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Planning Students' Conceptions of Research

Dorina Pojani[1], Anthony Kimpton[1], and Roberto Rocco[2]

Abstract

This study examines the conceptualizations of planning research by more than two hundred Master's students enrolled in planning schools located throughout four continents. The study is set in the context of theories on the two main traditions of planning thought: "planning as a social science" and "planning as design." The findings reveal that planning students typically have one of four conceptions of planning research: (1) research as trading of ideas, (2) research as gathering of evidence, (3) research as precursor to design, and (4) research as rhetoric. While the planning schools included in this study have diverse orientations (along the design–social science continuum), our findings suggest that planning students most often conceptualize this discipline as a social science. The orientation of a planning student's current school or department appears to be more important in determining a student's conception research than his or her undergraduate study major. While planning curricula are becoming more homogenized around the world, some national traditions persist which then affect how students regard planning research.

Keywords

planning education, planning students, research conceptions, planning paradigms

Introduction

Typically, university students find it difficult to conceptualize the purpose of research (Murtonen 2015). Novice students can struggle to distinguish between theoretical and empirical research, and between descriptive, interpretive, and statistical evidence (Goldstein 2012; Meyer, Shanahan, and Laugksch 2005). In the case of professional education majors, such as planning, difficulties are compounded by the different worldviews within the discipline: design oriented or social science oriented (Rocco and Rooij 2010).

Given that planning students at all levels (bachelor, master, and doctorate) are often expected to embark on the preparation of research-based theses, their conceptions of research are likely to influence the quality of their research engagement and their research contributions. While research generally occupies a prominent role within planning programs, how conceptions of research vary among planning students has rarely, if ever, been the subject of empirical investigation in the academic literature. Typically, planning programs include academic courses of research design, methods, and tools (qualitative and quantitative) with a strong reflective dimension, but, apart from ad hoc observations of students within their own programs, planning educators do not know whether and how planning students more broadly understand or regard the purpose(s) of academic research.

Are planning students' conceptions of research typically design oriented or social science oriented? Also, what determines student conceptions of research? To answer these questions, we surveyed and classified the conceptualizations of planning research by more than two hundred Master's students enrolled throughout four planning schools embedded in different cultural contexts. Furthermore, we modeled students' conceptualizations of planning research to determine the extent to which these are affected by students' undergraduate majors and the tradition of their planning school or department.

A better understanding of students' research conceptions could help planning programs to adjust their methods and thesis preparation courses. This could reduce attrition within programs that have a research component, accelerate coursework and thesis completion, and improve matching between students and supervisors (Daniel, Kumar, and Omar 2018; Kiley and Mullins 2005). Beyond schooling, it would enable planning graduates to sharpen their critical thinking skills and undertake sophisticated tasks in response to complex social challenges—although research in the traditional academic sense might not be a core function of their future jobs

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(Murtonen 2015; Nind, Kilburn, and Luff 2015; Pojani et al. 2018).

Different traditions of planning thought (design oriented or social science oriented) prevalent in different schools might impact planning students' conceptions of academic research, as well as their general conceptualization of the planning discipline. Acculturation during one's studies is likely to have some consequences. While in a number of planning schools the two traditions coexist, and there is vague agreement among academics that both design and social science are foundational, the reality might be shaped by the faculty makeup of different planning schools.

In the Anglosphere, most planning faculty are academic researchers with doctorates, who have a social science orientation to research (Edwards and Bates 2011). By contrast, in continental Europe, and many parts of the developing world, a positivistic paradigm tends to guide planning academia, and the focus continues to remain largely on physical planning and the design of the built environment; in some cases, students' graduating project is a design rather than a research thesis (Chettiparamb 2006; Pojani 2012; Rocco and Rooij 2010). Many planning faculty members in continental Europe are at the same time consultants in urban design and architectural practices, and transmit that outlook to their students.

Where design practice is emphasized in a planning program, students might tend to value creativity, spontaneity, and craftsmanship (Rocco and Rooij 2010). When the emphasis is on social sciences, students might dialogue with disciplines such as human geography, economy, law, sociology, and psychology. Planning students' conceptions of research are also expected to be informed by their educational background (Kaufman and Simons 1995; Kiley and Mullins 2005; Murtonen 2005).

This article is organized as follows. The background sets the study in the context of theories related to two main traditions of planning: "planning as a social science" and "planning as design," as well as theories on the conceptualizations of research by academics and students. A theoretical framework is derived from this overview, which has guided the research. The second part of the article details the study method and procedure. The remaining portions discuss the findings.

Background

Two Traditions of Planning Thought

Historically, planning academia has been organized into two distinct subcultures or traditions: that of planners as social scientists and that of planners as urban designers or technicians (Healey 2006; Marcuse 2011). Each subculture has arisen out of distinct sociohistorical backgrounds (Biggs et al. 2010). A brief discussion of these worldviews is necessary prior to exploring planning students' conceptions of research.

However, before proceeding, we must note that planning thought is much more complex and stratified than the "social science vs. design" dichotomy suggests (see Brooks 2002). Traditional planning was characterized as positivistic, based on efficiency and factual knowledge. While it remains so in many parts of the world (see Chettiparamb 2006; Cook 1999; Diaw, Nnkya, and Watson 2002; Kangasoja et al. 2010; Pojani 2012), in the Anglosphere a shift in planning theory was introduced starting in the 1960s. This was based on a revival of U.S. pragmatic philosophy which understands individual identity as formed in social contexts in relation to others (Healey 2009).

First, "advocacy" and "equity" planning formed the basis for a more progressive planning approach; later, "communicative" and "deliberative" planning received attention, followed by other process-oriented paradigms such as "radical" planning, "feminist" planning, and "development" planning (see, for example, Healey 1996). Product-oriented paradigms emerged too, including the "smart city," the "just city," or "New Urbanism."[1] Moreover, the planning field has been significantly influenced by public policy and public administration over the years, incorporating a range of concepts related to implementation, evaluation, public engagement, and policy-making (see Brooks 2002; Dalton 2001).

At this point, the discipline has expanded its boundaries and planning approaches have proliferated to the point that planning theory now resembles a sort of Hydra—a mythical creature with many heads. With relativism prevailing in the postmodern era, all paradigms appear to coexist in a cumulative rather than evolutionary process, with marked differences in planning education around the world. No single approach has achieved monopoly in planning programs (Ferreira, Sykes, and Batey 2009). This openness and eclecticism—both a strength and a vulnerability—may well be due to "the heritage of the planning profession being encroached upon and co-opted by other professions" (Myers and Banerjee 2005, 122). With these qualifications in mind, we discuss the "design" and "social science" approaches to planning, and the tensions between the two.

The creative design approach centers on the image and physical attributes of a place. Early on, this image consisted of utopian visions of what a city could be (Healey 2006), while more recently the image of place is seen as an evolving process rather than a fixed outcome (Van Assche et al. 2012). A design perspective in planning has been subject of both praise and criticism. On the positive side, some commentators contend that it can generate more solutions and make it easier to coordinate interests, resources, and problems—especially if design (or design-based spatial planning) accompanies decision-making at every step of the process rather than merely added on as a "finish" at the end (Van Assche et al. 2012). The creative design tradition is also praised for keeping alive an aesthetic consciousness within planning (Healey 2006). As such, it is present in most planning programs. Typically, at least one studio is offered—although contemporary studios

are "hybrid" and synthesize other elements of practice (such as collaboration, flexibility, and engagement with multiple stakeholders) in addition to physical design (see Long 2012; Pojani et al. 2018). Also, some contemporary studios take the form of service learning, workshops, or experiential field courses in which student teams work directly with community clients (e.g., nonprofit organizations) to scope and develop plans or conceptual designs (Balassiano and West 2012; Cole-Hawthorne et al. 2017; Freestone, Thompson, and Williams 2006; Sletto 2010). At the same time, "planning as design" is criticized for being deferential to power, not questioning existing institutional relationships, and sustaining the status quo in society (Marcuse 2011). Another critique centers on the excessive focus of this tradition on planning "products" at the expense of "processes" (Healey 2006).

By contrast, the social science tradition in planning is concerned with social welfare aspects and economic processes: health, crime, sanitation, housing affordability, inequality, social unrest, and pollution. It seeks to remedy social problems either within the existing structures of power, or, in its more radical versions, by challenging those structures. This planning approach focuses on the vulnerable, the disadvantaged, the minorities, the excluded, but also considers the broad social system in which social problems occur. It is critical of existing urban social and institutional relations, and at times it has even proposed sweeping alternatives (Marcuse 2011).

Different national settings and cultures favor different traditions in various doses (Knieling and Othengrafen 2015). A comparative study on planning education, conducted in the early 1990s, found that distinct professional training in planning (conceived as a social science) had a long-standing, well-established tradition in the Anglosphere, whereas in most of continental Europe specialized professional planning education was at the time nonexistent, and architecture programs dominated the scene (Alterman 1992).

Now, even in contexts outside the United States, Canada, Australia, the United Kingdom, and New Zealand, planning programs are developing an identity distinct from architecture programs and are also becoming more homogenized across cultures. This is due to the advent of the Internet, increased connectivity among institutions, the establishment of exchange programs for students and faculty, franchising of academic programs, and the widespread use of the English language. Academic globalization has enabled the transfer and flow of knowledge originating in one place to different national and international contexts (Yigitcanlar et al. 2009). Associations such as the Association of Collegiate Schools of Planning (ACSP) in the United States, the Association of European Schools of Planning (AESOP), and the Asian Planning Schools Association (APSA), as well as scholarship programs like the American Fulbright and the European Erasmus, increasingly facilitate contacts between planning scholars from different countries. Within the European Union, research funding is especially sensitive to creating new partnerships across the continent. Planning research grants are typically awarded to multinational university teams, as this contributes to homogenizing conceptual frameworks in the discipline. Beyond Europe, research networks are now organized based on convergence of interests and ideas rather than on proximity. Since 2000, there has been a significant increase in international coauthorships in the planning discipline and much spontaneous collaboration has evolved into structured relationships (Oner et al. 2010).

Another important change in planning education worldwide is the addition of environmental and sustainability courses in many curricula (Hurlimann 2009; White and Mayo 2005). In many planning schools, sustainability issues are weaved into nearly all lectures, studios, and workshops rather than offered in standalone courses. This may be attracting more students to planning who have undergraduate degrees in environmental engineering or environmental science. One can hypothesize that a natural science orientation may be shaping some students' research perspectives.

Consequently, in countries where the social science tradition has prevailed in planning programs, there is now more demand—from students and employers alike—to incorporate urban design more effectively into the curriculum (Pojani et al. 2018). Conversely, in places where physical planning has prevailed in the past, now there is more pressure to teach future planners economic, political, and social skills as well (Büchler, Biggs, and Rocco 2009; Pojani 2012; Rocco and Rooij 2010).

However, national distinctions and path dependences persist. For example, the production of physical plans, drawings, and designs is still emphasized more in continental Europe and much of Asia than in Anglo-Saxon countries (Kangasoja et al. 2010; Pojani 2012). In postcolonial planning systems, such as the ones found in Hong Kong and South Africa, planning education still retains a technicist colonial mold, although cities in East Asia and sub-Saharan Africa are faced with problems for which there is little useful precedent from the West (Cook 1999; Diaw, Nnkya, and Watson 2002).

Research Conceptions in "Planning as Social Science"

Studies about conceptions of research among social scientists (as opposed to students) are limited and yield inconclusive conceptual categorizations. For example, one study qualitatively distinguished four conceptions of social science research (Brew 2001, 2010). The (1) *layer* conception regards social science research as the discovery of underlying social meanings and social facts. The (2) *domino* conception regards social science research as problem solving by linking together methods, tasks, objects, and events. The (3) *trading* conception draws focus on publications, grants, and social networks, and views research as an ideas' marketplace where these products are exchanged. Last, the (4) *journey* conception

regards social science research as a scholar's journey of personal discovery and development to become a better problem solver. The distinction between conceptions is based on whether researchers are oriented toward *product* or *process*, and *external* or *internal* concerns (Brew 2001, 2010).

Another study qualitatively distinguished five conceptions of social science research: (1) research as an activity in which patterns are *disclosed*, with a focus on research products; (2) research as the *search* for patterns, with a focus on research process; (3) research as an activity in which patterns are *explained* for the purpose of theory building; (4) research as an activity in which the researcher *interprets* patterns in the data, with a focus on the person instead of the process or product; and (5) research as an activity in which patterns are *created* by the researcher. As in the previous study, these conceptions varied based on whether the focus was on the external or internal world, and the personal involvement of the researcher (Visser-Wijnveen et al. 2009).

Up to now, there have not been any studies about academic or student conceptions of planning research. However, a handful of studies from other disciplines, centering on students, provide some insight. A study of fifty-nine doctoral students in a variety of disciplines, which employed qualitative metaphors as its analytical method, distinguished four conceptions: (1) research is an *explorative* journey of discovery; (2) research is a *spatial* intersection of research domains and interests; (3) research is *constructive* by building the "edifice of knowledge"; and (4) research is *organic* by feeling alive to the student (Pitcher 2011).

A study of 224 undergraduate and postgraduate students from a variety of disciplines (Meyer, Shanahan, and Laugksch 2005) employed an exploratory factor analysis (EFA) method to identify six conceptions of research: (1) research as *information gathering* to explain something; (2) research as a *systematic discovery* of truth and evaluation of the validity of truth; (3) research as an *insightful process* for deepening understanding of a particular topic and generating new ideas; (4) research as *re-search* to discover the previously omitted, reinterpret the previously identified, or reevaluate prior findings; (5) research as finding *solutions to problems*; and (6) *misconceptions about research* where the objective is to persuade rather than be correct. While groundbreaking, the model employs sixty-nine survey items, many of which share similar meaning or wording. This suggests overfactoring. Also, as a dimension reduction technique, EFA cannot reveal mutually exclusive "conceptions of research." However, it is notable that the same constructs were confirmed in two replication studies. The first was conducted by the same author team (Meyer, Shanahan, and Laugksch 2007), augmenting the same sample by twenty-seven students. The second study was conducted by separate authors who sampled 227 hotel management undergraduate students regarding their conceptions of research, and introduced an item for capturing students' stage in the program (Zhang, Zwaal, and Otting 2018). It found that research misconceptions peaked by the second year of study, but diminished by the third year as students consolidated and deepened their understandings of research (Zhang, Zwaal, and Otting 2018).

While both the qualitatively derived and the quantitatively derived conceptual categories are insightful, the latter provide more robust foundations for further research.

Research Conceptions in "Planning as Design"

Academic research in the areas of creative practice, such as urban design and architecture, is in some way different to dominant models of academic research in the social sciences. To solve problems, social scientists generally adopt "a strategy of systematically exploring the possible combinations of blocks, to discover the fundamental rule which would allow a permissible combination" (Lawson, cited in Cross 1982, 223). By contrast, designers are "more inclined to propose a series of solutions, and to have these solutions eliminated until they [find] an acceptable one" (Lawson, cited in Cross 1982, 223). In other words, social scientists problem-solve by analysis, whereas designers problem-solve by synthesis (Cross 1982). While social scientists engage in *inductive* and *deductive* reasoning (deriving answers from empirical observations or theory), design requires *abductive* reasoning or the process of envisioning possible futures (Faste and Faste 2012).

These characteristics justify the existence of a distinct label for academic research in the areas of creative practice—for example, practice-based research or research by design (Biggs and Büchler 2008a, 2008b, 2011; Büchler, Biggs, and Ståhl 2011; Rocco, Biggs, and Büchler 2009). Some theorists further articulate these into (1) design through research or *studious* design research; (2) design of research or *formative* design research, (3) research on design or *diagnostic* design research, and (4) research through design or *embedded* design research. Studious design research is where traditional research activities seek to verify research hypotheses with or without the acknowledgment that such activities constitute "design." Formative design research describes the creative activities of preparation for subsequent empirical or theoretical research. In diagnostic design research, researchers systematically examine various design processes to improve the future practice of design. And in embedded design research, designers practice their craft in the pursuit of knowledge and by doing so gain insight into possible outcomes (Faste and Faste 2012; Rocco and Rooij 2010). These subsets depend on whether research by design is closer to creative practice or to traditional academic research, and on the degree of a practitioner's involvement in the activities being performed.

There is no empirical work on the conceptions of research by design among planning students. However, work that targets creative practice academia as a whole provides some insight. Same as traditional social science research modes, research by design is thought to be characterized by (1) presence of questions and answers, (2) quest for, and generation

Table 1. Summary of Research Conceptualizations (Findings from Prior Studies, Not Planning Related).[a]

Planning as social science		Planning as design	
1. Layer	Brew (2001, 2010)	1. Studious	Faste and Faste (2012)
2. Domino		2. Formative	
3. Trading		3. Diagnostic	
4. Journey		4. Embedded	
1. Disclosure	Visser-Wijnveen et al. (2009)	1. Nontraditional form and content	Biggs and Büchler (2008b)
2. Search		2. Nontraditional methods	
3. Explanation		3. Alternative rhetoric	
4. Interpretation		4. Personal, nontransferable or nonreplicable experience	
5. Creation			
1. Explorative	Pitcher (2011)		
2. Spatial			
3. Constructive			
4. Organic			
1. Information gathering	Meyer, Shanahan, and Laugksch (2005, 2007); Zhang, Zwaal, and Otting (2018)		
2. Insightful process			
3. Re-search			
4. Solutions to problems			
5. Misconceptions			

[a]The highlighted labels have been adapted and applied to the clusters revealed in this study, as they appeared to be the most closely related (see Figure 4).

of, knowledge, (3) specific methods, and (4) audiences who will consume the research. In addition, research by design is characterized by criteria which relate to the specific interests of creative practitioners. These include (5) use of nontraditional form and content, such as imagery, drawing, and even sound; (6) application of nontraditional methods such as modeling and pattern formation; (7) presence of alternative rhetoric which does not share the linear structure of language; and (8) special status ascribed to personal, nontransferable or nonreplicable experience, as well as emotions and aesthetic responses (based on Biggs and Büchler 2008b; see also Cross 1982; Faste and Faste 2012; Pojani and Stead 2015, 2016; Rocco, Biggs, and Büchler 2010; Rocco and Rooij 2010).

In this model, the mere presence of creative practice, such as urban design, is not necessarily an indicator of research by design. Other preconditions include the conceptualization of a research problem and solution to that problem that is born out of the practice, as well as a lack of conscious distinction between research and practice on the part of the researcher (Büchler, Biggs, and Rocco, 2009; Büchler, Biggs, and Ståhl 2011). While the foregoing theorists have laid the ground for further work, research by design—especially as conceived by students—is an area for which the epistemological, ontological, and methodological questions are still under discussion by the academic community.

Exploratory Theoretical Framework

The various conceptualizations related to planning research, which were delineated above, are summarized in Table 1. We reconstituted and condensed the findings of the aforementioned studies to build an exploratory theoretical framework, which guided this study of research conceptions among planning students. The framework is illustrated in Figure 1. As noted, no planning-specific studies have developed research conceptualizations; therefore, the framework employs theory developed for other disciplines as a basis.

Method

The study method and procedure are outlined below.

Case Studies

The data consist of a sample of students enrolled in Master's programs in urban and regional planning at the University of California at Los Angeles (UCLA, USA; $n = 44$), the University of Queensland (UQ, Australia, $n = 27$), and Delft University of Technology (TU Delft, the Netherlands; $n = 79$). Students attending a summer school taking place at TU Delft were also included, with many visiting from South China University of Technology (SCUT, China; $n = 21$). Notably, there are also students from other universities attending the TU Delft summer school but not in sufficient number to examine whether their individual programs influence student conceptions of research ($n = 40$).

The respective course offerings in these four schools or departments are listed in Table 2. The traditions vary substantially between them. For instance, the planning programs at TU Delft and SCUT are embedded within architecture schools, and creative practice heavily influences the curriculum. In contrast, the planning program at UQ is part of a large, multidisciplinary school with a heavy focus on environmental sciences and population studies. Hence, natural and social science heavily influence the curriculum. Last,

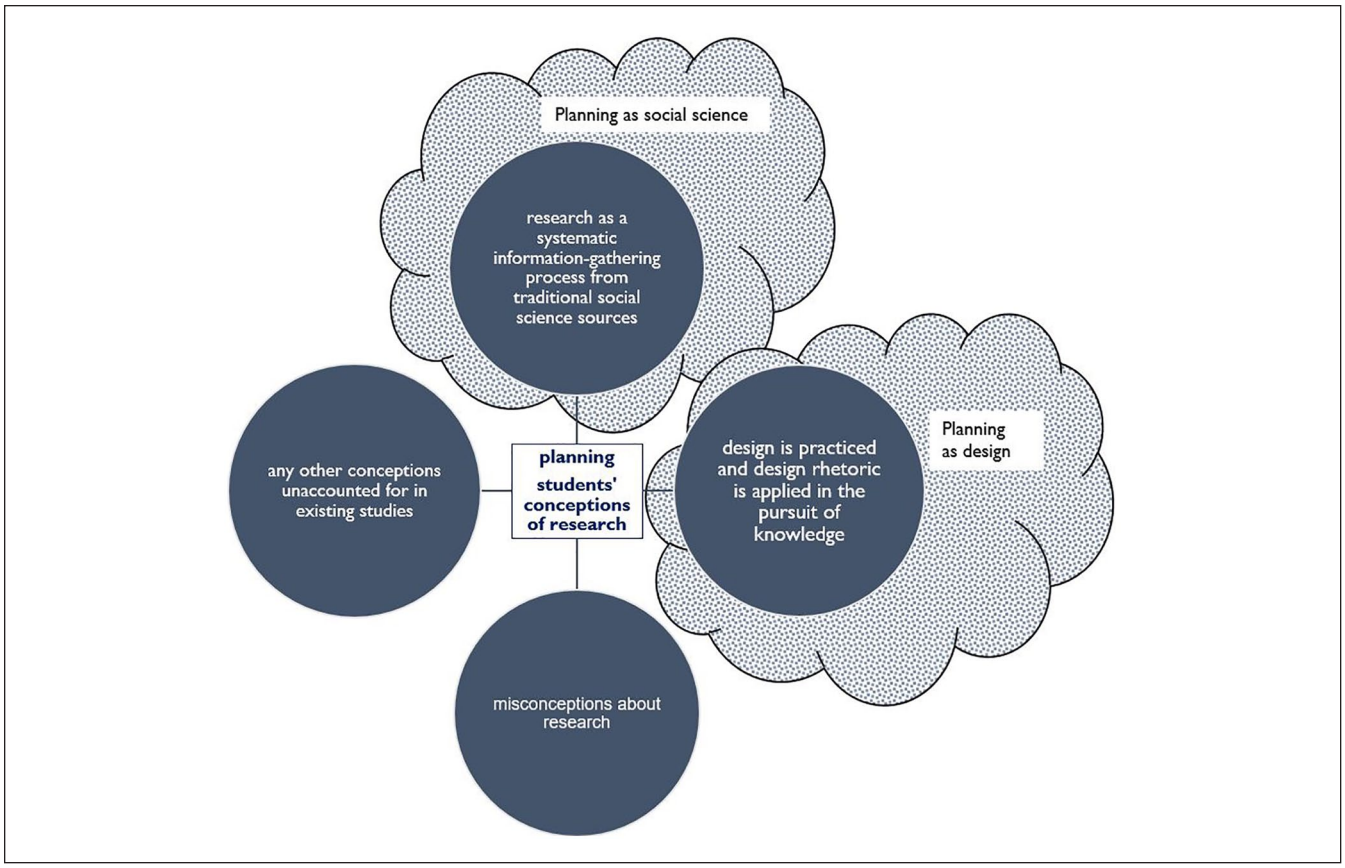

Figure 1. Exploratory theoretical framework.

planning at UCLA is embedded within a school of public affairs which also includes social welfare and public policy programs.

Master's students rather than undergraduate or doctoral students were selected for inclusion because all schools offer Master's programs in planning; therefore, the results could be compared across case studies. Most U.S.-based schools, including UCLA, do not offer undergraduate planning degrees. While all four schools have doctoral students, they are too few for quantitative analysis.

Data and Analysis

The survey used in this study was administered online in English employing Google Forms and had a response rate greater than 50 percent for each cohort.[2] In total, 211 completed forms were returned. The survey featured seventeen statements designed to capture conceptions of research, which were devised based on the exploratory theoretical framework. Students were asked to indicate the degree to which they agreed with the statement using a five-point Likert scale (Table 3). The statements aimed to gauge planning students' knowledge and appreciation of the nature of academic research and to investigate the implicit connections between research-based and design-based education. The statements were crafted so as not to preempt students' position regarding the importance or value of academic research. Students were also asked to indicate which planning school they attended at the time of the survey and their undergraduate major.

The examination of student conceptions of research was conducted in Stata 12 using three distinct methods: cluster analysis, discriminant analysis, and multinomial logistic regression.[3] The cluster analysis employed Gower's (1971) dissimilarity matrix and Ward's (1963) linkage method to identify students that share similar conceptions of research. Since this is an exploratory study, the number of distinct conceptions of research was unknown a priori. Therefore, a hierarchical cluster analysis approach was necessary using Calinski and Harabasz' (1974) pseudo-F index score to identify the point at which student conceptions of research are most similar *within* the cluster groups and most distinct *between* the cluster groups. Following, discriminant analysis of the cluster groups was necessary to determine whether the assignment to cluster groups was statistically robust (Albert and Harris 1989). Last, the stepwise multinomial logistic regression determined the likelihood that undergraduate major and the place of current enrollment influence the student conceptions of research.

Table 2. Core Curriculum in the Four Surveyed Planning Schools.[a]

TU Delft	SCUT	UQ	UCLA	Typical core requirements[b] (40%–50% of total credits)
R&D studio: analysis and design of urban form	City and town planning of subtropical area	Regulatory frameworks for environmental management and planning	Applied microeconomics for urban planning	Planning history, theory, and practice
R&D studio: designing urban environments	Urban design	Resource management and environmental planning	Law and the quality of urban life	Urban history and theory
R&D studio: spatial strategies for the global metropolis	Residential area and sustainable development	Climate change and environmental management	Quantitative analysis in urban planning I and II	Public/urban economics
History and theory of urbanism	Theory and method of urban development	Urban research and evaluation techniques	Introduction to planning history and theory	Legal aspects of planning
Sustainable urban engineering of territory	Development control and planning system	Transport planning	Urbanization course by area of concentration	Workshop/studio
R&D methodology for urbanism	Urban regeneration and historic protection	Planning theory		Statistics/GIS
Graduation lab: urban transformations and sustainability		Community planning and participation		Policy analysis
Analytical methods of urban planning and design		Urban design		
Theories of urban planning and design		Strategic metropolitan planning		
		Plan making		

Note: TU Delft = Delft University of Technology; SCUT = South China University of Technology; UQ = University of Queensland; UCLA = University of California at Los Angeles; GIS = geographic information system.

[a]As listed on each institution's website:

- TU Delft: https://www.tudelft.nl/en/education/programmes/masters/architecture-urbanism-and-building-sciences/msc-architecture-urbanism-and-building-sciences/master-tracks/urbanism/programme.
- SCUT: http://www2.scut.edu.cn/architecture_en/2015/0720/c6460a96561/page.htm.
- UQ: https://my.uq.edu.au/programs-courses/program_list.html?acad_prog=5559.
- UCLA: https://luskin.ucla.edu/upmurp-handbook.

[b]As surveyed by Edwards and Bates (2006).

Findings

The hierarchical cluster analysis was initially examined as a dendrogram (Figure 2). This method revealed that seven or more clusters would be inappropriate for these data (because the sixth cluster had a single observation). In the following step, the pseudo-F scores of the cluster sets were plotted, which revealed that, with more than four clusters, cluster sets became less empirically distinct (Figure 3). As such, a set of four clusters was defined. A discriminant analysis on this set (using proportional priors) confirmed that the empirical distinction between the four clusters is statistically robust and therefore unlikely to occur by chance ($p < .05$). The mean responses to each of the seventeen statements were then tabulated by cluster group (Table 4) to provide a general sense of the "conception of research" shared by each cluster.

On the basis of the literature review (see Table 1) and the cluster analysis, we applied the following labels to describe the four distinct conceptions of planning research: (1) *research as trading of ideas* (Brew 2001, 2010); (2) *research as gathering of evidence* (Meyer, Shanahan, and Laugksch 2005, 2007); (3) *research as precursor to design* (Rocco, Biggs, and Büchler 2009); and (4) *research as rhetoric* (Meyer, Shanahan, and Laugksch 2005; Zhang, Zwaal, and Otting 2018). These categories align well with the preliminary theoretical framework that guided the study, and with earlier research. However, the preliminary framework was slightly revised to reflect the empirical findings (Figure 4).

Overall, "research as gathering of evidence" is the dominant conception of planning research ($n = 124$; 59%), followed by "research as trading of ideas" ($n = 45$; 21%), "research as precursor to design" ($n = 30$; 14%), and finally "research as rhetoric" ($n = 12$; 6%). In combination, these findings indicate that planning is most often conceptualized by students as a social science. Design-oriented students are in the minority (Figure 4).

Table 3. Conception of Research Statements Used in the Survey.

No.	Statement
1[a]	Research is an essential part of an education at university level.
2[b]	Research is not really necessary for a good and creative design project.
3[a]	Academic research is essentially characterized by the existence of a question and methods to answer it.
4[a]	Being systematic is the only thing that matters in research.
5[a]	Having a method is extremely important in a design project.
6[c]	Method is something that everybody has in an instinctive manner. Everybody has a method to do things. No need to explain methods, because they are all different.
7[c]	I don't need to explain my methods. What really matters is that the results reach my quality standards.
8[b]	Design is a tool for negotiation among stakeholders.
9[c]	I base my projects on the personal opinions I develop in my daily life and in my communication with others.
10[a]	I base my design on research previously done.
11[c]	Wikipedia is a very good academic source. I can use Wikipedia as my main source for my research.
12[c]	Information in the Internet belongs to everyone. Therefore, I can use everything I find in the Internet on my research and design project without necessarily indicating where I got it from.
13[c]	As long as I don't copy the exact words from a text, it is OK to take as many ideas as possible and use them to underpin my project. I don't really have to mention the text because I already changed the words.
14[b]	Theory gets in the way of my creativity. Designing is all about coming up with great ideas and giving them a shape in the material world.
15[a]	Doing academic research makes me have new and more creative ideas.
16[a]	Without a good research, I cannot plan or design in a satisfactory manner.
17[a]	Society is complex. Planners and designers need to try and understand society before they can act.

Note: Statements align with the categories included in the preliminary framework. In order not to preempt the research, the preliminary framework also includes a loose category of "any other conceptions unaccounted for in existing studies."
[a]Research as a systematic information-gathering process from traditional social science sources.
[b]Design is practiced and design rhetoric is applied in the pursuit of knowledge.
[c]Misconceptions about research.

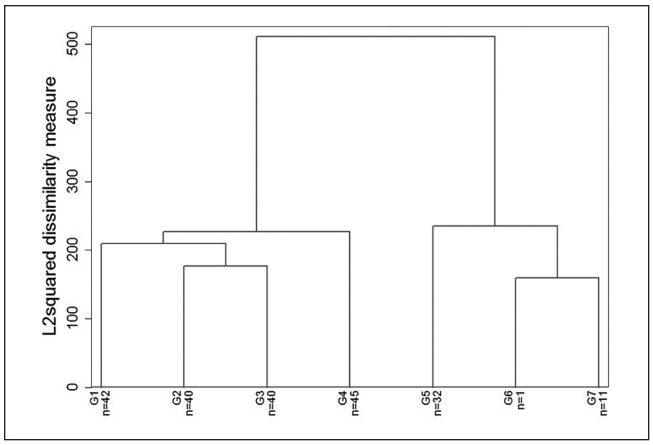

Figure 2. Dendrogram: student groups identified using hierarchical cluster analysis.

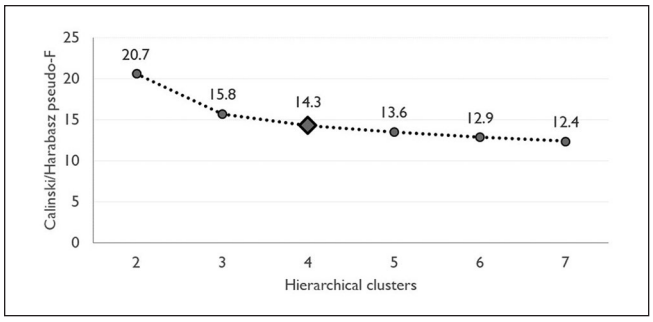

Figure 3. Hierarchical cluster analysis. Pseudo-*F* scores for models identifying between two and ten student groups.

The "planning research as trading of ideas" conception typically belongs to students that are critical of research quality and regard planning research as the communication and exchange of ideas. This conception is in line with a conception of social science research that was qualitatively identified by Brew (2001, 2010). Students with this conception typically regard planning research as a method for building consensus and aligning ideas. In the case of planning students, it may have its roots in the communicative planning paradigm, which is often taught in planning theory courses. While the communicative planning paradigm refers to planning as practiced outside academia, these students may have extended this conception to planning research.

The "research as gathering of evidence" conception typically belongs to students who, like the "traders" and "communicators" above, are critical of research, but regard planning research as the gathering of social facts (see Durkheim

Table 4. Mean Responses of Student Groups to "Conception of Research" Statements.

Statement	Conception of research (cluster group)			
	Research as trading of ideas	Research as gathering of evidence	Research as precursor to design	Research as rhetoric
1. Research is an essential part of an education at university level.	4.6	4.9	4.8	4.3
2. Research is not really necessary for a good and creative design project.	1.9	1.4	1.5	3.1
3. Academic research is essentially characterized by the existence of a question and methods to answer it.	3.8	4.0	3.9	3.9
4. Being systematic is the only thing that matters in research.	2.6	1.6	2.8	2.9
5. Having a method is extremely important in a design project.	4.0	4.4	4.0	4.0
6. Method is something that everybody has in an instinctive manner. Everybody has a method to do things. No need to explain methods, because they are all different.	1.9	1.8	3.0	4.0
7. I don't need to explain my methods. What really matters is that the results reach my quality standards.	1.7	1.4	1.9	4.1
8. Design is a tool for negotiation among stakeholders.	3.1	4.1	3.5	4.0
9. I base my projects on the personal opinions I develop in my daily life and in my communication with others.	3.2	3.4	3.6	3.8
10. I base my design on research previously done.	3.6	4.0	3.7	2.9
11. Wikipedia is a very good academic source. I can use Wikipedia as my main source for my research.	1.5	1.6	2.5	2.1
12. Information in the Internet belongs to everyone. Therefore, I can use everything I find in the Internet on my research and design project without necessarily indicating where I got it from.	1.2	1.1	1.9	1.6
13. As long as I don't copy the exact words from a text, it is OK to take as many ideas as possible and use them to underpin my project. I don't really have to mention the text because I already changed the words.	1.3	1.2	2.2	1.6
14. Theory gets in the way of my creativity. Designing is all about coming up with great ideas and giving them a shape in the material world.	2.2	1.8	3.7	3.3
15. Doing academic research makes me have new and more creative ideas.	4.2	4.7	4.4	3.6
16. Without a good research, I cannot plan or design in a satisfactory manner.	4.0	4.1	4.2	2.5
17. Society is complex. Planners and designers need to try and understand society before they can act.	4.6	4.8	4.8	4.5

1964) to inform planning design and practice. These students typically disagree that research methods are instinctive or that studying planning theory will inhibit their designs.

The "research as precursor to design" conception typically belongs to students who are less concerned about whether social facts exist and instead regard research as inspiration for their designs. They typically regard research methods as intuitive, thus not requiring explanation, have a product/outcome-focused orientation, and view planning as a creative rather than evidence-based enterprise. In this conception, design has a strong influence, and students' emphasis is on ingenuity, novelty, or the aesthetic value of solutions. Traditional research is generally employed to inspire particular design or planning products (Rocco and Rooij 2010).

Finally, the "research as rhetoric" typically belongs to students who regard research as essential, yet are unconcerned about its quality and rigor. This finding is in line with the observation by Meyer, Shanahan, and Laugksch (2005) that sometimes students believe that the objective of research is to persuade (or "tick boxes") rather than to produce evidence for decision-making. Fortunately, planning students with this conception are rare. This is expected since study participants were Master's students. Zhang, Zwaal, and Otting (2018) note with regard to hotel management students that research

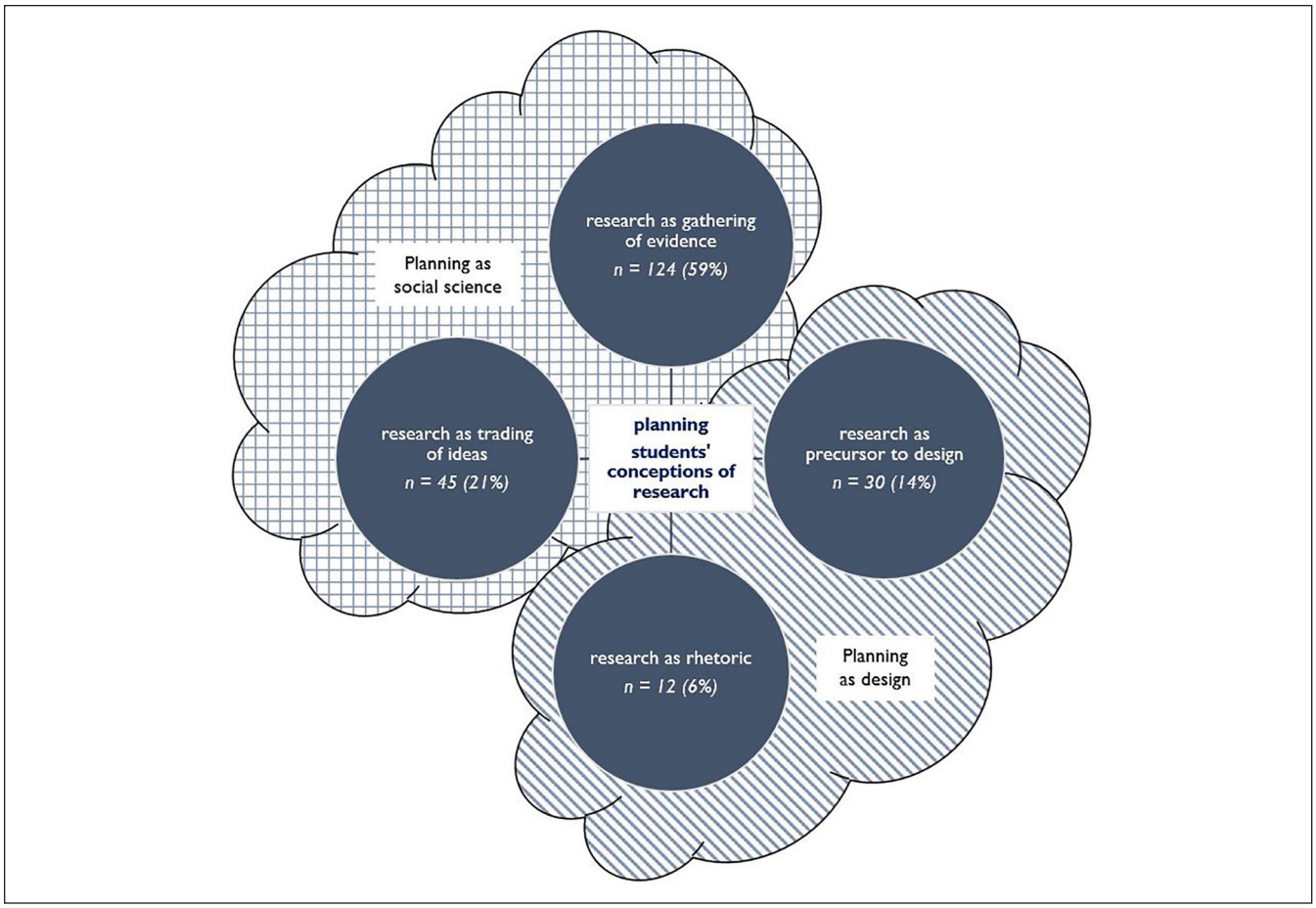

Figure 4. Revised theoretical framework: planning students' conceptions of planning research (and the planning discipline).

misconceptions typically dissipate as students enter the final stages of their programs and their knowledge consolidates and deepens. As such, the same may hold true for planning students too. Their misconceptions about research might disappear toward the end of their programs, for example, during the preparation of their Master's thesis.

Given that the typology of student conceptions of planning research described above was statistically robust, further modeling was carried out to determine whether students' undergraduate background and/or their current planning school influenced their conceptions of research.

The multinomial logistic regression models revealed that students' undergraduate backgrounds explained 3 percent of conceptions of planning research (pseudo-$R^2 = .03$), and introducing their current planning school explained a further 4 percent (pseudo-$R^2 = .07$; Table 5). Overall, students' present and past educational settings appear to have only a small (7%), yet statistically significant effect. It is plausible that model externalities (e.g., demographic, socioeconomic, psychological, and aptitude factors) could provide further explanation, but these factors were not captured within the survey.

Next, the distinctions between the conceptions were examined with "research is a marketplace of ideas" used as the base category to represent a conception of research. When examining the "research as gathering evidence" conception, we found that students with an educational background in humanities/business ($b = -1.38$; $p < .05$) or engineering/science ($b = -0.96$; $p < .10$) were less likely than students with an educational background in architecture to have developed it. This is surprising since students with an architecture background were expected to have received less training in scientific methods and in evaluating evidence.

Furthermore, students enrolled at UQ ($b = 1.15$; $p < .10$) or UCLA ($b = 1.38$; $p < .05$) were more likely to have developed the "research as gathering of evidence" conception than students enrolled at TU Delft. It is plausible that UQ's and UCLA's orientation toward social science and TU Delft's orientation toward design and creative practice could explain this finding.

In contrast, when examining the "research as precursor to design" conception of research, neither educational background nor current planning school explained its development ($p > .10$), although this could be attributable to

Table 5. Multinomial Logistic Regression Modeling.

	b (*SE*)	*b* (*SE*)
Cluster 1: research as trading of ideas (base)		
Cluster 2: research as gathering of evidence		
Undergraduate degree		
Architecture	*base*	*base*
Planning	0.27	−0.1
	(0.58)	(0.6)
Humanities	−0.41	−1.38*
	(0.52)	(0.67)
Engineering/science	−0.21	−0.96(*)
	(0.48)	(0.56)
Other	−0.81	1.16*
	(0.57)	(0.58)
Postgraduate program		
TU Delft		*base*
UQ		1.15(*)
		(0.67)
UCLA		1.38*
		(0.59)
SCUT		0.04
		(0.72)
Other		−1.22(*)
		(0.63)
Constant	1.16***	0.95**
	(0.30)	(0.32)
Cluster 3: research as precursor to design		
Undergraduate degree		
Architecture	*base*	*base*
Planning	−0.51	0.48
	(0.82)	(0.97)
Humanities	−1.39	−1.65
	(0.87)	(1.37)
Engineering/science	−0.92	−1.01
	(0.70)	(1.08)
Other	0.13	−0.54
	(0.63)	(1.07)
Postgraduate program		
TU Delft		*base*
UQ		1.54
		(1.13)
UCLA		1.07
		(1.10)
SCUT		0.41
		(1.28)
Other		1.41
		(0.97)
Constant	0.00	−1.6*
	(0.37)	−0.64
Cluster 4: research as rhetoric		
Undergraduate degree		
Architecture	*base*	*base*
Planning	0.81	−0.54
	(0.92)	(0.86)
Humanities	−0.76	−1.68
	(1.20)	(1.04)
Engineering/science	−0.29	−1.22
	(0.96)	(0.81)
Other	0.07	−0.64
	(0.98)	(0.71)
Postgraduate program		
TU Delft		*base*
UQ		1.67(*)
		(0.87)
UCLA		−0.32
		(1.23)
SCUT		1.68*
		(0.76)
Other		1.64*
		(0.74)
Constant	−1.32*	−0.58
	(0.56)	(0.45)
N	211	211
Log likelihood	−224.8	−213.9
Pseudo-R^2	.03	.07

Note: TU Delft = Delft University of Technology; SCUT = South China University of Technology; UQ = University of Queensland; UCLA = University of California at Los Angeles.
Significance levels: (*).1. *.05. **.01. ***.001.

insufficient statistical power ($n = 30$). Another explanation may relate to the extent to which undergraduates were exposed to research in their studies. It may be that students who have had the opportunity to work on a client-based research project or participate in an experiential fieldtrip have a much clearer idea of research than students who simply had classroom experiences. A number of studies related to experiential learning in planning point to its role in engaging students and drawing them into more critical inquiry (see Balassiano and West 2012; Cole-Hawthorne et al. 2017; Freestone, Thompson, and Williams 2006; Sletto 2010).

Last, when examining the "research as rhetoric" conception, which had the least statistical power ($n = 12$), we found that students enrolled at UQ ($b = 1.67$; $p < .10$) or SCUT ($b = 1.68$; $p < .05$) were more likely to have developed it than students enrolled at TU Delft; there was no statistically significant distinction between UCLA and TU Delft.

Conclusion

Our exploratory analysis found that planning students typically have one of four conceptions of planning research: (1) *research as trading of ideas*; (2) *research as gathering of evidence*; (3) *research as precursor to design*; and (4) *research as rhetoric*. While the planning schools included in this study have diverse orientations (along the design–social science continuum), our findings suggest that planning students more often conceptualize planning research as a social

science rather than as a step within the design process. These four conceptualizations tend to align with the reality of teaching planning at Master's level. Many instructors will be able to recall some of the following situations arising in research design classes or during thesis advisory sessions.

For example, some students will struggle to understand that research is "messy" and scholarly ideas do not necessarily align or progress in an evolutionary fashion. In fact, they may be contradictory and even regressive; negotiation and deliberation among scholars may be necessary to "shift paradigms" (see Kuhn 1996). If a research study has been assigned or suggested by their instructor, some students will treat the authors as authorities rather than as contributors to a body of knowledge or understanding. Other students will uncritically or opportunistically use the research as a trampoline to, and justification for, the design solutions they are eager to propose. While viewing planning research either as social science based or design based may be unique to planning, misconceptions are evident among students in other disciplines too (see Zhang, Zwaal, and Otting 2018).

This study showed that both students' undergraduate study major and their current planning school influence their general conceptions of research but their effect is small. It may be that the international benchmarking of planning curricula has eliminated some of the expected variability. Yet it is clear that some research traditions persist and influence student conceptions of planning research. As such, the character of programs is created, recreated, and reinforced through faculty intellectual evolution and replacement, which may take one generation or more to occur (Edwards and Bates 2011).

While exploratory, this study lays the empirical foundations for the systematic development of a survey instrument which captures planning students' conceptions of research in finer detail. Importantly, future studies need to tease apart whether planning students believe that research identifies social facts pertinent to planning; that research methods are intuitive or systematic; or that reliable evidence requires peer review. In addition, further studies could also examine socioeconomic and aptitude characteristics to determine whether these factors provide further explanation regarding the development of a particular conception of research. Indeed, these factors may have better explanatory power than the characteristics observed in this study. In addition to explaining how conceptions of planning research develop, further development of a survey instrument could prove well suited as a diagnostic tool in planning programs.

Given different conceptualizations of research, what would a planning instructor need to consider when teaching a classroom of students with mixed backgrounds? How might a research-oriented program respond when thinking about which applicants to select and how to train its future students? A broader question centers on the value of the "social science vs. design" dichotomy in planning practice, given that the needs facing cities and regions may often require more consensus and coalition building and "politicking" than traditional social science research or design (Moore 2001).

Our answer is that, whether planning is conceived primarily as a social science or a design discipline, both traditions are an integral part of the planning discipline and should be viewed as such—although a difference in focus and priorities might still exist (Biggs and Büchler 2008a, 2008b). Moreover, the type of "research" that planning graduates may actually use in practice is likely to be much broader than how most planning faculty perceive it. Academics place significant value on research, but the practice of planning often involves very different kinds of skills and strategies, including strategic thinking, negotiating, and visioning (Pojani et al. 2018). Universities need to accept the challenge of engaging with the wider society and its questions of "diversity or democracy, education or environment, globalization or growth, hunger or health, poverty or pollution" (Myers and Banerjee 2005, 125).

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Notes

1. Planning can be about either "process" or "product"—or both; in other words, it can be about means and/or ends.
2. The survey was designed in the ambit of a "research into practice" project conducted by the University of Hertfordshire (UK), in collaboration with TU Delft (the Netherlands).
3. The Stata 12 functions and options used were (1) "cluster wardslinkage vars_list" for the cluster analysis, (2) "discrim logistic vars_lists, group(cluster_group) priors(cluster_proportion)" for the discriminant analysis, and (3) "mlogit cluster_identifier ib(freq).explanatory_variables, base(largest_cluster_identifier)" for the multinomial logistic regression.

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