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7. STRATEGIC POSITIONING IN AUSTRALIAN HIGHER EDUCATION

The Case of Medical Schools

INTRODUCTION

The emergence of the concept of strategy in higher education can be traced to the late 1970s and 1980s as American universities, at that time, moved from a “managerial revolution” to an “enterprising evolution” (Thelin, 2004, p. 337). Rooted within the planning school of thought (Ansoff, 1965), higher education’s conception of strategy emphasised its use as a rational tool for orderly, systematic management—as a “disciplined effort to produce fundamental decisions and actions that shape and guide what an organization is, what it does, and why it does it” (Bryson, 1988, p. 74).

Strategic planning in higher education became widespread although scepticism towards it had also begun to emerge (Baldrige, 1971; March & Olsen, 1976; Mintzberg, 1983). Further, it was argued that business strategy does not apply to a substantially public and more institutionalised sector such as higher education (Amaral, Jones, & Karseth, 2002; Gumpert, 2001) and is not achievable in complex, loosely coupled organisations such as universities (Leslie, 1996; Musselin, 2007). Universities began to move away from the rigidity of the planning paradigm to a more flexible paradigm such as the interpretive model of strategy (Chaffee, 1985; Maassen & Potman, 1990)—which focuses on institutional culture and its influence on the motivation of individuals—to a mixed strategy approach which combines two or more strategies to better meet institutional diverse goals and policies. More recently, others have extended the notion of strategy in higher education to a more positioning focus (see examples of Fumasoli & Huisman, 2013; Fumasoli & Lepori, 2011; van Vught, 2008).

This chapter extends the notion of strategic positioning in higher education by investigating strategic positioning in higher education within the context of Australian medical schools. Medical schools operate in a regulated environment which can impact the role and character of strategy. Within this regulated environment, medical schools need to deal with the operational or technical aspects of regulation (Tan & Litschert, 1994) such as responding to accountability frameworks set up by the government, and managing their interactions with external entities such as regulatory agencies (Post & Mahon, 1980). It has been argued that a more focused

strategy is not feasible in regulated environments which are deterministic (Smith & Grimm, 1987). Indeed, strategies for organizations in such regulated situations would seem to be negotiated (Murray & Isenman, 1978).

This chapter reports on the findings of one component of a larger study which investigates the relationships between strategic positioning, environment and performance. Accordingly, this chapter presents the findings on the strategic positioning and performance of medical schools, and responds to two main research questions:

- In what ways are medical schools distinctive from each other?
- How does visualisation of performance affect strategy formulation in medical schools?

This chapter is divided into five sections. The first section reviews the limited literature on strategy in medical education. The second section advances the conceptual framework which was used to guide analysis of the study. The third section provides the research methods. Subsequently, the fourth section discusses the findings of the study. Finally, the last section offers a discussion of the findings and implications for theory and practice.

STRATEGY IN MEDICAL EDUCATION

There is very limited research which focuses on medical schools as a whole and from an institutional perspective. The vast majority of studies on medical schools have focused on basic medical education and conducted within a single medical school (Brosnan, 2010). Consequently, differences between medical schools have remained largely unexamined (Brosnan, 2009; Cribb & Bignold, 1999; Jefferys & Elston, 1989; Light, 1988). The lack of comparative studies could be attributed, among other reasons, to the theoretical background of medical education researchers (Brosnan, 2010). More often than not, medical researchers are focussed on clinical disciplines, education or psychology rather than the study of organisations such as medical schools. This section reviews the somewhat limited literature available.

In a study of medical schools in Canada, the authors analysed the positions of Medical Education Research and Innovation (MERI) units within medical schools (Varpio, Bidlake, Humphrey-Murto, Sutherland, & Hamstra, 2014). Looking at MERI as the unit of analysis, they found that the performance of those units could be measured through indicators of teaching, faculty mentoring, building collaborations, delivering conference presentations, winning grant funding, and publications. Additionally, they identified behaviours which MERI directors use to negotiate, strategize and position their units within their local contexts. These include: advocacy, promoting growth, managing expectations and building relationships with individuals. Varpio et al. (2014) concluded that their findings can produce insights which can be used to improve the academic output and status of MERI in the local, national and international contexts.

Research and practice in medical education must take into account the position of each medical school in relation to its competitors and to external agencies (Brosnan, 2010). In her study of 30 medical schools in the United Kingdom (U.K.), Brosnan (2010) argued that U.K. medical schools' varying curricula and admissions criteria serve to distinguish them from their competitors and to facilitate access to different forms of capital, including economic, cultural, social and symbolic. She further highlighted the need and importance of rendering the medical school an object of study and of examining the differences between medical schools.

Trumble (2010) drew an analogy of Brosnan's (2010) study to the Australian medical school context. He argued that medical schools in Australia can be characterised within two distinct positions: academic and vocational. In particular, the newer medical schools have a more vocational focus, in that they are more distinctly geared to produce a primary medical workforce. Trumble (2010) further explained that what counts as capital in the academic arena such as gaining a high ranking on international league tables or winning competitive research grants, has little value in the vocational field, which focuses on preparing and retaining best-suited health professionals for the region.

In a study of new Australian medical schools established in the early 2000, Lawson, Chew and Van Der Weyden (2004) found that the new medical schools differ from each other and from the more established medical schools. These differences include the ways the new schools structure themselves, employ resources for delivering the curricula, and prioritise and specify qualities they wish to foster in their graduates. In the study, the authors did not find any distinctiveness in the curriculum and medical programs, as all the new medical schools obtained their curriculum from an established medical school, which include recent reforms in medical education such as problem-based, self-directed learning, horizontal integration between disciplines, vertical integration between basic and clinical sciences, early exposure to patients, and increased emphasis on communication skills, ethics, and personal and professional development. Only one medical school, at the time, obtained its curriculum from a medical school overseas (Lawson et al., 2004).

It has been argued that medical schools, like any other organisations have to take into account of their external environment when developing strategies (Gordon et al., 2000). Looking at the issues raised by practical challenges in the environment across several contexts, Gordon et al. (2000) recommended four strategies for medical schools to promote more effective learning in clinical settings: using approaches to teaching and learning that are consistent with what medical schools already know about what, why and how students learn; providing students and their clinical supervisors with a clear and realistic understanding of the goals that they are expected to achieve and with coping strategies to achieve them; structuring the clinical environment in ways that will reinforce professional values and make the best use of learning opportunities; and capitalizing on the potential of new IT

resources to promote efficient learning in clinical settings. They believed that, in considering the external environment, these strategies lie within the reach of a well-positioned medical school.

In a case study of one medical school in the United States, the authors illustrate the emergent change in the medical school's informal curriculum as a successful and novel approach to organizational development (Cottingham et al., 2008). Despite operating in a regulated environment, large-scale change within a medical school can be promoted with an emergent and non-prescriptive strategy. This can be achieved through an appreciative perspective, as well as a focused and sustained attention to everyday relational patterns.

From the review of limited research on medical schools, a number of issues can be derived as a point of departure for this study. Firstly, there is a need to study medical schools as organisations. Secondly, there is some evidence to show that medical schools can be distinctive from each other but that further research is required which examines the differences between medical schools. Finally, strategy formulation with respect to medical schools' positions should take into account the environment and performance of medical schools. Consequently, this study is well-placed to contribute to perspectives, methods and insights which provide a basis for better understanding strategy formulation in medical schools.

THE CONCEPTUAL FRAMEWORK

The central tenet of the conceptual model proposed in this study is that strategy formulation is influenced by a medical school's external environment. In turn a medical school uses data and information on performance to develop strategy to adapt to that environment. In essence, the conceptual framework, as illustrated in [Figure 1](#), consists of the external environment, the strategic positions, and the performance of universities. The next sub-sections will describe the strategic positioning and performance as conceptualised within the framework. Due to scope of the chapter, the first element of the conceptual framework, environment, will not be discussed here.

Strategic Positioning in Higher Education

The second element of the conceptual framework, the strategic positions of universities, is conceptualised as the position or the niche of the university within the wider environment in which it sits. Strategic positioning in higher education is the process through which higher education institutions locate themselves in specific niches within the higher education system (Fumasoli & Lepori, 2011). It involves institutions selecting a number of dimensions of activities (Popielarz & Neal, 2007) such as research, teaching and learning, knowledge exchange, international or regional engagement (van Vught & Huisman, 2013a). Universities make strategic choices in which dimensions to focus their efforts on, not necessarily for direct

profit-making but for a variety of other reasons, including improving academic reputation. This will take into account the continuous relationship between procuring and allocating of resources, and the dynamic interactions between universities and other organisations within the system as well as with the state and national governments (Fumasoli & Huisman, 2013).

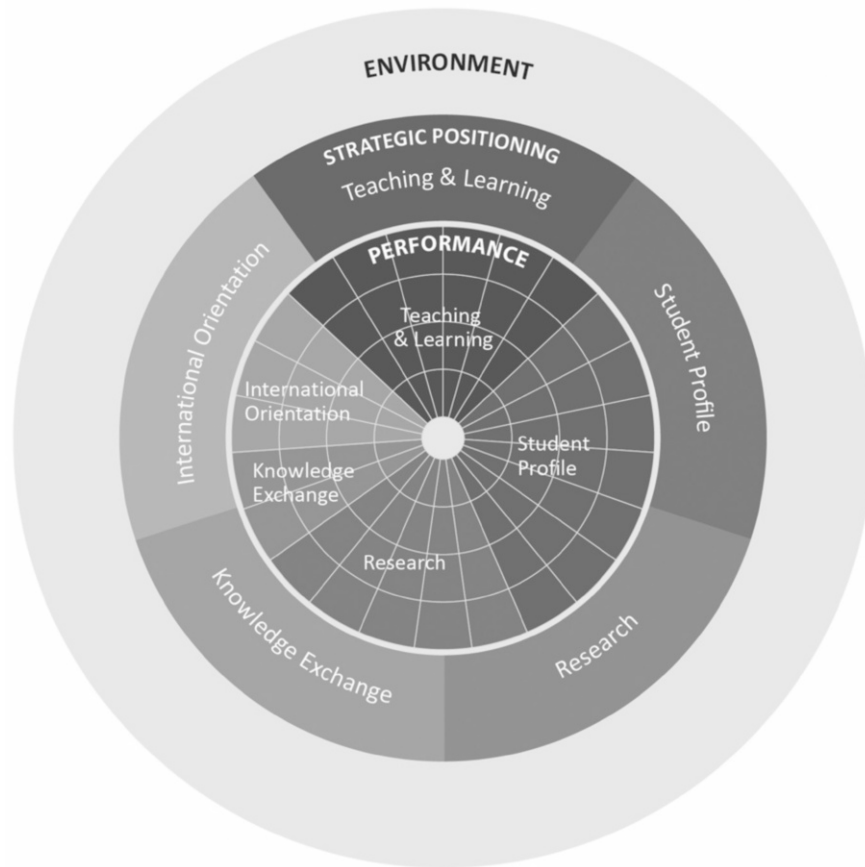


Figure 1. The conceptual framework

The dimensions of teaching and learning, research involvement and knowledge exchange reflect the core functions of higher education institutions (van Vught et al., 2010) and consequently, positions of institutions can be carved out within these three dimensions. However, a classification of positions into the three dimensions is a simplification of the complex world of higher education. In a profiling project of European universities (van Vught et al., 2010), two additional dimensions of international orientation and regional engagement were included, which concern the

extent to which the three core functions are directed at international and regional audiences. An additional dimension of student profile was also incorporated, which focuses on various aspects of the institution's student body as well as its total student enrolment. The authors argued that the nature and positioning of institutions can be partly determined by its student body (van Vught et al., 2010). In the study, the six dimensions were established for validity, reliability and feasibility through a detailed process of stakeholder consultations and a pilot test involving 70 institutions which confirmed that the dimensions are able to capture the essence of what institutions actually do.

In an Australian profiling project built on the European project (Coates et al., 2013; Mahat et al., 2014), the authors excluded the regional dimension. Acknowledging the limitation of this, they argued that there is difficulty in defining a university's 'region' in the Australian context. Further, even if some proxy for geographic region was derived, Australia lacks sector-wide data at sufficient granularity. In the study, the authors found a diversity of missions in Australian universities within the five dimensions of teaching and learning, research, knowledge exchange, international orientation, and student profile.

A review of existing program rankings (see [Table 1](#)) also found that league tables tended to focus mostly on teaching and learning, and research. A few of the program rankings also look at the activities of medical schools within knowledge exchange, international orientation, and student profile. Like the U-Map, the field based U-Multirank has an additional regional dimension.

Further, for some universities which see themselves in 'blue ocean' (Kim & Mauborgne, 2005), they may be able to position themselves distinctly through a focus on a single discipline such as business; or particular territory such as postgraduate business engagement or internationalisation; or emphasising on a particular research focus; or on learners; or based on academic enterprise or business-facing mission, as well as attributes such as commitment to diversity, serving the local area and religious affiliation (Morphew & Hartley, 2006).

Previous studies have also shown that organisations may direct their resources towards a limited set of strategic dimensions, in order to avoid becoming 'stuck in the middle' (Mahon & Murray, 1981). For example, organisations have been found to adopt strategies which emphasised some dimensions at the expense of others (Kim & Lim, 1988) or choose between alternative strategies (Lukas, Tan, & Hult, 2001; Tan & Litschert, 1994).

From a review of the literature and program rankings of medical schools, the position of medical schools can be described within the five dimensions of teaching and learning, research, knowledge exchange, international orientation and student profile. Further, for some medical schools which see themselves in 'blue ocean' (Kim & Mauborgne, 2005), they may be able to position themselves distinctly through other markets such as a focus in particular research areas or attributes such as commitment to diversity (Morphew & Hartley, 2006).

STRATEGIC POSITIONING IN AUSTRALIAN HIGHER EDUCATION

Table 1. Summary of program rankings

<i>Program rankings</i>	<i>Teaching and Learning</i>	<i>Research</i>	<i>Knowledge exchange</i>	<i>International Orientation</i>	<i>Student profile</i>
Academic ranking of World Universities – Clinical Medicine and Pharmacy		✓			
Find the best – medical school	✓				✓
QS World University Rankings by Subject – Medicine and Life Sciences	✓	✓			
The Guardian League Table for Medicine	✓				
THE World University Ranking by Subject – Clinical pre-clinical & health, Life sciences & Physical Sciences	✓	✓	✓	✓	
U-Multirank Field based – Medicine ¹	✓	✓	✓	✓	✓
US News & World Report – Best medical school	✓				✓

Visual Representation of Performance

The focus of the third element of the conceptual framework is on performance. It has been argued that the fit between environmental dimensions and strategy will lead to better organisational performance (Venkatraman & Prescott, 1990). There is also agreement in the literature that strategy is an important determinant of performance when strategic agency is relatively unconstrained (Schendel & Patton, 1978). Furthermore, Miller (1988, 1991) found that the match between strategy and environment was related to performance, especially in challenging settings.

The literature on strategy and performance has mostly been devoted to a study of the conditions under which organizations achieve different levels of effectiveness (see examples of Christensen & Montgomery, 1981; Jauch, Osborn, & Glueck, 1980; Palepu, 1985; Rumelt, 1974, 1982; Tan & Litschert, 1994).

The focus of this study is on the visual representation of a medical school's performance. The importance of visual representation to support decision making has been emphasized by many researchers (Eden & Ackerman, 1998; Foil & Huff, 1992; Lohse, Biolsi, Walker, & Rueter, 1994; Morgan, 1993; Tan & Platts, 2003; Tufte, 1990). From a synthesis of the literature, Tan and Platts (2004) found that visualisation techniques have many cognitive and operational functions, including focuses attention, shares and stimulates thinking, bridges missing information, identifies structure, trends and relationships, highlights key factors, and provides an overview of complex data.

There are a number of published techniques used to visualise performance in a strategy process, none of which capture rapidly, and display immediately in a simple, readily understandable form, all the varied aspects of a strategy (Richards, 2001). Platts and Tan (2004) advanced a number of techniques: performance profiling, strategy charting and tool for action plan strategy, and argued that different techniques should be used at different stages of the strategy process. In the context of higher education, van Vught and Huisman (2013b) identified a number of visual tools which could be used to analyse strategic positioning of higher education institutions: activity profiling, degree profiling, multidimensional performance ranking, and benchmarking. Particularly as a first step in the strategy process and in the context of aligning the environment and its performance (Platts & Tan, 2004), a profiling method would be useful to enable comparisons across multiple dimensions and range of attributes in order to assess the fit between environment and performance (van Vught & Huisman, 2013a).

The Australian University Profiles (Mahat et al., 2014) is an evidence-based visual tool which has been used to profile Australian universities. It was built to mirror two international profiling tools—the U-Map (van Vught et al., 2010) and U-Multirank (van Vught & Ziegele, 2012)—initiated in Europe. The U-Map and U-Multirank tools were developed to allow the creation and analysis of institutional profiles. While both are multi-dimensional—recognising that higher education institutions serve multiple purposes and perform a range of different activities—and user-driven, there are some marked differences between the two. In particular, the U-Map is a European classification mapping tool of higher education institutions which focuses on an institution's activities, while the U-Multirank is a global tool which focuses on performances of institutions.

This study extends the Australian University Profiles to the medical school level. There are a number of reasons why the Australian University Profile has been selected for this study. Firstly, the profiling tool could be utilised to display a comparative picture and the alignment between environment and achieved performance (Platts & Tan, 2004). Secondly, it could be used to make a range of profiles visible and transparent and only focuses at comparing “apples with apples and oranges with oranges” (van Vught & Huisman, 2013b, p. 30). Finally, it was found that the use of multiple colour-coded dimensions was engaging and provides a clear visual representation of performance (Mahat et al., 2014).

In the context of the present study, the tool was adapted to focus on the performance of medical schools. Through a rigorous process of validation (see [Figure 2](#)), a number of indicators were removed, adapted or included to suit the medical school context. A final set of 23 indicators were selected based on three criteria of practical consideration, technical consideration, and substantive consideration.

Practical criterion refers to data availability, data comparability and data stability. If the data was not available, or comparable, or stable, it was not included in the

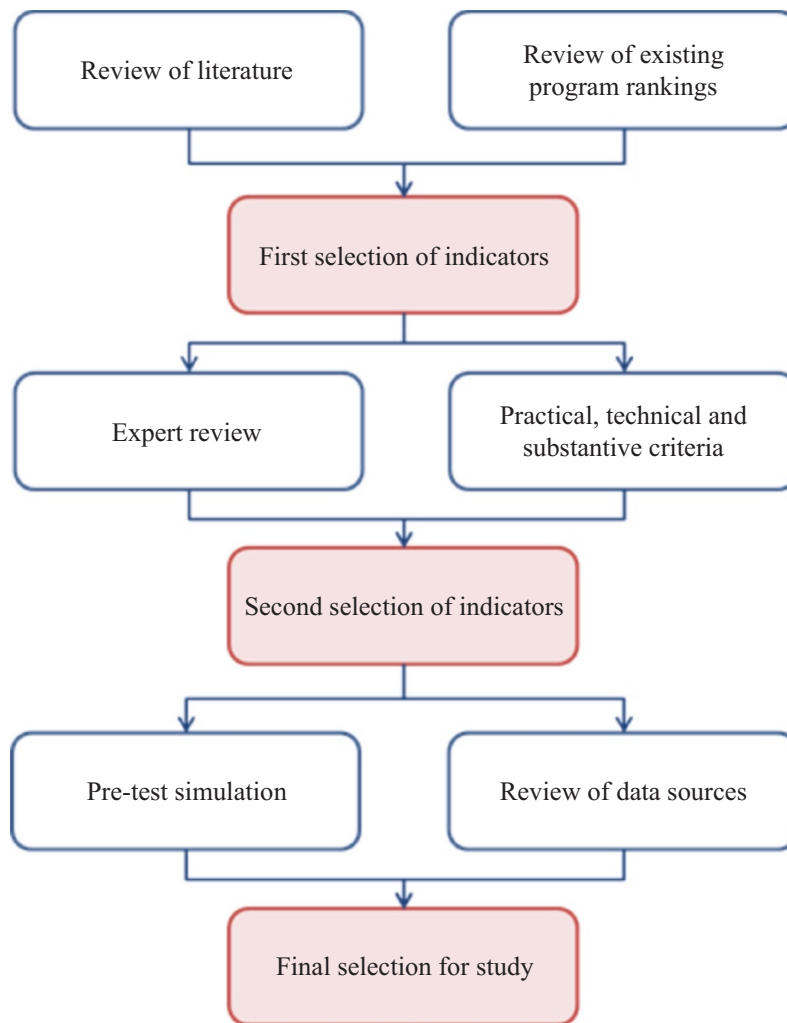


Figure 2. Indicator selection process

tool. The ideal scenario in terms of data availability from the point of view of validity, reliability and parsimoniousness of data collection (i.e. not bothering medical schools with unnecessary questionnaires) is to use existing databases or other publicly available sources, where, for the most part, third parties would have validated data. For this study, data was gathered from various established sources, including from the Department of Education, government and other databases (e.g. *uCube* and *SciVal*); websites (e.g. National Health and Medical Research Council (NHMRC) and Medical Deans Australia and New Zealand (MDANZ)); and other organizations (e.g. Social Research Centre and Graduate Careers Australia).

In terms of comparability, the indicators allow comparisons between medical schools (i.e. broadly similar definitions are used across medical schools so that data are comparable). For instance, some of the Australian medical schools combine a number of different foci including nursing and dentistry within the medical school framework. Consequently, the internal academic organizational structures vary between medical schools, as medical schools have different fields of education depending on their areas of disciplinary focus. Fields of education as defined by Australian Standard Classification of Education (ASCED) were initially mapped for a number of medical schools. In order to be consistent across medical schools, a broad range of fields of education were used in the profiling tool. Hence, while the data was comparable across medical schools, the profiling tool presented for each medical school may not reflect the actual internal academic structure of individual medical school.

Technical criterion included whether the data was valid and reliable. Validity means that the indicator measures what it claims to measure and is not confounded by other factors. This criterion is broken down into concept and construct validity (i.e. the indicator focuses on the performance of medical schools) and is defined in such a way that it measures 'relative' characteristics (e.g. controlling for size of the institution), and face validity (i.e. the indicator is used in other benchmarking and/or ranking exercises and thus may be regarded as a measure of performance which already appears to be used). Reliability indicates that the measurement of the indicator is the same regardless of who collects the data or when the measure is repeated. The data sources and the data to build the indicator are reliable and consequently consistent.

Substantive criterion indicates whether it was linked with outcomes, whether there were meaningful differences or whether it was research-, practical- or policy-driven. While many indicators could be of potential interest, there is no value in collecting information that is unlikely to distinguish between medical schools. Additionally, it is desirable that the data have prior research, or practical, or policy foundations. Evidence on such grounds is used to inform the use of individual indicators.

In arriving at the final tool, the evaluation of each indicator was both theory- and data-driven. Annexure A summarises the dimension and indicators used in the profiling tool for the current study.

RESEARCH METHODS

The research methods consist of quantitative analysis of data to assess and benchmark the performance of medical schools in Australia and qualitative interviews of academic and professional staff at six case study medical schools. Medical schools were selected, through purposive sampling (Kerlinger, 1986) in order to gain a range of perspectives from different size and/or groupings of universities in Australia. A total of 21 semi-structured interviews were conducted at the six medical schools. Interviews were conducted with the head/dean of the medical schools, as well as a range of staff who, at the time of the interviews, had substantive role in the management of the medical school and/or with specific responsibility in one or more of the following areas: teaching, learning, research and management. A profile of staff interviewed and the schools and universities is provided in [Tables 2](#) and [3](#).

Analysis of the qualitative data took the form of relatively straightforward thematic analysis. This involved initial listening of all audio files to gain an overall sense of the data. These interviews were transcribed, read and re-read and ‘open-coded’ to produce an initial code list until, the analysis had reached theoretical saturation. Although some codes were adapted which directly used the language of the participants, the majority were researcher-led and analytic. From

Table 2. Profile of participants

	<i>N = 21</i>	<i>Percent</i>
	<i>n</i>	
Gender		
Female	7	38%
Male	14	62%
Function type		
Academic	19	90%
Professional	2	10%
Position type		
Heads/Deans of medical schools	6	29%
Clinical Deans	1	5%
Heads of others schools/departments	3	14%
Associate Dean or similar (with specific responsibility)	3	14%
Professors/Chairs	5	24%
Senior lecturer	1	5%
Professional staff	2	10%

Table 3. Profile of universities and medical schools

	<i>N = 6</i>	<i>Percent</i>
	<i>N</i>	
Age of university		
Under 50 years	2	33%
50 – 70 years	2	33%
Above 70 years	2	33%
Size of university		
Small (Under 25,000 students)	0	0%
Medium (25,000 – 45,000 students)	4	67%
Large (Above 45,000 students)	2	33%
Age of medical school		
Under 10 years	2	33%
10 – 50 years	2	33%
Above 50 years	2	33%
Size of medical school		
Small (Under 500 students)	1	17%
Medium (500 – 1000 students)	2	33%
Large (Above 1000 students)	3	50%

this basis, the data were then selectively coded in terms of categories identified with the initial code list directly related to the research questions of the study mentioned earlier.

Analysis of the quantitative data involves an analysis of the performance of all 18 medical schools in Australia. The indicators exhibited normal characteristics and hence the four benchmark categories were set by taking quartiles of the national distribution. Each medical school was placed in the first, second, third or fourth group or quartile on each indicator. The output was compiled graphically into a sunburst performance profile for each medical school.

FINDINGS

The qualitative and quantitative findings are illustrated pictorially in [Figure 3](#), based on the conceptual framework described earlier. Based on the thematic analysis of the interview data, grey-shaded dimensions indicate the dimensions in which medical schools has made strategic decisions to focus on. Dimensions which are not shaded means that a medical school does not consider these dimensions as ones it focuses its efforts and resources on although it may conduct some or limited

activities within those dimensions. [Figure 3](#) also provides the performance profile for each medical school.

Strategic Positioning of Medical Schools

The qualitative findings suggest that the medical schools seem to focus predominantly on teaching and learning, and research (Brosnan, 2010; Trumble, 2010). From [Figure 3](#), all case study medical schools seem to strive for graduate outcomes through a focus on teaching and learning. Within a regulated environment where the Australian Federal government sets the student numbers and fees, developing a distinctive position through teaching and learning is probably one of the most obvious ways medical schools can position themselves. From the analysis of the data, this seems to be the case as each medical school has attempted to develop a distinctive medical curriculum as compared to other medical schools. This is particularly more so in the younger medical schools as they are more focused on the vocation rather than research (Trumble, 2010).

Research can also be seen as one differentiating factor common across all medical schools. Research is perceived by the more established medical schools as a strategic position it already occupies, and for the younger ones, something it aspires to have in the future. This finding challenges Trumble's (2010) notion that research has little value for those medical schools focused on the vocation. It also points to a more global agenda to improve reputation and prestige through a highly regarded research profile and consequently a higher position in global rankings (van Vught, 2008). In all the case study medical schools, the choice of which research areas to focus on is increasingly deliberate—either as a distinctive feature for the medical school or in an attempt to focus on high performing research areas.

As can be seen from [Figure 3](#), not all medical schools position themselves through the dimensions of knowledge exchange, student profile and international orientation. This concurs with previous studies (Kim & Lim, 1988; Lukas et al., 2001; Tan & Litschert, 1994), in that medical schools emphasised some dimensions at the expense of others. Remarkably, only one medical school (M5) seem to occupy a position in which its activities cut across all five dimensions. Location, age and size are seen as distinctive attributes for some medical schools.

From the analysis of the findings, some medical schools do attempt to position themselves in 'blue ocean' (Kim & Mauborgne, 2005). For the more established medical schools, M3 and M5, their international orientation in teaching and learning and research could be seen as an attempt to position themselves in distinctive markets. Furthermore, medical schools, M1, M2 and M6, pride themselves in having a focus on medical education research despite it not being a high national priority area.

The findings of the study concurs with previous studies (Brosnan, 2010; Lawson et al., 2004) in that medical schools are not all the same. They diverge in terms of their core functions of teaching and learning, research, and knowledge exchange as well as have varying histories, locations, size, student profile and international

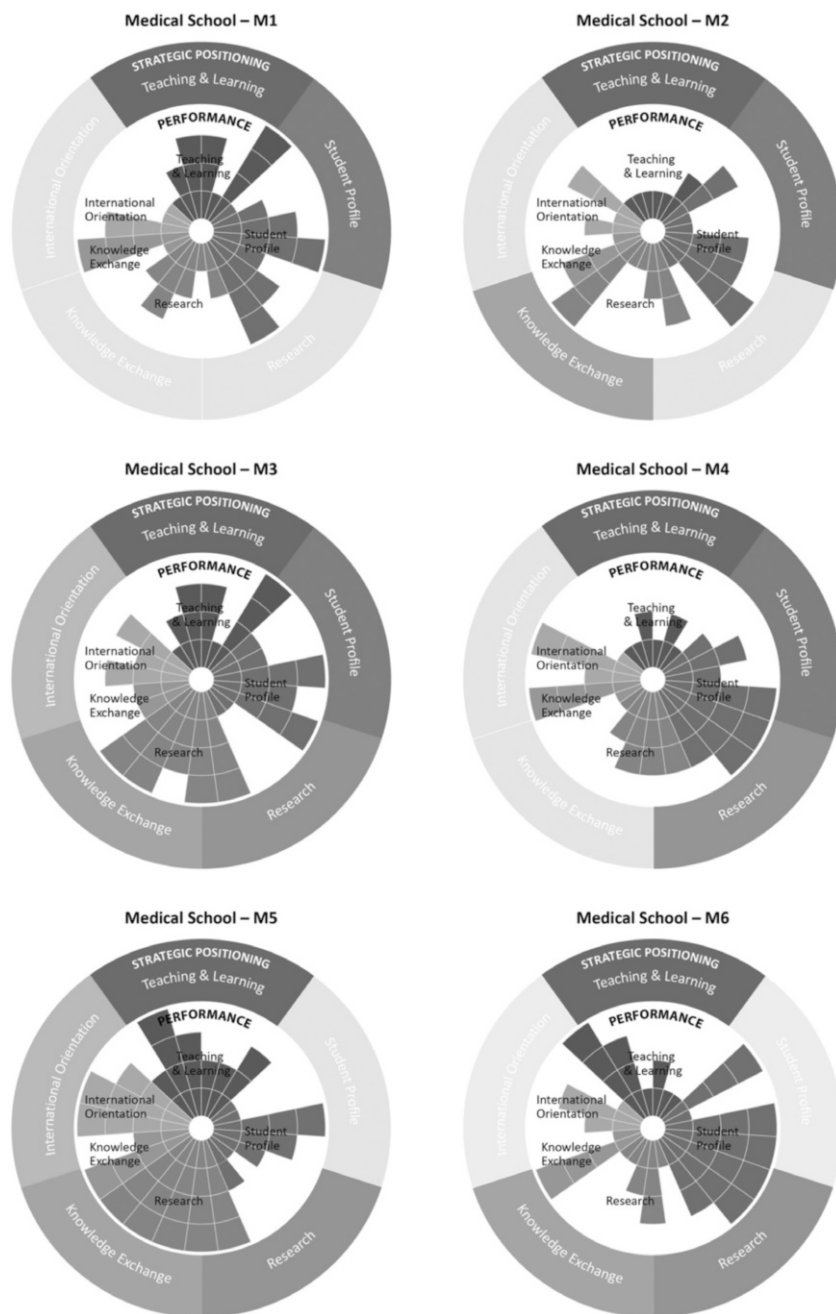


Figure 3. Positions and performances of medical schools

orientation. Attributes such as location and size are used to differentiate medical schools, but on their own are not sufficient to position medical schools strategically within the system. It would seem that all medical schools position themselves against the two differentiating factors of teaching and learning, and research, and make use of other attributes to strengthen its position within the system (Morphew & Hartley, 2006).

Performance of Medical Schools

The quantitative findings suggest that the performance of medical schools, for the most part, is aligned to the positions of medical schools. As illustrated in [Figure 3](#), while all medical schools have some activities across all dimensions, the visual profiling tool seems to indicate that the performance of each medical school is quite aligned to the individual strategic position. For medical school M1, for instance, their performance in teaching and learning and student profile seems to be quite consistent to the position it has defined for itself. Likewise, the performance of medical school M3 across all five dimensions seem to correspond to its strategic position within the system.

Only one medical school's performance did not seem to fit the strategic position it has articulated for itself. While participants in M6 perceive its position to be focused in teaching and learning, research, and knowledge exchange, their performance in these dimensions did not seem to measure up. This could just mean that the medical school was not performing as well as it could be in those areas. Additionally its performance in student profile, seem to indicate a distinctive feature for the medical school, one which was not perceived by participants.

When presented with the profiling tools, participants found that the visual profiling tool was better than just numbers on a page, visually engaging across the different dimensions of activities and colour, and provides an overview of the performance of the medical school. Participants agreed that the tool would be useful for strategy formulation: for external accountability purposes, to effect improvements, to direct discussions and enable more-focussed planning, to encourage a system of accountability that sets clear expectations of standards for performance, to promote a culture of evidence-based decision-making and continuous improvement, and to provide evidence to senior management and other stakeholders of the achievements of the medical school. The profiling tool could also be used to analyse strengths and weaknesses, focus resources and investment in areas where it might improve strategic positions of medical schools, and enable medical schools to outline priorities.

Analysing medical schools' performance suggests that performance standards and their degree of achievement do have an impact on strategy formulation in medical schools. A poor performance on one measure or activity may lead to strategic decisions aimed at effecting improvements, if it was considered to be of strategic importance to that medical school. The key to executing strategy is to have staff in the medical school understand it. It is evident from the findings, that a visual

profiling tool, which can convey instantly and memorably relationships that would otherwise be obscure, could be used effectively in the strategy formulation process (Platts & Tan, 2004).

DISCUSSION AND IMPLICATIONS FOR THEORY AND PRACTICE

Despite the highly structured and regulated field in which medical schools are located, the results of the empirical analyses provide evidence of strategic positioning and niche-finding behaviour of medical schools. Additionally, the findings of the study support the contention that within the regulated environment, medical schools are indeed able to formulate coherent strategies in order to achieve superior performance. Despite previous research, which has argued that strategy is contested due to the nature and complexity of the sector and the university (Amaral et al., 2002; Gumpert, 2001; Leslie, 1996; Musselin, 2007), the findings of this study have shown the contrary, and accordingly challenge these assertions.

The findings also challenge prevailing notions which suggest that organizations functioning in regulated contexts will be unable to achieve sustainable competitive advantage given the extent of regulatory control of competitive dimensions (for example, Mahon, & Murray, 1980, 1981; Smith & Grimm, 1987). This has implications for strategic leadership and management in higher education. Australian universities have seen the emergence of professional middle management that complements a similar structure at the central university level (Goedegebuure & Schoen, 2014). As well, there is likely to be an expansion and diversification of roles—reflecting an increasing variety of broad functions required in the future (Coates & Goedegebuure, 2010, 2012) such as business, commercial, and general capabilities. These include the management of multiple functions in a complex environment, delivering a wide transformational agenda, conducting a bridging role with external partners, organisational skills, and the capacity to create, navigate and lead networks and alliances locally and internationally across sectors, and with business and governments (Perkmann et al., 2013; Varpio et al., 2014).

The findings also suggest that the visual profiling tool provides evidence that transparency is of major importance for strategy formulation in higher education. Higher education institutions function in an increasingly complex environment and as a result require more reflective and data-driven strategic leadership and management. Such strategic leadership and management must be evidence-based and occur within transparent internal and external frameworks that can structure evaluation and application of data. The profiling tool provides indication that transparent reporting of the right kind of data is possible. In an era of greater accountability, such a transparent profiling tool can assist institutional leaders and policy makers to better understand, analyse and position themselves in rapidly changing contexts, nationally and internationally.

This study is based on specific conceptual choices: strategic positioning, which is analysed according to its alignment to environment and performance. From the

profiles of medical schools, strategic positioning can also be inquired as institutional spaces whose meaning is dynamically constructed by social actors through collective processes (Mohr & Lee, 2000; Rawlings & Bourgeois, 2004). A power approach could also be useful for understanding strategy formulation in medical schools, particularly from perspectives of bases of power in organisations (Emerson, 1962; French & Raven, 1959).

Finally, it would also be useful to address the prescriptive question of what types of alignments among environment, strategy, and internal features are important to organizational performance. Particularly in the early years of medical schools, a systematic comparative investigation of the relationships between organizational structure and situational variables would produce promising insights for structural configurations of medical schools (Blau, Heydebrand, & Stauffer, 1966; Hall, 1962; Pugh, Hickson, & Hinings, 1968).

NOTE

- ¹ Include one additional dimension of regional.

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APPENDIX A

<i>Dimension</i>	<i>Indicator label</i>	<i>Indicator detail</i>	<i>Data source</i>
Teaching and Learning	Academic staff	The proportion of academic staff in the medical school as a proportion of all academic staff in the institution.	Department of Education/ <i>uCube</i>
	Staff to student ratio	The ratio of staff to students.	Department of Education
	Retention rate	Retention rate of commencing bachelor domestic students.	Department of Education
	Quality of Teaching	The proportion of undergraduate domestic later students who responded in the top two response categories for this item in the Student Experience Survey (SES).	Social Research Centre
	Quality of educational experience	The proportion of undergraduate domestic later students who responded in the top two response categories for this item in the Student Experience Survey (SES).	Graduate Careers Australia
	Overall satisfaction	The proportion of domestic undergraduate students who completed their degree program in the previous year who were satisfied ('Agree' and 'Strongly agree') with the overall quality of their course in the Course Experience Questionnaire (CEQ).	Social Research Centre

(Continued)

<i>Dimension</i>	<i>Indicator label</i>	<i>Indicator detail</i>	<i>Data source</i>
Student profile	Student body	The proportion of students enrolled in medical school as a proportion of university's student body, as measured by the Effective Full-time Student Load (EFTSL).	Department of Education/ <i>uCube</i>
	Medical students	The number of students who are enrolled in medical programs as a proportion of all students in the medical school (Headcount).	MDANZ/Department of Education
	Postgraduate students	The number of domestic and international postgraduate students as a proportion of all students in the medical school (EFTSL).	Department of Education
	Mature age students	The proportion of students enrolled in the medical school who are mature age (30 years or more) (EFTSL).	Department of Education
	Part-time students	The proportion of students enrolled in the medical school who are part time (EFTSL).	Department of Education
	Low Socio Economic Status (SES) students	The proportion of students enrolled in the medical school who come from low socio-economic status (SES) (% of cohort).	Department of Education
	Regional students	The proportion of students enrolled in the medical school who come from regional/remote areas.	Department of Education

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<i>Dimension</i>	<i>Indicator label</i>	<i>Indicator detail</i>	<i>Data source</i>
Research	Research publications per academic	The ratio of academic weighted research publications to academic staff.	SciVal/Department of Education
	Citations per paper	The average number of citations received per publication.	SciVal
	Research income per academic	The ratio of National Health and Medical Research Council (NHMRC) research income per academic staff	NHMRC/Department of Education
	Higher Degree Research (HDR) students	The proportion of students in the medical school who are in higher degree research (EFTSL)	Department of Education/ <i>uCube</i>
	Graduates in full-time study	The proportion of graduates in further full-time study as reported by the Australian Graduate Survey (AGS).	Graduate Careers Australia
Knowledge exchange	Co-publications with industry partners	The number of publications with both academic and corporate affiliations as a proportion of all publications.	SciVal
	Graduates in full-time work	The proportion of graduates in full-time employment as reported by the Australian Graduate Survey (AGS).	Graduate Careers Australia
International orientation	International students	The proportion of students enrolled in the medical school who are international (EFTSL).	Department of Education
	Staff with overseas qualifications	The proportion of academic staff that obtained their highest qualification overseas.	Department of Education
	International co-authorship	The proportion of total research publications that have at least one international co-author.	SciVal