on part of the learner (for instance, Hay, Kinchin, & Lygo-Baker, 2008). Such a conception is consistent with Kolb's learning cycle, which describes learning as a process through which the learner experiences, reflects upon, conceptualizes and experiments new knowledge (Kolb & Fry, 1974). A corollary of such theory is that the learner must choose to actively learn (Jarvis, 1992).

According to Novak, the cognitive change (and, therefore, the quality of learning) occurs within a spectrum ranging from rote learning to meaningful learning. The former occurs when the learner adds new material superficially, without integrating it with previous knowledge. It usually has short term benefits only (Novak, 2002). The latter occurs when the learner integrates new knowledge with prior knowledge in a nontrivial – that is to say, meaningful – way. It usually generates long term benefits. Within this context, activating prior knowledge is recognized as the first step towards acquiring new knowledge (Ausubel, 1968). It is also useful to detect the presence of misconceptions in the student's process of learning which may hamper the construction of new knowledge (Novak, 2002).

One way to both track and activate prior knowledge is to graphically visualize the structure of knowledge a learner possesses in a certain domain. There exists a broad family of tools aimed at achieving this end. For example, mind mapping is a nonlinear representation of ideas variously, and spontaneously, related to each other; concept mapping is a more formal and structured representation of concepts and their relationship with each other (Davies, 2011); likewise, Ven diagrams illustrate how concepts interact with each other in the process of knowledge construction (Novak, 1990); finally, argument mapping is a computer-aided technique aimed at elucidating the more complex inferential structure of arguments (Davies, 2011). Such tools have been utilised both in corporate and educational settings (Davies, 2011; Lawless, Smee & O'Shea, 1998).

For the purposes of this study, the focus remains on the model of concept maps developed by Novak, since it proposes a structured approach specifically aimed at facilitating learning or understanding of knowledge through the graphical representation of concepts linked to each other by labelled connectors and organized in a hierarchical ("tree") structure. Since Law remains a highly abstract subject at undergraduate level, it naturally lends itself to being organized around a number of orderly interlinked themes.

Concept mapping may serve various educational purposes. For example, it has been used as a means of formal assessment in undergraduate Psychology (Jacobs-Lawson & Hershey, 2002) and Engineering courses (Bledsoe & Flick, 2012), as well as Accounting courses (Ku, Shih & Hung, 2014). It has also been used to foster deep learning in Medical (Biochemistry [Surapaneni & Tekian, 2013] and Pathophysiology [Rendas, Fonseca & Rosado-Pinto, 2006]) courses and Psychiatry courses (Hay, Wells & Kinchin, 2008). A common feature of all the concept mapping applications is that they have been mostly perceived positively by students and teachers alike. However, the use of concept maps in higher education presents both advantages and disadvantages.

Advantages include the opportunity of engaging learners in the process of graphically (re)constructing knowledge under the teacher's guidance. By exposing students to a process of learning from experience, concept mapping generates a form of expert interaction between teacher

**“** Concept mapping generates a form of expert interaction between teacher and students, thus initiating a Kolb cycle of learning. **”**

and students, thus initiating a Kolb cycle of learning (Yen, Lee & Chen, 2012). At the same time, the progression from novice to skilled learner proceeds through the acquisition of layers of knowledge represented by the hierarchical organization of concepts, the pace of which constantly remains under the student's control (Novak, 2010; Kinchin, Cabot & Hay, 2008). In this context, the role of the teacher as expert is instrumental to help students activate their prior knowledge and link it to new knowledge: it is only by letting students appreciate what is required of them to acquire the higher levels of knowledge possessed by the teacher that meaningful learning can take place (Novak, 2002; Ku, Shih & Hung, 2014).

The main disadvantage is that, although drawing and assessing a concept map is a rather simple and straightforward activity (Gerstner & Bogner, 2009), acquiring the relevant training on part of both the students and the instructor is time consuming (Davies, 2011; Lawless, Smee & O'Shea, 1998). A related weakness is that the graphic representation of knowledge unavoidably entails a degree of simplification which at times ends up in providing simplistic representations of meaning (Hay, Wells & Kinchin, 2008). For instance, a concept map may represent the main propositions explaining the functioning of a certain domain of knowledge without taking into consideration possible exceptions. One way to address such disadvantages is to make the students aware of them in advance. Since the

purpose of the work in small group tutorials is to ensure that all the students master a number of basic, subject-specific concepts, the approach appears both sensible and appropriate to the task.

The considerations above suggest that carefully designed concept mapping strategies may prove to be an appropriate teaching method for small group tutorials, where students' preparation is required in advance and 'measures of, and responses to, student prior knowledge [represent] an integral part of teaching' (Hay, Kinchin, & Lygo-Baker, 2008, p.302). Accordingly, the role the tutorial leader plays as facilitator turns out to be a key factor for achieving the module's learning outcomes (Surapaneni & Tekian, 2013).

## Method

### Participants

The pilot study was aimed at assessing the impact of concept mapping as a tool for enhancing deep learning on students enrolled on the undergraduate Constitutional and Administrative Law module. Ethical approval was obtained by the University of Leicester's Ethics Committee before the start of the current academic year to conduct research over the two teaching terms included in the period of time between October 2017 and March 2018.

Six tutorial groups of eight students each were randomly selected. All students were e-mailed by the project leader ahead of the first tutorial notifying them of the possibility to take part in the pilot study on concept mapping. Details of the purpose of the project, including the relevant data protection issues, were disclosed in the initial e-mail. During the first tutorial students were told about the nature of the project and what was expected of them, including their right to drop out of the questionnaire given at the end of the term.

This report discusses the interim findings of the project as it has been implemented in the period of time between October and December 2017.

### Design of study

The research methodology adopted consists of an action research based on Arnold's model, the main reason being that it requires the investigator to take a pragmatic approach to research while leaving ample room for self-reflection (Arnold, 2015). Accordingly, I articulated the project into four steps.

#### Step 1: Identification of the problem

Since October 2015, I have been part of the Constitutional and Administrative Law teaching team, where I lead tutorials and act as marker of both practice essays and exam papers. I noticed that every year a number of students struggle with certain tutorial questions. I observed that, in an attempt to formulate an answer to the difficult questions, they try to memorize excerpts taken from the textbook or their own lecture notes. This recurrent attitude of replacing understanding with memorizing cannot be regarded as a coincidence given the high number of students manifesting the same difficulty and the fact that such students belong to different tutorial groups.

The specific questions causing the problem turn out to be essay questions related to some of the key concepts of the discipline, which as such represent the pillars of the module's content. For instance, students usually find difficult to establish whether the British constitution is informed by the

principle of separation of powers. The source of confusion lies in the fact that the standard definition of separation of powers, as it appears in the teaching material, has been formulated taking the US constitution as the model constitution whereas the British constitution predates the US constitution and the related idea of separation of powers.

Addressing and redressing such difficulties in tutorials is important, since the assessment of the module – comprising a combination of multiple choice questions, essay questions and problem-solving questions – unavoidably tests the competence of students in mastering those concepts as a way of measuring the achievement of the intended module's learning outcomes.

Asked what, in their opinion, the source of the confusion was about those tutorial questions, the majority of students replied that they found lectures difficult or not sufficiently clear. Given the fact that lectures are recorded and available on BlackBoard, there is a module handbook containing a fair amount of suggested reading from various sources and that the tutorial sheets possess a carefully tailored reading list, I decided to improve the situation by taking a more active role in tutorials with a view to helping students understand those portions of the lectures (and related reading) they systematically find difficult or unclear. By doing so, I intended to help them develop a strategy for learning meaningfully.

### *Step 2: Refining the research focus*

Having spoken to colleagues about my intention to take a more proactive stance in tutorials, I searched the literature on learning styles and student engagement. I found Joseph Novak's work on meaningful learning through concept mapping useful for my work in tutorials. The basic assumption of Novak's approach is that, as already argued by Ausubel (1968), meaningful learning can only occur when the learner chooses to actively participate in the process of understanding the relationship between new concepts and those already present in her knowledge background (Novak, 2002). In this context, the teacher ('instructor') plays a fundamental role to stimulate the activation of prior knowledge by students.

### *Step 3: Research design (planning)*

The pedagogic literature on concept maps does not discuss applications of concept mapping techniques in Law Schools. I therefore planned a design from scratch to achieve my goal.

Having read extensively on concept mapping, I eventually decided to use Novak's model of concept maps, albeit in a modified form. I made two main changes to the original template. Firstly, I decided to explain how the concepts in the map relate to each other orally rather than by writing the linking words on the whiteboard. I was concerned that students would otherwise perceive the process of drawing concept maps as too patronizing or just limit themselves to reproduce the maps in their notes without taking an active role in constructing meaningful relationships between concepts.

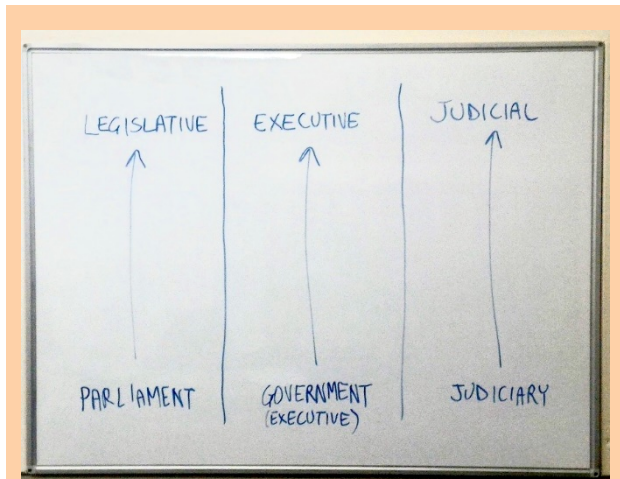
For instance, I explained that a possible approach to answering the question on the separation of powers is to start by clarifying the main aspects of the basic idea of separation of powers. According to the standard theory referred to in lectures and the teaching material alike, there are three institutions of government – namely, Parliament, Government and the judiciary. Each institution exercises one function – legislative, executive and judicial, respectively – independent of each other. As I was talking (and eliciting inputs from students), I decided to write the name of the three institutions of government next to each other, allowing for space, in a row at the top of the whiteboard. Below each of them, I wrote the name of the respective function they exercise. I then separated the three units (Parliament/legislative function, Government/executive function and



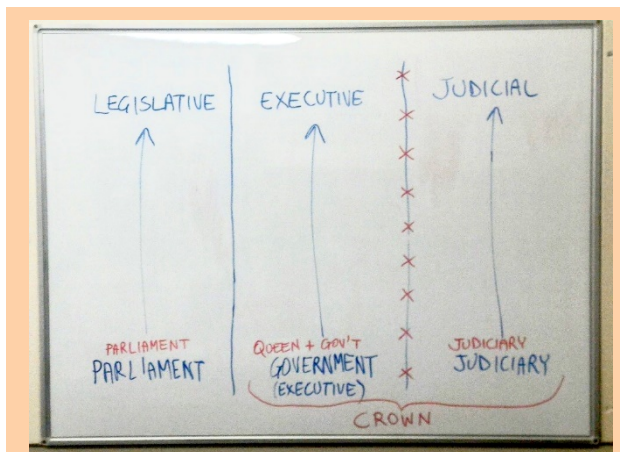
judiciary/judicial function) by drawing a line, effectively forming three distinct columns (figure 1). By doing so, I graphically visualized the relevant theoretical background with a focus on the underlying, and often overlooked, relationship between institutions and functions. I then rephrased the tutorial question in terms of inviting students to establish whether the United Kingdom possesses three institutions of government exercising three different functions as per the model written on the whiteboard.

Secondly, I decided to use two colours to construct concept maps – namely, blue and red – rather than one. Doing so allowed me to distinguish between different types of relationships. I read about this technique in the literature on mind and argument mapping (Davies, 2011).

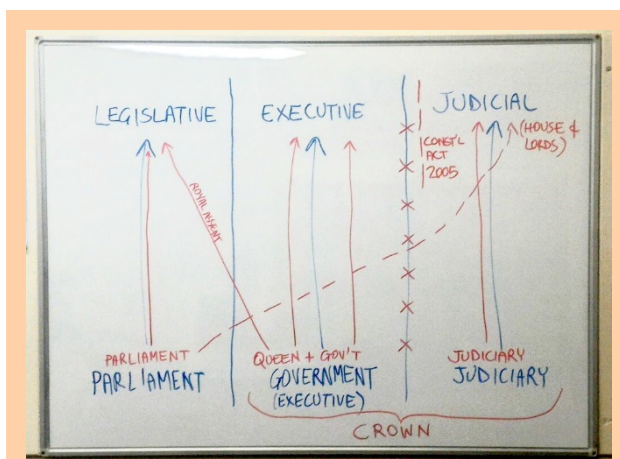
For instance, in relation to the question on separation of powers, I wrote the first, conceptual layer of the concept map, as described above, in blue. I then wrote the second one in red. Specifically, building on the first layer, I asked students to mention the institutions of government of the United Kingdom to see whether they match those of the template. It turns out that they do not, as there are only two – namely, Parliament and the Crown. The latter includes Government and the judiciary as well as the monarch, which does not appear in the template. I added the names of the Crown and the monarch above the corresponding institutions of the template. I then asked the students to identify which function each institution exercises. The monarch, for example, gives the royal assent to legislation, it appoints the Prime Minister to discharge the executive function and, since the judges formally belong to the Crown, is the source of the judicial function. I graphically represented such relationship by drawing arrows linking the monarch/Crown to each of the functions it exercises. In doing so, I crossed the blue lines separating the three units in the original template, thus showing that the British constitution is not informed by the standard



**Figure 1:** Visualising the three institutions of government using a whiteboard



**Figure 2:** Visualising the three institutions of government using a whiteboard



**Figure 3:** Visualising the three institutions of government using a whiteboard

definition of separation of powers, but it is rather informed by a different type of checks and balances preventing forms of abuse of powers by individual institutions.

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As the concept map allows the creator to see relationships, the more the background knowledge the student possesses, the more she is able to articulate a complex answer...

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Students with a solid preparation found the process of drawing of the concept map a simple and straightforward exercise. Those, however, that simply memorized the colloquial expression “the Queen is everywhere!” were exposed to the various stages leading to the reconstruction of the principal relations between institutions and powers. As the concept map allows the creator to see relationships, the more the background knowledge the student possesses, the more she is able to articulate a complex answer to the tutorial question. In this sense, drawing the concept map empowered all of the students in the tutorial group in the same way.

I have tried my version of concept maps with all the students assigned to my tutorial groups. Eventually, I decided to use concept maps in two out of five tutorials taking place over the autumn term, the reason being that they are the tutorials in which the questions students usually find the most difficult appear. At the end of the semester, I circulated a questionnaire to assess the students’ satisfaction and get feedback from them.

#### Step 4: Outcome of research

Since my project is the first documented assessment of the use of concept maps as a teaching method in a Law School, I decided to make the findings available to other researchers. In order to get my research published, I have obtained ethical clearance from University and written consent from all the students who agreed to take part in the project. By turning my study into a piece of pedagogic research, I aim at enriching the current scholarly literature and informing future practice both in Law Schools and other departments.

## Findings

### Results

Nine students out of the 28 who agreed to take part in the project returned the anonymous questionnaire circulated at the end of the semester. Eight were females and one male. However, not all of them answered all the questions. Given the low rate of responses, the following considerations must be taken as suggesting a trend rather than conclusive evidence about the value and effectiveness of using concept maps in Law Schools.

In general, students thought the tutorials were well organized. Half of them also perceived they were useful and interesting. However, while a female student stated the seminar activities were easy to follow, the male student found them difficult. With regards to concept mapping, students unanimously stated that, overall, they found the exercise beneficial and helpful to both facilitate the class discussion and visualize the structure of the answers. All of them also pointed out that concept mapping is an activity that should be used more often, in other modules as well, especially as a means for providing feedback.

In terms of students' perceptions of the purpose of the exercise, the results are not uniform. Five students stated that they understood the purpose of the exercise while two did not. Moreover, five students perceived this as a group activity while two would have preferred to have it done individually. Six students also felt more motivated working with others while one disagreed. Regarding the specific impact of concept maps on learning styles, at the end of the exercise only one student felt more confident as an independent learner. However, six students stated that concept mapping made them feel more prepared for the final assessment while two disagreed.

In the open comment box of the questionnaire, one student pointed out that concept maps are useful to summarise the main arguments. Another student stressed the usefulness of concept maps for both providing feedback and enhancing the analytical understanding of the subject matter.

## Discussion

Although the findings are not amenable to generalizations, they bring to the fore four main themes.

The first one is that female students tend to benefit more than male students from concept mapping. This gender issue is consistent with the findings of previous studies, which have demonstrated that female students on average produce more complex maps than male students, whether working individually or in groups (Gerstner & Bogner, 2009; Contra see Lawless, Smee & O'Shea, 1998).

“Activating prior knowledge is the precondition to help students learn deeply and meaningfully”

The second one is that concept maps are perceived as a useful exercise, as they facilitate students' engagement through group discussion. These findings are consistent with previous studies, which have demonstrated that utilising concept maps in medical education provides more opportunities for all students to actively participate in class activities, thus enhancing their capability to identify relationships among the key concepts within a given discipline (Hay, Wells & Kinchin, 2008; Rendas, Fonseca & Rosado-Pinto, 2006).

The third one is that concept maps are effective in helping students understand the subject matter, thus clarifying initial misconceptions (Hay, Wells & Kinchin, 2008; Rendas, Fonseca & Rosado-Pinto, 2006; Surapaneni & Tekian, 2013). This confirms that, in line with previous studies, activating prior knowledge is the precondition to help students learn deeply and meaningfully (Hay, Wells & Kinchin, 2008), albeit not the only relevant factor (Bledsoe & Flick, 2012). Likewise, this confirms that the role of the teacher in the process of constructing maps is central to securing the students' long-term learning success (Gerstner & Bogner, 2009; Rendas, Fonseca & Rosado-Pinto, 2006).

However, concept mapping did not change the students' learning style. Rather, students engaged in concept mapping as a way to obtain instant feedback on their work. This confirms that, as previous studies demonstrated, students are not going to adopt concept mapping as a regular part of their study strategies (Santhanam, Leach & Dawson, 1998). A possible reason is that drawing concept maps is time consuming for students (Rendas, Fonseca & Rosado-Pinto, 2006). Another possible reason is that changing habits of mind, including learning styles, is particularly difficult (Bledsoe & Flick, 2012): instances in which students have developed their own maps for individual studies are not rare, but are mainly found in laboratory-based courses (Rendas, Fonseca & Rosado-Pinto, 2006). This further suggests that the way highly abstract subjects like Law are structured tends to



encourage rote learning more than the discovery of new knowledge in the field, thus perpetuating a wider trend in higher education (Hay, Kinchin, & Lygo-Baker, 2008).

### Impact of study on my own practice

The pilot study on concept maps has had an impact on three aspects of my current teaching style and it is likely to influence my future practice.

First, it has exposed me for the first time to action research. Discussing, planning, adjusting, testing and revising my pilot study has forced me to think more deeply about ingrained habits I have. For instance, I used to underestimate that students and teachers may have different perceptions about the purpose of class activities. The fact that not all the students understood the purpose of the pilot study as I intended it, for example, suggests that I failed to explain how concept mapping would have helped them achieve some of the intended learning outcomes. Thus, as the literature on concept maps emphasises, I ended up introducing an innovation in learning without placing it properly in context of the module's curriculum design (Jacobs-Lawson & Hershey, 2002; Santhanam, Leach & Dawson, 1998).

I now appreciate the importance of clearly and plainly communicating the purpose concept mapping serves in context of tutorials – namely, an interactive form of oral feedback. I will start the first tutorial of future cycle by reminding students of the purpose of the project, thus amending the partial information provided initially.

Second, it has significantly raised my awareness of the responsibilities of the teacher toward the students. Although learning is ultimately the responsibility of the learner, the teacher should always be proactive in ensuring that every student gets involved in the construction of maps (Hay, Kinchin, & Lygo-Baker, 2008). This entails understanding, and subsequently accommodating, the students' needs. In my case, I was aiming to help students replace rote learning with deep learning by using concept maps to discern the layers of reasoning required to master certain fundamental legal topics. In doing so, I thought I would influence the students' learning style. However, students perceived concept mapping as a group activity aimed at spotting misconceptions and knowledge gaps in their answers. I therefore started using concept maps as a means for providing feedback since, in context of the tutorials, this proved to be the most effective strategy for transposing expertise from the teacher to the students.

For the second cycle of the pilot project and for the future, I will bear in mind that the learning outcomes of any module may be achieved by students in different ways, which do not necessarily coincide with the strategies I propose. I must allow a certain flexibility in my teaching style to be able to accommodate the students' needs, otherwise the risk is that, by imposing what I think is a successful approach on students, I will simply encourage them to keep relying on rote learning.

Third, it has provided an opportunity to rethink student engagement beyond the tutorial setting. Learning how to create a concept map and the rationale behind it has revealed a similar pattern occurring in larger group seminars and lectures, where teaching is often supported by visual aids like PowerPoint presentations. While much emphasis is usually put on the need for the lecturer to pause, ask questions and interact in various other ways with the audience, relatively little attention is given to the structure and content of the visual material presented to students. If this is simply used to deliver, perhaps in an embellished form, a linear narrative resembling the content of a textbook, the teaching provided fails to connect the audience with the topic of the lecture or seminar (Davies, 2011; Yen, Lee & Chen, 2012). Likewise, if the content of the lecture or seminar is entirely focused on one or two important issues, it lacks contextualization. As a result, in either case

students may feel encouraged to try to remember everything has been said in class, possibly in the same order, thus relying on rote learning instead of deep learning.

Quite the opposite, visualizations of knowledge can, and should, be more interactive if the aim of face-to-face teaching is to facilitate students' creative thinking and problem solving. In this sense, visualizations of associations, cause and effect relationships and different levels of reasoning can create a better emotional connection with the audience, thus facilitating a more active engagement and genuine understanding (Masika & Jones, 2016). I now see lectures and large seminars as an opportunity to discuss chains of narratives linked to each other rather an exercise in linear content coverage. The modern technologies allow users to create simple, interactive and engaging presentations that would serve the purpose of better connecting the students with the teaching provided. It is a change I can easily introduce to improve the quality of my teaching by rethinking the structure and visual content of my PowerPoint presentations.

## Conclusions

The findings of this and related studies show that students learn more and better under the expert guidance of the instructor. If lecturers want to avoid perpetuating the paradigm of universities as centres of non-learning, they need to find a better balance between student-centred and teacher-centred learning (Kinchin, Lygo-Baker & Hay, 2008). Concept mapping may well prove to be an effective technique to help students shift the balance from predominantly rote learning to predominantly meaningful learning: it does not require excessively demanding training on part of both the instructor and the students, it is fairly easy to use and it brings the benefits of group work, thus enhancing the sense of belonging to the university environment of students enrolled in predominantly theoretical courses like Law where much of the learning takes place individually.

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