In recent decades, higher education systems and institutions have been called to respond to an unprecedented number of challenges. Major challenges emerged with the phenomenal increase in the demand for higher education and the associated massive expansion of higher education systems. In response universities were called to adopt planning and research methods that would enable them to identify and address the needs of a larger, more diverse student body. Higher education institutions began to place greater emphasis on planning and marketing, seeking to maintain their position in an increasingly competitive higher education market. Under the current economic downturn, universities are under pressure to further cut costs while maintaining their attractiveness to prospective students.

As a result educational policy makers and administrators are called to select the ‘right’ alternatives, aiming for both efficiency and effectiveness in delivered outcomes. This book provides insights into the use of data as an input in planning and improvement initiatives in higher education. It focuses on uses (and potential abuses) of data in educational planning and policy formulation, examining several practices and perspectives relating to different types of data. The book is intended to address the need for the collection and utilization of data in the attempt to improve higher education both at the systemic and the institutional level.

"In a fast changing world of Higher Education, valid, reliable and meaningful data assume increasing importance as a factor in effective leadership and management. The wide ranging selection of essays provide state-of-the-art consideration of the technical and policy issues which underpin effective decision making in universities.”

– Professor Sir Howard Newby, Vice-Chancellor of the University of Liverpool

“This new book edited by Menon, Terkla and Gibbs will be an important resource for those of us in higher education for whom acquiring, reporting, understanding and most importantly using data have become a required core competency. This volume should also be useful to policy makers who are attempting to develop appropriate metrics for assessing institutional performance. While not avoiding the practical limitations and workloads associated with academic data, the editors’ orientation is positive as evidenced by their chosen title – Using Data to Improve Higher Education. The ensemble contributions of an impressive collection of chapter contributors navigate a balanced path of demonstrating the power of good data tempered by the caution that having good data is only a necessary, not a sufficient condition for robust decision making. The book’s final chapter of conclusions and policy implications employs an underlying theme of mission. This is insightful in that I am convinced that authenticity of institutional mission and the manner in which mission is used to develop and assess people and programs will be critical if the academy is to demonstrate its worth to an increasingly sceptical public.”

– Professor Vincent P. Manno, Provost and Dean of Faculty, Professor of Engineering, F.W. Olin College of Engineering
Using Data to Improve Higher Education
GLOBAL PERSPECTIVES ON HIGHER EDUCATION

Volume 29

Higher education worldwide is in a period of transition, affected by globalization, the advent of mass access, changing relationships between the university and the state, and the new technologies, among others. Global Perspectives on Higher Education provides cogent analysis and comparative perspectives on these and other central issues affecting postsecondary education worldwide.

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Using Data to Improve Higher Education
Research, Policy and Practice

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INTRODUCTION

Higher education systems and institutions are being faced with an unprecedented number of challenges, which call for new and innovative approaches to educational planning and decision making. A major challenge emerged with the phenomenal increase in the demand for higher education and the associated massive expansion of higher education systems in the second half of the twentieth century. In this context, universities were called to adopt planning and research methods that would enable them to identify and address the needs of a larger, more diverse student body. Additional challenges arose as economic developments led to a sharp decrease in government funding in many countries: Higher education institutions began to place greater emphasis on strategic planning and marketing, seeking to maintain their position in an increasingly competitive higher education market. Under the current economic downturn, universities are under pressure to further cut costs while maintaining their attractiveness to prospective students.

As a result, the risks associated with ineffective solutions to problems have increased both at the institutional and the systemic level. Educational policy makers and administrators are called to select the "right" alternatives, aiming for both efficiency and effectiveness in delivered outcomes. In this context, decision makers strive to make informed decisions, based on a thorough examination and analysis of relevant data. This book is intended to provide an insight into the use of data as an input in planning and decision making in higher education. It focuses on uses of data in planning and decision making, examining several practices and perspectives relating to different types of data.

Decision making theory highlights the importance of systematic research prior to the actual decision making and implementation stages, especially in cases of strategic planning. Educational administrators and policy makers are expected to engage in research by collecting and/or utilizing data that are, among others, accurate, relevant and timely. In this context, the book is intended to provide a basis for the examination of the quality of evidence used in decision making by examining different aspects of data utilization in higher education. These include the possible uses of data, strengths and weaknesses associated with different types of data, types of decisions informed by data, and issues linked to the quality of data (e.g. characteristics of data that render them useful).

The first part of the book provides an analysis of important aspects of the use of data in the planning and management of higher education, which include data collection methods and performance indicators in higher education institutions as
well as opportunities and barriers linked to the use of strategic and operational data in tertiary education. In the first chapter, the value of performance indicators in informing policy and practice in higher education is discussed. The author adopts a critical perspective, questioning the validity of many indicators and pointing to the possibility of “misuse.” Performance indicators can and should inform decision making in educational planning and policy making, but they should not be seen as a substitute for reflection and judgement. Chapter 2 provides an overview of opportunities and barriers to effective planning in higher education, focusing on data sources and techniques. It aims to provide direction and advice in relation to successful practices in the use of data for planning in higher education. The guidelines offered are informed by developments in management science, as well as by the personal experience of the authors. The effective use of data for strategic planning is linked to the presence of strong institutional leadership and the creation of a culture of inquiry. Chapter 3 presents the use of data as an input to institutional decision making at Tufts University in the United States. It presents a wide variety of techniques used in the collection and distribution of data in the context of a data-driven approach to decision making. In addition to describing data sources, the authors provide a discussion of the benefits and limitations of employing such techniques at the institutional level.

The second part of the book covers data relevant to the marketing of higher education institutions, with emphasis on the types of data used to build and promote the image of the university to prospective students. Chapter 4 deals with student feedback on the experience of higher education as it relates to institutional research data in the United Kingdom. The author discusses the purpose, results and value of student feedback, focusing on data provided by student satisfaction surveys conducted for more than two decades in the country. The chapter provides examples of changes in institutional strategy resulting from student feedback data and draws attention to the importance of involving students in the institutional improvement process. Chapter 5 investigates branding in higher education, examining branding concepts and objectives and the associated use of data in the implementation of a strategic approach to branding. The author discusses the importance of branding a university and the challenges of measuring branding in higher education. The need for more sophisticated data modeling in relation to branding activity in higher education is highlighted. Chapter 6 presents a research study using advanced statistical methods in order to evaluate students’ quality of academic life in Portugal. The authors provide an example of how specific types of data can be used in a structural model in the investigation of the relationship between the students’ quality of academic life and their intention to recommend, and remain loyal to, their university. The chapter ends with implications for higher education policy and recommendations for future research.

The third part of the book addresses evidence-driven decision making at the educational policy level through an examination of methods and data in the field of the economics of education. Chapter 7 consists of a presentation of methods and data associated with the estimation of the returns to investment in higher education. The author provides an overview of different methods of rate-of-return estimation,
with reference to their shortcomings. Evidence on the rates of return to higher education from different countries is provided and implications for educational policy are discussed, especially in relation to funding policies aimed at promoting equity and efficiency in higher education. Chapter 8 provides an overview of students’ expectations of the economic returns to higher education, through an examination of relevant methods and data. The data and methodologies of both early and recent studies on the topic are presented, along with their main findings. The author draws attention to differences in methodologies used to investigate the topic and points to new directions for future research. Chapter 9 tackles the issue of gender equity in higher education by looking at the determinants of the gender gap in annual earnings among college graduates in OECD countries. Data from 28 OECD countries are used to examine the association between fields of study in higher education and wage differentials between male and female graduates. The authors provide evidence that contributes to a better understanding of the link between higher education choices and the gender gap in the earnings of graduates. Chapter 10 deals with equality of opportunity in higher education, especially in relation to social class. An overview of relevant empirical findings is presented, with emphasis on data sets and methodologies employed by different authors. The authors point to the persistence of inequalities in opportunity and highlight the need for more refined data sets in the investigation of the topic.

The fourth part of the book addresses ethical issues in the use of data, with reference to cases of data misuse. Chapter 11 introduces the issue of student data privacy in the context of the discourse of surveillance and discusses the concerns this raises from an ethical point of view. The complexities and ethical dilemmas associated with the collection and analysis of data in higher education are examined. A student-centered analytics contract is proposed that will ensure a fair and student-oriented approach to learning analytics. Chapter 12 also deals with issues of privacy in higher education but does this in the context of higher education marketing. The author raises critical questions regarding advertising practices by higher education institutions and the use of data in ways that threaten individual privacy and integrity. The discussion of these questions leads to implications for the conceptualization and role of higher education in modern societies. Finally, Chapter 13 presents a case where data and experts were used to arrive at the “wrong” decision. Through a description of the events linked to the introduction and abolition of journal ranking in Australia, we learn that data-driven decisions will not necessarily be good decisions unless supported by sound judgement and proper management. The complexities of the adoption of a “data-strong approach” can result in many “unintended consequences” for higher education systems and institutions.

This book brings together a variety of perspectives on the use of data in decision making in higher education. Its contents draw from different fields of study and areas of expertise (e.g. higher education research, organizational theory, economics of education, higher education marketing). Its focus is on student data and their use in understanding the most important public of higher education and addressing its needs. Authors provide valuable insights into what can be considered good
practices in data collection and utilization in higher education. Different chapters reveal a host of issues to be tackled in the attempt to improve higher education through evidence-based strategies: Every stage of the data utilization process seems to be fraught with limitations and complexities. However, evidence-driven strategies clearly have a better shot at improving higher education than non-informed attempts to bring about positive change.

The increasing number and complexity of the challenges facing higher education systems and institutions will inevitably result in more attempts to collect and utilize evidence in the form of appropriate and relevant data. This book offers a basis for making better decisions with respect to data collection and use. Its value lies in that it can help researchers and decision makers answer critical questions that relate to the utilization of data in higher education: “what data should be collected?”; “what methods should be used to collect these data?”; “how can these data best inform strategic planning in higher education?” In attempting to answer these and other questions, the book adopts a critical perspective in the study of the topic, making it of interest to those who seek to study, understand and improve higher education.

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PART A

THE USE OF DATA IN THE PLANNING AND MANAGEMENT OF HIGHER EDUCATION
JOHN TAYLOR

INFORMING OR DISTRACTING? GUIDING OR DRIVING? THE USE OF PERFORMANCE INDICATORS IN HIGHER EDUCATION

INTRODUCTION

Contrary to widespread popular belief, the use of performance indicators in higher education institutions is nothing new. To take just one example, in 1916, the Dean of the Faculty of Engineering in the University of Bristol highlighted for the University Council the fact that, with 69 Engineering students, his Faculty was larger than similar Faculties at the Universities of Leeds and Sheffield with 59 and 68 respectively, and that this fact bore testimony to the “excellent reputation” of his Faculty compared with Faculties in cities that formed part of the industrial heartland of the U.K. In practice, the Dean, Professor Wertheimer, was using performance indicators and, moreover, was using such data to support claims for high quality and relative superiority. In this small example, drawn from nearly a century ago, can be seen some of the issues that continue to fascinate and, sometimes obsess, policy makers, leaders and managers in higher education, academic staff and students (past, present and future). Where did Professor Wertheimer obtain his data? Were they reliable? In particular, was it legitimate to draw conclusions about relative quality based on such data and to use this information to influence policy?

Today, interest in the development of effective performance indicators and their use within higher education has never been greater. They exist at many different levels: system wide and at national level, to monitor and compare the performance of different countries with each other and over time; within particular nations, to consider the performance of individual institutions over time and against prescribed criteria for comparison, and, increasingly, to inform resource allocation; within institutions to assess levels of achievement of different organizational units (Faculties, Schools and Departments, both academic and professional services), and to guide strategy and funding decisions; and at the level of the individual member of staff, to shape their personal career development and decisions. This paper considers some of the issues raised by this emphasis on performance indicators and, in particular, discusses how they are applied and used in practice. Are performance indicators merely a “management fad” or do they offer real value for higher education, both in terms of policy formation and evaluation? To this end, the paper questions the validity of many indicators and suggests that an over-
dependence on performance indicators may lead to an erosion in well-informed decision making.

**SOME INTERNATIONAL PERSPECTIVES**

In Europe, the increasing use of performance indicators in higher education over the last 30 years is widely associated with the emergence of ideas of “new public management” or “new managerialism” and with the concepts of “the evaluative state” (Neave, 1988) and “the audit society” (Power, 1997). Many of these ideas have their roots in a suspicion of the public sector. Neave refers to the movement towards *a posteriori* evaluation, looking at how far policy objectives have been met through control of the product rather than control of the process. Considering higher education in the Netherlands, Maassen and van Vught referred to the use of performance indicators as “an example of the way government wants to replace the former *ex ante* control mechanism of the performance of higher education by an *ex post* evaluation mechanism” (1988, p. 73). Similarly, Ferlie, Pettigrew, Ashburner and Fitzgerald (1996, p. 11) stress that the Conservative government in the U.K. in the 1980s, responsible for reforms such as the selective funding of research and increasing transparency in the public funding of higher education, led by Margaret Thatcher, viewed the public sector as “bloated, wasteful, over-bureaucratic and underperforming.” Funding had to be justified on the basis of results, and this process demanded the use of measures of performance. Moreover, advocates of this approach often shared a philosophical as well as a practical adherence to such methods, arguing that, by revealing different levels of performance, institutions would strive to improve their achievements relative to “competitors.” In this sense, the emphasis was on stimulating competition, or institutional rivalries, rather than on the creation of markets as such, and this process was accelerated by the “league tables” and rankings that began to appear, in the press and among university managers in the 1980s and 1990s.

Bleiklie (1998) noted that the reforms in higher education in the 1980s and 1990s were driven by an increasing emphasis on economic growth and, in particular, efforts to increase the numbers of students in higher education and to produce graduates more efficiently. He refers to a conviction “that greater efficiency can be achieved by means of performance indicators” and to the importance of “production goals, the mobilizing of resources and support by incentive systems” in achieving efficiency in both teaching and research (p. 307). More specifically, referring to the implications of such changes, Bleiklie comments as follows:

... the notion of academic performance is redefined from one which emphasizes its “inherent” quality to one in which measurable quantitative aspects are prominent. Here, qualitative considerations are presumed to be implied by the performance indicators employed. Thus, academic activity is open to external scrutiny by higher administrative authorities. Disciplinary competence is thus no longer necessary to evaluate disciplinary performance.
Performance indicators, such as number of candidates produced, books and articles published in respected journals, all provide simple standard information graspable by the meanest intelligence. (p. 308)

Bleiklie here refers to academic performance, but in reality such arguments can be applied to all forms of institutional activity, including financial performance and the use of physical infrastructure.

Looking more broadly at the concept of “the enterprise university,” Marginson and Considine (2000) discussed trends in governance within higher education, including new forms of executive power, increasing management flexibility and control, financial devolution and reduced involvement of academic disciplines. They note that “it has become possible to manage organizations without involving more than a few people in decisions” (p. 249). What needs to be emphasized, perhaps, is that such developments were critically dependent on the application of performance indicators. Within the context of “new public management,” the advent of new performance indicators provided managers with a legitimacy and an assumed authority based upon “facts” and irrefutable “evidence” and on performance relative to targets that were quantifiable and measureable over time and in comparison with other institutions or individuals.

Continuing these themes, in 2005, Deem and Brehony distinguished between “new public management,” with its roots in public choice theory and the development of quasi-markets, and often associated with regulatory reform, and “new managerialism,” which represents an expression of a fundamental ideological approach to the organization and delivery of public services, such as higher education. They discussed some of the characteristics of “new managerialism” in higher education, including the monitoring of employee performance and the encouragement given to self-monitoring and “new kinds of imposed external accountability, including the widespread use of performance indicators and league tables, target-setting, benchmarking and performance management” (p. 220). Of particular significance in thinking about the use of performance indicators, Deem and Brehony refer to “heavy emphasis on importing ideas and practices from the private world of business into the world of public service, on the assumption that the latter are (inferior) to the former” (p. 220).

Elsewhere, the key drivers in the use of performance indicators were slightly different, less interested in changing management practice and more concerned with the demonstration and enhancement of quality and with the demonstration of institutional diversity. In the U.S., there are long traditions of institutions collecting and publishing information on academic work and standards, motivated mainly by the desire to distinguish themselves within a highly competitive and diverse market. Thus, universities in the U.S. were leaders in the development of institutional research as a branch of institutional management. The term “performance indicator” is less well established in the U.S., but many of the measures routinely used helped to influence practice elsewhere in the world in the 1980s and 1990s. Hufner and Rau (1987) observed that
the U.S. market type of interaction in higher education has led to extensive and long-standing academic research activities in the field of performance indicators ... (and) the experience gained in the U.S. in developing, applying and modifying quality/performance indicators/measures in higher education ... (became) a methodological-theoretical starting point for similar attempts in Europe. (p. 6)

However, it would be wrong to see the use of performance indicators in the U.S. as totally benign, influenced purely by a desire to distinguish between institutions and enhance quality. Many U.S. states have sought to exert closer control over higher education through systems of accountability and funding based on performance. In 2001, Burke and Minnassians considered the methods used by different U.S. states to this end, highlighting the use of performance funding, which centered upon the distribution phase tied to actual performance and particular indicators, and performance budgeting, which linked resource allocation to specific measurable targets. Either way, the use of performance indicators was central to the process. Thus, it is possible to identify three further concepts, performance reporting, performance funding and performance budgeting, each of which is dependent upon the use of performance indicators.

Similarly, in Australia and New Zealand, whilst the move towards increasing use of performance indicators shares some of the philosophical underpinning witnessed in Europe, many of the strongest influences have been highly pragmatic. In Australia, the use of performance measurement in the 1990s was closely associated with the desire to monitor quality at a time when the higher education system was growing, but funding was being reduced; the encouragement of competition between institutions was, to advocates of such change, a welcome by-product of performance indicators rather than the primary motivation. Quality assurance was also a major concern in New Zealand, although performance indicators were also associated with the neo-conservative reforms that were experienced in the 1990s (Bruneau & Savage, 2002).

Clearly, the rationales for embedding the use of performance indicators within higher education can vary over time and will reflect a complex melange of local and national contextual factors. However, recognizing that such distinctions may be blurred in practice and that in reality both sets of drivers may be at play at a single point in time, it is possible to identify some of the key drivers and to distinguish between philosophical “push” and more pragmatic “pull” motivations: Philosophical drivers
   – To enhance public accountability and scrutiny.
   – To justify reductions in public expenditure leading to demands for increasing efficiency.
   – To encourage competition between institutions and individuals, in the belief that competition will achieve increased quality and efficiency.
   – To provide a source of information for stakeholders, thereby enhancing elements of choice for “consumers” of higher education.
THE USE OF PERFORMANCE INDICATORS IN HIGHER EDUCATION

– To challenge the domination of academic “vested interests” by providing measures that can be understood and applied by other stakeholders.

*Pragmatic drivers*
– To effect reductions in public expenditure – as a decision-making tool, as a means to monitor change.
– To encourage and measure increasing efficiency, either required by reduced resources or by system growth or both.
– To monitor quality, especially in teaching and research, both for regulation and for use in funding decisions, and to encourage improvements in the system.
– To support better policy formation and implementation by the provision of evidence and data, including comparative analyses.

LEARNING FROM THE WORLD OF BUSINESS

It has already been noted that a feature of “new managerialism” within higher education has been the desire to mimic business practice. In seeking to understand the use of performance indicators in higher education, therefore, it is worth considering further how performance is viewed in the business world, at least from a theoretical perspective.

An important starting point is in the concept of performance management. Bititci, Carrie and McDevitt (1997) argued that performance management is an integrated control system whereby all business processes, activities, tasks and personnel are directed towards the achievement of corporate strategy and within which performance is measured to indicate progress towards this end and to inform necessary management decisions. A similar emphasis on the importance of strategy in the world of business is developed by Ferreira and Otley (2009); indeed, this model has recently been applied within higher education by Franco-Santos, Rivera and Bourne (2014) who define performance management as “the evolving formal and informal mechanisms used to ensure the institution attains its aims and objectives satisfying its stakeholders and being sustainable” (p. 9). Thus, performance is intimately linked with ideas of mission and strategy, and with seeking to achieve the optimum deployment of resources for corporate success.

Performance management depends critically upon performance measurement. The underlying premise may be summed up by attitudes such as “what gets measured, gets done” and “if you can’t recognize success, you can’t reward it, and if you can’t recognize failure, you can’t remedy it.” Performance indicators are therefore fundamental for quality improvement and lie at the heart of ideas such as Total Quality Management (TQM), many of which originated in the manufacturing industry but which have permeated higher education. In this context, performance indicators may be used not only to consider whether a particular goal has been achieved, but may also be used as a diagnostic tool, to help with process improvement or to identify particular problems. Some key questions may be proposed:
– How well are we doing?
– Are we meeting our goals?
Are our customers satisfied?
Are changes needed?
The model for developing performance metrics developed in the U.S. by the University of California identifies eight key elements of the production process that may be measured:
- Alignment with organizational mission
- Quality of product (meeting customer needs and expectations)
- Timely delivery
- Cost reduction and/or avoidance (efficiency of operation)
- Cycle time reduction
- Customer satisfaction
- Meeting legal requirements
- Meeting other agreed commitments

Here, the lessons from the business world are very clear. Performance indicators are driven by strategy and, in particular, by customer satisfaction, as the essential prerequisite for profit and success. Each of these eight stages can be applied within higher education.

The model also describes the process to be undertaken in the development of performance indicators. Significantly, an underlying principle is the involvement of those individuals closest to the activity to be measured since it is those individuals who understand most about the work concerned. Once these individuals have been identified, there are four stages within the process:
- Identify critical work processes and customer requirements
- Identify critical results desired and align them to customer requirements
- Develop measurements for the critical work processes or critical results
- Establish performance goals, standards or benchmarks

Performance indicators may be uni-dimensional, comprising a number and a unit (e.g. the number of items produced) or multi-dimensional (e.g. the number of items produced per worker); indeed, they may also be further developed to offer a longitudinal perspective showing change over time and indicating trends for a particular indicator.

Finally, a number of key characteristics have been identified for the design of good performance indicators:
- Need to be externally driven (reflecting the views of customers) as well as internally driven (reflecting the views of managers)
- Need to provide an agreed basis for decision making, based on broad acceptance of their value and method of calculation
- Need to be simple to understand and based on agreed sources of information
- Need to apply at all levels of the organization, from strategy to delivery, and across all employees, including senior management
- Need to be precise and unambiguous
- Need to be cost-effective in terms of collection and data analysis

It is important to stress that there is no single approach to the use of performance management and performance indicators in the business world; nor is there necessarily any substance in the idea that business organizations are better
managed than their university counterparts. Moreover, whilst higher education institutions may be increasingly “business-like,” there remain very significant differences between most universities that remain “not-for-profit” and driven by multiple objectives and “for-profit” businesses. Nevertheless, there are some important points of emphasis in the use of performance indicators in the business sector that can be seen as lessons that have influenced higher education, representing either “good practice” or a “bad influence,” depending on the view taken of “new managerialism” in higher education. These include:

– The importance of corporate vision and strategy in driving the design and use of indicators
– The use of indicators as a diagnostic tool for improvement and not just as a means of scrutiny
– The importance of stakeholders in shaping the use of performance indicators, and especially the significance of using indicators linked with customer or consumer satisfaction
– The need to embrace a performance culture that applies at all levels within the organization
– The need to use indicators that are simple to calculate and easily understood

The influence of business management on higher education is often criticized and unwelcome. Interestingly, these factors suggest that it may be the crude, simplistic adoption of assumed business practice that is to blame, sometimes applied without real understanding or with ulterior motives, and that, in reality, some forms of business practice may offer a subtlety and breadth of application of value to higher education; shared ownership of performance measures and the use of indicators to shed light on process improvement are examples in practice.

PERFORMANCE INDICATORS IN PRACTICE

Many of these themes can be observed in developments in the use of performance indicators in Europe. The lead was taken by the U.K. Whilst indicators had been used informally by many institutions to assess their performance relative to competitors or peer group institutions, the roots of present usage lie in the changing financial environment of the 1980s. Reduced funding compelled higher education institutions to consider value for money and efficiency of operation; relative unit costs became an important aspect of management information. With increasing selectivity in funding, especially in research, there were pressures to be more transparent in decision making, based on verifiable data (as distinct from perceived reputation). At the same time, government was challenging institutions to become more accountable to their “stakeholders,” including students and employers as well as the wider general public. Against this background, the 1980s saw mounting concerns about quality and the need to demonstrate that standards were being achieved. A new emphasis began to be placed on institutional management – another feature of “new public management” and “new managerialism.” In this context, in 1985 the Jarratt Report, significant for its emphasis on the role of Vice-Chancellors as “Chief Executives” and for its stress on the responsibility of
University Councils to lead and manage their institutions, also drew attention to “the lack of systematic use of PIs” (Jarratt, 1985, para. 3.31). Significantly, Jarratt complained that, hitherto, much information had been collected by universities for “administration and not for management” (para. 3.33); he urged that “a range of performance indicators should be developed, covering both inputs and outputs and designed for use both within individual institutions and for making comparisons between institutions” (para 3.36).

Jarratt viewed performance indicators as a key management tool to assist university leaders and managers to shape and run their institutions more effectively. In this view, the report was reflecting practice from the world of business and industry. However, the approach from government, whilst moving in the same direction, was significantly different in its emphasis less on informed decision making and more on fiscal savings and value for money. In The Development of Higher Education into the 1990s (DES, 1985), a green paper that reflected much of government thinking at that time, it was argued that:

The essential purposes of performance management in education are to introduce into considerations of policy and the management of the education system at national and institutional level some concrete information on the extent to which the benefits expected from education expenditure are actually secured, and to facilitate comparisons in terms of effectiveness and efficiency as between various parts of the system, and as between different points in time. The pursuit of value for money in higher education can only be successful if it is based on an analysis of benefits and their related costs in different activities. There are significant difficulties in measuring performance in higher education …. But the effort has to be made if the government is to pursue its objectives of controlling public expenditure and of making the most effective use of the taxpayer’s money; and if institutions and others concerned with higher education planning are to be fully informed in taking their decisions on the allocation of the resources available. (p. 49)

Thus, reductions in funding underpinned two related rationales for the increasing use of performance indicators: improved decision making and enhanced use of public funds, and both were associated with greater transparency and public accountability. Here, therefore, are some of the initial forces behind the increasing emphasis on performance indicators in the 1980s. The outcome was a period of intense activity by the University Grants Committee (UGC) and the Committee of Vice-Chancellors and Principal (CVCP) examining the nature of the performance indicators to be adopted. A joint working group of the CVCP and UGC submitted a series of reports. A comment made in a 1987 report regarding a list of 39 indicators proposed by the working group a year earlier is, perhaps, as relevant today as it was then and still prompts heated debate: The report noted that the 1986 indicators were felt by some “to emphasize inputs and quantitative measures as opposed to outputs and qualitative results” (CVCP/UGC 1987, p. 4). However, the 39 indicators, subsequently extended to more than 50 indicators, became the basis of
THE USE OF PERFORMANCE INDICATORS IN HIGHER EDUCATION

an annual publication into the 1990s. These indicators were grouped by the following broad themes:
– Expenditure in academic departments
– Staff and students
– Expenditure on central administration
– Expenditure on libraries
– Expenditure on computer services
– Expenditure on premises
– Expenditure on careers services and student organizations
– First destination of first degree graduates
– Qualifications of undergraduate entrants

Over this same period, the U.K. was also developing the Research Assessment Exercise (RAE), an instrument to assess the quality of institutional research and thereby to guide the allocation of resources. The combined effect of these two developments was to familiarize the U.K. higher education system with the regular use of performance indicators at national level.

Today, with responsibility for higher education devolved, it is less easy to identify a single U.K. approach to the use of performance indicators. Nevertheless, in 1998, following the Dearing Report, *Higher Education in a Learning Society*, the government asked the four U.K. funding bodies to develop a series of suitable indicators and benchmarks of performance in the higher education sector, bearing in mind their diversity and the needs of stakeholders. Four sets of indicators were developed covering widening participation, non-completion, research output and employment of graduates. The first set of indicators in this format was published by the Higher Education Funding Council for England (HEFCE) in 1999; responsibility for production subsequently passed to the Higher Education Statistics Agency (HESA) in 2004, but the format has remained almost unchanged to date. This exercise is supervised by the U.K. Performance Indicators Steering Group which brings together representatives of the funding councils, government departments, HESA, higher education institutions and other interested bodies. Significantly, the performance indicators are published with the stated aim of providing data that will provide:
– reliable information on the nature and performance of the U.K. higher education sector
– the basis for comparisons between individual institutions of a similar nature, where appropriate
– benchmarks for use in institutions’ consideration of their own performance
– evidence to inform policy developments
– information that contributes to the public accountability of the higher education sector

At the time of writing this paper, a review of these national performance indicators is in progress. Whilst this review has challenged the utility of some of the present statistics, it is unlikely that significant changes will result. In reality, the agenda has changed. Over the years, U.K. higher education institutions have come to accept, perhaps reluctantly, the provision of national performance data while
many of the dire consequences foreseen when the debates began in the 1980s have not been realized. Performance indicators may, indeed, be a tool of "new managerialism," but it is their implementation within institutions, rather than at national level, that now excites most interest.

Following the lead set by the Jarratt report, higher education institutions have come to apply performance indicators across a wide range of activities:

**Strategy**

Most universities will use performance indicators to assist in the formulation of strategy at all levels within the organization (Institution, Faculty, School, Department, Service). This may take the form of benchmarking against a peer group of comparative or competitor institutions and will normally have a longitudinal aspect to show trends, both favorable and unfavorable. Indicators may be used for analytical purposes (as part of environment scanning or self-evaluation) or for target-setting, or both. Data are normally prepared from published sources (especially using national statistics from HESA). Commonly used data include income and expenditure across different heads, student recruitment (including entrance qualifications and background), graduation and employability and research performance. Methodologies, such as the balanced scorecard, may be used to bring together a set of indicators offering different institutional perspectives. Most institutions will use a set of key performance indicators (KPIs), normally comprising a relatively small number of indicators that are central to the achievement of institutional mission, and which are long-term in nature; KPIs will vary in detail between institutions, but will normally change only when an organizational goal has been achieved or if a major change in direction is to be undertaken. Performance indicators at the institutional level linked to overall strategy require to be “owned” at a senior level, by the University’s governing body and by the senior leadership of the institution. They should form the basis of regular reporting and review with the intention of making any necessary changes within implementation. Similarly, performance indicators used in the development of strategy within particular organizational units require both ownership and a long-term perspective.

**Management**

Performance indicators also form an important management tool for monitoring progress against agreed targets. Again, these indicators may cover a wide range of activities spanning the whole institution and they may represent either a snapshot in time or be longitudinal in nature. The indicators may be used both to measure progress towards particular goals or may be used as a means for the identification and diagnosis of shortcomings. They may apply to specific organizational units, but are commonly associated with forms of performance management, a concept that is widely regarded with suspicion within higher education. Franco-Santos et al. (2014, p. 9) found that
The phrase performance management … is primarily perceived as being associated with individual performance appraisals or the management of poor performance. Performance management has negative connotations for the majority of people … especially those in academic roles. The phrase is not part of the common lexicon of most HEIs. Indeed, institutions often avoid it and adopt alternative phrases such as “performance review” or “personal review.”

Such performance indicators may be more tactical and short-term in nature, varying more frequently in line with changing operational plans and working conditions. Many of these indicators are personal, operating at the level of individual members of staff (e.g. indicators of student satisfaction with a particular course unit or measures of research activity, such as papers published or income earned). They are commonly seen as intrusive and threatening, and as a threat to notions of academic freedom; many indicators are seen to measure quantity rather than quality; and indicators are widely associated with “league tables” and rankings. Such criticisms are often loud and heartfelt. However, it is also important to view the use of performance indicators in a less emotional and possibly more objective way. Commonly performance measures are used by academic staff themselves to compare levels of activity; use of indicators is very far from being the preserve of institutional leaders and managers. Moreover, it is often less the indicators themselves that are being criticized than the way they are being used. Thus, uni-dimensional indicators may simply record a point of fact (e.g. a number of students or a sum of money); it is their use without contextual explanation or understanding that is really to blame and sometimes their highly subjective combination with other indicators, possibly complicated further by the use of even more subjective weightings.

Efficiency

Universities have become increasingly concerned with matters of cost. This reflects reductions in levels of public funding, the drive to develop alternative sources of funding and increasing pressures for accountability. Thus, indicators such as cost per student by different subject areas and organizational units, have become familiar within institutions and as a point of comparison with other institutions. Again, the use of such indicators often prompts debate. On the one hand, it can be argued that institutions have a responsibility to understand their cost base, especially in the expenditure of public funds; on the other hand, the resulting performance indicators can form a crude instrument in the absence of deep and broad contextual understanding. In practice, within an increasingly competitive environment, decisions on relative fee levels or the pricing of research are heavily dependent upon accurate costing information.
Quality

Issues of quality have been central within U.K. higher education institutions since the 1990s. Whether the emphasis has been on quality assessment, assurance or enhancement, universities have placed considerable emphasis on the use of performance indicators. Initially, most indicators measured inputs, such as entrance qualifications, and outputs, especially progression and completion rates. Such data were used to highlight areas of perceived strength or weakness, and thus served both as a regulatory tool and for diagnostic purposes. These indicators continue to be widely deployed. However, the last ten years have seen an important shift towards indicators that aim to measure the quality of the student experience, especially from the perspective of the student who, arguably, may be seen as the “consumer” or the “customer.” Hence, most universities have developed student satisfaction surveys, undertaken at various points from before entry to after graduation, to obtain feedback on the quality of academic programs and the wider student experience. Such information, which complements the development of national indicators in the form of the National Student Survey, reflects an important move from indicators influenced by academic priorities and staff perceptions of quality to measures of whether students are happy or unhappy with the courses and services they are receiving. Put another way, the emphasis has shifted from supply-driven to demand-driven indicators of quality. Moreover, continuing the theme of increasing marketization and choice, universities have now been compelled to publish key sets of performance data relating to the courses they offer, including completion rates and employability statistics. In this way, the performance indicators used by higher education managers for quality purposes have also taken on a wider role associated with transparency and student choice; indeed, the performance indicator, if it tells a favorable story, has become a marketing tool, a means to attract students and a means to convey a message about university profile and brand.

Resource Allocation

Many universities now use performance indicators to influence internal resource allocation procedures. This can take the form of formulaic models where levels of achievement directly drive the core funding that is allocated; alternatively, indicators, normally associated with specific performance targets, can be used to justify additional or reduced marginal funding, either as a “bonus” for good performance or as a “punishment” for under-achievement. Both approaches are forms of performance-based funding, and are dependent upon the use of agreed, transparent performance indicators. Such funding methods are commonly used to fund academic departments or services, especially in universities that seek to reallocate income to support university-wide strategy, but even universities that pursue more income-driven resource models, with less central direction, commonly apply performance-driven funding for particular activities. Here it is possible to see the use of performance indicators as linked with motivation and with notions of
Incentives. Indicators are used to identify and then reward performance that meets or exceeds targets or expectations, and may apply across whole organizational units. The same principle is now being applied increasingly at the level of individual members of staff, and most universities now apply some form of performance-based remuneration for staff, commonly restricted to senior managers and leaders and normally applied as a % bonus on top of core pay (say 5% or 10%) assessed by a remuneration committee. Such schemes are often highly contentious, raising the prospect of very substantial additional payments for staff concerned. As with other sectors of the economy, the application of “bonus” payments for individuals who, it could be argued, are already relatively well paid and who are “doing their job” can be divisive; on the other hand, it may be argued that such schemes reflect the need to recruit and retain outstanding leaders and managers within a competitive market. Again, perhaps, as with other issues concerned with the use of performance indicators, part of the problem relates to transparency (or the lack of it) and to the nature of the precise indicators in use. Further, in many universities, performance-based funding tends to work well within a positive funding environment; allocating additional funds as a “reward” is relatively simple and relatively uncontroversial, but taking away funds as a “punishment” is difficult to implement (at department level, jobs may be at stake) and highly contentious. The importance of placing performance indicators within a proper context and of developing a true understanding of the cause and effect factors that underlie particular measures is also highly pertinent; in other words, performance-related payments need to be fully and publicly justified.

Considering the use of performance indicators in higher education institutions, across all five areas of activity (strategy, management, efficiency, quality and resource allocation), it is clear that significant responsibility rests with those individuals who set the measures to be applied, and who are responsible for the presentation and interpretation of data. One of the important factors that has contributed to the growing availability and use of performance indicators is the use of new technology. Modern computing applications mean that huge amounts of data can be stored and manipulated in ways that were never contemplated a generation ago; performance indicators can be stored on mobile phone or tablet and can be used “instantly” to make a particular point or to support a specific case. This creates an important challenge for university leaders and managers; such ease of access can raise dangers as well as advantages and can foster the inappropriate use of data. From the vast array of potential indicators that may be calculated, which really are the most relevant and important measures to be used? Moreover, what are the indicators actually demonstrating? What do they mean? Commonly, the answers are ambiguous or complex. Herein lies a fundamental point. Performance indicators represent a very accessible and apparently simple tool for management – a unit or an individual is either meeting or not meeting a target, and by a demonstrable extent. However, such simplicity, whilst superficially attractive, is also fraught with potential dangers. Performance indicators have much to offer university managers and wider staff, but they require full understanding and sensitive awareness of the operating environment within which they have been
applied. This includes a knowledge of potential flaws in underlying data and a willingness to react accordingly. Today, performance indicators emerge from many different areas of professional management, including planning, finance, human resources, marketing, estates and buildings, and quality assurance departments. The staff who work in such departments need the time and commitment to move beyond the mechanistic production of performance indicators; they need to be able to uncover the background and to be able to explain and interpret the indicators in use. They also need to balance the demands of producing accurate, helpful management information with the growing expectations to produce data for a particular end or to support a specific, pre-determined management objective. Expert staff may be an information authority, but they may also be the “spin doctor” (Taylor, Hanlon, & Yorke, 2013). Performance indicators are a powerful tool; with such power come unprecedented levels of responsibility in their use for all university staff.

USING PERFORMANCE INDICATORS IN HIGHER EDUCATION: SOME FINAL THOUGHTS

The development and use of performance indicators in higher education prompts much debate and argument, both at national level and within institutions. As stated from the outset, there is nothing new in the use of performance measures. However, it is possible to trace the impact of “new public management” and “new managerialism” on the use of performance indicators, and especially the influence of lessons learned from the business world. At one, very simple, level, indicators represent a means to provide useful information regarding particular outputs or processes. However, it is their association with new forms of management and control, with “league tables” and rankings, and with over-simplified, insensitive individual assessment that has contributed to subsequent problems. Moreover, performance indicators have contributed to the increasing awareness of quality issues within higher education and to the shift in emphasis from the dominant interests of academic staff (supply) to the needs and expectations of students (demand). They have also been fundamental in opening up a wider appreciation of university funding and outputs, beyond a small, closed group of leaders and managers to the wider institutional community, and to the wider world of stakeholders. Performance measures have been important in underpinning further accountability and transparency within and between institutions. They cannot simply be dismissed as a management fad, as something imported from the business world and a distraction from the true purpose of higher education and as the preserve of a new management cadre; rather, they provide access to important, useful information that, used properly, can add value to university management and benefit the higher education community generally.

However, some important issues remain, and are relevant to the use of performance indicators at all levels, from system-wide analysis to the individual member of staff:
Quality of Data

Underpinning the development of good performance indicators must be strong data. It is important to look beneath a superficial message to understand how source data have been compiled; in particular, it is important to appreciate how such data can be manipulated, not least by universities themselves in order to optimize their position. There is sometimes an assumption that data, especially numerical statistics, are “right” and therefore have some inherent authority, without recognizing that such data require an appropriate methodology. Other data may be influenced, or distorted, by bias and prejudice or by misunderstandings; some forms of student evaluation are a case in point.

Types of Data

Important questions remain about the types of data used and the nature of the subsequent indicators. For example, many performance indicators rely on input measures (such as research income or student numbers), but it is widely contended that indicators based on output measures (such as papers published or student graduations) are more meaningful. Similarly, the importance of a time series is clear, to show trends in performance rather than achievement at a snapshot in time.

Methods

It is important that performance indicators (essentially a quantitative measure) are balanced with other forms of research inquiry. In particular, in order to understand the meaning of a specific measure and to understand the context for the activity in question, it may be necessary also to undertake some qualitative research (such as interviewing key actors). This may require time and effort, but will lend additional depth and credibility to the performance indicators in use; too often, the weight attached to individual measures is unjustified.

Quantity or Quality

One of the most important debates relating to the use of performance indicators concerns the measurement of quantity rather than quality. This debate is especially vigorous in the context of research assessment; is one paper in a journal perceived to be of high quality “better” or “worth more” than two papers in a lower ranking journal? In response, it is clearly important to use such data with sensitivity; crude statistics do not tell the full story. Sadly, performance indicators have been associated with a move towards quantity rather than quality. This is a clear risk, but is not necessarily true if the indicators are appropriately designed and applied.
Using Performance Indicators

A theme that recurs throughout this chapter is that problems and misunderstandings often arise less from the performance indicators themselves and more from how they are used. The importance of understanding the context within which the indicator is sited cannot be under-estimated, but is so often missing from higher education management. Performance indicators can be an invaluable diagnostic tool to reveal issues and problems to be overcome. They should form part of the armoury of information available to policy-makers and managers, but they should not be applied slavishly or formulaically or without question. Rather, they represent a guide; they should prompt questions, not answer them.

Transparency and Agreement

The most successful performance indicators should be transparent, using openly accessible, verifiable information and a clear methodology. When applied through performance management and performance funding, they should be realistic and fair. Similarly, as part of quality assessment and enhancement, it is important that indicators are developed in association with staff concerned, both to ensure that the measures are appropriate and to obtain some degree of “ownership” of the process.

“Apples and Pears”

One of the most unfortunate aspects of the use of performance indicators is the temptation to adopt “broad-brush” comparisons, sometimes across whole institutions (e.g. comparing research inputs and outputs in, say, the physical sciences, with, say, the humanities). This sort of approach overlooks the very deep differences of practice within most universities, and even within particular subject areas. Performance indicators that seek to combine “apples and pears” within a single measure will rapidly lose credibility and have little or no value. Rather, indicators need to be developed that reflect local working practice; one size does not fit all.

Drawing False or Unjustified Conclusions

At the start of this chapter, the example is cited of Professor Wertheimer at the University of Bristol who quoted some simple performance indicators referring to student numbers and then made an inference about quality. In reality, the figures that he used were not measures of quality and his statement cannot be justified. However, such practice and such errors are commonplace. Performance indicators are commonly interpreted wrongly and are used to draw false conclusions, losing their validity as a result; sometimes their meaning is “extended” to suit a political purpose. Policy decisions based on such evidence are even more questionable. In using any measures of performance indicators, it is important to remember that “two plus two equals four” and nothing else.
Decision Making

Performance indicators should inform decision making, but they are not a substitute for reflection and judgement or for debate. Too often, performance indicators are an excuse that allows leaders and managers to opt out of their responsibilities to take considered decisions. They are seen to provide “fact” and “evidence” and can become an end in themselves, rather than a means to an end. In reality, policy should be shaped by strategy and needs (and performance indicators have a crucial role in underpinning this approach), but should not simply reflect indicators of prior performance.

Performance Culture

It must be recognized that the use of performance indicators can often be challenging and threatening. Even if well designed and owned, they can reveal under-performance and weakness. In this context, it is important that all staff face the same pressures. Performance indicators should apply at all levels of the organization and there should be no groups (especially senior managers and leaders) immune from such analysis.

User Perspectives

There are sometimes dangers arising from the use of performance indicators that are devised and applied solely within the institution. Indicators that reflect external or “user” perspectives (including students or funders of research activity) can often provide important alternative perspectives.

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Performance indicators are here to stay and will continue to play an important role in the management of higher education institutions. They can fulfill an important part in suggesting areas for improvement and in enhancing the understanding of relative performance at all levels within the institution. The main question facing institutions is not whether indicators should be used; rather, it is how they are used, and this question forms a key challenge for today’s university leaders and managers throughout the world.

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OPPORTUNITIES AND BARRIERS TO EFFECTIVE PLANNING IN HIGHER EDUCATION

Data Sources and Techniques

OVERVIEW

Two imperatives for better use of data confront higher education. The first is driven by external factors while the second is driven internally by continuous quality improvement. Steep declines in financial and public support have driven efforts by governments to collect data that support the proposition that institutions are accountable for the revenue they receive. Working from a defensive posture, many colleges and universities have been able to waylay undesirable changes by satisfying external requests for data. At a higher level, however, those institutions that deliberately use data to improve overall performance meet compliance-based requirements while enacting a future that is informed by data.

The proposition that higher education’s approach to data use has changed very little may be disputed. At the same time, it also is clear that technology has made new conversations possible. New techniques including analytics or predictive analytics provide institutions new opportunities to use data to improve their efficiency while better serving students (see, for example, Bichsel, 2012 and WCET, n.d.). Colleges and universities are entering an era in which strategic information about student learning and success, budgeting, and efficiency can be united under the umbrella of big data.

Higher education is now collecting more data than ever before. However, these efforts are most often directed at the first imperative, compliance reporting, rather than the second imperative, improving institutional strategy. Forward thinking institutions will quickly resolve this seeming dichotomy. They will seek opportunities to build capacity, remove constraints to span existing boundaries that determine data use and find ways to bring data and strategy together. The result can advance institutional mission, meeting external policy demands and improving student success.

In a time of shifting demographics and disruptive technology, strategy takes on a higher priority in planning and college operations. George Keller’s landmark book Academic Strategy (1983) is as relevant now as when it appeared four decades ago. Among Keller’s sage observations is that the “strategic planning concentrates on decisions, not on documented plans, analyses, forecasts and goals” (p. 148). While data and analysis are critical, there is always room in any planning
process for educated guesswork. While educated opinions can drive decision making, the power of data to drive decisions is indisputable.

Strategic thinking and the data that serve those strategies come at a price. In this chapter, we review both opportunities and barriers associated with creating and using actionable strategic and operational data. We also identify successful steps for data use based on our experiences in working with higher education institutions to facilitate strategic planning and to create cultures of inquiry and evidence. We also survey emerging technologies and their promise to help institutions help their students. This chapter is intended to provide practical advice and not to provide a theoretical overview of the tenets of strategic planning. Institutions sufficiently courageous to engage in a data journey require support. Toward that end, this chapter also provides advice drawn from personal experience and new developments in management science to help navigate these new pathways.

**EFFECTIVE PLANNING: OPPORTUNITIES AND BARRIERS**

Two significant approaches to data use drive institutional behavior: (1) purposeful engagement and (2) adroit leadership. The first approach is captured by Alicia Dowd (2005) who argues that “data don’t drive” higher education institutions unless faculty, staff, and administration are engaged in thoughtful interpretation of data that demonstrate results, especially in modifying instructional approaches. In our experience such exchanges have been quite rare, although now growing, throughout colleges and universities nationally. Where these conversations exist, they are most productive when their foundation is collaborative inquiry and when participants are receptive to discovery. In those cases, college and university stakeholders draw upon both quantitative and qualitative data to explore their current performance. To this end, inquiry and well-formulated questions are more important than the data at hand.

The second element, leadership, also shapes how institutions engage in the data journey. One paradox before leadership is the difficulty in marrying innovation to empirical rigor (Lafley, Martin, Rivkin, & Siggelkow, 2012). We believe institutions can and must pursue innovation, the use of actionable data, and foster deeper conversations about student success simultaneously. To do so requires nimble and courageous leadership as well as a willingness to nurture a culture of inquiry and high expectations for improved performance.

Institutions vary widely in their capacities to use data owing to their culture, available personnel, and financial resources. These factors can be used to assess any institution’s capacity to fully engage in using data. The authors have worked with resource-poor institutions that have just begun to grapple with using data, at one extreme, to institutions with ample resources to gather, use, and employ data, at another extreme. Regardless of institutional circumstances, a range of barriers and challenges are likely to exist that can explain the inconsistency of effective use of data. We explore these barriers and opportunities and ways of addressing them below.
Build a Culture of Inquiry and Evidence

Rigorous and systematic thinking about the implications of data as well as a commitment to using data to improve institutional performance is what separates colleges and universities that have developed a culture of inquiry from those who simply muddle along. Inquiry is the cornerstone of discovery. It requires the willingness and ability to ask the difficult questions to pursue change that is grounded in good data, research and collaborative conversations. This foundation can bring people together to draw upon research practices to discover how data and information can shape strategic thinking. Research and information are the sine qua non of inquiry but not a substitute for the purposeful engagement of faculty, staff, administrators, and students in dialogue; open minds seeking answers for breakthroughs in instructional and student service areas; improved student success with innovation and the best use of fiscal, personnel, and technological resources.

Other opportunities and barriers can be found within efforts to create a culture of inquiry and evidence. As noted earlier, the first of these are barriers of trust inherent in our discomfort with data. At the same time, this tension is one of the greatest opportunities as it represents the potential to develop an institution’s human resources through strategic professional development. In this culture, data are everyone’s concern and not the domain of a few.

The means to overcoming these barriers and seizing the opportunity takes us again to leadership. Leadership at the trustee and presidential levels will need to establish policies and funding sources that are a demonstrable commitment to professional and organizational development. With policies and funding in place, presidents and executive teams will need to lead in a manner that incubates a network of leaders throughout the institution; people who are empowered to create innovation based on data.

Map out High Level Strategy

Colleges and universities will want to start by revisiting their mission, vision, and strategic goals. Campus wide recognition of these essential, core products of good planning helps everyone to contribute through their respective roles with what Edward Deming referred to as a “constancy of purpose.” Questions driven by a focus on these core elements can lead to instructional, administrative, and student service practices to set the stage for creating actionable data to foster innovative, tactical responses for improved learner outcomes and institutional results. Decisions about how these analyses will be carried out with human capital and technology should be part of high-level strategy. Nimble institutions will also provide a visible mechanism to refresh strategic issues and to introduce new thinking.

We are, in essence, proposing that strategic thinking and planning is the critical gateway to creating a culture of inquiry. Paradoxically, strategic planning is both an opportunity and a barrier for most colleges and university communities. On one hand, strategic planning provides an opportunity to invite broad engagement that
can bring clarity to the things an institution ought to be doing, including using data to refine mission and vision. On the other hand, strategic planning processes are frequently poorly executed, resulting in quickly abandoned planning documents and mission, vision, and value statements developed only for public relations purposes. In contrast, well-executed strategic planning is integrated throughout the academic community, providing a coherent and innovative plan to deliver rigorous learning opportunities. Such a plan establishes a framework for collaboration with academics, student and administrative services personnel.

Key to overcoming these barriers is acceptance by leadership that strategic planning and concomitant use of data arises from a commitment to organizational development. Organizational learning requires both time and an iterative process for organizational and professional growth, or what Senge (2006) refers to as organizational learning. Nimble institutions will also provide a means for review to refresh strategies with continuous data review and updates.

**Defining Roles**

McLaughlin, Howard, Cunningham, Blythe, and Payne (2004) suggest three distinct professional roles are necessary to produce timely and accurate information: the custodian, broker, and manager roles. The authors have found these roles to be fragmented in many institutions. The *custodian* function focuses on the integrity of data and helps to select appropriate data for analysis. The *broker* works to transform data into [actionable] information. The *manager* takes information and applies it to the given situation. The manager is often the decision maker but may also be someone who is responsible for supporting the decision process. Institutions should clearly delineate these functions by making specific assignments for each across the entire organizations.

In most educational institutions, these roles are spread unevenly across Information Technology, Institutional Research, Institutional Effectiveness, Assessment, Strategic Planning and/or a Vice President’s Office. At colleges with limited human resources, these roles are especially blurred and may lie entirely within the purview of one person. Unless these roles are clarified at any institution, the production of credible, cogent, and value-added strategic data and information can be quickly compromised. Barriers including inadequate and outdated data management systems, heavy workloads and broad demands on IT staff resources, compliance-driven institutional research staff, and inadequate capacity among personnel to navigate the organizational dynamics, as well as a limited capacity to retrieve, review, manipulate, and analyze data beyond the Institutional Research Office, contribute to the confusion, turf battles, and mistrust that can emerge from poorly defined roles and relationships.

**Engage Teamwork**

In as much as we believe that colleges and universities will profit from efforts to develop a culture of inquiry, settle on high-level strategy, and define roles, we also
believe that teamwork to support these efforts is frequently a missing piece. Establishing, fostering, and rewarding teamwork creates both synergy and new opportunities to use data effectively. Bolman and Deal (2013) advance four frames under which any organization operates, the most critical of which is the Structural Frame which speaks directly to organizing structures, groups, and teams to produce results.

Institutional leadership is most challenged at the onset of a journey to effectively produce data and information. We have heard from faculty, staff and administrators that they are eager to use data to embrace a culture of evidence and equally frustrated by inadequate access, retrieval and help with analysis. We would observe that once data are produced, it is imperative that leaders demonstrate and model their commitment to using data and setting the expectation that data offered in evidence will be used when making decisions, allocating resources, and assessing institutional, department, and student success.

Create Actionable Data

Voorhees (2007a) introduces the term “wallpaper data” to label data that may be interesting to look at but do little to address an institution’s future. Colleges and universities should focus on producing data that would help the entire organization and its components to take action. In this vein, institutional fact books, while helpful because they provide a common and official set of institutional data, seldom point to action.

The wallpaper data phenomenon suggests other factors that demand our attention to advance our data and strategy-driven educational institutions. First, it is apparent that data have not been the currency of higher education. Only recently have we observed the call for, and reluctant embrace of, data, data analysis, and a culture of evidence in colleges and universities. Second, as stated above, what data have been produced in our institutions often have been held in the purview of presidents and a go-to individual or office (most often Institutional Research) generating compliance reports. Institutions may have little experience in separating data that are truly helpful (actionable data) from passive data (wallpaper data).

Expand Comfort Zones

The opportunity to use data to make decisions takes many in education out of their comfort zone. There is a certain attraction in any organization toward the status quo, especially in maintaining the decision-making process that perhaps only few can access. New insights into the daily teaching and organizational life, including how learners are impacted by decisions, can be revealing and threatening at the same time. New knowledge casts a wide shadow but also shines new light on avenues for institutional performance.

Institutions that view data as a means mostly to satisfy external bureaucracies will find it easier to maintain data comfort zones, simply because these data likely will remain in silos throughout the organization. These institutions miss important
opportunities to take ownership of their data to become the masters of their own destiny. From this vantage point, leaders and all members of the college and university community will be well served to think and act internally and externally. Foremost in this work is the internal imperative to clearly and coherently state the institutions’ shared mission, visions and goals as well as to track progress with data. By so doing, we can renew efforts to set the agenda with a universally held focus on strategies to preserve and reimagine education in the 21st Century. Of equal importance to our institutions is the external task of reaching out to legislative and community leaders to better inform them and shape public policy to serve diverse student populations, economic development, and citizen participation.

Waiting for Perfection

There is neither perfect data nor is there a single auspicious time to introduce data to institutional dialog. Hoping for near certainty in data and information or even waiting for institutional culture to change can only continue inaction and data paralysis. The successful launch of data initiatives must start somewhere and, in our opinion, the sooner the better since the very act of sharing and discussing data will identify data quality issues while advancing a culture of inquiry. Reaching for new ground can be discouraged by culture, tradition, and practice. Waiting for perfection, however, is to surrender to forces that prevent institutions from engaging with their own data to chart an actionable future.

SUCCESSFUL PRACTICE IN USING DATA TO PLAN

Given an overview of barriers and opportunities to more effective use of data, we now turn to examples of successful practice that can help to overcome those barriers. The practices we offer below are drawn from practical experiences as well as our aspirations for institutions to better use data in the planning processes.

Strategic Planning and Data

It is one thing to create the high-level set of strategic issues we mention above and quite another to frame those issues in a strategic plan. While many institutions have developed strategic plans to counter their uncertain future, many strategic plans are little more than slick, aspirational documents intended to convey the image of rational decision making. We observe that there is an upside to making external stakeholders feel good and many institutions do not want to bother them with the details of how strategic goals are to be carried out and measured. Most strategic plans are lacking in five key areas: (1) using actionable data, (2) assigning responsibility to individuals, (3) tying operational plans to strategic goals, (4) embedding measurable goals that can, in turn, lead midstream corrections, and (5) most importantly, tying the entire planning process to the institution’s budget.
Oakland Community College, in Southfield, Michigan, has developed a comprehensive planning process to address each of these key areas noted (Showers & Wright, 2013). The Office of Institutional Research, Quality, and Planning provides research and data to support college decision making. In this capacity, the office works with college stakeholders with a comprehensive process and practices to help those requesting assistance to identify the questions being asked and the data required. Data are generated and reported using institutional standards and templates that serve to align the research and data products with institutional strategic priorities. The office works with each research request to determine how the data will be used to address strategic priorities and provides assistance with presentation of data.

Inviting Constructive Conversations

Dowd’s (2005) observation is that before data can drive, they must be shared and explored with an openness to discovery. This is especially true in areas of instruction and student services where there is direct student contact. Faculty, staff, administrators, and students are well served when constructive conversations occur that are carefully structured. The authors have relied on Brown and Isaacs’s World Café (2005) as a guide to shape meaningful and systematic conversations with a broad range of institutional stakeholders. Inviting conversations that harvest and share collective discoveries and which also use an institution’s collective intelligence is a critical and achievable goal. The methodology for such conversations is straightforward (Brown & Isaacs, 2005) and includes six principles. These are: (1) create hospitable space, (2) explore questions that matter, (3) encourage everyone to contribute, (4) connect diverse people and ideas, (5) listen together for insights, patterns, and deeper questions, and (6) make collective knowledge visible.

Institutions embarking on hosting conversations that matter will face several challenges. The first challenge is not to become bogged down in the minutia of that data. Groups themselves should not be engaged in data capture. Rather, at higher ground, the process is intended to focus on collaborative learning, especially creating collective intelligence that is developed by paying close attention to the levels of meaning and insight within those data. A second challenge is the assumption that the knowledge and wisdom needed to have conversations that matter is already present and accessible within the institution. Honoring this assumption means that the ensuing conversations will be informed by data brought to the table but that data should not dictate the course of conversations. The overall goal is to provide an environment for emergent intelligence, requiring specific skills of the facilitator, not just to produce data, but to guide the group to connect ideas, take stock of deeper patterns and themes in the data, and, above all, to be deep and effective listeners.
Assessing Institutional Data Readiness

Voorhees (2007b) created the Institutional Data Readiness Assessment (IDRA) that institutions can use to assess their current functioning in three areas identified by McLaughlin et al. (2004). These factors are data management, processes, and people. The inventory helps institutions locate their capacities to develop actionable data at a granular level. The IDRA can also be used to document the receptivity, and commitment to using data among administrators, faculty, and staff. The IDRA intends to assist institutions with the development and implementation of a strategic data plan, building from the ground up comprehensive policies, practices, and capacity to create and sustain a culture of evidence. A review of the assessment can provide a conceptual and pragmatic resource to integrate data and information through effective use of technology, people, and processes that facilitate communication of data for inquiry and decision making. The authors have worked closely with 14 Texas colleges who committed to starting their student success work by investing in the creation of a solid data foundation. The IDRA has been used to create deep conversations about people capability, capacity building in information technology, institutional research units, and data management issues.

The IDRA is one embarkation point for the data journey. The importance of developing a realistic understanding of current institutional data resources and personnel capacity to use data to inform decisions is an essential building block for advancing a culture of inquiry and evidence. As Glover (2009) observes, “… colleges that make the investment necessary to collect data, and to effectively interpret and present it, are far better positioned to deepen their understanding of student progression and outcomes, and identify strategies for improving student success” (p. 1).

Approach Software Acquisition Cautiously

Entering data into software systems, extracting, editing, and preparing those data for analyses are basic processes that have been largely unchanged for more than fifty years. In the intervening time, technology has speeded these processes, relational databases have made storing complex data more manageable, and new interfaces have brought data closer to end-users. Meanwhile, the processes for creating actionable data have remained static. The authors have observed that small, under-resourced colleges make use of old software to create actionable data while better-resourced colleges neglect the possibilities in their more advanced software systems. In our experience, it is more important to invest in committed and talented people than the latest tools.

Analytics

Analytics has become a buzzword in higher education in recent years. It has been defined as “the use of data, statistical analysis, and explanatory and predictive
models to gain insights and act on complex issues” (Bichsel, 2012, p. 6). Propelled by the use of technology to match existing institutional data with new data that trace student interaction inside and outside the classroom, analytics can help identify places in the student experience where an institution can intervene to improve success rates. Precision in analytics is only as good as the institutional data that support it, however. Local student-level data systems, for example, seldom contain the number and quality of interactions that students have with the institution, necessitating alternative data gathering and storage steps before a full understanding of where students are succeeding in, and outside of, classrooms can be performed.

Colleges and universities will need to explore both quantitative data to learn what is happening and concurrently develop qualitative data to probe the deeper issues that explain what may be lurking behind the numbers. Working with the support of Educause’s Next Generation Learning Challenges collaborative multi-year initiative, colleges like those participating in the Iowa Community College Online Consortium are learning how to develop, use and discuss analytics to advance student success and scale their work.

*Focus First on Diagnosis*

Institutions that have made a commitment to increasing student success through data frequently want to leap to solving all known issues unearthed by data. While that zeal is understandable, it can also cause future problems if the premises underlying interventions are not fully developed. Moving quickly to solutions without understanding the shape of the problem is ill advised. González (2009) recommends four sequential steps for institutions grappling with issues of student success: (1) find out “what’s wrong?,” (2) use data to answer the “why” question, (3) address the underlying factors impeding student success through new and revised interventions or policy changes, and (4) assess impact through evaluation. Obviously, institutions would be well served by fully understanding “why” a particular behavior or set of behaviors is manifest.

To answer the “why” will cause institutions to collect and analyze a second set of data. For example, in open access institutions, a central question is why certain groups of students are succeeding better than others. These insights are unlikely to be found solely in student unit record data systems and are much more likely to be found in rigorous qualitative research, i.e., focus groups, that can uncover how students are interacting with the institution. This is to say that analyses of grade-point average, cohort survival rates, and other quantitative data that can be generated by student unit record software systems are valuable as a starting point but serve only as a partial answer to underlying student behavior.

*Create Data Allies*

Colleges and universities seldom promote familiarity with their own data systems and do not produce actionable information criteria for hiring decisions. Only a
limited number of individuals are employed to perform these tasks. The result is that data work becomes specialized work that frequently becomes isolated as a matter of course unless deliberate steps are made to share and discuss institutional data widely.

Those in institutional research capacities would do well to create appetites for data as well as to make intentional training available to make data actionable. Remembering that while some individuals may be interested in how data are gathered and prepared, a main focus will be on how data can be used in their work environment. Learning curves likely will be steep, yet another reason to create a culture of inquiry in which faculty, staff, and administrators gain an understanding of where data arise and how they can best be used. One key partnership that should be formed early is that between institutional research and information technology units. Symbiotically, one cannot exist without the other. While these two offices provide the infrastructure and data access for this work, an institutional research and planning office or the equivalent must forge effective relationships with stakeholders that include faculty leaders, department chairs, student services, and administrative personnel. It is incumbent on institutional research leadership to help colleagues identify pertinent data, develop researchable questions, and facilitate analysis. In doing so, they will create trusting allies to assure that reliable data are a valued asset in making data-informed decisions.

Connecting Bottom-up Planning to Data

Too often planning data are gathered only from a handful of units that are thought to affect strategy. It is counterintuitive that detailed plans from academic units would be neglected in strategic planning processes since instruction constitutes the largest share of expenses at most institutions. Most institutions in the United States are now required to generate assessment of learning plans by their regional accreditors, but in our experience assessment planning at the academic unit level seldom appears in strategic planning.

Too often we have seen institutional plans that are a product of gathering departmental plans in one place, editing them somewhat, and binding them together without analysis or synthesis. Unless there is provision of a template supported by outcome data for transfer and employment, as well as an environmental scan of developments in a given field, departmental level plans may lapse into only a description of the status quo without evidence-based consideration of future opportunities and of how those opportunities align with the overall institutional mission.¹

Create Early Data Victories

We noted above the dearth of data in most strategic planning exercises. Institutions undertaking comprehensive strategic planning in which a public commitment to data use is made often find themselves on new ground and facing skeptical individuals. Making clear the institution’s expectation that any strategies will be
based on actionable data, and that the success of subsequent operational planning will be determined on evidence and data, will provide a visible transition point from data-free, aspirational planning to a rational model. One might anticipate that future data requests from units will become more focused once a sound strategic plan is in place. Before that happens, and ideally in the strategic planning process, institutional leaders should spend time discussing data availability and what those data say about an institution’s future.

Settle on Approaches to Benchmarking

The attraction to making comparisons between institutions is an inescapable part of life in higher education. Rankings of institutions abound and these data frequently are used to drive strategic planning. In the extreme, redesigning whole programs and services to climb higher in ranking schemes is a potential response. The authors’ experience is that institutions are better served by not pursuing external validation through third-party ranking but by determining their current performance on activities they consider critical and using those data to set realistic benchmarks and milestones. Embedding those benchmarks within strategic planning processes also carries the advantage of educating the institutional community about an institution’s own data and how they are used to internally rank priorities and strategies.

Managing Change Processes

In previous sections we discussed specific techniques for using data in planning. We now turn to a broader look at the institutional change processes associated with data use and how those processes can be managed to help institutions along the pathway to create a culture of inquiry. Where not supported by culture or recent history, the institutional commitment to use data for planning is likely to surface opposition. Improvement always entitles change and people react to change in different ways.

Recent advances in management science, in particular what is now known as “sense-making” and the Cynefin model, can be a useful tool in understanding change processes (Snowden & Boone, 2007). Cynefin is a framework of four domains in which the responses by adroit managers to organizational challenges vary from: (1) simple, (2) complicated, (3) complex, and (4) chaotic. The authors have used this framework to help institutions understand the challenges they face in using data and increase their capacities to create a culture of inquiry. In the simple Cynefin domain, standard operating procedures exist and the accent is on consistency. The critical decisions are for the manager to sense incoming data, categorize those data, and then respond according to accepted practice. The focus is on efficiency. A traditional view of higher education would encompass the simple domain where there is a sense of order and the variables to be manipulated are few. Cause and effect relationships are predictable and repeatable and the result is on maintaining the status quo. Best practices tested elsewhere can be
implemented. The simple domain may be the starting point for institutions new to the data journey, especially the requirement to create highly structured learning experiences. At the same time, our experience is that there is considerable and quick overlap with the other domains, especially given an institutional commitment to create a culture of inquiry.

The complicated Cynefin domain is also an orderly domain but is distinguished from the simple domain by its embrace of a spirit of inquiry including experiments, fact-finding, and scenario development. The emphasis here is on the knowable, not the known. Something that is known can be found, for example, policies for reporting enrollments, faculty workload, or course transfer, if one knows the right questions to ask. Cause and effect relationships may not be immediately obvious to everyone engaged in the data journey or they may be known only to a limited number of people. For example, the intricacies of accreditation or quality assurance reporting may be vested in only one or more individuals, making this key responsibility the exclusive domain of expert staffers and not shared across an institution. Kurtz and Snowden (2003, p. 478) suggest that organizational experts are often the most conservative when it comes to new thinking. Savvy managers will want to be aware of a potential gulf between those who have the data and those working with the data to create a culture of inquiry. There is always a potential that experts can stifle innovation with their wider knowledge of the field and beliefs that their opinions should prevail. Another common misstep in sense making occurs when one assumes that complicated actions are simple when, in fact, considerable gaps may exist between the two.

The next two Cynefin domains deal not with ordered events as much as with patterns and spotting new patterns in data. In the complex domain the task is to spot cause and effect relationships among a number of entities and relationships. The underlying sources of these patterns, however, are not predictable and hence the need to engage in multiple probing. That is, an interval of time after initial attempts to create a culture of inquiry, it may be evident that not all key stakeholders understand the dimensions of the work. The implications for institutions are to continue efforts to inform all stakeholders and to search for new patterns in data that can guide discussions. The World Café approach we discussed above seems ideally matched to the responses organizations can make in the complex domain. At the same time not all organizational phenomena are complex and, accordingly, not all institutional events require multiple probing which, left unchecked, can lead to “paralysis by analysis.”

The last Cynefin domain, chaos, is also unordered and arises when there is no perceivable relationship between cause and effect. The environment is turbulent and there is little time available to deal with change. Rarely have we seen chaos as an underlying factor among institutions engaging in a data journey. This is not to say that to an occasional observer institutional systems may not appear chaotic and lack of systems may play a large role in whether an institution is able to retrieve, edit, and use data. However, in a larger picture it is unlikely that an entire institution is engaged in chaotic behavior, unless some large-scale and disruptive event threatens its survival.
OPPORTUNITIES AND BARRIERS TO EFFECTIVE PLANNING IN HIGHER EDUCATION

SUMMARY

Using planning as a metaphor, this chapter explores the pathways to creating a culture of inquiry that can increase the use of data and data capacity at committed institutions. Barriers and opportunities to creating a culture of inquiry are many but chief among them is institutional inertia. Data generated for external compliance can aid internal strategy but to maximize their use as well as to create new data requires steady institutional leadership. The techniques reviewed by the authors here are presented so as to save time and energy but are not the only avenues to creating a culture of inquiry.

NOTE

1 Hollowell, Middaugh, and Sibolski (2006, p. 106, p. 107) offer a template for leaders to collect department-level teaching workload and fiscal data for institutional planning. Data from this template can be aggregated at the institutional level to form an institution-wide picture of academic activity.

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