Planning Thoughts – The evolution of themes in Master Dissertations and Doctoral Theses in the field of specialisation in Spatial Planning, FEUP

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Abstract

The formal existence of a specialisation in spatial planning at FEUP dates back 50 years. The present paper aims to contribute to the analysis of this experience, and to some extent of its contributions, by tracing the evolution of the themes of MSc dissertations and PhD thesis. under the scope of the different spatial planning specialisation courses.

After a brief contextualisation, which refers to changes in higher education in Portugal and in FEUP, the paper answers two research questions: How did the themes of Master Dissertations and Doctoral Theses in Spatial Planning evolve within this field of specialisation in FEUP? How do the themes in the field of Spatial Planning correlate between themselves? To this end, methodologies of content analysis of metadata, titles, and abstracts (CAMTA) and cluster analysis based on the software VOSviewer were applied.

The increasing number of publications and themes, which reflect the consolidation of this field of specialisation, and the permanence of three major research clusters, which are thus a characteristic of the planning approach developed at FEUP, constitute some of the main results of the study.

Author Keywords. Spatial Planning; Planning Education and Research; FEUP.

Type: Research Article

1. Introduction

The emergence of planning as a field of specialisation within the Faculty of Engineering of the University of Porto (FEUP) took place at a time of change in higher education in Portugal. (Tavares de Castro 2001).

The *Estado Novo* regime which ruled in Portugal (1933-1974), meant a general educational stagnation in all areas of study, to which the areas of engineering were no exception. In this field of study, financial attributions and the definition of curriculums were made exclusively by the central state. In fact, the curriculum was characterised by a common set of subjects for all areas of engineering in the first three out of six years of study (Tavares de Castro 2001). This set was shared with the Faculty of Sciences up until 1975, with classes taking place in the latter (FEUP 2022a; Fernandes and Ribeiro 2001). The consequence of this core curriculum within the Faculty, its corresponding courses, and the way teaching establishments functioned at the time translated into a weak specialisation in specific areas of knowledge within the field of engineering (Tavares de Castro 2001). As early as 1952, Antão de Almeida Garrett argued for the need for a strong specialisation within the different areas of Engineering, as a way to advance and modernise the field of study, giving the country the fields of specialisation most needed (Almeida Garrett 1952). According to the author, this should be achieved through optional or complementary courses of improvement and repetition.

However, according to (Tavares de Castro 2001), it was only in the early '70s that a few changes occurred. These changes happened due to an educational reform concerning the area of engineering with the publication of Decree nº 540, on 10 November 1970. This decree increased the number of courses and reduced the duration of the engineering degree to five years and enabled the creation of optional subjects and seminaries in students' final year of studies. Furthermore, faculties were now allowed to define their own *curricula* with autonomy, which led to a general abandonment of the previous national core engineering curriculum. Moreover, engineering education evolved into an area of strong growth, characterised by higher diversification and internal complexity. There is a growth in numbers and variety of both courses and specialities, as well as students (Rodrigues 2003). Consequently, from 1975 onwards, first and second-year students started enrolling directly in the Faculty of Engineering, leaving behind the Faculty of Sciences, resulting in an exponential growth in the number of students enrolled (Tavares de Castro 2001).

As a consequence of this growing context, in the first report about the expansion of the facilities of FEUP, in March 1972, Professor Luís Valente de Oliveira defended the need to invest in the Spatial Planning field in civil engineering studies, with the vision that this area of knowledge would grow in importance in the future (Valente de Oliveira 1972). In this same year, fifth-year Engineering students started to have an optional regime, enabling them to specialise in a specific area during their graduate studies, as was the case of Spatial Planning. The goal was to incentivise students to actively participate and develop their taste for investigation. In its first year, nine students chose Spatial Planning as a field of specialisation (Barbosa de Abreu and Valente de Oliveira 1973). From an early stage, Spatial Planning was characterised by being cross-sectional and, according to the authors, it acknowledged students that had a wide range of interests (Barbosa de Abreu and Valente de Oliveira 1973).

In 1974, in the "*Congresso para a Estruturação da FEUP*" (Congress for the Structuring of FEUP (free translation)), Campos Guimarães and Valente de Oliveira defended that lab research and the consequent scientific dialogue represent the intellectual capital of a scientific department. Additionally, the authors agreed on the need to reorganise the Faculty of Engineering, encompassing its scientific departments - taking particular interest in their human and material elements - with the aim of creating a cohesive team with established goals, and developing new research projects (Campos Guimarães and Valente de Oliveira 1974).

In this time of change in the education sector, it was important for these authors that faculties had autonomy in some key features, such as finances. The new vision was to transform a

service system at the service of elites into a system of democratic education at the service of Portuguese Democracy. Other goals were to increase the budget for Education in centres of popular culture and investigation, mainly in institutions of higher education (Campos Guimarães and Valente de Oliveira 1974).

In the following years, a growing movement continued to defend that the study of Engineering within the Faculty should encompass the dissemination of science, the practice of investigation, laboratory research, and contact with sources of knowledge through the professional component (Fernandes and Ribeiro 2001). Interventions were made in all aspects of the Faculty of Engineering, with actions over the organisation of the different courses, as well as proposals on the way management and teaching were made regarding higher education and scientific research (Fernandes and Ribeiro 2001).

With that in mind, and regarding the specific area of Spatial Planning, several courses were designed to accommodate this field of specialisation. A case in point is the Master in Environment Planning and Urban Project (MPPAU), which emerged in the academic year of 1994-1995 in the scope of the Resolution nº. 19/SC/SG/94, on the 20th of July, joining the Faculties of Engineering and of Architecture of the University of Porto (FEUP and FAUP, respectively) (Fernandes and Ribeiro 2001). This Master came to an end because of the Bologna Process. In Portugal, this process started in 2006 in accordance with the Decree-Law nº. 74/2006, 24 of March, stating the objective of guaranteeing a higher mobility of Portuguese students in the European area, leading to the internationalisation of academic training and qualifications. (MCTES 2006). In the following year, the implementation of Law no. 62/2007, September 10th, detailed some improvements concerning the transitioning process to the new study cycles, while also promoting the simplification of related proceedings (Assembleia da República 2007). In accordance with this legislation, the adaptation of the different courses was made until the end of the academic year of 2008/2009, so that in 2009/2010 all cycles of study would be organised according to the new model (U. Porto 2022). Thus, the Master in Spatial Planning and Urban Project (MPPU) emerged in the academic year of 2011/2012.

The Bologna Process also introduced changes in the civil engineering course, implementing the Integrated Master in Civil Engineering (MIEC), in 2006 (FEUP 2006), with a specialisation in spatial planning. The MIEC was later extinguished by the article 19th of Decree-Law no. 65/2018, August 16th, which divided this course into two independent study cycles - the Bachelor and the Master in Civil Engineering (L.EC and M.EC, respectively) (FEUP 2022b).

Regarding the Doctoral Degree, the Doctorate in Civil Engineering (DEC) began in the academic year 1973/1974 and lasted until the academic year 2010/2011 (FEUP 2013). The ending of this course also resulted from the changes in the formative structural reforms implemented by the Bologna Process. In this context, the Doctoral Program in Civil Engineering (PRODEC) was created in 2007/2008 (FEUP 2022c), through the Resolution no. 198/2010 (Universidade do Porto - Reitoria 2010). Moreover, as a way to "foster advanced knowledge in the field of spatial planning, aiming at explaining, resolving and supporting future public policy agendas" (FEUP | Departamento de Engenharia Civil 2022), the *Doctoral Program in Spatial Planning* (PDPT) emerged in the academic year of 2012/2013. This course results from the cooperation between FEUP and the Faculty of Sciences and Technology of Coimbra University (FCTUC) (FEUP 2022d; FEUP | Departamento de Engenharia Civil 2022). Both PDPT and MPPU have now a strong international audience.

All the aforementioned courses enabled the definition of the field of specialisation in Spatial Planning in FEUP to what it is today, with its own curricular autonomy in the field of Spatial

Planning, and the aim of providing advanced knowledge on a wide variety of themes surrounding this topic (FEUP 2022a).

Taking into consideration this historical contextualisation and to celebrate 50 years of the specialisation in spatial planning in FEUP, this study aims to answer the following research questions (RQ):

RQ1: How did the themes of Master Dissertations and Doctoral Theses in Spatial Planning evolve within this field of specialisation in FEUP?

RQ2: How do the themes in the field of Spatial Planning correlate between themselves?

This paper is structured as follows. Firstly, the methods employed for the data gathering and data analysis stages are presented. Secondly, the data was analysed, and the findings were summarised, answering the research questions, and fulfilling the research objectives. Finally, the discussion and conclusion section evidence the contribution of this study in terms of understanding how the different themes emerged, evolved, and correlated with each other. Furthermore, challenges, as well as possible future studies are presented.

2. Materials and Methods

The study of the evolution of themes in Master Dissertations and Doctoral Theses encompassed two main stages, namely, data gathering and data analysis.

The data gathering stemmed from two data sets. The primary data set was collected from the FEUP website, resulting in the list of all Master Dissertations and Doctoral Theses completed in the last 50 years under the scope of the different Spatial planning specialisation courses (i.e., MPPAU, MIEC, MPPU, M.EC, DEC, PRODEC, and PDPT), with a total of *305 publications*. Since the teaching staff contributed to the creation and development of the field of specialisation in Spatial Planning in FEUP, a secondary data set was gathered. This data set accounted for the teaching staff's Master Dissertations and Doctoral Theses, as well as the ones they supervised in other cross-sectional fields, as long as their focus remained in the Spatial Planning field. This data was collected from both the FEUP website and the Open Repository of UP, resulting in *29 publications* added to the total.

From these two data sets, a total of *334 publications*, of which *291 Master Dissertations* and *43 Doctoral Theses*, were collected. From each publication, metadata features (e.g., author, supervisor and co-supervisors, year of publication, degree, and university), title, and abstract were stored in EndNote.

Since not all the publications entailed a set of keywords that would help understand the main themes in the dissertations and theses, the data analysis resorted to a content analysis of metadata, titles, and abstracts (CAMTA). According to (Donald 2021), this type of content analysis enables the understanding of how the literature has evolved by looking at each publication's metadata, title, and abstract to define themes and analyse their representativeness. In the case of this study, the themes derived from the CAMTA and underwent incremental adjustments at each iteration. This method identified 54 themes, which were added to their correspondent publications in EndNote.

The next step of the data analysis encompassed the exportation of data from EndNote to both Excel and VOSviewer. Whilst Excel enables quantitative data analysis, VOSviewer provides a mixed methods approach that links qualitative and quantitative analysis by carrying out a unified approach to mapping and clustering data (van Eck and Waltman 2010; van Eck, Waltman, and Noyons 2010). The complementary between these software programmes can provide an insightful and comprehensive analysis of the main themes, their relationship, and their evolution in the field of specialisation in Spatial Planning.

3. Data Analysis

Following the aforementioned methodology, a total of 334 publications underwent two types of analysis to fulfil the established research objectives. The first type of analysis encompassed the study of the themes through Excel. This uncovered how they have evolved, and which are most recurrent themes in Master Dissertations and Doctoral Theses throughout the last 50 years of the field of specialisation in Spatial Planning. The second type of analysis entailed the clustering of themes through VOSviewer, revealing their overall correlation.

Accordingly, this chapter comprises two main sections. In the first section (3.1), the study revolves around the evolution of themes in both Master and Doctoral degrees. The second section (3.2) entails the cluster analysis of the themes.

3.1. Spatial Planning, a tale of two degrees: their evolution

The 54 identified themes emerged at different times throughout the last half-century. Figure 1 provides the debut year of each theme in chronological order.
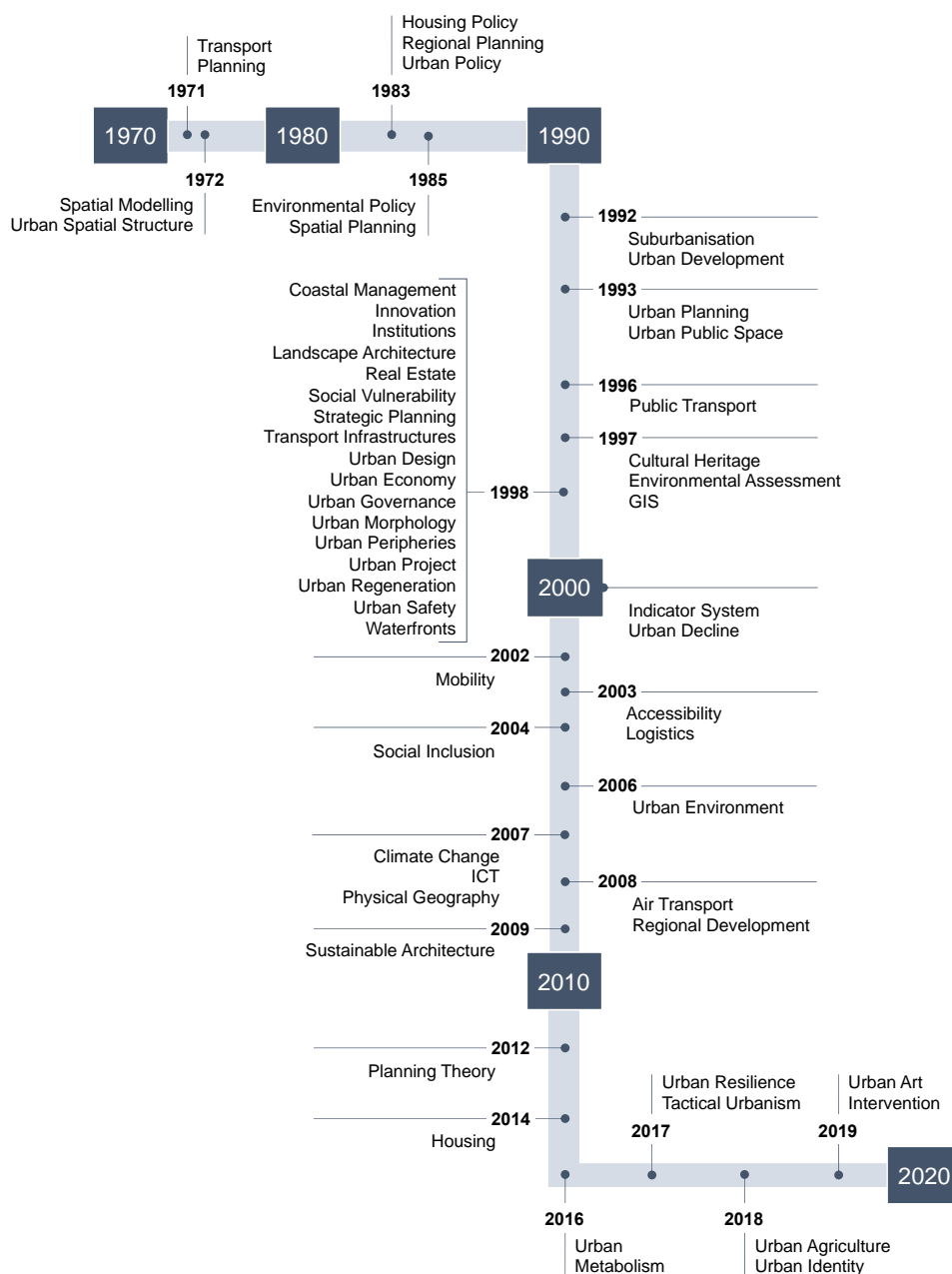

Figure 1: Chronological timeline of the appearance of themes.

As Figure 1 illustrates, the 90s was an important decade for the field of Spatial Planning in FEUP. During these years, 25 themes (an estimated 46% of the total) debuted, with 1998 gathering 17 of these themes alone.

Regarding all the themes in the 334 publications, these have different frequencies of occurrence. Bearing this in mind, Figure 2 showcases the most frequent research themes, i.e., the ones with 20 or more occurrences. As can be seen, *Transport Planning* is not only the first but also the most frequent theme, with the highest number of occurrences. Alongside this theme, the *Urban Policy* and *Urban Planning* themes also encompass a high number of occurrences, with 69 and 58 occurrences each.
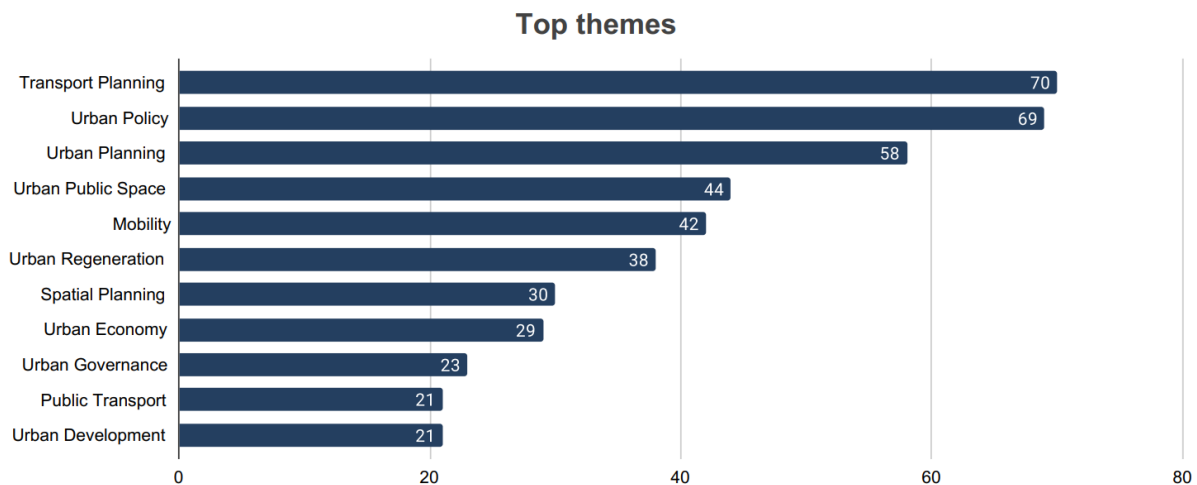

Figure 2: Top themes with 20 or more occurrences.

Inspired by the above findings, the research pathway followed a more interconnected and deep drive understanding of themes in both Master Dissertations and Doctoral Thesis. This pathway, in the past half-century, was paved by singular and broad stages of knowledge in the field of specialisation in Spatial Planning. The following subsections provide an in-depth analysis of how the themes evolved within both Master (3.1.1) and Doctoral (3.1.2) degrees.

3.1.1. Master Dissertations

Concerning the 291 Master Dissertations gathered for this analysis, a total of 53 themes were identified through CAMTA. From this analysis, it is possible to see that a wide range of themes was covered in the last 50 years in the field of specialisation in Spatial Planning in FEUP.

Transport Planning was the earliest theme identified, with the Master Dissertation "*Information requirements for the estimation of trip-generation rates for colleges and hospitals*", in 1971, by Prof. Valente de Oliveira. In fact, this was the most studied theme among Master Dissertations within the field of specialisation in Spatial Planning, with a total of 65 occurrences attributed to it. This can be explained due to its early appearance as an area of study when in comparison to other themes, but also for the fact that it is a relevant topic up until today. Indeed – except for 2006 and 2011 – from 2003 onwards there has always been at least a master dissertation per year concerning this theme. Alongside *Transport Planning*, eight other themes have a high number of occurrences (20 or more associated master dissertations). Seven of them emerged before the year 2000, namely, *Urban Planning* (47 occurrences) and *Urban Public Space* (38), in 1993; and *Spatial Planning* (23), *Urban Economy* (25), *Urban Governance* (21), *Urban Regeneration* (37) and *Urban Policy* (64), in 1998. Despite emerging before the year 2000, these themes present a higher frequency of occurrence from 2005 until 2021. The case of *Urban Planning* is noteworthy because it first peaked in 1998,

with a total of six occurrences, later matched in 2018 and 2019. Still regarding the themes with a high number of occurrences, *Mobility* is the exception concerning their timeframe, debuting only in 2002 and gathering a total of 39 occurrences throughout. However, it was only after 2014 that dissertations surrounding this theme started to pick up the pace in terms of occurrences. In fact, along with *Transport Planning*, *Mobility* amounted to ten occurrences as late as 2021, the highest number of occurrences found across all the themes within a single year throughout the timeframe of this study.

On the other side of the spectrum, several themes only appear once throughout the timeframe of this study, failing to gather the same amount of interest throughout the years, namely, *Urban Peripheries*, in 1998; *Spatial Modelling*, in 2007; *Sustainable Architecture*, in 2009; *Environmental Policy*, in 2012, and *Urban Identity*, in 2018.

Furthermore, an additional 28 themes entail less than ten occurrences throughout the last 50 years. From these, ten themes emerged after 2010: *Housing*, *Planning Theory*, *Tactical Urbanism*, *Urban Agriculture*, *Urban Art Intervention*, *Urban Metabolism*, and *Urban Resilience*. This demonstrates that some themes only emerged in recent years within this field of specialisation. All the remaining themes have a sporadic distribution throughout the timeframe.

3.1.2. Doctoral Thesis

In what concerns the 43 Doctoral theses gathered for this analysis, a total of 32 themes were identified through CAMTA.

Regarding the timeframe of this study, the earliest themes to be identified were *Spatial Modelling* and *Urban Spatial Structure*, in 1972, with the Doctoral Thesis of Professor Valente de Oliveira. These themes appear only once throughout the last 50 years. Similar to these, eleven other themes also occur only once throughout this study. From these, four are not addressed in recent years, i.e., after 2010: *Suburbanization*, in 1992; *Real Estate*, in 2003; *ICT*, in 2008; and *Logistics*, in 2009. In contrast, seven other themes emerged only once in more recent years: *Urban Decline*, in 2011; *Air Transport*, in 2012; *Regional Development* and *Sustainable Architecture*, in 2013; and *Urban Regeneration*, in 2016. *Coastal Management* and *Urban Resilience* are the two most recent themes, emerging only in 2021.

Taking into consideration the themes with multiple occurrences (nineteen themes), these are sporadically distributed throughout the timeframe of this study, without major divergences in what concerns their occurrences. From these, two main features can be highlighted. On one hand, the most studied theme is *Urban Planning* which amounts to a total of 11 occurrences. On the other hand, four themes emerged only after 2010: *Climate Change*, *Institutions*, *Urban Design* and *Urban Governance*.

3.2. Cluster Analysis

Following the previous analysis, a cluster analysis was employed to address the second research question: "*How do the themes in the field of Spatial Planning correlate between themselves?*". Thus, this section aims to uncover the correlation between the different themes.

With that purpose, the themes were gathered in clusters, resorting to the co-occurrence mapping feature of the VOSviewer software (see Figure 3). This feature showcases the number of times each theme was found among the publications (i.e., occurrences) and how the themes relate to one another, by taking into consideration their total link strengths (i.e., the total cited references between one theme and the others) (Tamala et al. 2022).
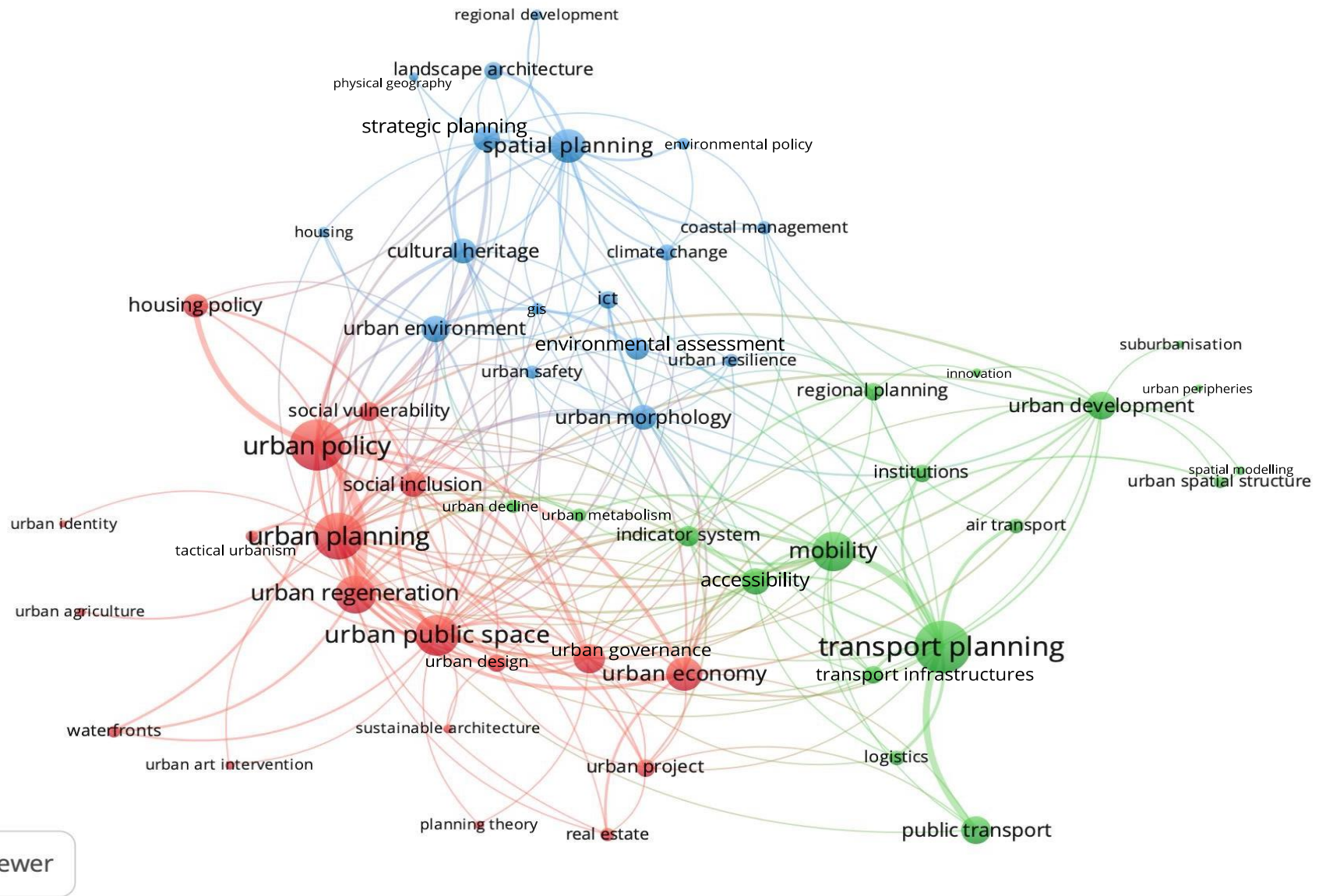
Figure 3: Network of themes and corresponding clusters.

Table 1 comprises the themes with both more occurrences (over 20) and a higher total link strength (over 30).

Theme	Occurrences	Total Link Strength
Transport Planning	**70**	72
Urban Policy	69	**114**
Urban Planning	58	72
Urban Public Space	44	63
Mobility	42	53
Urban Regeneration	38	74
Spatial Planning	30	35
Urban Economy	29	41
Urban Governance	23	36

Table 1: Most highly co-occurring themes with the corresponding cluster colours.

Additionally, and as seen in Figure 3, the co-occurrence mapping illustrates three clusters assembled by VOSviewer (red, green, and blue). In this analysis, three aspects should be taken into consideration. Firstly, the themes are colour-coded according to their prevalence and linkages. Secondly, the circle and text sizes of each theme are compatible with their number of occurrences, i.e., the higher the number of occurrences, the bigger the circle and text sizes. Thirdly and lastly, the distance between themes and the lines that link the different themes report their relatedness, implying that the closer two themes are to each other, the more related they are and the stronger the colour of the line that links them (Tamala et al. 2022; van Eck, Waltman, and Noyons 2010).

Taking into consideration the VOSviewer analysis and starting by performing an in-depth analysis of each cluster, it is possible to acknowledge that the three clusters are balanced concerning the number of themes associated with each cluster: the **red** cluster groups nineteen themes, the **green** cluster eighteen, and the **blue** cluster seventeen.

The **red** cluster is the most representative one, as can be seen in both Figure 3 and Table 1. This cluster encompasses a total of nineteen themes, of which six are amongst the most highly co-occurring themes. Most themes within this cluster are not only highly connected to each other – as seen by the proximity between their circles and the thickness of their links – but also with the other clusters. Nevertheless, the themes represented by smaller circles are strictly connected within the red cluster, without linkages to the other two clusters and occupying a peripheral place in the network. Additionally, it is noteworthy that the themes in this cluster are mainly bound up with urban-related affairs.

The **green** cluster is the one closest to the red cluster, encompassing a total of eighteen themes, with two of them being part of the most highly co-occurring themes: *Transport Planning* and *Mobility*. Together with these themes, this cluster comprises the other identified transport-related themes, i.e., accessibility, public transport, transport infrastructures, and air transport. Along with these transport-related themes, the green cluster also covers multidisciplinary themes, such as regional planning, urban development, and the role of institutions. Furthermore, the position of both urban decline and urban metabolism in Figure 3 is noteworthy. Even though these themes are grouped in the green cluster, they are centrally placed near the **red** and **blue** clusters due to their links with urban policy, urban planning, and urban regeneration themes (in the **red** cluster), as well as cultural heritage and urban environment (in the **blue** cluster).

Lastly, the **blue** cluster is the least representative one. Despite having a total of seventeen themes, only one - *Spatial Planning* - is among the most highly co-occurring themes (Table 1). In fact, this theme can be considered central to the blue cluster since it is a common denominator to a majority of its themes (see Figure 4(a)), with the exception of urban environment, environmental assessment, urban resilience, and urban morphology (Figure 4). In turn, these themes are anchored by least representative themes in the blue cluster, bridging this to the most highly co-occurring themes in both the red and green clusters. Such features highlight the wide-ranging nature of the blue cluster.
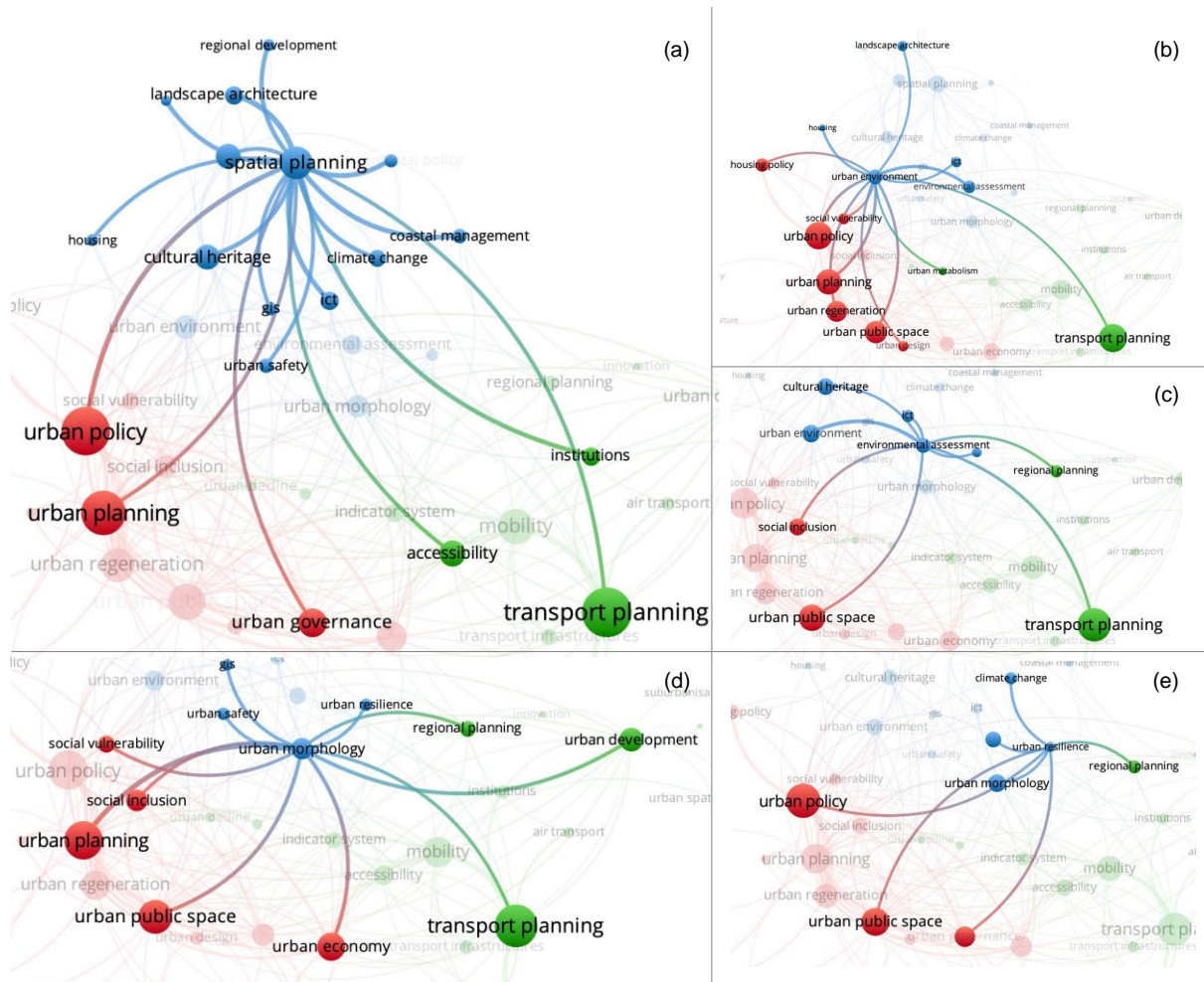
Figure 4: Network of spatial planning (a), urban environment (b), environmental assessment (c), urban morphology (d), and urban resilience (e).

With the help of Excel, these clusters can be further analysed in what concerns the evolution of the amount of research in the last 50 years, as seen in Figure 5.
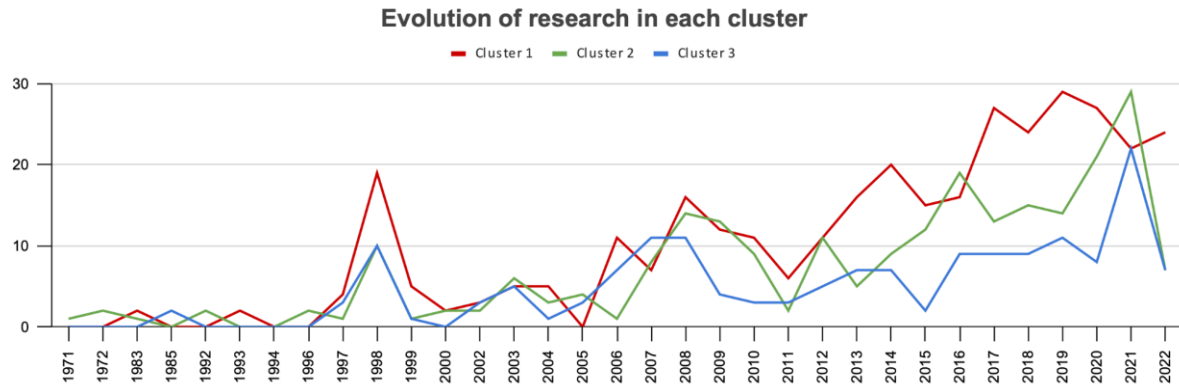
Figure 5: Evolution of the amount of research in each cluster throughout the last 50 years.

The three clusters exhibit a similar behaviour in the first 25 years of this study, with slight variations. The second half of the timeframe of this study entailed several changes in the amount of research of each cluster. As can be seen in Figure 5, the latter half of the 90s entailed the first peak of all three clusters, which happened simultaneously in 1998 – a one-time event. After this year, the amount of research of the three clusters decreased, up until 2005/2006, with the blue and red clusters having no results in the year 2000 and 2005 respectively. From 2004/2005 onwards, the amount of research of each cluster had a steady growth up until 2011 – the year with a brief decline in the knowledge production. Furthermore, the period between 2013 and 2016 was marked by an increase in interest for the themes associated with the green cluster, gathering the highest amount of research in 2016. By comparison, during this period, the knowledge production in the red and **blue** clusters declined and stagnated.

As Figure 5 illustrates, the red cluster gathered the higher amount of research throughout this timeframe, being surpassed only by the green cluster in 2016 and 2021. Nevertheless, the red cluster is the only one that has a downward tendency in the last few years (from 2019 onwards). In contrast with this, the green and blue clusters had an analogous growth, although with different magnitudes – the blue cluster has gathered the least amount of research, except for 2011 and 2013. It is also noteworthy that the research of both clusters has an upward tendency since 2020.

4. Discussion and Conclusion: The Different Planning Thoughts

Half a century later, 334 publications were gathered, resulting in 54 themes discussed and studied by several students in both Master and Doctoral degrees, which have taken centre stage in this study. These themes were analysed through different methods in order to fulfil the aim of understanding how the different themes emerged and evolved, uncovering the correlation between all themes. Taking this into consideration, the goal of this discussion and conclusion is to provide some considerations on the Planning Thoughts that emerged in the last 50 years, as well as dwell on some of the limitations of this study and the possibility of future research.

Regarding the previous analysis, several Planning Thoughts about the overall findings can be highlighted. Firstly, given the contextualisation in the first chapter and the analysis made throughout this study, a link can be made between the emergence of themes and the changes in the courses of the field of Spatial Planning. Bearing this in mind, it is possible to see that the themes that emerged in the 90s (Figure 1) can be attributed to the creation of the Master in Environment Planning and Urban Project (MPPAU). In turn, the implementation of the

Bologna Process brought some consequences for knowledge production in the following years. The creation of the Integrated Master in Civil Engineering (MIEC), in 2006, along with the Master in Spatial Planning and Urban Project (MPPU), in 2011, and the Doctoral Program in Spatial Planning (PDPT), in 2012, might explain the period of growth in academic production from 2006 onwards (Figure 5), since there was a larger number of available courses in the field of Spatial Planning, translating into a larger production of Master Dissertations and Doctoral Theses. Moreover, this might also justify the fact that fewer themes have ceased to be studied within this timeframe.

Secondly, attention should be taken to the remote themes in Figure 3, namely, *Suburbanisation*, *Urban Peripheries*, *Urban Agriculture*, and *Urban Identity*. All these themes present a low number of occurrences and are less connected to the others in the network (presenting only one link), as showcased in the previous study of Master and Doctoral publications (in 3.1), as well as in Figure 3. Their low representativeness might be a consequence of their own features. On one hand, the first two themes were the earliest identified, which can imply that they have failed to gain momentum throughout the timeframe of this study. On the other hand, the last two themes were some of the more recent to emerge, which might mean that they had less time to gather interest and are still trying to build their own line of thought.

Thirdly, some of the themes have withstood the test of time, namely, *Transport Planning*, *Regional Planning*, *Urban Policy* and *Spatial Planning*. Whilst these were some of the earliest themes to be identified, they managed to gather at least one occurrence in each decade throughout the last 50 years, which might be due to their central role in the field of Spatial Planning. Additionally, the resilience of these themes can also be linked to their capacity for adaptation throughout the decades, changing their perspective and taking notice of contemporary issues.

Fourthly, the most recurrent themes among all publications in the last 50 years were *Transport Planning*, *Urban Policy* and *Urban Planning*, as seen in Figure 2. These themes are represented in the VOSviewer network with the biggest circles and form the core of each cluster. Additionally, it is interesting to note that even though the themes in Figure 2 are the most recurrent, not all of them imply high connectivity. On one hand, it is possible to see in Figure 3 that both *Public Transport* and *Transport Planning* have fewer links than the other recurrent themes. Since they are both part of the same cluster (green cluster), this might suggest that this field of spatial planning is not as connected to the others. On the other hand, it is noteworthy that *Urban Regeneration* has the second-highest total link strength, whilst having a low number of links, which highlights the importance of its links.

Last but not least, the most cross-sectional themes should be highlighted. These themes are characterised by having the highest number of links to other themes, being more highly connected. In fact, the themes with more co-relations within the field of Spatial Planning are part of the most recurrent themes, namely, *Urban Governance* (with 23 occurrences and 20 links), *Urban Policy* (with 69 occurrences and 20 links), *Urban Public Space* (with 44 occurrences and 27 links), and *Urban Planning* (with 58 occurrences and 29 links).

Overall, the findings of this research corroborate the view of Professor Luís Valente de Oliveira, who defended the need to invest in the area of Spatial Planning in civil engineering studies, since there has been a growing number of themes as well as academic production associated with this field in the last 50 years. This might have contributed to his goal of encouraging students to actively participate and develop their thoughts for Spatial Planning research. Thus, since its inception, Spatial Planning has always been characterised by being

cross-sectional, attracting students with a wide range of interests and possibly adding value to (Portuguese) urban thinking. However, this study has some limitations. Looking at the timeframe of this study and the fact that the data was collected up until October of 2022, the analysis of this last year can be misleading concerning the study of the evolution of themes since it was not over by the time this study was concluded. Furthermore, there might be a bias associated with the method of designation and distribution of the themes across the publications, even though the authors based this step on the CAMTA method in order to minimise it.

Future studies regarding the evolution of themes in the field of Spatial Planning in FEUP can be related to the impact that this field of specialisation has had on the practice of Portuguese spatial planning, as well as the impact that international trends had in this field of specialisation.

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