

# The methodological rigour of South African master's and doctoral planning theses: 1963-2007

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## Abstract

Planning knowledge is increasingly contested while publication pressure on supervisors and their students is mounting. Given these challenges, to what extent has the methodological rigour of South African master's and doctoral planning theses improved over time? This article examines improvements in methodological rigour of theses completed between 1963 and 2007 by describing how the structure of theses and the use of research designs changed. Data are based on a survey and methodological content analysis of 143 theses sampled by university and programme. Although the structure and 'science' of theses improved over time, theses still require better explication of designs, while designs are increasingly limited to case studies and qualitative approaches. It is concluded that a typology of designs for planning research is needed so that students may better choose and explicate their designs.

## DIE METODOLOGIESE DEEGLIKHEID VAN SUID AFRIKAANSE MAGISTER EN DOKTORALE TESIJSSE: 1963-2007

Beplanningskennis word toenemend bevestigingsgeteken terwyl publikasiedruk op studieleiers en hul studente toeneem. Gegewe hierdie uitdagings, tot watter mate het die metodologiese deeglikheid van Suid-Afrikaanse magister en doktorsale beplanningstessisse oor tyd verbeter? Hierdie artikel bestudeer verbeteringe in metodologiese deeglikheid van tesse voltooi tussen 1963 en 2007 deur te beskryf hoe die struktuur van tesse en die gebruik van navorsingsontwerpe verander het. Data is gebaseer op 'n opname en metodologiese inhoudsanalise van 143 tesse gesteeekproef per universiteit en program. Alhoewel die struktuur en 'wetenskaplikheid' van tesse oor tyd verbeter het, benodig tesse steeds 'n beter uiteensetting van ontwerpe, terwyl ontwerpe toenemend tot gevallestudies en kwalitatiewe benaderings beperk word. Daar word tot die gevolgtrekking gekom dat 'n tipologie van ontwerpe vir beplanningsnavorsing nodig is sodat studente ontwerpe beter kan kies en uiteensit.

## MATLA A MEKGWA YA MERALO THESESE YA MERARLO YA DIKGAW TSA MASTERS LE YA BONGAKA YA: 1963-2007

Tsebo ya ho rala e ntse e eketsa ho phenyaphengwa ha kगतello ya ho phatlalatsa ditaba (articles) ho balaodi le baihuthi ba bona e ntse e tota. Ka ho fumantshwa diphepetso tsena matla a mekgwa ya dithisise tsa dikgau tsa masters le ya bongaka a moralo a ntlafetse hakae ka nako e fetileng? Ditaba tsena di hlahloba dintlafatso matleng a mekgwa wa dithisise tse phethetsweng dipakeng tsa dilemo tsa 1963 le 2007 ka ho hlalosa kamoo sebopelo sa thisise le tshbediso ya meralo ya dipatlisiso e fetohileng kateng. Dideitha tse thehilweng hodima dipatlisiso

o le manolla ya dikateng ya mekgwa ya dithisise tse legolo le mashome a mane a metso e meraro (143) tseo ho entsweng mohlala ka tsona ke yunivesithi le ba lenaneho lena. Le ha sebopelo esitana le saense ya dithesese e ntlafetse dilemo tse fetileng, thesese e sa ntse e boela e hloka moralo o ntlafetseng o totobetseng, ka ha meralo e ntse e tswela pele ho qepha ho dithuto le mekgwa ya ho etsa ya boleng. Ho entswe qeto ya hore meralo ya bonono ba kगतiso ba ho rala dipatlisiso e a hlokaha hore baihuthi ba kgone ho kgetha le ho totobatsa meralo ya bona.

## 1. INTRODUCTION

Planning as a discipline and profession depends on knowledge of planning itself and the realities with which planners/planning deal. This knowledge, as in any discipline, is continuously expanded through research by postgraduate students, academics, professional researchers, and to a lesser extent practitioners and other role players. Following the democratisation of the South African society and planning system since 1994, planning knowledge is increasingly contested within a post-apartheid and increasingly postmodern society (e.g., see similar arguments made by Turok & Watson, 2001; Harrison, 2002; Watson, 2002b; Watson, 2003). Like most social research in democratic and postmodern societies, planning research is nowadays required to produce not only valid, but also socially relevant and robust findings (Nowotny, 1999: 251-255).

Apart from increasing contestation over planning knowledge, there is mounting publication pressure on supervisors and postgraduate students due to faculty requirements extending evermore to architecture, urban design and planning schools. Yet, these schools traditionally focus more on training than research (Stevens, 1998: 153-155; Forsyth & Crewe, 2006: 172-173; Forsyth, 2007: 470). In addition, planning research is nowadays expected to meet the methodological standards of the social sciences (Goldstein & Carmin, 2006: 75-77). Given these challenges, to what extent has the methodological rigour of South African master's and doctoral planning theses improved over time? This is an important question considering that theses constitute an important resource for faculty to increase publications, while students themselves often end up doing applied research for government or basic research for academia.

There is no fixed method for examining the methodological rigour of theses. Instead, 'methodological rigour' was conceptualised in terms of basic criteria that theses should meet, including

criteria pertaining to the structure of theses and the use of research designs. 'Structure of theses' refers to the extent to which students included clearly phrased research problems/questions and discussions of research designs and methods. 'Use of research designs' refers to the extent to which students used different designs applicable to planning research.

Literature on methodological rigour in planning research is generally absent, focusing instead on normative arguments for, in particular, qualitative and participatory methodologies (e.g., see Dandekar, 1986; Dandekar, 2005; Gaber, 1993; Flyvbjerg, 2001; Flyvbjerg, 2002; Watson, 2002a; Ellis, 2005; Maginn, 2006). A few studies on planning scholarship hint at the notion of methodological rigour. Goldstein & Carmin (2006) surveyed articles published in the *Journal of the American Planning Association (JAPA)* between 1963 and 2002. They found that planning scholarship has become theoretically and methodologically more 'compact', or 'scientific' in some respects, meaning that "the repertory of concepts, methods, tools, and innovations are exposed to critical appraisal and modification based on (more or less) consensual criteria that stem from well-known and broadly accepted disciplinary goals and ideals" (Goldstein & Carmin, 2006: 68). However, Lauria & Wagner (2006: 375) surveyed articles reporting case studies in planning practice and found contradictory evidence for the extent to which deductive case studies were able to resolve theoretical contentions in planning. They also raised several concerns about the methodological rigour of some case studies, and doubt whether improvements in case study methodology will resolve contentions.

## 2. RESEARCH DESIGN AND METHODS OF THE STUDY ITSELF

The research design constituted a survey and methodological content analysis of theses. The survey pertained to all completed master's and doctoral theses at seven of the eight South African planning schools from the year of inception of planning programmes up to 2007, the year in which the survey was conducted.<sup>1</sup> A sample frame outlining numbers of completed theses by university and programme was compiled in order to draw a sample from

which findings could be generalised to the spectrum of theses in the country. Numbers were obtained from university administrations and the National Research Foundation's Nexus database. Some administrations were either slow or unable to provide numbers, resulting in the use of numbers from Nexus while numbers from administrations served as cross-checks.

The author visited North-West University as a pilot to establish a survey protocol and to sample and survey theses from that institution. Following a workshop with six undergraduate planning students from the University of Pretoria, each student visited one of the remaining six universities as a fieldworker with the guideline to sample at least 30

contents and coded various items as numerical data, while data were captured, cleaned and analysed using SPSS (Statistical Package for the Social Sciences). Data were weighed to account for different sample sizes between universities, i.e., theses from universities with proportionally smaller samples were assigned larger weights and vice versa. Data were analysed using contingency tables, while the statistical significance and strength of relationships between row and column items were tested using *chi-squares* and measures of association. Statistical significance was calculated at the 95% confidence level.

Findings are presented over two periods, namely prior to 1994, and

Table 1: Numbers of completed and sampled theses

University	Programme					
	Master's		Doctoral		Total	
	Number completed	Number sampled	Number completed	Number sampled	Number completed	Number sampled
Cape Town	*68	8	1	0	69	8
Free State	*56	30	5	3	61	33
KwaZulu-Natal	**4	2	5	5	9	7
North-West	12	9	7	7	19	16
Pretoria	52	29	7	7	59	36
Stellenbosch	*195	27	5	5	200	32
Witwatersrand	***38	9	6	2	44	11
<b>Total</b>	<b>425</b>	<b>114</b>	<b>36</b>	<b>29</b>	<b>461</b>	<b>143</b>

Notes:

\* These figures are for mini-theses from taught master's programmes, since these universities did not have research master's programmes.

\*\* This figure excludes housing theses at the University of KwaZulu-Natal. The figure is an estimate based on library records, since Nexus indicated 52 theses, but did not distinguish between housing and planning theses.

\*\*\* This figure excludes development planning theses at the University of the Witwatersrand.

master's and doctoral theses randomly. In most cases students had to sample all available theses as there were fewer than 30 in university and departmental libraries. Table 1 shows numbers of completed and sampled theses by university and programme.

Table 1 shows that the number of theses in question totalled 461. Of these, 143 were sampled yielding a 31% sample size. Students returned to the University of Pretoria with copies of the title page, abstract, table of contents and introductory and methodology sections of each sampled thesis. The author analysed the methodological

during and after 1994. The year 1994 constituted the median year, while 1994 also marked the symbolic transition to a full democracy in South Africa. It was assumed that the transition to democracy might have caused a shift towards research conducted within a more critical social science paradigm with preferences for qualitative and participatory approaches.

## 3. FINDINGS

Improvements in the methodological rigour of theses are examined by describing how the (1) structure of

<sup>1</sup> The University of Limpopo was excluded as it had yet to produce a master's or doctoral thesis at the time of the survey. Although included in the survey, Stellenbosch University discontinued its urban planning programme some time prior to the survey.

theses and (2) use of research designs have changed over time.

### 3.1 Structure of theses

Changes in the structure of theses are examined by looking at the extent to which students included clearly phrased research problems/questions

frameworks, structure plans, guidelines, etc. Consider the following examples of theses with such practical aims:

The overall goal of the research is to suggest a framework for a different approach to national settlement planning in Botswana.

function of the City of Tshwane Metropolitan Municipality from 5 December 2000 to 30 June 2002. The study is rendered in the form of a narrative told in the first person. The focus of the story is on how power and the aspiration to power influenced the actions of the people in the employ of the municipality and the relations between them during the study period. In this regard the story draws heavily on the work of Bent Flyvbjerg.

(Extracts from theses)

The former examples are indicative of 'applied' or 'policy-oriented' research (e.g., see Andranovich & Riposa, 1993: 5; Hedrick, Bickman & Rog, 1993: 1-11; Neuman, 2006: 25). Although appropriate for planning practice, it does not suffice for postgraduate research since it does not aim to solve a theoretical problem, but a practical one. Yet, the theoretical imperative of postgraduate research should not prevent students from doing research in an applied context such as planning practice, provided the research is guided by a theoretical research problem/question (e.g., see Forsyth & Crewe, 2006: 163-169; Forsyth, 2007: 465-467).

In addition to research problems/questions, students ought to include discussions of research designs and methods in which they clearly demonstrate how their choice of design and methods maximised the validity (i.e., the meaningfulness, accuracy, or 'truthfulness') of their findings and how they ensured some degree of reliability (i.e., replicability) to their study. The more substantial such discussions, the greater the methodological rigour of theses. Table 3 shows the extent to which students included discussions of research designs and methods.

Although any thesis, qualitative or quantitative, should at least include a stand-alone chapter on methods (e.g., see Leedy & Ormrod, 2010: 302-304), only approximately 15% of theses included such a chapter. However, the proportion of theses with chapter discussions increased significantly from approximately 8% prior to 1994 to approximately 22% during and after 1994, while the proportion of theses with no discussion decreased from approximately 21% to approximately 7% ( $\chi^2 (2, N = 143) = 10.64, p = .01$ ). The proportion of theses with section or limited discussions remained almost constant.

Table 2: Extent to which students included clearly phrased research problems/questions

Clearly phrased research problems/questions	Period				Total	
	Prior to 1994		During and after 1994		Number	%
	Number	%	Number	%	Number	%
Included	36	70.6	65	95.6	101	84.9
Not included	15	29.4	3	4.4	18	15.1
<b>Total</b>	<b>51</b>	<b>100.0</b>	<b>68</b>	<b>100.0</b>	<b>119</b>	<b>100.0</b>

Note: Data exclude all theses from which it was unclear whether clearly phrased research problems/questions were included or not.

and discussions of research designs and methods over time. It is critical that any thesis should at least include a clearly phrased research problem/question; otherwise, the aim, rationale and contribution of the thesis may seem ambiguous. Table 2 shows the extent to which students included clearly phrased research problems/questions.

The proportion of theses with clearly phrased research problems/questions increased significantly from about 71% prior to 1994 to about 96% during and after 1994 ( $\chi^2 (1, N = 119) = 14.19, p = .00$ ), i.e., there is less than a 5% probability that the same relationship over time does not exist in the spectrum of theses in the country. However, a measure of association, *phi* ( $\phi$ ), indicates that the strength of the relationship, although statistically significant, is not that strong ( $\phi = -.345$ ) (considering that *phi*-coefficients vary between zero and  $\pm 1$ ). Nevertheless, the methodological rigour of theses appears to have improved over time with regard to the inclusion of clearly phrased research problems/questions.

It is cause for concern that there is a large proportion of theses (about 29%) without clearly phrased research problems/questions prior to 1994. This may be due to a number of older theses that aimed to collect, analyse and interpret large volumes of data to inform planning interventions such as regional

The purpose of this report is to conduct a thorough analysis of forms, causes and effects of growth within the municipality in order to develop a long-term strategy for guiding growth within the municipality.

The purpose of this study was to establish uniform definitions and a set of development guidelines that would give details on the procedures and criteria for evaluating the applications of guesthouse establishments. Such guidelines would be used to formulate a guesthouse policy proposal that could be distributed to all municipalities, consultants and other relevant role players in the Western Cape.

(Extracts from theses)

Contrast the above with the following two examples of theses with theoretical aims:

The purpose of this study was to find the extent to which the Westlake project has succeeded in addressing the problem of low cost housing. The study employs Patsy Healey's institutional model of the development process as an analytical framework in order to understand how the development of the project unfolded. The study is presented as a qualitative case and its reporting takes a form of a narrative.

The study is a participant observer study of the transformation of the city planning

Table 3: Extent to which students included discussions of research designs and methods

Discussions of research designs and methods	Period					
	Prior to 1994		During and after 1994		Total	
	Number	%	Number	%	Number	%
Included as a chapter	5	7.5	17	22.4	22	15.4
Included as a section/Limited within the text	48	71.6	54	71.0	102	71.3
Not included	14	20.9	5	6.6	19	13.3
<b>Total</b>	<b>67</b>	<b>100.0</b>	<b>76</b>	<b>100.0</b>	<b>143</b>	<b>100.0</b>

Since chapter discussions represent greater methodological reflection on the side of students compared to section or limited discussions, the methodological rigour of these also appears to have improved with regard to discussions of research designs and methods, although the relationship over time appears to be average ( $\rho = -.272$ ).

However, Table 3 does not distinguish between discussions of research 'designs' as opposed to 'methods'. 'Research designs' are logical plans involving strategic decisions to maximise the validity of findings (Du Toit, 2010: 90). Well-known designs include surveys, experiments, case studies, etc. Research methods are detailed steps within a design, involving data collection, analysis and interpretation.

A more coherent discussion of research design and methods should therefore include an explication of the design followed by a stepwise discussion of the methods as the research unfolded. Yet, very few students followed such an approach. Students more often simply stated whether the research was qualitative or quantitative and what the main method of data collection was. For example:

The research takes a combination of quantitative and qualitative approaches through the extraction of relevant data from different sources such as the population census ... It also involved broad informal interviews with various stakeholders to establish their position as regard the effectiveness of the current National Settlement

Policy and to what extent they are working to improve on the policy.

(Extract from a thesis)

Contrast the above with the following example of a more coherent discussion:

The survey was undertaken under 505 schoolchildren in 18 schools in the traditional white suburbs of Pretoria. The survey employed both written descriptions and the drawing of cognitive maps of the respective environments on both city and neighbourhood level. The questionnaires were analysed and codified in terms of the description of the relevant environments given by the respondents, their likes and dislikes, suggestions for improvement tendered and the completeness of the sketches of their neighbourhood and of greater Pretoria. The analysis was done in terms of Kevin Lynch's elements of city form, namely routes, nodes, borders, landmarks and districts. These factors represent the dependent variables in the investigation. The statistical relationship between the dependent and independent variables was determined by means of the chi-squared test with the independent variables being the factors established in terms of the theories of Holahan and Piaget.

(Extract from a thesis)

Moreover, many students appeared to use the term 'case study' to denote the setting for their research with little consideration for actual case study designs and methods. Yet, this shortcoming applies to published research

as well. Lauria & Wagner's (2006: 375) survey of articles reporting case studies found that "very few authors who claim that they conducted a case study give any source for their research design and methodology or guidance for the reader in terms of what they actually did." To conclude, although the proportion of theses with stand-alone methodology chapters increased significantly, theses still require much better explication of research designs.

### 3.2 Use of designs

Before considering the extent to which students used different designs, a classification of designs applicable to planning research is necessary. Methodologists differ in their criteria for classifying designs. Some criteria pertain to aspects of control (experimental vs. non-experimental designs), time (cross-sectional vs. longitudinal designs), methodological approach (quantitative vs. qualitative designs), etc. The author concurs with Fouché & De Vos and Mouton's notion of classifying designs in terms of their 'compact formulas' or 'core logics' (Fouché & De Vos, 2005: 132-133; Mouton, 2009: personal communication). Classifying designs based on core logics yields a slightly more encompassing yet concise range of designs, which is useful considering the breadth of planning research.

Table 4 presents an index of designs applicable to planning research. The first column lists 25 different subtypes identified from a systematic review of methodology textbooks published since 1990 within the broader built

2 These include Shefer & Voogd's *Evaluation methods for urban and regional plans* (1990), Sanoff's *Visual research methods in design* (1991), Andranovich & Riposa's *Doing urban research* (1993), Groat & Wang's *Architectural research methods* (2002), Dandekar's *The planner's use of information* (2003), Vestbro, Hürol & Wilkinson's *Methodologies in housing research* (2005), Zeisel's *Inquiry by design* (2006), Gaber & Gaber's *Qualitative analysis for planning and policy* (2007), Wang & Vom Hofe's *Research methods in urban and regional planning* (2007), Knight & Ruddock's *Advanced research methods in the built environment* (2008), and LaGro's *Site analysis* (2008).

Table 4: An index of designs applicable to planning research

Research design subtypes	Research designs	Core logics
Cross-sectional surveys	Surveys	Generalisation
Longitudinal surveys		
True experiments (aka laboratory experiments)	Experiments	Causal attribution
Quasi-experiments (aka field/natural experiments)		
Modelling; simulation	Modelling, simulation, mapping and visualisation	Prediction/illustration
Mapping; visualisation		
Content/textual analysis	Textual and narrative studies	Interpretation (hermeneutical)
Discourse/conversational analysis		
Historiography; biography		
Ethnography (aka participant observation)	Field studies	Interpretation (ethnographical/phenomenological)
Phenomenology		
Single/multiple case studies	Case studies	Contextualisation
Comparative case studies		
Site/settlement analysis and assessment	Intervention research	Intervention
Plan/policy analysis and assessment		
Diagnostic/clarificatory evaluation (aka ex ante evaluation)	Evaluation research	Evaluation
Implementation evaluation; programme monitoring		
Outcome/impact evaluation (aka ex post evaluation)		
Technical/scientific/collaborative PAR	Participatory action research	Participation/action
Practical/mutual and/or collaborative/deliberate PAR		
Emancipating/enhancing/critical science PAR		
Literature reviews; research synthesis	Meta-research	Various logics depending on the objectives of the research (e.g., to review, synthesise, analyse, etc.)
Conceptual analysis		
Typology/model/theory construction		
Philosophical/logical/normative argumentation		

Note: The three PAR subtypes were taken from Berg (2007: 230-233), and the four meta-research subtypes were taken from Mouton (2001: 175-180).

'phronetic planning research', with its focus on issues of power in planning, is epistemologically and methodologically similar to participatory action research (PAR), since the core logic is to participate in and act on planning practices (Flyvbjerg, 2007: personal communication).

Nevertheless, the index is useful to map and make sense of a multiplicity of designs applicable to planning research. Table 5 shows the extent to which students used the 10 prototypical designs.

Most importantly, students have been using all 10 prototypical designs. Evaluation research has been used most (approximately 27% of theses), jointly followed by surveys and case studies (both approximately 23%), and intervention research (approximately 11%). The large proportion of evaluation research is not surprising. Khakee (1998: 363-371) argues that there is a longstanding association between planning and evaluation, with shifts in evaluation from first to fourth generation evaluation corresponding with shifts in planning theory from rational to communicative planning theory. However, the decline in evaluation research during and after 1994 is possibly due to less interest in normative theories and greater interest in critical theories that aim to understand planning as social control, especially following political

environment field.<sup>2</sup> The second column clusters the subtypes into 10 prototypical designs, while the third classifies them in terms of their unique core logics.

The index sufficiently encapsulates various designs coined by scholars in the broader built environment field. For example, Hillier & Hanson's (1984) 'space syntax research' can be included under 'visualisation', since the core logic is to illustrate the adjacency and permeability of spaces and their effects on social interactions. Lynch's (1960) 'cognitive mapping', although seemingly belonging to 'mapping', is in fact a phenomenological field study since the core logic is to interpret how people make sense of their environments in a phenomenological way. Flyvbjerg's (2002)

Table 5: Extent to which students used different designs

Research designs	Period					
	Prior to 1994		During and after 1994		Total	
	Number	%	Number	%	Number	%
Surveys	24	24.8	22	20.8	46	22.8
Experiments	1	0.6	0	0.0	1	0.3
Modelling, etc.	4	4.7	4	3.3	8	4.0
Textual and narrative studies	4	4.4	5	4.3	9	4.3
Field studies	0	0.0	3	3.1	3	1.6
Case studies	15	15.9	31	29.2	46	22.6
Intervention research	14	14.3	8	7.4	21	10.8
Evaluation research	28	29.6	25	24.0	54	26.8
PAR	2	2.4	0	0.4	3	1.4
Meta-research	3	3.3	8	7.5	11	5.4
<b>Total</b>	<b>95</b>	<b>100.0</b>	<b>106</b>	<b>100.0</b>	<b>202</b>	<b>100.0</b>

Note: The total number of 202 designs is necessarily higher than the number of sampled theses (143) due to some theses having featured multiple designs.

transition in South Africa. Intervention research halved from approximately 14% prior to 1994 to approximately 7% during and after 1994. This corresponds with another finding that the proportion of theses with theoretical as opposed to practical aims doubled from approximately 11% to approximately 22%. Theses therefore appear to have become more theoretical or 'scientific' rather than practical. The more than doubling of metaresearch from about 3% to about 8% is also indicative of theses having become more theoretical. Indeed, Goldstein & Carmin's (2006: 72-74) survey of articles in *JAPA* also found an increasing trend towards 'scientific' rather than 'technical' articles.

Discourse analysis, a subtype under 'textual and narrative studies', has recently received much attention in the field of housing studies, while Lees (2004) and Jacobs (2006) support its use in planning research. However, textual and narrative studies decreased slightly and remained a small contribution during and after 1994 (approximately 4%). Discourse analysis is arguably difficult for students due to its tendency towards abstract reasoning and an in-depth engagement with language. Watson (2002a: 184-185) argues for 'practice movement' research, and supports the use of textual and narrative studies, field studies, and case studies. Case studies have indeed almost doubled from approximately 16% to approximately 29%, but the contribution of field studies remained small during and after 1994 (approximately 3%). The popularity of 'case studies' is probably due to its methodological flexibility, but also its logic of contextualisation considering that planning and planning realities are nowadays widely regarded as contextual. Flyvbjerg (2002) argues for 'phronetic planning research' and supports the use of methods associated with PAR. Yet, PAR was almost negligible during and after 1994 (less than 1%).

To summarise, although students have been using all ten prototypical designs applicable to planning research, the bulk of theses during and after 1994 remained limited to three designs, including case studies (approximately 29%), evaluation research (24%) and surveys (approximately 21%). Only three designs showed an increase during and after 1994, including field studies, case studies and metaresearch, while students conducted no experiments. The use of what is in fact a wide range

of designs applicable to planning research is therefore increasingly limited to certain designs, in particular case studies.

Finally, the survey also determined the extent to which students used different methodological approaches (i.e., quantitative vs. qualitative vs. mixed method). The proportion of theses with qualitative approaches increased significantly from 24% prior to 1994 to approximately 55% during and after 1994, while the proportion of theses with quantitative approaches decreased from 20% to approximately 6% ( $\chi^2 (2, N = 114) = 12.47, p = .00$ ). The doubling in qualitative approaches corresponds with that of case studies. Therefore, not only are theses increasingly limited to particular designs such as case studies, they are also increasingly limited to qualitative approaches. Although a shift towards more exploratory, interpretative and descriptive research in planning schools in South Africa is a possible contributing factor, the poor state of maths education in the country can, however, not be ignored.

#### 4. CONCLUSION

Given the challenges of increased contestation over planning knowledge and publication pressure on supervisors and their students while adhering to the methodological standards of the social sciences, this article questioned the extent to which the methodological rigour of South African master's and doctoral planning theses has improved over time. Following a survey and methodological content analysis of a representative sample of 143 theses completed between 1963 and 2007, this article found that more students nowadays include clearly phrased research problems/questions and stand-alone methodology chapters. Theses also appear to have become more theoretical or 'scientific' in some respects. However, reasons for these improvements are speculative and may include a closer relationship between planning and the social sciences, with planning loosening its technical roots (e.g., see Auster, 1989); an end to academic isolation; an increase in academic discourse and debate following transition to a full democracy; or planning schools simply raising their standards. However, there is room for further improvement, while additional research is needed to gauge the extent to which current improvements result in an increase in research

outputs and a change in research culture at planning schools.

However, the article also found that theses still require better explication of research designs, while designs are increasingly limited to case studies and qualitative approaches. How then may planning students diversify and explicate their designs in a more scientific, argumentative or defensible manner? Students should be enabled to make more informed and considered choices of designs during the proposal phase of their theses. However, in order for them to do so, they need a comprehensive typology of designs applicable to planning research that classifies designs in terms of important methodological considerations such as different research aims and purposes, methodological paradigms and approaches, etc. Thus, there is a need to develop the index of designs presented in this article into such a typology. Such a typology, showing prototypical designs and their associated methodological considerations, may help students to better explicate their designs, maximise the validity of their findings, and ultimately defend and publish their results with greater success.

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