GLOBAL PERSPECTIVES ON HIGHER EDUCATION

Using Data to Improve Higher Education

Research, Policy and Practice

Maria Eliophotou Menon,
Dawn Geronimo Terkla and
Paul Gibbs (Eds.)

SensePublishers

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.

Series Editor:
Philip G. Altbach
Center for International Higher Education, Boston College, USA

This series is co-published with the Center for International Higher Education at Boston College.

Using Data to Improve Higher Education

Research, Policy and Practice

Edited by

Maria Eliophotou Menon
University of Cyprus, Nicosia, Cyprus

Dawn Geronimo Terkla
Tufts University, Medford, USA

and

Paul Gibbs
Middlesex University London, UK

SENSE PUBLISHERS
ROTTERDAM / BOSTON / TAIPEI

A C.I.P. record for this book is available from the Library of Congress.

ISBN 978-94-6209-792-6 (paperback)
ISBN 978-94-6209-793-3 (hardback)
ISBN 978-94-6209-794-0 (e-book)

Published by: Sense Publishers,
P.O. Box 21858, 3001 AW Rotterdam, The Netherlands
https://www.sensepublishers.com/

Printed on acid-free paper

TABLE OF CONTENTS

MARIA ELIOPHOTOU MENON

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

M. E. Menon et al. (eds.), Using Data to Improve Higher Education, 1–4.

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.

Maria Eliophotou Menon
Department of Education
University of Cyprus

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-

M. E. Menon et al. (eds.), Using Data to Improve Higher Education, 7–24.

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 bi-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.

– 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 Principals (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

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 complemesnts 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 uncontentious, 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 publically 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.

* * *

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.

REFERENCES

Bititci, U. C., Carrie, A. S., & McDevitt, L. (1997). Integrated performance management systems: A development guide. *International Journal of Operations and Production Management*, *17*(5), 522-534.

Bleiklie, I. (1998). Justifying the evaluative state: New public management ideas in higher education. *European Journal of Education*, *33*(3), 299-316.

Bruneau, W., & Savage, D. C. (2002). *Counting out the scholars: The case against performance indicators in higher education*. Toronto: James Lorimer & Co. Ltd.

Burke, J. C., & Minassians, H. P. (2001). *Linking resources to campus results: From fad to trend, the fifth annual survey*. Albany, NY: The Rockefeller Institute.

Committee of Vice Chancellors and Principals of the Universities of the United Kingdom and Universities Grants Committee (CVCP/UGC). (1987). *University management statistics and performance indicators*. London: CVCP/UGC.

Deem, R., & Brehony, K. J. (2005). Management as ideology: The case of "new managerialism" in higher education. *Oxford Review of Education*, *31*(2), 217-235.

DES. (1985). *The development of higher education into the 1990s.* Green paper, Cmnd 9524. London: HMSO.

Ferlie, E., Pettigrew, A., Ashburner, L., & Fitzgerald, L. (1996). *The new public management in action*. New York: Oxford University Press.

Ferreira, A., & Otley, D. (2009). The design and use of performance management systems: An extended framework for analysis. *Management Accounting Research*, 20(4), 263-282.

Franco-Santos, M., Rivera, P., & Bourne, M. (2014). *Performance management in U.K. higher education institutions: The need for a hybrid approach*. London: Leadership Foundation for Higher Education.

Hufner, K., & Rau, E. (1987). Measuring performance in higher education – Problems and perspectives. *Higher Education in Europe*, *12*(4), 5-13.

Jarratt Report. (1985). *Report of the steering committee for efficiency studies in universities*. London: CVCP.

Maassen, R., & Van Vught, F. (1988). An intriguing Janus Head: The two faces of the new governmental strategy for higher education in the Netherlands. *European Journal of Higher Education*, *23*, 65-76.

Marginson, S., & Considine, M. (2000). *The enterprising university*. Cambridge: Cambridge University Press.

Neave, G. (1988). On the cultivation of quality, efficiency and enterprise: An overview of recent trends in higher education in Western Europe, 1986-1988. *European Journal of Education*, *23*, 7-23.

Power, M. (1997). *The audit society*. Oxford: Oxford University Press.

Taylor, J., Hanlon, M., & Yorke, M. (2013). *The evolution and practice of institutional research*. In A. Calderon & K. L. Webber (Eds.) *New directions in institutional research*. San Francisco: Jossey Bass.

John Taylor
Higher Education Management Studies Unit (HEMSU)
University of Liverpool

RICHARD A. VOORHEES AND JOHN D. COOPER

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

M. E. Menon et al. (eds.), Using Data to Improve Higher Education, 25–38.

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 many 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.

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.

REFERENCES

Bichsel, J. (2012). *Analytics in higher education: Benefits, barriers, progress, and recommendations*. Louisville, CO: Educause Center for Research. Retrieved from http://net.educause.edu/ir/library/pdf/ERS1207/ers1207.pdf

Bolman, L. G., & Deal, T. E. (2013). *Reframing organizations: Artistry, choice, and leadership*. San Francisco, CA: Jossey-Bass.

Brown, J. & Isaacs, D. (2005). *The world café: Shaping our futures through conversations that matter*. San Francisco: Berrett-Koehler Publishers, Inc.

Dowd, A. C. (2005). *Data don't drive: Building a practitioner-driven culture of inquiry to assess community college performance*. Indianapolis, IN: Lumina Foundation for Education.

Glover, R. (2009). *Strengthening institutional research and information technology capacity through achieving the dream: Principles and practices of student success*. Retrieved from http://www.achievingthedream.org/sites/default/files/resources/PrinciplesAndPracticesofStudentSuccess_StrengtheningInstitutionalResearchAndInformationTechnologyCapacityThroughATD.pdf

González, K. P. (2009). *Using data to increase student success: A focus on diagnosis*. Retrieved from http://www.achievingthedream.org/sites/default/files/resources/ATD_Focus_Diagnosis.pdf

Hollowell, D., Middaugh, M. F., & Sibolski, E. (2006). *Integrating higher education planning and assessment: A practical guide*. Ann Arbor, MI: Society for College and University Planning.

Keller, G. (1983). *Academic strategy: The management revolution in American higher education*. Baltimore, MD: Johns Hopkins University Press.

Kurtz, C. F., & Snowden, D. J. (2003). The new dynamics of strategy: Sense-making in a complex and complicated world. *IBM Systems Journal, 42*(3), 462-483.

Lafley, A. G., Martin, R. L., Rivkin, J. W., & Siggelkow, N. (2012). Bringing science to the art of strategy. *Harvard Business Review*, *90*(9), 3-12.

McLaughlin, G. W., Howard, R. D., Cunningham, L. B., Blythe, E. W., & Payne, E. (2004). *People, processes, and managing data* (2nd ed.). Tallahassee, FL: Association for Institutional Research.

Senge, P. M (2006). *The fifth discipline: The art and practice of the learning organization* (revised edition). New York: Doubleday.

Showers, N., & Wright, T. (2013, February). *Creating a culture of evidence: Laying the foundation and constructing the tools*. Presentation at the Achieving the Dream Conference, Anaheim, CA.

Retrieved from http://www.achievingthedream.org/resource/creating_a_culture_of_evidence_laying_the_foundation_and_constructing_the_tools

Snowden, D. J., & Boone, M. E. (2007). A leader's framework for decision making. *Harvard Business Review*, *85*(11), 1-8.

Voorhees, R. A. (2007a). *Institutional data readiness assessment tool*. Retrieved from http://www.voorheesgroup.org/tools/institutional-data-readiness-assessment-tool

Voorhees, R. A. (2007b, May). *Bringing information home to roost: Using data for local decisions*. Presentation at the Florida Achieving the Dream CONNECTIONS 2007 Statewide Conference. Retrieved from http://www.voorheesgroup.org/Bringing%20Information%20Home%20to%20Roost.pdf

Western Cooperative for Educational Technologies (WCET). (n.d.). *Predictive analytics reporting (PAR) Framework: Current status, future directions.* Retrieved from http://wcet.wiche.edu/wcet/docs/data-summit-2013/PredictiveAnalyticsReportingFramework_AcademicRiskIdentification.pdf

Richard A. Voorhees
Voorhees Group LLC

John C. Cooper
Community College Leadership Program
Walden University

DAWN GERONIMO TERKLA, JESSICA SHARKNESS,
LAUREN M. CONOSCENTI AND CHRISTINA BUTLER

USING DATA TO INFORM INSTITUTIONAL DECISION MAKING AT TUFTS UNIVERSITY

INTRODUCTION

Higher education institutions employ a variety of techniques in order to obtain information to facilitate data-driven decision making. This chapter will describe a variety of activities utilized by members of Tufts University to inform their decision making processes. Tufts University, founded in 1852, is a private not-for-profit medium-sized research university with a Carnegie classification of RU/VH (very high research activity).[1] There are 108 institutions in the United States with this classification. Approximately 11,000 students, 1,300 faculty members and 3,200 staff comprise the Tufts University community. The constellation of schools within the university is quite broad. In addition to its undergraduate liberal arts and engineering programs, the university has several graduate and professional schools, including those awarding advanced degrees in arts and sciences, engineering, law and diplomacy, nutrition, biomedical sciences, medicine, dental medicine, and veterinary medicine.

TECHNIQUES EMPLOYED AT THE UNIVERSITY

Over the past few decades, the leadership at Tufts has placed a greater and greater emphasis on making decisions that are data-driven. This was most recently illustrated in the university's 2013-2023 Strategic Plan, which called for the extensive development of metrics to monitor the success of the initiatives proposed in the plan (Tufts University, 2013). In order to provide decision makers across the university with information to assist in decision making and planning, the Tufts Office of Institutional Research and Evaluation (OIRE) employs a variety of techniques to collect and distribute relevant data. These techniques include 1) a university-level dashboard and risk register (tools used to share critical information with the University's Board of Trustees), 2) surveys (administered at regular intervals to a wide array of stakeholders), 3) multivariate predictive modeling, and 4) benchmark comparisons. The following pages will describe these techniques and provide specific examples of how they have been used at Tufts.

M. E. Menon et al. (eds.), Using Data to Improve Higher Education, 39–63.

Dashboard

College and university dashboards are management tools that present critical information in a concise, easily understood, and visually appealing format (Terkla, Sharkness, Cohen, Roscoe, & Wiseman, 2012). Doerfel and Ruben (2002) describe a dashboard as a set of indicators that "reflect key elements of [an organization's] mission, vision, and strategic direction" (p. 18). Collectively, dashboard indicators can be "used to monitor and navigate the organization in much the same way a pilot and flight crew use the array of indicators in the cockpit to monitor and navigate an airplane" (Doerfel & Ruben, 2002, p. 18). Tufts has had an institutional dashboard since 2002, when the Board of Trustees and top members of the administration developed a set of metrics to monitor the overall performance of the university. The metrics were selected to evaluate the progress that the university was making towards its strategic objectives, and since their development they have been presented annually to the board in a two-page dashboard (Allen, Bacow, & Trombley, 2011).

In order to help the President and the Board select the metrics that would be included in the Tufts Dashboard, the Director of OIRE compiled a list of existing data that were available and that met the following criteria: 1) The data were auditable, 2) historical data were available for at least six years, and 3) the information was relevant to the mission of the university. This information was shared with the President and other senior leaders. The final metrics were selected based on a series of discussions regarding what data would be most relevant for the Board of Trustees to see on a regular basis.

The indicators ultimately included in the Tufts dashboard fall into the following broad categories: Finance, Admissions, Enrollment, Faculty, Student Outcomes, Student Engagement, Satisfaction, Instruction, Board Metrics, Research, and External Ratings. Table 1 highlights some of the types of indicators that are included in each category.

Once a determination was made regarding which indicators would be included in the dashboard, OIRE was tasked with the collection and management of the data, as well as the creation and visual design of the dashboard. There are six basic pieces of information that are shown on the Tufts dashboard: the name of the indicator, the highest value for this variable over the previous six years, the lowest value over the previous six years, the current value, and an arrow or dot, the shape/direction of which indicates whether the current value is higher than, lower than, or the same as the previous year's value, and the color of which indicates whether this change is good, bad, or neutral (see Figure 1).

The dashboard has proven very useful for senior leadership in terms of steering the institution towards its goals. For example, many years ago the Board and senior leaders noticed that the proportion of students who were satisfied with career services was steadily dropping. In response, career services received an increase in resources, and over the next few years, student satisfaction with the service rose.

Table 1. Dashboard indicators.

Category	*Indicator Types*
Finance	Endowment & expenses data Net assets growth Fundraising achievement Financial aid information
Admissions	Admissions test scores Key admissions statistics (applications, acceptance rate, yield rate) Composition of the incoming class
Enrollment	Graduate and undergraduate enrollment Enrollment for special populations
Faculty	Faculty counts Faculty composition (Special populations) Awards Salary information
Student Outcomes	Graduation rate Retention rate Measures of success, including honors and awards Post-baccalaureate plans
Student Engagement	Student academic engagement, including research Alumni engagement, including giving
Satisfaction	Student satisfaction with advising Student satisfaction with instruction Student satisfaction with career services
Instruction	Student/faculty ratio % of courses taught by tenure/tenure-track faculty Class sizes
Board Metrics	Attendance at board meetings Board giving
Research	Research volume per faculty Number of research applications and awards Research expenditures Indirect cost recovery Royalty income
External Ratings	*U.S. News and World Report* academic reputation *U.S. News and World Report* faculty resources rank % of new faculty from top-rated graduate programs

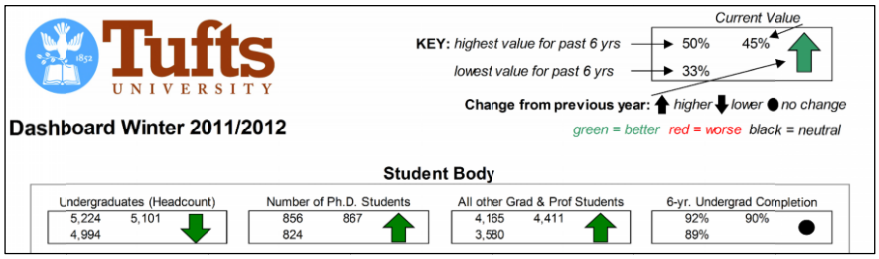


Figure 1. Tufts University dashboard (selected indicators).

Risk Register

Another tool employed by Tufts' senior leadership to monitor the health of the institution is a risk register. A risk register can be defined as a management tool used to assess the risks facing an institution, division, or project. Risks are any uncertain events or occurrences that could impact the operation of the university or the achievement of a strategic objective. As Alhawari, Karadsheh, Talet and Mansour (2012) note, "risks in an organization can span the gamut of natural disasters, security breaches, failings of human resource, third-part[y] vendors, financial turmoil, unstable business environments and project failures" (p. 51). Risk registers are designed to catalog not only the risks facing the institution, but also information about the risks, including the likelihood of their occurrence, the severity of the potential impact, and risk reduction and contingency plans (Patterson & Neailey, 2002). In a document entitled *How to Develop a Risk Register*, created by Vancouver Island University (n.d.), it is noted that having a risk register is beneficial as it provides "conciseness and clear presentation of the logic which supports the decision making process" (p. 2).

The Tufts risk register contains a list of 44 risks that have been identified by senior leadership, the probability of the risks occurring, their potential impact, information about the risks' owners, and mitigating strategies. In developing the risk register, a consulting firm was engaged to help members of the senior leadership identify business processes and activities that might expose the university to risks, to assess the probability of the risks occurring and the velocity of the impact, and to document existing mitigating practices. Based on the consultants' work, a template was developed to categorize and assess each of the identified risks. The template includes the following broad headings: risk area (strategic, operations, natural disasters, academic quality and so on); risk type (academic, administrative, compliance, financial, etc.); risk statement (a paragraph describing the risk); current mitigation practices; a risk exposure rating (impact x velocity); an assessment of the strength of the mitigating practices; residual risk (difference between the risk exposure rating and the strength of the current mitigating practices); a list of metrics used to measure the effectiveness of current

mitigation practices; and the responsible individual(s). Table 2 provides examples and definitions of each of these headings.

Table 2. Risk register: Headings and definitions/examples.

<table>
<tr><th>Risk Register Heading</th><th>Definition/Example</th></tr>
<tr><td>Risk Area</td><td>Example: Strategic</td></tr>
<tr><td>Risk Type</td><td>Example: Financial</td></tr>
<tr><td>Risk Statement</td><td>Example: Inability of the university to employ investment strategies that reduce the impact of market decline and financial crisis on investments</td></tr>
<tr><td>Current Mitigation Practices</td><td>Example: Regular reporting of investment strategies and performance; Quarterly reporting of market risks</td></tr>
<tr><td>Inherent Risk Exposure (Impact x Velocity)</td><td>Definition: Inherent Risk is represented by a Risk Exposure Rating which reflects a judgment rating the Impact of the identified risk multiplied by the Velocity with which the risk could occur. The Impact was assigned a rating from 1 (which is insignificant) to 5 (which is catastrophic) by an ad hoc committee of senior administration convened for this purpose. Velocity was measured as slow, medium or fast by this committee. Risk Exposure Rating is then created by multiplying the Impact Rating by the Velocity.

Impact Rating
5 Catastrophic
4 Major
3 Moderate
2 Minor
1 Insignificant

Velocity
3 Fast
2 Moderate
1 Slow

Risk Exposure Rating
13-15 Catastrophic
8-12 Major
4-7 Moderate
1-3 Minor</td></tr>
<tr><td>Mitigation Practices Strength</td><td>Definition: The strength of current mitigating practices (strong, moderate or weak); determined by an ad hoc committee of senior administrators, along with the manager responsible for the risk area.

Mitigating Practice Strength
Weak
Moderate
Strong</td></tr>
<tr><td>Residual Risk</td><td>Definition: The risk that remains after the mitigating practices (e.g. controls, policies, practices) are taken into account (net risk).</td></tr>
<tr><td>Metrics</td><td>Example: Asset Growth</td></tr>
<tr><td>Responsible Person(s)</td><td>Definition: Individual(s) responsible for the area of risk</td></tr>
</table>

Once the risk register template was created and filled out, a heat map of all 44 risks was created to provide a one-page graphic presentation of the risks. The heat map displays a plot of all of the identified risks with the risk exposure rating on one axis, and the strength of the mitigating practices on the other axis. The heat map allows the senior leadership to assess all of the risks together and to identify

the risks that need the most immediate attention. The risk register and the risks that it catalogues are assessed on a regular basis by the University Compliance Committee, the President's senior leadership team, and the Trustees' Audit committee. The Risk Register is a work in progress and is continually refined, in accordance with best practices (Patterson & Neailey, 2002).

Surveys for Assessment

Surveys are data collection tools that institutional research offices commonly use for assessment, accountability, quality assurance, accreditation, and internal improvement (Delaney, 1997; Gonyea, 2005; Porter, 2004; Schiltz, 1988). While surveys are by no means the only sources of data that can (or should) be used for these purposes, they are incredibly useful tools and are thus heavily utilized on many campuses. There are several reasons why surveys have proven so useful. To begin with, survey data are inexpensive and simple to obtain – there are few other data collection methods that can gather such a wide variety of information from such large numbers of people with so little cost (Weisberg, Krosnick, & Bowen, 1989). In addition, surveys are one of the only ways to collect certain types of information from stakeholders in the campus community, including indicators of attitudes, engagement, values, satisfaction, interests, and well-being (Gonyea, 2005). Further, surveys are easily customizable, and can obtain very targeted information about a particular subject. Finally, survey data can be both quantitative and qualitative, and the combination of the two data types can serve as compelling supporting data for decision-making purposes.

Surveys comprise a large portion of the work done by OIRE at Tufts. Members of the OIRE staff work with staff, faculty and students at all of Tufts' campuses to develop and administer surveys, and to analyze the data collected by the surveys, for a variety of assessment purposes. The vast majority of the office's survey-related assessment efforts are tailored to the particular need and context of the school, department, program, or unit that is being assessed. As a result, this chapter cannot describe all the surveys done for assessment at Tufts, but will instead focus on key surveys that the office typically works with.

Broadly speaking, there are two general "types" of surveys that OIRE administers. The first are Customer Satisfaction Surveys. These tend to ask about the experiences and satisfaction that stakeholders have with particular units, departments, or services on campus. Customer Satisfaction Surveys may be done on an ad-hoc basis, or they may be done annually or biennially. Questions on these surveys are typically targeted to a particular issue, and survey results tend to be used to monitor performance over time and/or identify areas for improvement.

OIRE also often administers a second type of survey that covers the "lifespan" of a Tufts student. These include surveys administered to prospective students, current students, alumni, and employers, on topics as wide-ranging as perceptions of the university, educational and co-curricular experiences, student outcomes, and attitudes. At the beginning of a student's career, *Admissions Surveys* are often administered to applicants or prospective applicants of a particular school to assess

how these applicants view Tufts, how well the admissions office is working, and to get a sense of the competitive landscape. After students matriculate, *Continuing Student Surveys* may be given to currently-enrolled students at various points in their educational career to measure things such as student engagement, utilization of resources, campus climate, and satisfaction with academic and co-curricular services. Students who are close to graduation are often invited to complete *Exiting Student Surveys*, which ask students to reflect on their time at Tufts, assess how they believe they have changed during that time, provide overall opinions about their experience, and indicate their future plans. After graduation, former students may receive *Alumni Surveys*, which can have many purposes, but which often ask about employment and educational history since graduation, as well as evaluations of the education received at Tufts. Lastly, *Employer Surveys* are administered to the employers of certain groups of alumni. These surveys typically ask about the work-related performance of Tufts graduates in key areas, and also often ask employers to compare the quality of work done by Tufts graduates to graduates of other institutions. As a suite of surveys, the student "lifespan" surveys are used for a myriad of purposes, including general education and program-level assessment, evaluation of academic and curricular services and opportunities, reviews of student advisors, longitudinal student studies, accreditation, strategic planning, and much more.

Below, we describe some specific examples of Admissions, Exiting, Alumni, Employer, and Customer Satisfaction surveys that are routinely administered by OIRE. We describe the purposes of these surveys, the survey recipients, the types of questions typically asked, the insights gleaned from the surveys, and the ways in which survey results have been utilized to make changes on campus. Challenges to data collection and data interpretation are also discussed.

Admissions surveys. Tufts Admissions offices utilize two main types of surveys, *Inquiry Surveys*, which provide information about perceptions of Tufts from individuals who have inquired about admissions, and *Admitted Student Surveys*, which help Admissions offices understand why students choose to attend – or not to attend – Tufts. Both surveys paint a picture of Tufts from the outside looking in, and answer questions such as, do others see Tufts the same way we see Tufts? Does the "Tufts brand" have value?

Inquiry surveys. Each year, thousands of prospective applicants from around the globe request information from Tufts admissions offices. They might make contact in any number of ways, such as by e-mailing admissions counselors, by submitting web forms, or by attending a campus tour. However, not everyone who requests information ends up applying to Tufts. Inquiry Surveys seek to answer questions about how the institution presents itself to prospective students and whether this presentation affects students' decisions to not apply. One inquiring student might decide several weeks into his/her senior year that he/she does not want to attend a college far from home, while a second student may visit campus but not like his/her tour guide. Both students may choose not to apply, but for very different

reasons. It would be impossible to do anything about the first student's situation, but an admissions office with an unenthusiastic tour guide can make a very specific change. Inquiry Surveys are therefore important tools for monitoring the quality of information and services provided by an admissions office.

At Tufts, the recipient of an Inquiry Survey is usually someone whose contact with the admissions office has been recorded, but who has not filed an application for admission. The broadness of this definition allows an admissions office to collect data from a variety of "non-applicants" and to explore many different reasons why people choose not to apply. Some of the non-applicants may have had only superficial contact with the Admissions Office and others may have had multiple visits to the campus, but all students' views are important in ensuring that Tufts is presenting itself consistently.

The content of an Inquiry Survey can vary from school to school and from year to year. Typically, the survey asks about the kind of information sought from Tufts, satisfaction with the information received, and reasons why the individual did not apply to Tufts. However, the survey content can change depending on admissions trends at both the national and institutional level, upcoming projects, or events that might impact admissions, such as an economic recession. For example, the Tufts undergraduate admissions Inquiry Survey recently asked questions about the design, ease of use, and quality of information contained on the admissions website. Non-applicants were asked to describe website features that they liked and what was lacking on the site. The answers to these questions helped the admissions office prepare for an overhaul of its website design. When the website project was complete, the questions were removed from the survey to make room for other questions.

Because Inquiry Surveys seek information from a set of people who chose not to pursue a relationship with the institution, there are unique challenges to designing, administering, and drawing inferences from the survey. First, the definition of "non-applicant" does not discriminate between individuals who had minimal contact with the admissions office and those who had frequent contact. Those who had minimal contact may not remember their experience with the admissions office or may not have formed any strong impressions of the university. For example, in 2013, a small fraction of those who completed the undergraduate Inquiry Survey had not visited campus, had not met an admissions counselor at an off-campus event, and had not received the admissions magazine. Their contact with Tufts was limited to using the Admissions website – and the majority of these students had used the website fewer than five times. Although data from such individuals can be very useful, it is important to be mindful that a not insignificant minority exists that may not be able to give insightful information.

Second, in order to be most successful, inquiry surveys must be brief and to the point. Individuals who are uninterested in applying to Tufts are also unlikely to be interested in investing a great deal of time in completing a lengthy or sophisticated survey. Ensuring that participants are asked only to rate services they have used is important in both reducing participant confusion and improving data quality.

Finally, one of the largest challenges facing inquiry surveys is that response rates are usually quite modest. The undergraduate admissions' Inquiry Survey typically returns a 6% response rate, and a recent Tufts graduate school's inquiry survey returned a response rate of 15%. Low response rates put the data at risk for non-response bias, and for this reason, Inquiry Surveys may provide insufficient evidence for decision making. However, findings of Inquiry Surveys can be used in tandem with findings from other surveys (such as admitted student surveys) or other sources of data (such as web hits) to provide a fuller picture of the admissions landscape.

Admitted student surveys. Like Inquiry Surveys, Admitted Student Surveys provide information about how an institution is perceived by others, and this information can be useful for decision making. Specifically, admitted student surveys seek to compare the perceptions of two groups of admitted applicants: those who decide to matriculate at the university and those who do not. Information gathered from these two groups can help the admissions office answer several important questions, including: Why do some students choose to attend Tufts? Why do other students choose to go elsewhere? And if they go elsewhere, where are they going?

Students can choose to attend or not attend Tufts for reasons that the university may or may not be able to control. Although it is understandable why a student who hates cold weather might not choose to attend a university in New England, there is nothing that can be done about it. However, most students evaluate Tufts against factors that are more controllable than the weather, such as financial aid or the quality of an open house event. Admitted Student Surveys help gather information about which factors were most influential in students' matriculation decisions.

Because the primary purpose of Admitted Student Surveys is to compare Tufts against admissions offers from other schools, questions on the surveys tend to focus on the students' applications and outcomes at other schools. Both matriculating and non-matriculating students are asked to indicate schools to which they applied, the type of application (early action, early decision, regular decision, or rolling admissions), and the admissions outcome (accepted, rejected, withdrew application, still waiting, or other). Students are also queried about financial aid, whether and when they visited campus, and whether various admissions programming aided their decision. Students choosing not to matriculate are also asked why, specifically, they did not choose Tufts. Data from these questions can be analyzed in many ways: For example, a win-loss analysis can identify which schools typically "win" the student over Tufts and which schools do not.

Similar to Inquiry Surveys, the accepted applicant instruments may focus on a particular topic for one or more years in response to national or local trends, newly-launched initiatives, or other events. For example, after the undergraduate admissions office created the "Tufts Supplement," a set of thought-provoking essays that applicants can choose to complete, the admissions office sought feedback on whether the exercise was valuable. For two years, the Admitted

Student Surveys included a bank of questions about the Supplement. Both matriculating and non-matriculating students overwhelmingly reported that they enjoyed the essay topics and felt that the essays allowed them to showcase their personality. This information supported the continued inclusion of the essays in the admissions process.

Response rates for Admitted Student Surveys are usually much higher than those of Inquiry Surveys. At Tufts, approximately 40% of non-matriculating undergraduate students and nearly 60% of matriculating students have responded to the survey invitation in recent years. At the Veterinary School, where the applicant and admitted students pool is much smaller, the response rate for non-matriculating students can be over 70% (matriculating veterinary students complete a survey during registration, and the response rate to this instrument is close to 100%).

Despite robust response rates, users should be aware of the limitations of accepted applicant survey data. One of the primary concerns is that students are asked to evaluate Tufts and the other schools to which they applied only after receiving admissions decisions and selecting a school to attend. The outcomes of admissions decisions can change the type of information the student provides on the survey, as cognitive dissonance bias may lead individuals to change their attitudes so that they are in harmony with reality (Svenson & Benthorn, 1992). For example, a student who was rejected from a school that was their top choice upon submitting their applications may later "demote" the school from its top ranking and instead list the school he or she will be attending as their top choice. Another concern is that the data may also be subject to non-response bias. Even with a response rate of 40% for the non-matriculating undergraduate survey, there is the potential that those responding are those who were most dissatisfied with Tufts, or those who perhaps had the most difficulty choosing their school. Thus, it is important to be cautious about the conclusions drawn from the data. Like Inquiry surveys, triangulating findings of Admitted Student Surveys with other sources of data is recommended.

Exiting student surveys. Students on the cusp of graduation are often in a reflective position and can provide rich information to an institution. More than other currently-enrolled students, exiting students are perhaps best able to provide feedback about the institution because they have the benefit of a full tenure at Tufts to draw upon when responding to questions. Exiting surveys also represent one last chance to obtain feedback from students before they leave campus and become potentially unreachable. Both are powerful reasons to seek data from students who are about to graduate.

Exiting Student Surveys are administered by most schools at Tufts, and many have done so for years. Undergraduate, graduate, and professional programs throughout Tufts regularly survey students just prior to graduation. Exit Surveys can be valuable in multiple ways. First, graduation is an appropriate time to ask students about their satisfaction with various aspects of their university experience. Were they happy with their courses and professors? Did they find various

academic resources, like the library, helpful? Did auxiliary services like dining, the gym, or the bookstore meet their needs? Did students have opportunities to participate in extracurricular activities? The responses to such questions can lead to changes that substantially improve the student experience. At the Cummings Veterinary School for example, construction of a new student center that included a fitness center and café was prompted largely by student feedback on Exit Surveys. Additionally, dissatisfaction with the faculty mentoring system, as noted on Exit Surveys, has prompted administrators at the school to review and restructure advising.

Exit Surveys can also be useful in the assessment of student learning. Did students improve in the ways we expect them to improve? What weaknesses did they perceive in the curriculum? Although assessment is a process that should encompass many sources of data over multiple time points, responses from Exit Surveys can and should inform the process. At the Cummings school, exiting students for many years indicated that they did not feel confident with their surgical training at the time of graduation. This information, combined with similar feedback collected on alumni and employer surveys, has helped the school's leadership develop a new surgical curriculum designed to offer more hands-on training experiences.

One particularly valuable aspect of Exit Surveys is that they can be combined with other surveys to produce longitudinal data sets that can examine student change over time. For example, students are asked at the start of their first year of veterinary school what careers they intend to pursue after graduation. The same question is asked at graduation, and again in alumni surveys. Combining these data allows exploration of the differences between what students think they will do with their degree and what they actually do. This information has helped prepare academic or career advisers to meet with students who may not know about certain job trajectories or post-graduation training opportunities.

Perhaps the biggest challenge of administering Exit Surveys is getting a high response rate. Although this is a challenge for all surveys, it is especially so for Exit Surveys. Once students graduate and leave campus, it can be difficult to contact them, so there is some time pressure to collect survey responses before graduation. Furthermore, non-response bias can have a pernicious effect when evaluating student satisfaction or success. Extant research shows that non-responders of student surveys can be quite distinct from those who do surveys; for example, non-responders typically have lower GPAs than responders, and non-responders may be less satisfied with the university (Sharkness, 2012). Yet students with lower grades or satisfaction levels can provide extremely valuable insight into the functioning of a university at the point of graduation. Were these students aware of support services, and if so, did they use them? Were they dissatisfied with their professors or advisers? Did these students work off-campus in order to pay for college? It is imperative that institutions make every effort to get a high response rate for exiting surveys in order to fully and honestly evaluate whether the school is meeting its own expectations.

Because the Cummings School graduates a relatively small class of veterinarians (approximately 80 each year), staff and faculty can remind students personally to take the survey, and the survey has been incorporated into the "check-out" activities students must complete in order to graduate. Thus, the Cummings exit survey has typically garnered a very high response rate, typically close to 100%. Other schools and programs administering Exit Surveys at Tufts have similarly incorporated exit surveys into their checklist of "pre-graduation" activities, and have similarly robust response rates. Those schools that do not formally incorporate exit surveys in this way typically get lower response rates.

Alumni surveys. More and more, colleges and universities are being asked to provide evidence of student success. In addition to inquiries from students and parents, accrediting commissions are increasingly requiring institutions to collect data on post-graduation outcomes. Many schools at Tufts use data collected from alumni surveys to fulfill this requirement. Some of these schools administer alumni surveys annually, while others conduct such surveys on an ad hoc basis. For example, the School of Engineering, the School of Dental Medicine and the Cummings School of Veterinary Medicine all administer annual alumni surveys. By contrast, the School of Arts and Sciences conducts alumni surveys intermittently, often in response to a particular area of focus at the University, or because there is an opportunity to participate in a consortium-run survey, and thus obtain comparative data.

At Tufts, most of the annually-administered alumni surveys are organized by school-level Outcomes Assessment Committees. These committees are responsible for keeping survey instruments up-to-date and for ensuring that the data collected from the surveys can be used to assess the school's outcomes. The committees work closely with OIRE, which provides assistance with instrument development, survey administration, data analysis, and reporting.

Depending on the school, alumni surveys may be sent to recent graduates or to older cohorts of alumni. The School of Dental Medicine, for example, annually distributes an alumni survey to alumni who graduated two and five years prior. The Cummings veterinary school annually surveys students who graduated one year prior, and every two to five years surveys older alumni. Every year, the School of Engineering surveys graduates who are two, five and ten years out from graduation. Typically, the schools that are accredited by specialized agencies tend to have the most regular and most robust alumni survey data collection schedules.

The basic content of Tufts' alumni surveys tends to be similar, but the length of the survey instruments and the topics covered vary from school to school. Almost always, alumni surveys ask questions about current employment, graduate school attendance, and future plans. Questions are also usually aimed at assessing a school's learning outcomes, and gathering feedback on the student experience. The Dental School Alumni Survey, for example, collects information on employment, feedback on mentoring, reflections on the student experience, and assessment of key dental competencies. Changes made to survey instruments may be driven by accreditation requirements, data quality concerns, or issues that are of current

concern to the university. During the development of the recent Dental School Strategic Plan, for example, a set of questions was placed on the alumni survey in order to solicit alumni feedback on areas of strategic concern.

In collecting data from alumni, schools hope to use the results to support informed decisions regarding academic and extracurricular programs. Of course, one source of data is usually not enough to make an adequately informed decision, so Outcomes Assessment Committees tend to review the results of alumni surveys in conjunction with other data before making recommendations about programmatic changes. For example, after noticing on the alumni survey a trend of decreasing satisfaction levels with specific courses, the Dental School conducted a series of focus groups with graduating students, and examined results of relevant course evaluations as well. Based on all of these data sources, the Outcomes Assessment Committee recommended some specific changes that could be made to improve the courses.

Alumni surveys provide valuable information, but data collection can pose challenges. To begin with, it can be difficult to obtain contact information for an entire population of alumni. Once students at Tufts have graduated, their contact information is moved to alumni database systems, which can be difficult to keep current. Not only do recent graduates tend to move fairly frequently, but they also tend to change their email address upon graduation and may not inform the institution of their new contact information. Therefore, lists of student addresses, physical or virtual, that are obtained from alumni databases, and which OIRE uses to send surveys often miss students or include outdated information.

In addition, response rates to alumni surveys tend to be lower than response rates to surveys of prospective or current students. Low response rates can pose challenges in terms of data interpretation; if respondents are not representative of the population being surveyed, schools may be unable to effectively use survey data to make informed decisions. Thus, it is always a good idea to use multiple sources of data to frame decisions suggested by alumni survey. Exit survey data, when available, can be a particularly good complement to alumni survey data.

Employer surveys. A number of schools at Tufts conduct employer surveys, or surveys of individuals and companies that employ their graduates. The primary purpose of these surveys is to assess how well the school is preparing its students for the workplace. These assessments are usually conducted as part of the specialized accreditation process that several of Tufts' schools undergo. The School of Engineering, for example, is asked by the Accreditation Board for Engineering and Technology (ABET) to assess whether the school's graduates are achieving the school's educational objectives. As part of this assessment, the Engineering Outcomes Assessment Committee developed an Employer Survey to collect data from employers of recent graduates. This employer survey asks for specific feedback on the degree to which graduates are performing in the workplace, which in turn helps the school assess how well it is preparing students for employment, a key educational goal.

Employer surveys at Tufts are generally sent to the employers of recent graduates. Employer information is collected from a variety of sources, including the university's career center, alumni relations databases, social networking sites like LinkedIn, faculty contacts, and alumni. For the most part, the content of employer surveys is similar, as the instruments are all designed to collect feedback related to educational objectives. Some of the surveys are short, asking only a few key questions about the Tufts graduates who are employed at the company. Other surveys are longer, as they also seek to obtain feedback on the employers' perceptions and opinions of Tufts. Very often, employer surveys ask employers to rate their overall satisfaction with the Tufts graduates they have hired, and to indicate how likely they would be to hire Tufts graduates in the future.

The administration of employer surveys may present numerous logistical challenges, not least because developing a distribution list of employers to survey can be time and cost-intensive. At Tufts, there is no single source of employment data, so alumni employment information must be collected from multiple sources. Even after employment information has been collected, it often only includes the name of the company or organization. Therefore, another step must be taken to determine the appropriate person or people to contact within each organization. Ideally, the points of contact for employer surveys will be the direct supervisor(s) of Tufts graduates, but this level of specificity can be difficult to ascertain. Extensive Internet and telephone research may be necessary just to identify the appropriate persons.

Despite the effort that goes into creating distribution lists for employer surveys, response rates are generally low, and so place the collected data at risk of non-response bias. In addition, the possibility of bias in the data is heightened even further by the fact that it is often easier to obtain contact information for direct supervisors at smaller companies than at larger companies, so the surveys may not reach a representative sample of employers. Therefore, as with other types of survey data, it is essential for schools to review employer survey data along with other sources of information before drawing any conclusions. For instance, some programs will rely on feedback from their board of advisors, comprised of professionals outside the university, as another source of information about professional readiness.

Customer satisfaction surveys. Tufts OIRE is often asked to design and administer customer satisfaction surveys for various offices and departments at the university. In general, the purpose of these surveys is to assess opinions about the office or department, to address a perceived problem, and/or to obtain data that can be used to improve existing processes. Customer satisfaction surveys may also be conducted as part of a broader strategic planning initiative.

Satisfaction surveys at Tufts are administered annually or cyclically for certain departments and on an ad hoc basis for many others, and are given to a variety of populations, depending on the purpose of the survey. While some satisfaction surveys are administered to a census of students, faculty, or staff, random sampling of target populations is employed whenever possible to minimize the risk of survey

fatigue. Customer satisfaction surveys may also be administered to very specific audiences. For example, one of Tufts' libraries administers a survey every two years to faculty and students from a few specific schools within the university, as faculty and students at these schools tend to be the heaviest users of that library's services.

Customer satisfaction surveys tend to differ from one another greatly in content and length, as the questions asked on these surveys are dependent on the objectives of the department or office conducting the research. Departments may want to gauge the level of awareness of their services on campus, or they may want to determine satisfaction with specific services that they offer. The surveys may also include items designed to address a perceived problem. A department or office may hear anecdotal reports of a problem with their services, and will then administer a survey to determine if an actual problem exists (and if so, how they might make improvements). Survey instruments may further be used to assess the value of adding services. Prior to installing enhanced software packages on public computers, for example, the library added questions to their satisfaction survey to collect data on the level of interest in a variety of software programs. Based on student and faculty responses to these questions, the library was able to make informed decisions about the specific software products that would be most useful to the community.

The information collected from customer satisfaction surveys is often used to make changes to programs and services on campus, though rarely is this information the sole source of evidence supporting the need for change. Departments and offices will usually combine survey data with other sources of information to make decisions. For example, results from one of the library satisfaction surveys showed that students were relatively dissatisfied with the library's study space. Based on this information, library staff conducted student focus groups to determine, specifically, what was wrong with the study space. Based on the data from both the survey and the focus groups, substantial improvements were made to the study spaces available to students. The library expects to see higher levels of satisfaction with study space in the next administration of their satisfaction survey.

Because customer satisfaction surveys vary greatly, the challenges to data collection also vary. Numerous satisfaction surveys may be administered throughout the year to the same or similar populations of students, so survey fatigue is a persistent problem. Also, limited departmental budgets may impact the expansiveness of the data collection and analysis. For example, in many cases paper surveys may yield higher response rates than online surveys, but because of the cost associated with printing surveys, administering them, and entering data, this is not always a feasible data collection method. In addition, budgets may limit the size and desirability of survey incentives, which can impact how many students respond to the survey.

Although not always the case, low response rates can be a challenge for customer satisfaction surveys. Minimal incentives, high survey burden and online distribution methods are all factors that can negatively impact response rates

(Sharkness, 2012; Sharkness & Miller, 2013). At Tufts, many customer satisfaction surveys achieve response rates between 20 and 30 percent, though some achieve response rates of over 50 percent. When response rates dip too low, it can be difficult to make sense of results and use survey findings to impact change. Additionally, students have reported that they tend to take surveys on topics of personal interest (Conoscenti & Butler, 2013). Given this, students may not complete a survey about a department or office that they do not use or about which they have no interest. This can limit the types of responses that are gathered on the survey. For example, students may not take the library satisfaction survey if they never visit the library. However, the library is using their survey, in part, to determine which services would appeal to more students on campus. The results of related questions may be difficult to interpret if a majority of respondents are currently active library users.

Modeling

Most of the data collected via the survey instruments described are used for descriptive analyses, that is, for describing certain characteristics of a population of interest. While this type of analysis can be invaluable to university stakeholders, descriptive data are occasionally not sufficient for decision making. Specifically, there are situations in which the relationship between a set of variables needs to be examined in order to tease out the unique impact of each. In these cases, OIRE employs multivariate modeling procedures that can help decision makers make sense of multiple, interconnected elements. Examples of modeling run the gamut from regression analyses designed to examine faculty salary equity across certain demographic categories, to structural equation models aimed at assessing whether the university's campus culture has been successful at infusing civic-mindedness in all undergraduates (see for example, Billings & Terkla, 2011). Below, we describe an ongoing modeling project that OIRE has been working on with the undergraduate admissions office to help admissions officers predict who among the accepted applicants will enroll at Tufts, and who will choose to go elsewhere.

Enrollment modeling. When a college admits students for its incoming freshman class, it considers a variety of factors, including academic strength and promise, financial need, and whether the admitted student is likely to matriculate. Predicting how many of the admitted students will matriculate ("yield") can be tricky, and a poor prediction in either direction has serious institutional consequences. If too many accepted applicants choose to enroll, the institution may not have sufficient dorm or classroom space for all of the students. If too few students enroll, revenue may be insufficient to cover the cost of educating the students.

In the fall of 2010, OIRE was approached by the undergraduate admissions office to help develop a predictive model of student yield that would take into account multiple key variables. Although the admissions officers had long understood correlations between matriculation and single variables like geographic location or financial need, they did not know how these and other variables

interacted to impact student decisions. For example, they knew that students from Massachusetts were more likely to enroll than were students from Texas, and they knew that students who received a significant financial aid award were more likely to attend than students who did not. But would a Massachusetts student with no financial aid be more likely to enroll than a Texan receiving a large financial aid award? The correlational approach that admissions had been using was insufficient to answer such questions.

A binary logistic regression model, where multiple factors can be used to predict the likelihood of an event had been piloted by other universities in similar settings and was deemed an appropriate statistical model for the problem at hand. In a binary logistic regression, independent variables combine to predict group membership (in this case, whether the applicant chose to attend Tufts). Each independent variable (predictor) can be expressed in terms of an odds ratio, interpreted as the degree to which the variable increases or decreases the likelihood of inclusion in the group. To build a binary logistic regression model of student yield at Tufts, regular-decision admissions data from the previous three years were employed to create two initial models, one for the undergraduate engineering program and one for the arts and sciences program. Several types of variables were targeted in building the model, including but not limited to: demographic variables (e.g. geographic location, gender), high school academic performance, student interest in Tufts (e.g. whether they visited campus), financial need and aid award, and other special considerations (e.g. if the student was a recruited athlete). These were selected based upon hypotheses held by the admissions officers about key yield factors, as well as by empirical observations of the variables that were most strongly correlated with yield.

Once the initial predictive models were built, they were tested using the 2011 application cycle data to ensure that the model accuracy was the same as for the calibration data. Finding that accuracy was maintained, the admissions office incorporated the models into the 2012 admissions process by programming the equations as a "yield index," or a number representing the likelihood of a given student enrolling at Tufts. To do this, the odds ratio generated by the logistic regression equation was converted into a probability, ranging from zero to one. Multiplying the probability by 100 resulted in an easier-to-understand "percentage" that was presented as the yield index. In 2013, the index was simplified by converting the yield percentages into quintiles for use as "yield index bands." This was well-received by the admissions office, and will continue to be employed in future iterations of the project. The yield index and subsequent yield index bands were refreshed as data within the student's profile were updated, and provided a real-time estimate of the likelihood that the student would yield to Tufts if offered admission.

In creating the original yield models, OIRE and the admissions office learned several things about the undergraduate applicant pool that would not have been discovered using the bivariate correlations originally employed. For example, the size of the financial aid package is more important in determining yield for engineers than for arts and sciences students, while campus visits are stronger

predictors of yield for students with weaker academic profiles. Being a recruited athlete improves the likelihood of yield for engineers but not for arts and sciences, while being from states geographically far from Massachusetts (such as Idaho) decreases the likelihood of enrolling. Such information can help Tufts admissions learn where it may need increased outreach to certain regions or populations, who would benefit most from increased financial aid offerings, or which kinds of campus contacts are most valuable for admitted students.

Building and using predictive models, especially for college admissions offices, can be challenging for reasons entirely unrelated to the mathematics. First, it is extremely important to underscore to all admissions staff using the model that it should not dictate who is accepted and who is not. A student with a high predicted "yield index" is not guaranteed to attend. There is quite a lot we do not know about students that can influence college selection, including personality or family variables, their perception of "fit," where else they received acceptances, and how much financial aid was offered by other institutions; to treat the model's prediction of yield likelihood as anything more than a best guess would be unwise. Furthermore, it is extremely important for admissions officers to use the model only in specific situations, and not throughout the admissions cycle, so as not to bias the holistic way that applications are read and judged. For example, during the last week of the admissions decision-making period, just before admission decisions are sent to applicants, an institution might use the model to inform final decisions about applicants with specific academic and financial aid profiles.

Another challenge to yield modeling is the fact that admissions offices are constantly adjusting their processes in order to accommodate new testing standards, national or local trends, or institutional changes. Because predictive models rely on past data, new variables, variables whose definitions change, or variables that are no longer relevant can render the model inaccurate or unstable. For example, changes in the SAT scoring system or a redefinition of financial aid brackets can have implications for the model that may take several years to adjust.

Finally, the accuracy of predictive yield models can be affected in surprising ways by forces outside of the statistical variables captured in the model. In 2013, Tufts was hosting admitted students when the campus shut down in response to a massive regional search for the Boston Marathon bombing suspect. Activities planned for the day were cancelled and on-campus services were limited. This event, unexpected by all and unlikely to occur again, may have impacted the yield rate of students who were on campus for its duration. In addition, the impact of the Boston Marathon event on the 2013 yield decisions of students as a whole may have implications for future iterations of the predictive model.

Benchmark Comparisons

Dashboards, Risk Registers, surveys of campus constituencies, and predictive models have proved tremendously useful for assessment and decision making at Tufts. However, these tools alone are not always sufficient to evaluate Tufts at the institutional level because they lack context. Here, context is defined as the

perspective provided by comparative data about other institutions. Such comparative data points can be very illuminating, and the perceptions that decision makers have of a particular institutional area may change when data are compared to other institutions. As a hypothetical example, suppose the rate of student satisfaction is 85% at Tufts. This may be seen by institutional leaders as unproblematic until compared to a set of similar institutions at which student satisfaction is 95% or higher. Therefore, whenever possible, OIRE collects comparative data against which Tufts can be benchmarked.

There are a variety of factors that must be taken into consideration when making benchmark comparisons at any institution. One of the most critical is the choice of the institutions to which a comparison is made. In the early 2000's, the Director of OIRE and the senior leadership at Tufts developed a set of 12 peer institutions that, as a group, share many of the same characteristics of Tufts, including its unique mix of schools as well as its focus on both research and education. Some of Tufts' peer institutions are aspirational – their admissions are more selective, or they have more research funding – and some are direct competitors. In addition to this official peer group, OIRE often compares Tufts to consortia that have already been identified – for example, the New England Small College Athletic Conference (NESCAC), or the member institutions of the Consortium on Financing Higher Education (COFHE). Specific schools, departments and programs at the university have also developed peer sets for use in specialized comparisons.

Another critical factor that must be taken into consideration when making benchmark comparisons is the availability of data. The vast majority of benchmark data that OIRE collects compares Tufts to institutions in the United States, not because these are the only institutions to which Tufts should be compared, but simply because there exists well-defined, comparable data for U.S. institutions that do not exist for international schools. Below, a recent application of benchmark comparisons called *Tufts in Context* is described, including the purpose of the study, the data sources utilized, their strengths and weaknesses, and the difficulties encountered when trying to describe how a complex university fits into the national context.

Tufts in Context. OIRE was asked to conduct the Tufts in Context project to set the context of Tufts University for new Trustee members who were unfamiliar with the landscape of higher education, as well as the strengths and limitations of Tufts University within that landscape. Specifically, OIRE was asked to use any available data to develop a comparison of Tufts to its twelve official peers and to research universities nationally. The primary data source that was used for the project was the Integrated Postsecondary Education Data System (IPEDS), a project run by the National Center for Education Statistics, an arm of the U.S. Government's Department of Education. IPEDS is a system of interrelated surveys that are required of all U.S. institutions that participate in federal student aid programs. The surveys collect data on seven areas: institutional characteristics (including prices and admissions requirements), enrollment (graduate and undergraduate), all degrees and certificates conferred, undergraduate student

financial aid, undergraduate student graduation rates, institutional human resources (staff and faculty counts and salaries), and institutional financial resources (IPEDS, n.d.). IPEDS is a tremendously useful source of comparative data because the data are public, easily accessible, cover a wide variety of areas, and are very well-defined, making it easy to compare institutions to one another.

Beyond IPEDS, three additional public data sources were employed for the Tufts in Context project. Specifically, data were drawn from the Survey of Earned Doctorates (SED), the Survey of Graduate Students and Post-Doctorates in Science and Engineering (GSS), and the Higher Education Research and Development Survey (HERD). These three surveys are designed to capture information about the research activity of universities, as well as the personnel conducting the research activities. The SED is an annual census of all individuals who received a research doctorate from an accredited U.S. institution in a given academic year. It collects information about educational experiences, postgraduate plans, and various student characteristics (National Science Foundation, n.d.-a). The GSS is an annual census of all U.S. academic institutions granting research-based master's degrees or doctorates in science, engineering, and selected health fields, and it collects information about the number of graduate students, postdoctoral researchers, and doctorate-level non-faculty researchers, by demographic characteristics as well as sources of financial support (National Science Foundation, n.d.-b). The HERD is an annual census of institutions that expended at least $150,000 in Research and Development (R&D) in a fiscal year. It collects information on R&D expenditures by field of research and source of funds, as well as information about type of research and expenditures, and counts of R&D personnel (National Science Foundation, n.d.-c). The data from the SED, GSS and HERD surveys help an institution like Tufts compare its research activities to other universities, which is helpful for assessing strengths, weaknesses, and future opportunities.

In addition to data drawn from public government surveys, the Tufts in Context project utilized a variety of proprietary data sources. The Council for Aid to Education's Voluntary Support of Education (VSE) Survey collects data on annual fundraising at U.S. higher education institutions, and reports these data in a variety of formats, some of which are publicly available and some of which require a purchase (Council for Aid to Education, n.d.). Comparative data on fundraising success is critical for Tufts in order to evaluate how well its advancement efforts are working. The Association of University Technology Managers (AUTM) fields several surveys in the U.S. and Canada that collect information about licensing activity and income, start-ups, funding, staff size, legal fees, patent applications filed, royalties earned, and more (AUTM, n.d.). The results of the AUTM Licensing Activity Survey are available for free to member institutions that participate in the survey, as well as others who pay an access fee, and provide essential comparative data on the impact and scope of technology transfer and other such activities. Academic Analytics provides a database to paid subscribers that includes information about faculty and scholarly productivity, by discipline, for faculty members at hundreds of research universities in the United States and abroad. The information in the Academic Analytics Database includes publication

data (books and journal articles), citations (to journal articles), research funding (by federal agencies) and honorific awards given to faculty members (Academic Analytics, n.d.). These data allow Tufts to compare the research productivity of its faculty to those of other institutions, which allows for an assessment of which departments and schools are strongest in their field, as well as the identification of areas in which research activities could be strengthened or enhanced.

One incredibly useful source of information that brings together many of the data sets listed above is the Center for Measuring University Performance's *Top American Research University Annual Report*. This report, published annually, contains selected data elements from the IPEDS, HERD, GSS, SED, and VSE surveys, as well as additional information from the National Academies of Sciences and Engineering and the Institute of Medicine, the National Merit Scholarship Corporation, the Association of American Medicine colleges, and a number of other agencies (Lombardi, Phillips, Abbey, & Craig, 2012). The report is published freely on the web, and contains information by institution name, as well as rankings associated with that institution, which can further add context to Tufts' data by placing them within the universe of research universities across the country.

Finally, the Tufts in Context project utilized the results of some proprietary ranking systems, such as U.S. News & World Report *Best Colleges* and the National Research Council (NRC) Data-Based Assessment of Research-Doctorate Programs (2010) to give a sense of how various outside organizations evaluate Tufts, relative to other institutions. The U.S. News *Best Colleges* rankings are perhaps the most well-known rankings of undergraduate programs in the United States. The rankings are based on admissions characteristics, graduation rates, reputational surveys of higher education administrators and guidance counselors, class size information, faculty information, financial resources, and alumni giving (U.S. News and World Report, n.d.). The data used for the rankings are published every year in a guidebook that is available for purchase, and online access to data is available as well with a subscription. Using Tufts' ranks in various U.S. News categories provides a sense of how Tufts compares to other universities in key undergraduate-related areas.

To look at doctoral programs, OIRE used the NRC's 2010 Assessment of Research-Doctorate Programs, which contains rankings for over 5,000 research-doctorate programs in 62 fields at 212 institutions (National Academy of Sciences, n.d.-d). These rankings are available for purchase on the NRC website, and free downloads are available as well. For Tufts in Context, the data collected from the NRC rankings were utilized to show which of Tufts' research-doctoral programs were rated most highly in the U.S., providing valuable context for the large number of doctoral programs that are offered by the university.

Using all of the data sources listed above, OIRE compiled data for Tufts, its official peer set, and all the research universities in the U.S. To summarize the vast amount of information that resulted, the data for each metric were presented for Tufts next to a summary of the data for the comparison groups; this summary included the median value for the institutions in each comparison group, as well as

Tufts' rank among the comparison institutions (see Figure 2). This approach allowed the audience for Tufts in Context to easily see how Tufts compared to the institutions within the other groups without being inundated with too much information. In the example shown in Figure 2, it is easy to see that on Metric 1, Tufts compares well to its peer group, but it compares less well to all national universities; for Metric 2, the opposite is the case.

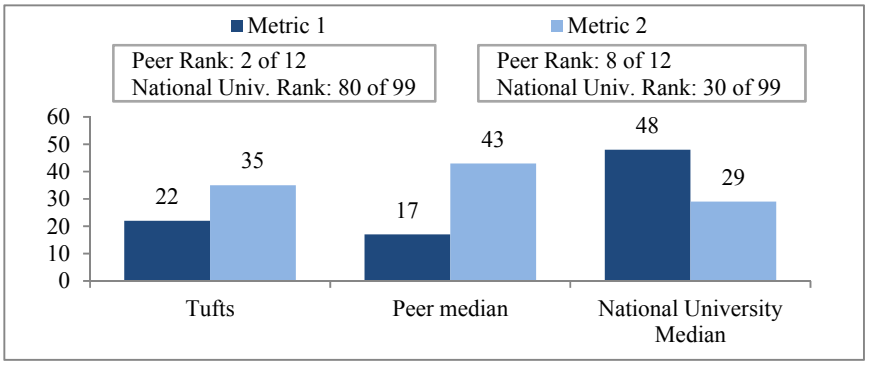


Figure 2. Example of data presentation for Tufts in context.

One of the primary challenges of the Tufts in Context project was finding data that covered a broad range of subject areas. Although a wide number of data sources were drawn upon, the types of available data were limited and did not cover all of the areas of interest to the Trustees and senior leaders. For example, IPEDS collects statistics on undergraduate admissions, but does not do the same for graduate admissions. As another example, there were relatively little data that could describe Tufts' societal impact relative to other institutions. Because of the limitations presented by the data, the conversation generated by the Tufts in Context project was more limited in scope than what was originally intended. OIRE attempted to round out the presentation by including historical data on Tufts for certain critical areas in which no comparative data were available. While this allowed the trustees to see how Tufts was performing in these areas, the data, of course, lacked a comparative context.

Another challenge of the project was in assisting individuals in interpreting the data that were presented. Because Tufts is relatively unique as an institution – few other schools have the same constellation of undergraduate and graduate schools – it is difficult to truly compare the university to other institutions. If the data show Tufts performing less well than its peers in a given area, questions may arise about the appropriateness of the peer set or the comparison. Are these the institutions to which Tufts should be comparing itself? Should Tufts be expected to perform well in this area, given the particular configuration of the university? How would Tufts fare if, for this metric, an alternative comparison group was used? Would that be a more appropriate comparison? In addition, when the data did not show what was

expected, questions of veracity were naturally raised. Is it really true that Tufts compares so well in one particular area, and so poorly in another? For this reason, OIRE was very careful to check and re-check the data before they were made public.

CONCLUSION

This chapter has illustrated a variety of research techniques that one university is using to help facilitate data-driven decision making. In addition, the authors have provided a discussion regarding the benefits and limitations of employing such techniques, as well as, a description of various data sources. Using information to inform decisions has become common practice at many higher education institutions, and the need for reliable data at the institutional, regional, national, and international level will continue to grow. The authors hope that the information presented in this chapter will be of use to those who are interested in establishing or enhancing a culture of evidence and inquiry at their institution.

NOTE

[1] Please refer to http://classifications.carnegiefoundation.org/descriptions/basic.php for the comprehensive definition of an RU/VH institution.

REFERENCES

Academic Analytics. (n.d.). *What we do: The comparative dataset*. Retrieved from http://www.academicanalytics.com/Public/WhatWeDo

Alhawari, S., Karadsheh, L., Nehari Talet, A., & Mansoura, E. (2012). Knowledge-based risk management framework for information technology project. *International Journal of Information Management, 32*(1), 50-65. DOI: 10.1016/j.ijinfomgt.2011.07.002

Allen, C., Bacow, L. S., & Trombley, L. S. (2011). Making the metrics matter: How to use indicators to govern effectively. *Trusteeship, 19*(1), 8-14.

Association of University Technology Managers (AUTM). (n.d.). *AUTM licensing activity survey*. Retrieved from http://www.autm.net/FY_2011_Licensing_Activity_Survey/9140.html

Billings, M. S., & Terkla, D. G. (2011). Using a structural equation model to describe the infusion of civic engagement in the campus culture. *The Journal of General Education, 60*(2), 84-100. DOI: 10.5325/jgeneeduc.60.2.0084

Conoscenti, L. M., & Butler, C. (2013, November). *We're listening: Improving survey processes based on student feedback*. Paper presented at the 40th Annual Conference of the Northeastern Association of Institutional Research (NEAIR), Newport, RI. Retrieved from http://provost.tufts.edu/institutionalresearch/files/NEAIR-2013-Were-Listening.pdf

Council for Aid to Education. (n.d.). *Fundraising in education – VSE survey & data miner*. Retrieved from http://cae.org/fundraising-in-education/category/home/

Delaney, A. M. (1997). The role of institutional research in higher education: Enabling researchers to meet new challenges. *Research in Higher Education, 38*(1), 1-16. DOI: 10.1023/A:1024907527884

Doerfel, M. L., & Ruben, B. D. (2002). Developing more adaptive, innovative, and interactive organizations. *New Directions for Higher Education, 118*, 5-28. DOI: 10.1002/he.53

Gonyea, R. M. (2005). Self-reported data in institutional research: Review and recommendations. *New Directions for Institutional Research, 127*, 73-89. DOI: 10.1002/ir.156

Integrated Postsecondary Education Data System (IPEDS). (n.d.). *About IPEDS*. Retrieved from http://nces.ed.gov/ipeds/about/

Lombardi, J. V., Phillips, E. D., Abbey, C. W., & Craig, D. D. (2012). *Top American research university annual report: 2012 annual report*. The Center for Measuring University Performance at Arizona State University and the University of Massachusetts Amherst. Retrieved from http://mup.asu.edu/research2012.pdf

National Science Foundation. (n.d.-a). *Survey of earned doctorates (SED)*. Retrieved from http://www.nsf.gov/statistics/srvydoctorates/

National Science Foundation. (n.d.-b). *Survey of graduate students and postdoctorates in Science and Engineering (GSS)*. Retrieved from http://www.nsf.gov/statistics/srvydoctorates/

National Science Foundation. (n.d.-c). *Higher education research and development survey (HERD)*. Retrieved from http://www.nsf.gov/statistics/srvyherd/

National Academy of Sciences. (n.d.-d). *Assessment of research doctorate programs*. Retrieved from http://sites.nationalacademies.org/PGA/Resdoc/index.html

Patterson, F. D., & Neailey, K. (2002). A risk register database system to aid the management of project risk. *International Journal of Project Management, 20*(5), 365-374. DOI: 10.1016/S0263-7863(01)00040-0

Porter, S. R. (2004). Raising response rates: What works? *New Directions for Institutional Research, 121*, 5-21. DOI: 10.1002/ir.97

Schiltz, M. E. (1988). Professional standards for survey research. *Research in Higher Education,* 28(1), 67-75. DOI: 10.1007/bf00976860

Sharkness, J. (2012). *Why don't they respond? An investigation of longitudinal survey nonresponse among college students attending four-year institutions* (ProQuest Digital Dissertations, Publication # 3518318). Retrieved from http://gradworks.umi.com/35/18/3518318.html

Sharkness, J., & Miller, K. (2013, November). *Which students respond to the surveys you send them? Using online panels to track student survey response over an academic year*. Paper presented at the 40th Annual Conference of the Northeastern Association of Institutional Research (NEAIR), Newport, RI. Retrieved from http://provost.tufts.edu/institutionalresearch/files/NEAIR-2013-Panel-Response-Rates-FINAL.pdf

Svenson, O., & Benthorn, L. J. (1992). Consolidation processes in decision making: Post-decision changes in attractiveness of alternatives. *Journal of Economic Psychology, 13*(2), 315-327. DOI: 10.1016/0167-4870(92)90036-7

Terkla, D. G., Sharkness, J., Cohen, M., Roscoe, H. S., & Wiseman, M. (2012). Institutional dashboards: Navigational tool for colleges and universities. *Association for Institutional Research (AIR) Professional File, 123*. Retrieved from http://www.airweb.org/EducationAndEvents/Publications/Documents/123.pdf

Tufts University. (2013). T10 Strategic Plan 2012-2023. Retrieved from http://strategicplan.tufts.edu/wp-content/uploads/Tufts-Strategic-Plan-Full-Report-web.pdf

U.S. News and World Report. (n.d.). *National university rankings*. Retrieved from http://colleges.usnews.rankingsandreviews.com/best-colleges/rankings/national-universities

Vancouver Island University. (n.d.). *How to develop a risk register*. Retrieved from http://www.viu.ca/bcco/documents/2b-1-How-to-develop-a-Risk-Register.pdf

Weisberg, H. F., Krosnick, J. A., & Bowen, B. D. (1989). *An introduction to survey research and data analysis* (2nd ed.). Glenview, IL: Scott, Foresman and Company.

Dawn Geronimo Terkla
Office of Institutional Research & Evaluation
Tufts University

Jessica Sharkness
Office of Institutional Research & Evaluation
Tufts University

Lauren M. Conoscenti
Office of Institutional Research & Evaluation
Tufts University

Christina Butler
Office of Institutional Research & Evaluation
Tufts University

PART B

MARKETING/STAKEHOLDER DATA

JAMES WILLIAMS

STUDENT FEEDBACK ON THE EXPERIENCE OF HIGHER EDUCATION

A Significant Component of Institutional Research Data

INTRODUCTION

Scholars have long recognized the value of student feedback surveys as a tool for informing institutional or even sector-wide improvement. As early as the early 1980s, scholars have noted the value of feedback surveys for finding out what the students really thought about their programs and their wider experience of life in higher education (Marsh, 1982; Ramsden & Entwhistle, 1981; Winter-Hebron, 1984). At the same time, institutions have been collecting feedback from their students "assiduously since the 1980s" (Harvey, 2001). Since the early 2000s, student surveys have become even more prevalent. Students are surveyed on almost every aspect of their experience from institutional to modular levels and questionnaire surveys seem to have become the preferred approach in each of these. They therefore form a significant part of institutional data: that is, information collected by institutions that can be used to inform policy and practice. Whilst not intended as a piece of scientific research, this chapter is intended as a "think-piece" to stimulate discussion and thought on the development of institutional student feedback processes.

Harvey argued in 2001 that despite the widespread collection of student feedback, institutional managers had little understanding of how to use the data collected in this way. Today, arguably, there is much more awareness that something must be done with feedback collected from students. It is no longer felt acceptable simply to collect survey data and ignore them. Four questions still need to be kept firmly in focus: 1) What is the purpose in collecting feedback from students? 2) How are the results of student feedback surveys used? 3) What can student feedback surveys really show us? 4) Have they really changed anything? This chapter explores the value of student feedback as institutional research data through a reflection on these four key questions. The chapter analyzes existing data and experience, built up over two decades of working with student feedback surveys. The chapter focuses on experience in the United Kingdom. In part, this is because there is a long and consistent debate on student feedback but it is also because there has been an interesting tension between national and local feedback processes following the development and implementation of the National Student Survey (NSS) in 2005. The focus of much current debate is, inevitably, perhaps, the NSS, but there is also a significant archive of data and literature from

M. E. Menon et al. (eds.), Using Data to Improve Higher Education, 67–80.

institutional surveys stretching back over a twenty year period: a resource that needs to be used.

The literature includes a range of both published and "grey" material. It comprises reports by government agencies, reports commissioned by government agencies and published academic work. Material from national media, including the professional press (for example, the *Times Higher Education*) has been explored for current concerns. In addition, opinions and experiences of officers with a role in the management of the NSS at several institutions were canvassed by e-mail and telephone. In addition to the discussion of the NSS, the chapter also draws on material from a large archive of student feedback data and institutional action from the Student Satisfaction Approach, developed at the University of Central England (now Birmingham City University) and used in several different institutions.

Background

There has been a significant body of research carried out on the role and development of student feedback in the United Kingdom over the last twenty-five years. However, significant reviews have only been undertaken at moments when governments have been interested: In particular, this occurred in 2001 to 2002, when the British government commissioned the Cooke Committee to report on the most effective ways of providing the public with reliable, up-to-date and valuable information about higher education institutions in the United Kingdom. As a result, Harvey's 2001 review was undertaken as part of the Cooke Committee (2001 to 2002) and the 2003 report by the Centre for Higher Education Research and Information (CHERI) on student feedback (Williams & Brennan, 2003) was commissioned by the Higher Education Funding Council of England (HEFCE) in the wake of the Cooke Report (2002). To date, Harvey (2001) and Richardson (2005) were the last significant academic reflections on the broad evolution of student feedback on their experience of higher education in the United Kingdom. As in most other countries, there is a clear need for such work.

The establishment of the Cooke Committee in 2001 demonstrates that over the course of the 1980s and 1990s, student feedback had become increasingly viewed as an important element in the *information* that management needed to support their decisions (Cooke, 2002). By the 1990s, most higher education institutions were collecting feedback assiduously (Harvey, 2003). Feedback was collected on a range of different aspects of the students' experience of the institution such as core aspects of learning and teaching, facilities and services such as catering and accommodation. Most, if not all, academic courses were subject to routine student evaluations. However, as Harvey argued (2003) such feedback was collected, usually in the form of questionnaire surveys and the institutions generally had little clear idea of what to do with the resulting data.

The evolution of feedback processes in the course of the 1980s and 1990s was un-coordinated and developed under a range of different influences. Although there were more developed student feedback processes being undertaken in U.S.

universities, where such models as total quality management (as proposed by Deming and others) and the Noel-Levitz satisfaction index were popular, this seems to have had little real impact on British universities in the 1980s and 1990s. Indeed, the implementation of so many student feedback surveys indicates that this was an attempt to demonstrate accountability, as required by the Thatcher governments of the 1980s and increasing managerialism that engulfed the sector (Harvey, 2003; Richardson, 2005).

One of the few exceptions to this was the model of student feedback, which developed from the late 1980s at the University of Central England, a method that became known as the Student Satisfaction Approach (Harvey, Moon, & Plimmer, 1997). It was unique in the United Kingdom and was adopted by many other institutions at home and abroad. It was designed both to engage students in the feedback process, developing questions from "group feedback strategy" and to provide reliable, valid and up-to-date information from the students on their experiences at the institution and easily accessible data for senior managers (Green, Brannigan, Mazalan, & Giles, 1994). Similar to the Noel-Levitz satisfaction index, it combined satisfaction and importance allowing senior managers to identify items that were considered as most important and focus resources on improving those items (Harvey et al., 1997; Richardson, 2005).

An explosion of interest in student feedback occurred during the late 1990s and early 2000s (Harvey, 2001). Student feedback became the core of discussions of the Cooke Committee in 2001 to 2002, which was concerned with how to encourage higher education institutions to provide valid, useful information to stakeholders. Arguably, the underlying driver behind the government's commissioning of the Cooke Committee was the imposition and expansion of tuition fees for students in England and Wales from 1998. The principle concern of the government and thus of the Cooke Committee, was to provide reliable information to parents and potential students so they could make informed choices about which program to apply for. These choices would, after all, result in the payment of significant tuition fees. The Cooke Report (2002) led to the commissioning of the Centre for Higher Education Research and Information (CHERI) study on student feedback and eventually to the piloting of a national student survey in 2003.

PURPOSES OF COLLECTING STUDENT FEEDBACK

The purposes of student feedback surveys are now well rehearsed and part of the current language of higher education at both sectoral and institutional levels. The basic understanding of the role of feedback has not noticeably changed over recent decades (Harvey, 2001, 2003). First, student feedback is collected because it is a standard approach to "listening to the students' voice." It can be an effective way of collecting valid, up-to-date data on the students' experience from the students themselves. Second, student feedback can be an accountability tool. Student feedback surveys ensure that institutions are aware of the concerns of the students and that they cannot simply ignore what the students say (assuming that the data

are made public). Third, student feedback can inform potential students and their parents about which program and institution to choose. Information from students about their own lived experience is likely to be more relevant to potential students than that provided by institutional staff. Finally, student feedback informs institutional senior managers about what concerns students. This allows them to develop improvement plans that are realistic, based on the needs of their students.

Ironically, as early as 2007, critics highlighted the *lack* of clear purpose of the National Student Survey. It was noted by Williams and Cappuccini-Ansfield (2007) that the survey was primarily designed as a measurement tool rather than one for quality improvement, although managers and policy makers have assumed that it can be used to improve the student experience. Indeed, the survey is often (anecdotally) thought to be a "crude instrument." It is too short and broad to focus on specific institutional issues. As Harvey argued (2003), the then proposed NSS supposedly measured mathematically proven "concepts" such as teaching and learning, even though for most of us, such notions are preposterous. More recently, critics have begun to focus on another issue. The NSS fails to provide any real information about the quality of learning and teaching activities (Buckley, 2012; Gibbs, 2012). A new approach, it is argued, is needed, and one answer is thought to be a new survey that explores student engagement based on models such as the U.S. National Survey of Student Engagement (NSSE) (van der Welden in Buckley, 2012).

Different Purposes; Different Types of Survey

The different types of surveys are also well known. Harvey outlined the full range of surveys that were in use in 2001: institution-wide surveys; classroom experience surveys/modular evaluation surveys; surveys on facilities and social environment; surveys on accommodation; national surveys on institutional experience. The variety still exists, although institutional surveys have become subordinate to or been entirely replaced by the National Student Survey. In addition to university-wide experience surveys, U.K. universities employ a range of other surveys which are of varying value, such as first and second year surveys, modular feedback surveys and user surveys for facilities and services.

Some institutions now run annual first and second year student feedback surveys in order to identify issues early on in the students' journey that might appear later in the NSS. These usually follow the same or similar format to the NSS. This approach has merit in that it allows institutions to address student concerns before they emerge in public and with potentially damaging consequences in the NSS. However, this approach might also be criticized for being a cynical manipulation of the process that is rooted in a concern for position in the student satisfaction league tables rather than in concern for the genuine well-being of the student.

Modular feedback is used almost comprehensively to assess the quality of individual courses. Use of this approach shows an upward trend, perhaps because it is easier than using alternative modes. However, it is much criticized by staff, who often feel that they are not only useless in providing information for improvement

but also have a negative effect: A single negative point raised by a student, for example, can be presented as representative of all the students' views. This is particularly problematic when there are small numbers of students. Alternatives are occasionally suggested, such as using focus groups or managed class discussions, in which direct feedback is given by the students to the tutor. Surveys in this case are clearly inappropriate (Williams & Kane, 2013).

A more valid category of surveys which is often to be found in contemporary U.K. universities is the facility user survey. Such service user surveys often include Library surveys, Union surveys, sports facilities surveys etc. They are used to gauge the use of the facility and user satisfaction with a view to improving the service. User surveys will reflect on a range of issues, mainly practical, for which there should be a solution. The key to successful user satisfaction surveys, however, is to ensure that action results from collecting the feedback. Otherwise, the process loses its credibility and response rates plummet. In this case, it is important that users are asked only questions to which there is a solution.

"Tick-box" surveys have long been a preferred approach for many institutions, perhaps because they are both easy to produce and the data provided by them are easier to analyze (being simple, quantitative data collection instruments). Indeed, experience indicates that senior management is uncomfortable with analyzing qualitative data in the form of student comments. Quantitative surveys are clearly appropriate in particular cases.

HOW SURVEY RESULTS ARE USED

In the United Kingdom's higher education sector, the NSS has been an important, if controversial, instrument since its first use in 2005 and institutions are unable simply to ignore it. Practically, it forms a central element in the collection of data that institutions provide for potential students known as the key information set (KIS), introduced in 2012. However, more invidiously, it forms an influential part of the development of the reputation of U.K. institutions. It is important, therefore, to explore the ways in which the NSS and other feedback instruments are used by institutions to improve the quality of learning and teaching. At most universities in the United Kingdom, the NSS, as the dominant student feedback survey, is used by senior managers in their quality improvement processes. Key messages from the NSS are raised at senior management level and action is taken to address the concerns.

The Consultation Process

Harvey's model of the student feedback and consultation process at the University of Central England in the period 1992 to 2007 illustrated how the student satisfaction survey fitted into the existing structures of authority at the University (Williams, 2011a). It shows clearly not only how the annual student satisfaction survey was reported back to the vice chancellor and senior management (including faculty deans and directors of service, heads of departments, all academic staff and

the representative bodies), but also how the students were included. It also shows how the student satisfaction report was produced by a unit outside the structure of the management: the Centre for Research into Quality.

This model, as Kane, Millard and Williams (2013) argued, has slightly, but significantly, altered. Although processes vary across institutions, a generic model is common. The starting point is now a particular contact person within each institution, which, in several institutions, appears to be an officer of the Marketing Department. The NSS is distributed and managed by the University's Marketing Department, in a partnership (varying between institutions) with the Students' Union. When responses have been received and analyzed, the analysis reports are delivered to the faculties. The Associate Dean circulates the results to the course directors. The Associate Deans with responsibility for the student experience meet with course directors to identify issues for improvement. Special monitoring is established for courses that are underperforming. This can be illustrated by a revised version of Harvey's model but it is now a far less tidy and clear process. The key difference between the two models is that the management of the institutional survey process is no longer the responsibility of an autonomous unit within the University (in the case of UCE, the Centre for Research into Quality) and has become part of the institution's corporate function.

Accountability for Improvement: Impact of NSS

Ultimately it is the universities who are responsible for addressing issues raised in the NSS. This is especially true of specific issues that arise owing to students' particular concerns with their institution. When scores appear on the "Unistats" website that hosts the NSS results, there is a rush to identify where the problems are. However, there is sector-wide support, if not formal responsibility, on some broader issues, particularly core issues such as feedback and assessment, where the sector explores different ways in which an issue can be addressed. By "the sector" we mean representative and support organizations such as the Higher Education Academy. In order to support institutions address issues raised in the NSS, the HEA offer advice through workshops and other, targeted activity.

Data from the NSS have huge impact at institutional and sub-organizational levels. There is anecdotal evidence that suggests near panic can ensue on receipt of poor NSS results. Poor results in the NSS can be picked up by the national media, as for example, when it was noticed in 2007 that assessment and feedback had "routinely scored the lowest satisfaction rates in U.K. higher education." Publication of NSS results is followed by serious internal discussion. Most staff seem to be aware of the NSS and have an established view on the survey and its results. It appears to be one of the most talked about items in U.K. higher education. This, however, is largely the "noise" but is there any evidence that it has any real effect on improving the students' experience? Some would say that it does not. However, the NSS, despite its faults, is the only nationally based tool for gathering student data that we have in the U.K., so in this sense, we know more about the student experience of higher education nationally than we have ever

done. This has proved a shock for many institutions (in particular, arguably, for the pre-1992 universities) but in several cases, the results are merely what many people thought all along (Williams & Kane, 2009).

WHAT STUDENT FEEDBACK DATA TELL US

On key elements of NSS, there is actually very little that is surprising. The most controversial issue: Assessment and feedback scores, are a case in point. Scores for the two items in the NSS, "promptness of feedback" and "usefulness of feedback" have been consistently low in comparison to other core elements of the survey, such as course organization and teaching and learning (Williams & Kane, 2009). However, there is much evidence to show that in fact, these items have always scored less well than others: Indeed, research has shown that the NSS score was not much different from those in many long standing institutional surveys. In some cases, the "poor" score achieved in the NSS turned out to be the result of many years of improvement: The score had been much lower in the 1990s. What this indicates is that assessment and feedback, as one Associate Dean recently observed, are not easy to resolve and, as research has shown, takes time and consistent attention. On a more positive note, the concern that was raised as a result of this controversy seems to have stimulated a much more concerted attempt to address issues around this issue and the NSS results have shown an improvement in scores.

Whilst the NSS really tells us little we did not already know, Kane, Williams and Cappuccini (2008) have shown us that student feedback surveys using a more flexible and adaptable institutional survey process such as the Student Satisfaction Approach as developed and used at the University of Central England, can provide a much more nuanced picture of change and development. Questionnaires using this approach are based on concerns raised by students in focus groups and thus change to reflect their current concerns. Hence, the questionnaire reflects current issues amongst students and helps institutions to understand what issues are on-going, which are new and which are old. It also shows that effective feedback surveys can be a dynamic tool: Satisfaction increases when effective action has been taken to improve the situation. As Kane et al. note (2008, p. 156), "the omission and adoption of questions mirrors changes in concerns and priorities amongst the students and in the educational arena more widely."

The data derived from the questionnaires also indicate which issues are of most importance to different groups of students. In a study of what student feedback surveys can tell us, based on another analysis of the Student Satisfaction Approach data, Williams (2011b) identified a number of key trends. There were several issues that were consistently regarded as important: issues relating to teaching and learning; development of knowledge in chosen subject; library and learning resources. Student Union issues are routinely least important. Several issues were now no longer regarded as so important. Computing resources have increasingly become less important. In part, this may be because computing facilities are more easily available and students are more likely to own their own facilities. More

diversity is now required of catering facilities, especially on religious or other principled grounds. Financial concerns seem less of an issue now than they were in the mid-1990s. This is particularly interesting considering that fees were introduced in Autumn 1998. Little comment was made by students when fees were increased threefold in 2003. Issues are different for final years than they are for first years. This highlights the relationship between satisfaction and increased pressure on resources at particular times of the academic year.

Several key issues appeared to satisfy students (Williams, 2011b). Teaching and learning issues saw a gentle rise in satisfaction from 1996. Library facilities saw substantial increases in satisfaction from 1996. The interactive, learning elements of the University experience were consistently regarded as very satisfactory. There are some issues which consistently attracted lower satisfaction ratings: items relating to social life; social networks, social experience of university; cost of refreshments; learning resources during "crunch-times." Interestingly, part-time students are increasingly less satisfied than full-time counterparts (Williams, 2010). Some areas are difficult to improve and this is reflected in the surveys. Most noticeably, assessment and feedback have proved difficult to address, although they saw gradual improvement in satisfaction ratings from 1996.

Of particular interest is the work done by Williams and Kane (2008, 2009) on the issue of assessment and feedback on students' academic work, which reflected on student feedback data and university responses over a period of 11 years. This detailed piece of work not only demonstrated that student satisfaction with key items which routinely appeared in student satisfaction questionnaires (these being "promptness of tutor's feedback on students' work" and "usefulness of tutor's feedback") had increased over the period of study, but that university action was both a response to and a contribution to student feedback.

CHANGE AS A RESULT OF STUDENT SURVEYS

For Harvey (2003), it was essential that student surveys result in action to improve the student experience. This was because it is both a waste of the students' time to encourage them to complete a survey that will simply be ignored and, hopefully, empowering to the students as key stakeholders in higher education. This ethical approach to collecting student feedback found expression in the Student Satisfaction Approach. The now well-known "A to E" matrix developed by Harvey, enabled results of an annual student feedback survey to be presented in alphabetic format, where a capitalised A represented a score of "very satisfactory" and "very important" and a capitalised E represented a score of "very unsatisfactory" and "not so important." The action implication of different satisfaction scores was also highlighted (Figure 1). Whilst an E score clearly identified an "urgent need for immediate action," an A score implied that effort was required to "maintain excellent standards."

	Very un-satisfactory *E*	*Unsatisfactory* *D*	*Adequate* *C*	*Satisfactory* *B*	*Very satisfactory* *A*	
Very important	Urgent need for immediate action	Action in these areas has high priority	This is to be targeted for future improvement	Ensure no slippage, improve where possible	Maintain excellent standards	7
Important	Action to substantially improve this area	Target this area for improvement	Ensure no slippage	Maintain standards	Avoid overkill	5.5
Not so important	Improve where resources permit	Ensure no further slippage	Restrict attention	Maintain standards where possible	No need for action here	5
	1	2.75	3.75	4.25	5.25	7
			Mean score			*Mean score*

Figure 1. A to E action implications.

This principle is, in fact, recognized by many institutions when dealing with the NSS. At one institution (that did not wish to be named), the survey link gives out results as the students open the link. On their website, the University of Brighton suggests that staff "demonstrate changes that have been made in response to student feedback and highlight improvements in the course, school or university" (University of Brighton, n.d.). On their website, the University of Sussex encourages the same approach: "Keep students and staff in your department up-to-date with the latest response rates, when you receive them." Interestingly, the guidelines note that "the element of friendly competition amongst departments, as well as the visibility of the impact their individual response could make on the overall response rate, did seem to encourage students" (University of Sussex, n.d.).

This approach was used by several institutions that used the Student Satisfaction Approach during the 1990s and 2000s, where effort was made to publicize action that was taken by the institutions. In most cases, these were in the form of feedback flyers (at the University of Central England, this was known as *Update*). To date, little analysis has been made of such flyers, although the issue of "closing the feedback loop" has been and remains a difficult issue (Kane et al., 2013; Watson, 2003). A brief review of feedback flyers, indicates that change resulted from the surveys (Williams, 2011a). At the University of Central England, for example, *Update* was distributed with each year's survey questionnaire, partly as a method of encouraging students to respond and partly as an information policy and other institutions used a similar approach. It is interesting to focus on a number of key areas covered by the surveys: assessment and feedback, library and learning resources. In 1995–96, for example, the University instituted more realistic turnaround targets:

> In response [to low satisfaction with promptness of feedback] the faculty [of Computing and Information Studies] set a target of a "four-working-week turnaround" on assignments, which has proved very successful. (Center for Research into Quality, 1996, p. 150)

The Sheffield Hallam University feedback flyer of 2003 noted the implementation of a "three-week rule" for the return of feedback to students (Williams, 2011a), although it has been made clear, publicly, that this is difficult to achieve in some faculties.

As a result of lower satisfaction rates with Library opening hours, the 2008 *Update* noted that:

> As a result of feedback a decision has been taken to extend library opening hours: The Mary Seacole Library will open from 7.15 am every week day morning during term time. The Gosta Green Library will open at weekends during term time: 9:00am–7:00pm. Kenrick Library will open 24/7 during exam periods in January and May/June. (Center for Research into Quality, 2008, p. 3)

In a year when students were expressing low satisfaction for personal tuition, there were two items of action by the University. One faculty claimed to be "strengthening its guidance to students on dissertation supervision" (Center for Research into Quality, 2000, p. 2) whilst another "introduced a pilot scheme to increase the *amount of tutorials* giving students the opportunity to contact tutors directly" (Center for Research into Quality, 2000, p. 2).

The flyers also indicate where different approaches to simply expanding the quantity of available resources are used. For example, the University of Central England took a different approach to low satisfaction scores for the availability of items in the Library. Along with expanding its digital collections, the Library was now exploring ways of encouraging students to use new approaches to using learning resources. In 2003, it was noted that:

> The Library has made available on its web pages the policies that are in place to develop the library collection and support users. A variety of programs of education in more effective library use are undertaken in many faculties. (Center for Research into Quality, 2003, p. 3)

This was an ongoing process at faculty level. In 2008, *Update* noted:

> At the faculty of Education, information relating to the digital library (UCEEL) is now included in all induction sessions and a leaflet is included in all student induction packs. Workshops for undergraduates now highlight the importance and use of library PINs and UCEEL. (Center for Research into Quality, 2008, p. 3)

Approaches to Closing the Feedback Loop

In addition to *Update*, posters were distributed around the University's campuses in an attempt to advertise the survey. The posters, which used the phrase "You said; we did," were an attempt to demonstrate that the questionnaire was worth completing because action resulted. Unfortunately, no internal research was conducted to explore the effectiveness of this, or other methods of advertising. In the age of online bulletin boards, information was transferred to electronic media. During the last years of the Student Satisfaction Approach at the University of Central England, faculty boards were used to display messages about actions taken as a result of the survey. It is common now to use a wide range of electronic media to deliver messages about the NSS, including social media. It is interesting to note that the NSS uses a similar phrase to emphasize that action is taken on the basis of the results of the NSS. Although the "You said; we did" format has been commonly used, some institutions are moving away from it because of "the tension between its perceived consumerist tone and the increasingly widespread sense that students are partners in the educational process, and that genuine dialogue is more appropriate than responding to demands" (Buckley, 2012, p. 25).

The vital part of the NSS feedback process from September 2012 has been the Key Information Set (KIS) that all prospective students are to receive from institutions. The KIS is a collection of data provided to enable students to make up their minds about which institution to choose: "It gives prospective students access to robust, reliable and comparable information in order to help them make informed decisions about what and where to study" (HEFCE, n.d.). The KIS contains a wide range of data including results from specified questions in the NSS, but also information about the amount of time spent in learning and teaching activities, types of assessment, accommodation, fees, bursaries available, graduate employment, potential earnings of graduates etc. as it ties the NSS to information that students require in order to make what is now an extremely expensive choice. In a sense, this could be the most effective element of the NSS closing the feedback loop. KIS was implemented as a result of recommendations from independent research (Oakleigh Consulting and Staffordshire University, 2010). The KIS has been widely reported in the national press, with critics arguing that it is part of an accountability agenda, that it suits the government and that it is part of the out-of-hand number crunching process. At the time of writing, it is too early to evaluate its success (see, for example, Tubbs, 2012a; Underwood, 2012b, 2013).

Working in Genuine Partnership with Students

Delivering messages electronically or by traditional formats is easy enough but it is likely that such messages are of limited effect. A more personal and effective approach to demonstrating that a survey is important may be through activities such as the Student Advisory Boards and other peer-to-peer based activities referred to above. This is a way of engaging students directly with the institution (in this case the faculty) to identify what needs are changing and what has changed.

It is an example of senior management engaging with students directly leading to a feeling of being listened to, or, as one respondent recently observed, "belongingness."

In part this is all about engaging students in the improvement process, which was one of the key motivations behind the Student Satisfaction Approach. Some institutions are beginning to engage with students outside of the survey context, seeking more immediate feedback and solutions. Student engagement activities, through schemes such as Student Academic Partners at Birmingham City University, see students and staff working in partnership to identify problems and co-create solutions that provide immediate impact on the student experience and the institutional context. Recent work indicates that student engagement in partnership activity actually raises scores on the NSS (Kane et al., 2013).

CONCLUSION

Much of this shows that since the early 2000s, despite the huge growth in the student feedback survey "industry," there has been very little significant change in the underpinning principles of student feedback. The purposes identified by Harvey in 2001 and by Richardson in 2005 have not significantly altered. Surveys are still collected for purposes of accountability, providing information for stakeholders and in some cases actually being used to improve the student experience. Student feedback still can, if used thoughtfully, provide useful information about what students view as being important. They can also be a valuable instrument for engaging students in the improvement process. Issues such as: how to encourage students to respond to the survey and to take ownership of a process generally felt to be their own; how to develop appropriate action plans as a result of receiving NSS results; and how to feedback appropriately to students remain perennial issues.

Before 2005, several institutions in the United Kingdom, on which this study has focused, were already engaged in this process and had developed successful student feedback mechanisms. Other institutions in the United Kingdom's higher education sector were stimulated to consider different ways of "listening to the student voice" by the NSS, despite its faults, as Buckley (2012) argues. Since 2005, there has been a growth in the ways in which institutions attempt to engage their students with different aspects of higher education, perhaps as a result of the NSS, or perhaps as a result of unique institutional developments.

In particular, student engagement has become a key element in higher education policy at all levels, perhaps as a result of the concerns that the NSS has never fully addressed in relation to what are seen as core issues of the students' experience through methods, such as the Student Academic Partner scheme. The NSS is now viewed as the primary measure of student experience in the United Kingdom and, rightly or wrongly, this is unlikely to change. The least desirable elements, such as league tabling, might become less significant if the move towards other methods of engagement continues to develop.

REFERENCES

Buckley, A. (2012). *Making it count: Reflecting on the national student survey in the process of enhancement*. York: Higher Education Academy.

Center for Research into Quality. (1996). *Student satisfaction: Update, 1995-1996*. Birmingham: University of Central England.

Center for Research into Quality. (2000). *Student satisfaction: Update, 1999-2000*. Birmingham: University of Central England.

Center for Research into Quality. (2003). *Student satisfaction: Update, 2002-2003*. Birmingham: University of Central England.

Center for Research into Quality. (2008). *Student satisfaction: Update, 2007-2008*. Birmingham: University of Central England.

Cooke, R. (2002). *Information on quality and standards in higher education: Final report of the Task Group*. Bristol: Higher Education Funding Council for England. Retrieved from http://www.ihep.org/assets/files/gcfp-files/HEFCEQA.pdf

Gibbs, G. (2012). *Implications of "dimensions of quality" in a market environment*. York: Higher Education Academy.

Green, D., Brannigan, C, Mazelan, P., & Giles, L. (1994). Measuring student satisfaction: A method of improving the quality of the students' experience? In S. Haselgrove (Ed.) *The student experience* Buckingham: Society for Research into Higher Education and Open University Press.

Harvey, L. (2001). *Student feedback: A report to the Higher Education Funding Council for England*. Retrieved from http://www.uce.ac.uk/crq/publicatgions/studentfeedback.pdf

Harvey, L. (2003). Editorial: Student feedback. *Quality in Higher Education*, *9*(1), 3-20.

Harvey, L., & Williams, J. (2007, November). *Student feedback*. Workshop presented at the 2nd European Quality Assurance Forum, Rome.

Harvey, L., Moon, S., & Plimmer, L. (1997). *Student satisfaction manual*. Buckingham: Society for Research into Higher Education and Open University Press.

Higher Education Academy. (n.d.). Students as partners change program 2012-2013. *The Higher Education Academy*. Retrieved from http://www.heacademy.ac.uk/resources/detail/change/SAP_CP

Higher Education Funding Council (HEFCE). (n.d.). *Key information sets*. Retrieved from http://www.hefce.ac.uk/whatwedo/lt/publicinfo/kis/

Ipsos MORI. (2013). *National student survey 2013: Promotion guidelines for institutions and students' unions*. Retrieved from http://web.anglia.ac.uk/anet/student_services/public/NSS%202013%20Promotion%20Guidelines.pdf

Kane, D., Millard, L., & Williams, J. (2013). Transforming the student experience in the U.K. from 1989. In M. Shah & C. S. Nair (Eds.) *Enhancing student feedback and improvement systems in tertiary education*. Commission for Academic Accreditation (CAA) Quality Series, 5, United Arab Emirates.

Kane, D., Williams, J., & Cappuccini, G. (2008): Student satisfaction surveys: The value in taking an historical perspective. *Quality in Higher Education*, *14* (2), 135-155.

Marsh, H. W. (1982). SEEQ: A reliable, valid and useful instrument for collecting students' evaluations of university teaching. *British Journal of Educational Psychology, 52*, 77-95.

Oakleigh Consulting, & Staffordshire University (2010). *Report on understanding the information needs of users of public information about higher education*. Bristol: HEFCE.

Powney, J., & Hall, S. (1998). *Closing the loop: The impact of student feedback on students' subsequent learning*. Edinburgh: Scottish Council for Research in Education.

Ramsden, P., & Entwistle, N. J. (1981). Effects of academic departments on students' approaches to studying. *British Journal of Educational Psychology, 51*, 368-383.

Richardson, J. T. E. (2005). Instruments for obtaining student feedback: A review of the literature. *Assessment & Evaluation in Higher Education, 30*(4), 387-415.

Tubbs, N. (2012a). The importance of being useless. *Times Higher Education*. Retrieved from http://www.timeshighereducation.co.uk/story.asp?sectioncode=26&storycode=421413

Underwood, S. (2012b). Number crunching. *Times Higher Education*. Retrieved from http://www.timeshighereducation.co.uk/story.asp?sectioncode=26&storycode=421157

Underwood, S. (2013). In the twilight zone. *Times Higher Education*. Retrieved from http://www.timeshighereducation.co.uk/story.asp?sectioncode=26&storycode=422717

University of Brighton. (n.d.). *Promoting the NSS*. Retrieved from http://staffcentral.brighton.ac.uk/nss/Promotion.shtm

University of Sussex. (n.d.). *Good practice for promoting the NSS*. Retrieved from http://www.sussex.ac.uk/nss/resources/goodpractice

Watson, S. (2003). Closing the loop: Ensuring effective action from student feedback. *Tertiary Education and Management*, *9*(2), 145-157.

Williams, J. (2010). New learning paradigms? Exploring the part-time student's experience 1996-2007. *Tertiary Education and Management*, *16*(3), 183-209.

Williams, J. (2011a). Acting on student feedback to effect change. In P. Mertova (Ed.) *Student feedback: The cornerstone to an effective quality assurance system in higher education.* Cambridge: Woodhead Publishing.

Williams, J. (2011b, June). Taking the long view: What institutional student feedback surveys have shown us. Paper presented at the *2011 Higher Education Institutional Research (HEIR) network conference,* Kingston University, U.K.

Williams, R., & Brennan, J. (2003). *Collecting and using student feedback on quality and standards of learning and teaching in higher education*. Bristol: Higher Education Funding Council for England.

Williams, J., & Cappuccini-Ansfield, G. (2007). Fitness for purpose? National and institutional approaches to publicizing the student voice. *Quality in Higher Education*, *13*(2), 159-172.

Williams, J., & Kane, D. (2008). *Exploring the national student survey: Assessment and feedback issues*. York: Higher Education Academy. Retrieved from http://www.heacademy.ac.uk/resources/detail/ourwork/nss/NSS_assessment_and_feedback_report

Williams, J., & Kane, D. (2009). Assessment and feedback: Institutional experiences of student feedback, 1996 to 2007. *Higher Education Quarterly*, *63*(3), 217-317.

Williams, J., & Kane, D. (2013). It's hard to tell what students think. In H. Strawson (Ed.) *53 ways to deal with large classes*. Newmarket: The Professional and Higher Partnership Ltd.

Winter-Hebron, C. (1984). An aid for evaluating teaching in higher education. *Assessment and Evaluation in Higher Education*, *9*(2), 145-163.

James Williams
Faculty of Education, Law & Social Sciences
Birmingham City University

CHRIS CHAPLEO AND PETER READER

HIGHER EDUCATION BRANDS AND DATA

Should Branding Metrics in U.K. Universities Be Better Informed?

INTRODUCTION

Branding in higher education is highly topical; in recent years there has been a trend among most U.K. universities to seek to employ the techniques of branding, often expending considerable sums in the process. Whilst branding activity in U.K. higher education is arguably as relevant as in the commercial world (Roper & Davies, 2007), it is a sector that does not suit a simplistic application of commercial approaches without some understanding of the particular qualities of the higher education "market."

However, branding's currency in higher education is driven by increasing external forces; in particular the move towards competition among universities has seen a corresponding quest for differentiation as part of the adoption of market-based models (Becher & Trowler, 2001). In the U.K., this has recently been exacerbated by the incremental introduction of tuition fees.

In 2011, the Higher Education Funding Council for England (HEFCE)-funded "Distinct" project concluded that communication distinctiveness was beneficial to universities as it "enables an organization to achieve many of its strategic goals by being memorable, authentic and clearly articulating what it has to offer to the people that are important to it" (Distinct Project, 2011, p. 4). This in essence is what branding is about and it has become increasingly important given the huge shift in the higher education environment since 2009.

However, factors including budgetary limitations, a limited marketing culture or indeed a lack of senior management understanding of branding in its widest sense have sometimes led to branding activity being rather limited, ad hoc and not always strategic in its application. The situation is further complicated by debate on the extent to which real differentiation is possible or indeed desirable (Waeraas, 2008). This has led to criticism of branding in academic circles with accusations of considerable sums of money spent on promoting universities, without publicly available research on the efficiency or the outcomes of these investments (Jevons, 2006).

A key issue in the credibility and effectiveness of branding in higher education is the development of clear brand-related objectives, metrics and use of data to underpin and track brand activity, which so far has been limited or poorly articulated. However, this appears to be changing as the use of data has become

M. E. Menon et al. (eds.), Using Data to Improve Higher Education, 81–91.

deeply embedded in U.K. higher education marketing. The purpose of this chapter is to explore branding concepts and objectives, and the corresponding use of metrics and data to approach branding in a strategic and more empirical fashion.

In doing this we consider and embrace branding in its widest sense to include all brand-based activity (NB communications activity or "service touch points" that impact upon brand or brand experience). This means that diverse activities that include open days, business networking events, applications tracking and monitoring, community activities and league tables can all impact upon the overall brand and therefore data can and should feed into branding policies and decisions. These are of course in addition to more traditionally conceived branding metrics such as competitor analysis or perceptual analysis of brand values. NB "stakeholder data" could include competitor mapping and analysis, use of student application data on perceptions (and reasons for choosing/not choosing) and data on competitor institutions.

WHY IS BRANDING IMPORTANT?

Branding is crucially important to modern organizations as everything that they do and they are converges on the value proposition offered to the customer. That value proposition has to have a name that comes to represent everything an organization does or strives to do (de Chernatony & McDonald, 2011). Articulating what you have to offer coherently though your brand is not superficial marketing gloss, rhetoric or the re-design of a logo or marketing materials; it is about encapsulating the core strengths of an institution and communication effectively to the people that matter. In short, good branding enables you to tell your audiences what your institution's strengths are in an increasingly competitive market (Distinct, 2011).

Many higher education institutions are increasingly managed as corporate brands (Kotler & Kotler, 1998; Whelan & Wohlfeil, 2006). This move towards a branding culture has largely come about through necessity in markets such as the U.K., with factors such as increased competition, a drive to differentiation and finally, student fees driving marketization. These factors are part of a shift in higher education culture (Becher & Trowler, 2001) that has forced U.K. universities to adopt branding concepts and practices.

When seeking insights from the published literature, the body of work concerning branding of higher education is not huge (Hemsley-Brown & Oplatka, 2006; Waeraas & Solbakk, 2008) despite branding's rapid rise in the strategic agenda for U.K. universities (Rolfe, 2003) and the view that higher education and branding have a historical relationship (Temple, 2006). However, a number of aspects of branding have been explored; the role of websites in university branding (Opoku, Abratt, & Pitt, 2006), the role of heritage (Bulotaite, 2003), the emergence of brand identities (Lowrie, 2007), and harmonization within the brand architecture of universities (Hemsley-Brown & Goonawardana, 2007).

There is also a growing body of work that questions the suitability of commercial branding concepts for higher education (Jevons, 2006; Temple, 2006; Waeraas & Solbakk, 2008). This arguably stems from a fundamental examination

of the applicability of market principles to higher education (Gibbs, 2001). There is concern that attempts to apply commercial style branding to higher education can actually challenge the institutional integrity of universities (Waeraas & Solbakk, 2008).

When considering the applicability of branding to higher education, a tension that quickly becomes apparent is that of whether *reputation* and *brand* are the same thing. The literature suggests that an organization can define and communicate *brand* but that *reputation* is harder to manage as it results from impressions of organization's behavior (Argenti & Druckenmiller, 2004). However, there seems to be little doubt that there can be a degree of overlap between the terms when used in a university context, and that *reputation* is often more comfortable for internal audiences to discuss (Frost & Cooke, 1999).

Another fundamental issue is communicating a naturally diverse and complex university's corporate brand to multiple stakeholders with differing perceptions (Roper & Davies, 2007), which inherently adds to the challenge of branding activity (Waeraas & Solbakk, 2008). One can call into question the very notion of what universities mean by branding and whether their understanding is the same as that for many commercial organizations (Chapleo, 2004). Whilst too large to fully explore in this chapter, this is an area that may need consideration when one seeks to understand whether branding can be measured in terms of its effectiveness for a university. There is clearly evidence of barriers to the implementation of branding in universities – not least frequent "internal resistance" to the very concept (unless, seemingly, it is talked of as "reputation") or a rather simplistic implementation of branding that is marketing-communications led (Chapleo, 2007). Against these barriers, however, modern higher education marketers increasingly understand and attempt to employ branding in a fuller context.

Rationales for applying the principles of branding to higher education are therefore evident, but actually quantifying benefits is somewhat more elusive and a debate on desirability continues to a certain extent. As current political and market forces increasingly make competition in education inevitable, brands can be both a strategic asset and a source of sustainable competitive advantage (Caldwell & Coshall, 2002). However, a cautionary view is that branding in non-profit organizations such as universities may create a spirit of unhealthy competition, prompting expenditure that is of dubious benefit (Sargeant, 2005). Blumenthal and Bergstrom (2003) offer a more generous view of branding in that it can offer something "of substance" to help stakeholders differentiate between organizations, and should therefore be inextricably linked to an organization's corporate and social responsibility. It may also be that branding makes the consumer's choice process more effective (Doyle, 1989) and this alone could offer a rationale for branding's usefulness in higher education. In conclusion, it is fair to argue that whilst the benefits for the application of branding in the higher education sector are clearly and potentially significant, the needs to demonstrate those benefits in a quantifiable way are evident, and the use of empirical measures and data can add credibility.

WHAT ARE THE OBJECTIVES OF BRANDING A UNIVERSITY?

The benefits of branding, whilst arguably challenging to measure in any sector, become particularly so when applied to higher education. Whilst most commercial models have a degree of applicability to the university sector, they are primarily focused on commercial brands and upon close examination do not wholly suit the particular situation of universities. Variables such as "market share," "price premium" and "loyalty" are examples of the metrics that may need adjustment for the higher education context.

Any examination of the objectives of branding for U.K. universities should take account of what branding in a wider context seeks to achieve. Initially branding was conceived as a means to establish a product's name and to convey the legitimacy, prestige and stability of the manufacturer. This has evolved into the modern paradigm built upon abstraction and cultural engineering, where products embody people's ideals and are only tenuously linked to functional benefits (Holt, 2002).

Most conceptualizations of brand are reasonably explicit when it comes to the advantages of branding, but generally relate more to a commercial arena. De Chernatony and McDonald (2005) assert that a successful brand delivers sustainable competitive advantage and invariably results in superior profitability and market performance. These concepts, whilst arguably challenging to measure in any sector, become particularly so when applied to higher education.

Holt (2002) argues that, to be socially valued, cultural content must pass through brands; post-modern consumer culture insists that meanings must be channelled through brands to have value. In short those brands will be more valuable if they are offered not as cultural blueprints but as cultural resources – useful ingredients to produce the "self" one chooses. This analogy may help in understanding the role of branding in what is increasingly marketed as the university "experience."

De Chernatony and McDonald (2005) and Keller (2003) agree that it is important to measure brand performance, but suggest that monitoring systems should suit the organization in question. Keller (2003) offers the *brand value chain* as a means to ultimately understand the financial impact of brand marketing expenditure. A number of other models such as Millward Brown's c*riteria to assess the strength of a brand* (1996) and Young and Rubicam's *brand asset valuator* (1994) are widely known. However, all of these models, whilst having a degree of applicability to the higher education sector, are primarily focused on commercial product brands and upon close examination do not wholly suit the particular situation of universities. As previously mentioned, variables such as "market share," "price premium" and "loyalty" are examples of the metrics discussed in these models, which may need a good degree of re-conceptualization for higher education markets.

However, the marketization of U.K. higher education (Stamp, 2004) may change the way that branding activity is quantified, as price comes into the equation. When consumers have limited prior knowledge of a product or service category, brand name may be the most accessible and diagnostic cue available.

Strong brands get preferential attribute evaluation, generally higher overall preference and can charge price premiums (Hoeffler & Keller, 2003). The price premium theme may become increasingly relevant as many countries adopt a market system for university tuition fees.

Despite the wealth of literature on strong or successful brands, the literature is more limited when it comes to discussing the specific area of brand metrics or specific objectives of brand spending. This situation is exacerbated when it comes to considering specific objectives in less traditional marketing fields such as education. This is perhaps surprising as spending university budgets on branding activity can be controversial (Jevons, 2006).

It is argued that branding can be measured through a whole range of criteria that go to make up the quality of the university (Jevons, 2006), while Bennett, Ali-Chowdhury and Savani (2008) suggest that universities require strong brands to enhance awareness of their existence and course offerings, to differentiate themselves from rivals and to gain market share. These criteria perhaps offer a rationale for branding activity but again actually measuring outcomes or return on investment may be more elusive. This is symptomatic of the argument that conventional brand management techniques are often inadequate in higher education due to brand proliferation, media fragmentation, rising competition, greater scrutiny from "customers" and internal resistance to the concepts.

It may be that the better brands gain in quality of student intake and raise the overall academic standing of a university through enhancing reputation and positively influencing university ranking but there is seemingly little evidence in rankings to support a direct link to branding activity (Bunzel, 2007). However, it seems one cannot ignore the relationship between brands in universities and league tables. The question would seem to be the extent to which branding activity seeks to influence league table position. Does the presence of league tables change the conception of branding in the sector, as there is an increasing focus on league table position as a measure of success among some target groups (HEFCE, 2008)?

However, there is clearly a role for branding over and above a focus on league table positioning alone. HEFCE argue that league tables may be influential, but are only part of the complex decision making process and often used to confirm a decision already made. A strong brand should communicate far more about strengths in key areas than the often narrow league table placing indicator. If used appropriately, branding could build upon league table positioning (whether that be high, middle or low) by emphasizing unique selling points. This illustrates the essence of the difference between a successful brand and a league table position, as it may be argued that an institution that is comparatively lowly placed in the league tables can nevertheless have a successful brand with niche target audiences.

It is evident that brands in higher education are complex, and any monitoring system should be tailored to suit the organization's environment (de Chernatony & McDonald, 2005). Whether we should seek to quantify all branding activity in universities is therefore debatable, but it seems evident that some appropriate metrics are both necessary and desirable. The literature reveals work on measurement of branding activity in general, but very little for university branding

programs. The competitive situation in U.K. higher education has forced U.K. universities to adopt a more professional approach to their marketing activity (Bakewell & Gibson-Sweet, 1998). However, whether this extends to branding objectives in debatable. Whilst it is conceded that not all branding activity can be quantified, surely when it has been claimed that "vast sums are spent without clear purpose" (Jevons, 2006, p. 466), the use of data to support decisions is necessary and timely.

Specific objectives for university branding that can, to varying degrees, be measured include:

- To create the correct image of the university
- To communicate to audiences the performance of the university
- To communicate to audiences the types of education offered
- To communicate to different audiences the different facets of the university
- To educate members of the organization on how to communicate the brand
- To create a competitive advantage

However, there seems to be a wide variance in published objectives (Chapleo, 2011) from wider ones (e.g. achieving clarity) to more specific (e.g. for stakeholders to recognize the university). Some objectives may therefore be reasonably straightforward to measure (given sufficient resources), such as "awareness" or "recognition" but many are fairly broad and therefore difficult to quantify.

It is to be expected that there will be no simple answer to the question of what the objectives of branding in universities are and how data can be used in the modern university. However, this lack of commonality in answers does little to help justify the case for spending money on branding and it is a situation that needs clarification.

This is reflected in current practical challenges, where expenditure on branding is a media "hot potato" for universities. It is a regular subject for Freedom of Information enquiries to universities, often from journalists who, seemingly inevitably, seek to portray expenditure on branding as wasteful. For marketing practitioners, lack of clarity on the brand can lead to wasted expenditure. Without a clear brand, there is a danger of seeking to address a variety of messages to all possible audiences, through all possible channels, rather than targeting in the most effective way, with value for money being demonstrated.

IS HIGHER EDUCATION CLEAR ABOUT THE OBJECTIVES OF BRANDING IN THE SECTOR?

As discussed, the sector is arguably not particularly consistent concerning the objectives of branding programs (Chapleo, 2011). Reasons for this are debatable; there may be confusion between brand and brand identity or misconceptions, even at a senior level, about branding. It may be that marketing professionals are clear about branding objectives, but that in these times of budgetary constraint, policies that allow measurement of branding on a strategic institutional level may struggle to gather senior approval. There is evidence of a focus on measuring elements of

brand "identity" instead of "whole brand" and this may be a pragmatic solution to at least attempting to use data to quantify and assess elements of branding policy.

Even those who seek to advise the sector about brands are often not clear about what branding should mean for universities. Proposals from consultants seeking to advise higher education vary in their language and meaning from "brand experiences," "identifying marks or characteristics," "dictated by design" to "depending on robust positioning" (Reader, 2003). Hardly a day for higher education marketers now goes by without an unsolicited email arriving from a previously unknown company offering all manner of variants on what a brand should and could be.

CAN BRANDING IN HIGHER EDUCATION BE MEASURED*?*

Research carried out by the authors (Chapleo, 2011) demonstrated that higher education marketers were working to measure or quantify the success of their branding activity, but there seemed to be great variance in what specific metrics were employed. Some offered measures such as regularly measuring brand perceptions or generic commercial branding measurement tools such as "brand audit"/ "perceptual audit," or comparison with other universities. There was also reference to what were termed standard, oversimplified measures such as attitude measurement. This shows some congruence with commercial branding where there is a clear need to measure and track metrics such as brand equity, but there is variability in methods and dimensions to be tracked (de Chernatony & McDonald, 2005).

A number of specific activities to evaluate brand activities have been suggested, including staff surveys, student surveys, graduate employer surveys, key stakeholder surveys and indicative studies, user surveys for websites, press cuttings, league tables, or the National Student Survey (NSS); clearly when branding activity through all communications is embraced, then these measures are pertinent and of value.

Indeed, a wider vision of branding activity could include many areas of data input such as research into opinions. The difficult area to quantify in terms of these metrics is the part in any improvement that can be attributed to branding activity, and indeed the benefits these actually bring in terms of institutional strategic objectives. The strategic level is, ultimately, where arguments for branding at a broader level should resonate, although data quantifying this can be elusive or at the very least expensive to obtain.

An interesting area is that of internal metrics, with criteria such as internal stakeholders "speaking consistently about the university" and "how well the brand message is communicated by the universities' own internal stakeholders" suggested as metrics (Chapleo, 2011, p. 416). The problem with metrics such as these may be the effort and expense required to attempt to actually measure them, and again many universities struggle to find funding for this extra stage.

Measures of success in branding may also be particularly qualitative in nature, such as "key brand messages in the university outputs." Overall, this demonstrates

the widely varying expectation of what branding activity can and should achieve for a university. A clearly identifiable link between spending on branding and university objectives should surely be expected (de Chernatony & Segal-Horn, 2003) and this alludes to a possible debate on whether branding really is a strategic activity in many U.K. universities. If it is accepted that branding should be strategic, then clearly the sector needs to identify and utilize metrics with accessible data that can benchmark and demonstrate return on investment.

WHAT DATA IS THE SECTOR CURRENTLY USING TO INFORM BRANDING?

Data in the sector come from many sources. If branding is seen as being broad, experiential and based on values, rather than narrower and based on operational targets, then it follows that the data of significance to marketers are also broader.

Some U.K. data are collected nationally, such as the National Student Survey and the Key Information Set, although they may be published selectively by institutions. Other data are drawn from the Higher Education Statistics Agency (HESA), the Universities and Colleges Admissions Service (UCAS) and economic impact studies. Data are also used to support the brand and its delivery. Current examples include analytics used to define activities such as web site performance, open day attendance, and (through linkage of the data) the whole student journey, from engagement with an outreach activity, to engagement with recruitment and marketing events, to application, confirmation and registration. Using data segmentation, it is possible to identify where and with which audiences the brand is performing and where it is underperforming.

An example is the Higher Education Access Tracker (HEAT) database, a monitoring and evaluation tool for subscribing higher education institutions, which is to be rolled out nationally. The database has been developed collaboratively to provide a web-based data capture system that tracks student engagement in outreach activities delivered currently by subscriber higher education institutions and partnership projects.

Currently a small number of universities are exploring the principles of relationship building, comparing the perceptions of students and staff through data collection generated in surveys. One example, Tempo, has its main focus on the relational dimensions that underpin attitudes and perceptions. These can also be based on transactional experiences of practical concern to students, staff and management. An output from this work is cross-mapped data and insights focusing on a small number of core themes, utilizing Net Promoter Scores to segment analysis.

Student Opinion Panels are another example of innovation in terms of their use, rather than the methodology or the questions being asked. At the University of Portsmouth, a volunteer panel is polled on a regular basis on both academic and non-academic matters, to provide data for different parts of the institution.

Other data now commonly used include competitors' brand analysis, often as an adjunct or part of perceptions research, which when repeated over time, allows brand shift to be assessed through benchmarking and tracking. Routine use of

institutional analysis, both of competitors and comparators, using data from HESA, UCAS, league tables and that published on institutional websites, is typical of activity within market research teams, particularly when researching what is arguably a type of sub-brand (individual courses).

These data are subject to increasing scrutiny, however; in March 2014 the Office of Fair Trading (OFT) called for clearer information on information on the degree to which institutions' and third party "choice tool" websites permits students to make informed choices. The argument is that there is a good deal of information available to students, but there are some significant gaps, including long term job prospects that result from their course and institution.

Two questions are posed by that statement: First, do the data (that are desirable to use) actually exist? – for example, there are little data available on long term job prospects. Secondly, if they do exist, are they reliable in statistical terms?

There are therefore innovations in data gathering, but also significant challenges; particularly data scrutiny and survey fatigue. The latter is evident in students as a community who are increasingly targeted by brands (commercial and non-commercial, local and national) resulting in overload and diminishing responses. For universities themselves, this can impact negatively and may put at risk the credibility of metrics and response targets for surveys such as the NSS and, potentially, the DLHE (Destination of Leavers from Higher Education) survey.

CONCLUSIONS

Overall, branding is a key issue for U.K. universities. In times of constrained budgets, it is often controversial and much misunderstood and therefore looks likely to remain topical for some time. The on-going marketization of U.K. higher education in a time of rapidly evolving marketing communications offers a number of opportunities to understand and embrace branding approaches that can genuinely add value through a real understanding of the sector and its specific qualities. However, simplistic adoption of many commercial branding techniques is a "blunt tool," not least in the area of brand measurement and effectiveness. As evident in this chapter, the U.K. higher education sector is increasingly employing sophisticated and sector specific approaches to track, assess and inform many different aspects of branding, but this remains challenging in several key areas. Key among these is the lack of a real conceptual model of what a brand is and could be in universities. The call is clear; to understand what we really mean by branding in higher education, to articulate real benefits in a meaningful way and to adapt increasingly sophisticated data modeling to demonstrate the effectiveness and value of branding activity for the sector. Cooperation between academics and practitioners in this field (as in the approach of this chapter) must surely be the way forward.

REFERENCES

Argenti, P., & Druckenmiller, B. (2004). Reputation and the corporate brand. *Corporate Reputation Review, 6*(4), 368-374.

Bakewell, J., & Gibson-Sweet, M. F. (1998). Strategic marketing in a changing environment: Are the new U.K. universities in danger of being "stuck in the middle"? *International Journal of Educational Management, 12*(3), 108-113.

Becher, T., & Trowler, P. R. (2001). *Academic tribes and territories: Intellectual enquiry and the cultures.* Philadelphia, PA: SHRE and Open University Press.

Bennett, R., Ali-Chowdhury, R., & Savani, S. (2008, April). *Defining the components of a university brand: A qualitative investigation*. Paper presented at the International Conference of Higher Education Marketing, Krakow, Poland.

Blumenthal, D., & Bergstrom, A. J. (2003). Brand councils that care: Towards the convergence of branding and corporate social responsibility. *Journal of Brand Management, 10,* 327-341.

Bulotaite, N. (2003). University heritage – An institutional tool for branding and marketing. *Higher Education in Europe, 28*(4), 449-454.

Bunzel, D. (2007). Universities sell their brands. *Journal of Product and Brand Management, 16*(2), 152-153.

Caldwell, N., & Coshall, J. (2002). Measuring brand associations for museums and galleries using repertory grid analysis. *Management Decisions, 40*(4), 383-392.

Chapleo, C. (2004). Interpretation and implementation of reputation/brand management by U.K. university leaders. *International Journal of Educational Advancement, 5*(1), 7-23.

Chapleo, C. (2007). Barriers to brand building in U.K. universities. *International Journal of Nonprofit and Voluntary Sector Management, 12*(1), 23-32.

Chapleo, C. (2011). Exploring rationales for branding a university: Should we be seeking to measure branding in U.K. universities? *Journal of Brand Management*, *18*(6), 411-422. DOI: 10.1057/bm.2010.53.

De Chernatony, L., & McDonald, M. (2005). *Creating powerful brands*. Oxford, U.K.: Elsevier.

De Chernatony, L., & McDonald, M. (2011). *Creating powerful brands* (4th ed). Oxford, U.K.: Butterworth Heinemann.ebook

De Chernatony, L., & Segal-Horn, S. (2003). The criteria for successful service brands. *European Journal of Marketing, 37*(7/8), 1095-1118.

Distinct Project. (2011). *Distinctiveness in higher education*. Oxford Brookes University.

Doyle, P. (1989). Building successful brands: The strategic options. *Journal of Consumer Marketing, 7(2),* 5-20.

Frost, A. R., & Cooke, C. (1999). Brand v reputation: Managing an intangible asset. *Journal of Brand Management, 7*(2), 81-87.

Gibbs, P. (2001). Higher education as a market: A problem or solution? *Studies in Higher Education, 26*(1), 85-94.

Hemsley-Brown, J., & Goonawardana, S. (2007). Brand harmonization in the international higher education market. *Journal of Business Research, 60*, 942-948.

Hemsley-Brown, J., & Oplatka, I. (2006). Universities in a competitive marketplace – A systematic review of the literature on higher education marketing. *International Journal of Public Sector Management, 19*(4), 316-338.

Higher Education Funding Council for England (HEFCE). (2008). Counting what is measured or measuring what counts? – League tables and their impact on higher education institutions in England. *HEFCE Issues Paper*, April 2008/14. HEFCE: Bristol, U.K.

Hoeffler, S., & Keller. K. (2003). The marketing advantages of strong brands. *Brand Management, 10*(6), 421-445.

Holt, D. (2002). Why do brands cause trouble? A dialectical theory of consumer culture and branding. *Journal of Consumer Research, 29*, 70-90.

Jevons, C. (2006). Universities: A prime example of branding gone wrong. *Journal of Product and Brand Management, 15*(7), 466-467.
Keller, K. L. (2003). *Strategic brand management*. New Jersey, U.S.A.: Prentice Hall.
Kotler, N., & Kotler, P. (1998). *Museum strategy and marketing: Designing missions, building audiences, generating revenue and resources*. San Francisco: Jossey-Bass.
Lowrie, A. (2007). Branding higher education: Equivalence and difference in developing identity. *Journal of Business Research, 60*(9), 990-999.
Millward Brown International. (1996). *The good health guide.* Warwick: Millward Brown International.
Office of Fair Trading. (2014). *Call for information on the higher education sector (undergraduate) in England*. Retrieved from http://www.oft.gov.uk/OFTwork/markets-work/othermarketswork/higher-education-cfi/#.U0WhRk2PLcs
Opoku, R., Abratt, R., & Pitt, L. (2006). Communicating brand personality: Are the websites doing the talking for the top South African business schools? *Brand Management, 14*(1-2), 20-39.
Reader, P. (2003). Towards the globalization of the brand. *Education Marketing, 28*, 26-27.
Rolfe, H. (2003). University strategy in an age of uncertainty: The effect of higher education funding on old and new universities. *Higher Education Quarterly, 57*(1), 24-47.
Roper, S., & Davies, G. (2007). The corporate brand: Dealing with multiple stakeholders. *Journal of Marketing Management, 23*(1-2), 75-90.
Sargeant, A. (2005). *Marketing management for nonprofit organizations*. Oxford: Oxford University Press.
Stamp, R. (2004). The new challenge of branding buy-in. *Education News, 7.*
Temple, P. (2006). Branding higher education: Illusion or reality? *Perspectives, 10(1), 15-19.*
Waeraas, A. (2008). Can public sector organizations be coherent corporate brands? *Marketing Theory, 8*(2), 205-221.
Waeraas, A., & Solbakk, M. (2008). Defining the essence of a university: Lessons from higher education branding. *Higher Education, 57*(4), 449-462.
Whelan, S., & Wohlfeil, M. (2006). Communicating brands through engagement with 'lived' experiences. *The Journal of Brand Management*, *13*(4-5), 313-329.
Young and Rubicam. (1994). *Brand asset valuator*. London: Young & Rubicam.

Chris Chapleo
The Business School
Bournemouth University

Peter Reader
Department of Marketing and Communications
University of Portsmouth

EUGÉNIA PEDRO, HELENA ALVES AND JOÃO LEITÃO

EVALUATING STUDENTS' QUALITY OF ACADEMIC LIFE

Using Data in a Structural Model Approach

INTRODUCTION

In a context of globalization and international competition in higher education, higher education institutions (HEI) increasingly understand that higher education can be considered as a business-like service industry, consequently needing better understanding of how their students perceive the services provided and how they can compete in attracting and holding on to more students (Douglas & Douglas, 2006). From the perspective of both universities and public managers, the fundamental issue is how to improve measurement and management of Quality of Academic Life (QAL) to give a better service to university students (Sirgy, Grzeskowiak, & Rahtz, 2007). Studies on this subject should help HEI managers to identify both weaknesses and strengths, with problems being indicated by classifications of dissatisfaction related to university facilities and services, and also to academic management and social action (Sirgy et al., 2007). If state institutions, especially HEIs, have access to a national program of monitoring the QAL in HEIs, they can make decisions to carry out changes in areas where there is a need for correction and/or support. Measuring and monitoring the performance of the state higher education system can help better allocation of the resources necessary to improve the potential to attract, hold on to and support students at risk, in this way benefiting society as a whole (Sirgy et al., 2007). HEIs have to treat their students more as customers, trying to hold on to them, as it is much harder to attract students than to gain their loyalty (Joseph, Yakhou, & Stone, 2005).

The subject of QAL has recently been analyzed in different studies, with those by Sirgy et al. (2007), Yu and Lee (2008), Yu and Kim (2008) and Sirgy et al. (2010) standing out. Nevertheless, research needs to be deepened with additional efforts.

For Sirgy et al. (2007), determination of QAL is based on bottom-up spillover theory, proposing that the university's quality of life is influenced positively by satisfaction with academic and social aspects of student life, constructed on top of satisfaction with the institution's facilities and services (Hassan, 2011). When students have a high QAL, they tend to identify with their own university (Hennig-Thurau, Langer, & Hansen, 2001) perceiving it as attractive and identifying with its

M. E. Menon et al. (eds.), Using Data to Improve Higher Education, 93–118.

institutional image (Bhattacharya & Sen, 2003). In the view of Sirgy et al. (2007), a high QAL leads to loyalty and the student recommending the institution.

Yu and Lee (2008), based on Sirgy et al. (2007), conducted a study that develops and tests a model of students' QAL in South Korea. They used the conceptualization of students' QAL in terms of both an affective and cognitive component relating to the need and the balance of satisfaction with academic services, administrative services and infrastructure to which students have access throughout their time at university. This study demonstrated that satisfaction with these services has a significant impact on QAL, which in turn may positively influence identification with the university, recommendation and quality of life in general. Yu and Kim (2008) extended the study by Yu and Lee (2008) to test the mediating effect of QAL on the component of loyalty; and Sirgy et al. (2010) expanded the study by Sirgy et al. (2007), also considering QAL from the point of view of university management. The reason given was that QAL is related to programs and services that can be operated and improved through HEI management.

From the literature review on QAL, there is a notable gap in the lack of depth in this matter. Therefore, this chapter contributes to the literature through elaborating a proposal followed by an empirical test applied to the context of state universities. Setting out from the conceptual model of Yu and Lee (2008) and the measures of student satisfaction proposed by Sirgy et al. (2010), the determinant factors of QAL are tested, with simultaneous testing of the effects of QAL on loyalty and recommendation, through Structural Equation Modeling (SEM).

This chapter is structured as follows. It begins with a review of the literature considered as relevant, in order to identify the determinant factors of students' QAL, and determine the relationship between QAL and the students' intention to recommend and remain loyal to the university. Secondly, using random samples collected in Portuguese state universities (PSU), hypotheses are tested, bearing in mind the proposed conceptual model and its components. Thirdly, the conclusions, limitations and lines of future research are presented.

LITERATURE REVIEW AND RESEARCH HYPOTHESES

Quality of Academic Life

Hassan (2011) states that university students' QAL is centered on their well-being and is only one of the many dimensions of life having an important role in determining general contentment, satisfaction with life or subjective well-being. According to the same author, QAL concerns the degree of need for satisfaction and the experiences that create positive emotions throughout the student's time at university. A useful measurement of university students' QL should be related to the university's vision and values, and students' experiences, with the interests of the institution and students converging in the classroom where the teaching and learning process occurs (Roberts & Clifton, 1992).

QAL covers both the cognitive assessment of life in the faculty and the affective experiences occurring during the time spent at university (Hassan, 2011; Yu & Kim, 2008; Yu & Lee, 2008), with the cognitive component referring to the degree of need for satisfaction with university life, and the affective component relating to the frequency of experiences that influence students, positively, throughout their time at university (Campbell, Converse, & Rodgers, 1976; Diener, 1994). For Sirgy et al. (2007)) and Sirgy et al. (2010), QAL is satisfaction with the domain of university life and a sub-domain of quality of life in general, conceptualizing QAL as students' general feeling of satisfaction with the experience of university life through positive sentiments and the absence of negative ones. In turn, Yu and Kim (2008) conceptualized QAL as a composite of global need for satisfaction and affective balance in university life.

The cognitive component refers to the degree of need for satisfaction with university life, whereas the affective component concerns participation in good experiences that positively affect the student during the time at university (Diener, 1994). Yu and Lee (2008) and Yu and Kim (2008) measured QAL as a composite of cognitive QAL (related to satisfying needs at university) and affective QAL (i.e., the positive and negative affect towards the university) giving relevance to satisfaction with university services, which include academic services, administrative services, and university infrastructure.

Determinants of Quality of Academic Life

The results of previous research in the area of students' general satisfaction with their experience of education revealed that students' satisfaction has a positive impact on their motivation, loyalty, recruitment and fund-raising, making it a critical need for universities to satisfy (Elliot & Shin, 2002; Schertzer & Schertzer, 2004). As a result, universities have shown their commitment and efforts towards strengthening student satisfaction through declarations of mission, vision, strategic objectives, operational goals, performance indicators, promotions and marketing strategies (Elliott & Shin, 2002).

According to Sirgy et al. (2007), QAL can be assessed in terms of feelings of overall satisfaction with the student's experience of university life. Sirgy et al. (2010) revealed that different levels of satisfaction with academic management, social action, services and infrastructure have a significant influence on students' QAL.

Since educational services can be classified in teaching services (provided by lecturers); administrative services (i.e., support services); and infrastructure (for example, classrooms, canteens, sports facilities, etc.) (Chadwick & Ward, 1987; Simpson & Siguaw, 2000), collecting feedback from students about their satisfaction with various areas such as academic management, infrastructure to support learning (for example, libraries and computing centers), physical structures and environment (classrooms, laboratories, social areas and university buildings), social infrastructure (canteens, student accommodation, health centers, sports centers and student services), and external aspects related to the student (such as

finance and transport), is crucially important in assessing QAL (Leckey & Neill, 2001).

Students' satisfaction is marked by experiences continuously repeated in university campus life, and furthermore, the campus environment is also apparently a web of interconnected experiences which prevail over and influence students' overall satisfaction, i.e., what happens to students in the classroom is not independent of all the other experiences related to campus life (Elliot & Shin, 2002).

Satisfaction with academic management. Satisfaction with life is thought to be at the top of a hierarchical attitude (or satisfaction), meaning that the former is influenced, generally speaking, by satisfaction with the different domains of life (for example, satisfaction with the community, family, work, social life, health and so on) and satisfaction with life in a specific domain (namely, satisfaction with university life). In turn, that satisfaction is also influenced by lower levels of worries about life within that domain (for example, satisfaction with the academic aspects of university life) (Hassan, 2011), i.e., QAL as a life domain is influenced by satisfaction with specific sub-domains (Yu & Lee, 2008). Therefore, the greater the satisfaction with some aspects of university life, for example, academic management, the greater the satisfaction with university life, and QAL will consequently be better (Hassan, 2011; Sirgy et al., 2007; Yu & Kim, 2008; Yu & Lee, 2008).

Sirgy et al. (2007), Yu and Lee (2008) and Hassan (2011) point towards students' satisfaction with academic management influencing positively their general feelings about academic life at university. Students' involvement in university life has some moderating effect on students' satisfaction with administrative services in forming QAL (Yu & Kim, 2008).

According to Yu and Lee (2008), academic management covers two types of services: administrative, and academic support. The same authors concluded that satisfaction with academic management (SATAM) has a positive impact on QAL, although students have revealed limited interaction with administrative services, and for that reason give it less importance in the context of determining QAL. The following hypothesis is therefore formulated:

H1: Satisfaction with academic management has a positive influence on QAL.

Satisfaction with social action. Sirgy et al. (2007), Yu and Lee (2008), Yu and Kim (2008) and Hassan (2011) reveal that student satisfaction with the university's social action influences their general feelings towards their academic life; the greater the satisfaction with social action (SATSA) at the university (for example, halls of residence, international programs and services, clubs and parties, university sport and recreational activities) (Sirgy et al., 2007), the greater the satisfaction with QAL in general. Consequently, the greater the SATSA, the greater the satisfaction with university life, and so QAL will be better (Hassan, 2011; Sirgy et al., 2007; Yu & Kim; 2008; Yu & Lee, 2008). According to Sirgy et al. (2007),

campus accommodation, religious services, associations and parties are factors determining students' QAL. The following hypothesis is therefore considered:

H2: Satisfaction with social action has a positive influence on QAL.

Satisfaction with the educational supply. Yu and Lee (2008) argue that student satisfaction is more linked to services of education and infrastructure than to administrative services. University services can be classified as a function of the educational supply (Astin, 2001; Chadwick & Ward, 1987; Simpson & Siguaw, 2000). In the view of Chadwick and Ward (1987), Simpson and Siguaw (2000) and Astin (2001), QAL is influenced by various factors related to the teaching supply of university services, i.e., the greater the satisfaction with the educational supply (SATES) in university life (for example, teaching staff, teaching methods, atmosphere in the classroom, student workload, academic services, reputation and academic diversity), the greater the satisfaction with QAL. This gives rise to the following hypothesis:

H3: Satisfaction with the educational supply has a positive influence on students' QAL.

Satisfaction with infrastructure. Yu and Lee (2008) conceptualized satisfaction with university services, forming three sub-dimensions: academic services; administrative services; and infrastructure. From this perspective, university services can be classified in terms of infrastructure, including facilities related to social activities, facilities of convenience, campus atmosphere and general facilities (Yu & Lee, 2008) and also basic services such as libraries, transport, parking, health services, bookshops, telecommunications and recreational infrastructure (Sirgy et al., 2007).

The greater the satisfaction with the university infrastructure (SATI), the greater the satisfaction with QAL inasmuch as the latter can be influenced positively by satisfaction with university facilities and university services in general (Hassan, 2011; Sirgy et al., 2007; Yu & Kim, 2008; Yu & Lee, 2008). However, Hassan (2011) underlines that the effect on QAL can be indirect, i.e., satisfaction with facilities and basic services tends to affect satisfaction with academic and social aspects of university life, which are important in determining QAL.

For Sirgy et al. (2007), conceptualization of QAL is based on the notion that overall satisfaction with university life is determined by satisfaction with academic and social aspects of the university, which are in turn influenced by satisfaction with university facilities and services. This leads to the following hypothesis:

H4: Satisfaction with infrastructure has a positive influence on students' QAL.

Quality of Academic Life and Loyalty

Student loyalty refers to a positive cognitive and emotional attitude towards the institution, which in turn provides the motivation underlying a student's behavior (Hennig-Thurau, Langer, & Hansen, 2001; Verhoef, 2002). Satisfied students can return to the university, expressing the loyalty effect, through making the personal choice to attend other courses conferring a degree or not (Helgesen & Nesset, 2007; Mavondo, Tsarenko, & Gabbott, 2004; Schertzer & Schertzer, 2004; Wiers-Jenssen, Stensaker, & Grrogaard, 2002). Student loyalty is important for universities, because it forms a sustainable source of own income that contributes to raising their self-financing capacity and reduces dependency on direct state transfers (Yu & Kim, 2008).

The HEI receiving the student should motivate its academic community through making a long-term commitment, so that students do not abandon it or exercise their right to transfer (Schertzer & Schertzer, 2004). Consequently, students experiencing high satisfaction with QAL at their university feel they would choose the same institution again and would recommend it to a colleague or friend (Billups, 2008). On the contrary, low satisfaction contributes to student wastage (Bryant, 2006), which in turn can mean a reduced total number of registrations, making it difficult for the institution to promote itself in terms of reputation and vitality (Miller, 2003). Attracting students requires emphasis on what really is important for them in their process of selecting and assessing the university, whereas for retaining students, it is necessary to maintain a high level of student satisfaction (Elliott & Healy, 2001) over the whole period they remain at the university. In turn, satisfied students can attract new ones, becoming involved in positive recommendation to inform family, friends and acquaintances, and they may return to their original university to attend other courses (Mavondo et al., 2004; Schertzer & Schertzer, 2004; Wiers-Jenssen et al., 2002).

Schertzer and Schertzer (2004) propose that a determinant factor of student loyalty concerns the fact that they are now more "consumer-oriented" and look for the right institution, demanding high satisfaction, and so factors such as academic management and social action influence satisfaction and the degree of institutional commitment, which have an impact on students' loyalty. It is widely accepted that students' satisfaction with university services has a positive influence on their loyalty (Dick & Basu, 1994; Gustafsson, Johnson, & Roos, 2005; Oliver, 1999).

Academic management and satisfaction with university services influence student loyalty (Schertzer & Schertzer, 2004; Yu & Kim, 2008), with loyal students being more likely to identify, and have a strong emotional bond, with their university (Cardador & Pratt, 2006). These students recommend the institution (Reichheld, 2003; Verhoef, 2002) and have a strong desire to remain loyal to their university, even after completing the initial period of study and training (Oliver, 1999; Reichheld, 2003; Russell-Bennett, McColl-Kennedy, & Coote, 2007). In a context of loyalty, students who are more satisfied with their university can return there to attend other courses (Helgesen & Nesset, 2007; Mavondo et al., 2004; Schertzer & Schertzer, 2004; Wiers-Jenssen et al., 2002).

For Yu and Kim (2008), QAL has a mediating effect between the relationship of satisfaction and student loyalty. The same authors claim that students' satisfaction with university services has a positive impact on student loyalty, with the latter being mediated by QAL. Consequently, the following hypothesis is formulated:

H5: Students' QAL has a positive influence on loyalty to the university.

Quality of Academic Life and Future Recommendation

Current data reveal that satisfied students can attract new ones, becoming involved in positive recommendations to inform friends and acquaintances (Billups, 2008; Helgesen & Nesset, 2007; Mavondo et al., 2004; Schertzer & Schertzer, 2004; Wiers-Jenssen et al., 2002). Therefore, students who are very satisfied with the QAL at their university, as they realize they have chosen the appropriate institution for their aspirations, are more likely to recommend the institution to friends and acquaintances (Billups, 2008), through positive word-of-mouth. They may also return to the same university to attend other courses (Mavondo et al., 2004; Schertzer & Schertzer, 2004; Wiers-Jenssen et al., 2002). So loyal students can be expected to recommend the institution (Reichheld, 2003; Verhoef, 2002).

Student feedback can be obtained through casual comments made in or outside the classroom (Richardson, 2005). According to Yu and Lee (2008), recommendation is inter-personal communication between members of a given group and includes behaviors of reference in which people communicate positive or negative things about a product based on their experience. This means the recommendation is reliable, as it is not directly related to the consumer's own interests (Anderson, Fornell, & Lehman, 1994). Recommendation is effective in improving a company's long-term performance (Reichheld, 2003). The studies by Yu and Lee (2008) and Hassan (2011) argue that QAL and the consumer's future recommendation present a positive and significant correlation. When QAL is high, students are likely to generate a positive recommendation about their university life (Hennig-Thurau et al., 2001; Verhoef, 2002). Students' QAL has a positive influence on recommendation, as when they are happier and more satisfied with their academic life, they tend to transmit a positive view of the university (Yu & Lee, 2008). Therefore, the following hypothesis is considered:

H6: Students' QAL has a positive influence on future recommendation of the university.

Proposed Conceptual Model

From the literature review of QAL and setting out from the conceptual model of Yu and Lee (2008) and the measures of student satisfaction proposed by Sirgy et al. (2010), the determinants of QAL are tested, with simultaneous analysis of the effects of QAL on loyalty and recommendation, as proposed in the conceptual model in Figure 1. This model posits that SATAM has a positive impact on QAL

(Yu & Lee, 2008); SATSA has a positive impact on QAL (Hassan, 2011; Sirgy et al., 2007; Yu & Kim, 2008; Yu & Lee, 2008); SATES has a positive influence on QAL (Astin, 2001; Chadwick & Ward, 1987; Simpson & Siguaw, 2000); SATI has a positive influence on QAL (Hassan, 2011; Sirgy et al., 2007; Yu & Kim, 2008; Yu & Lee, 2008); QAL has a positive influence on student loyalty (Yu & Kim, 2008); and QAL has a positive influence on recommendation (Yu & Lee, 2008).

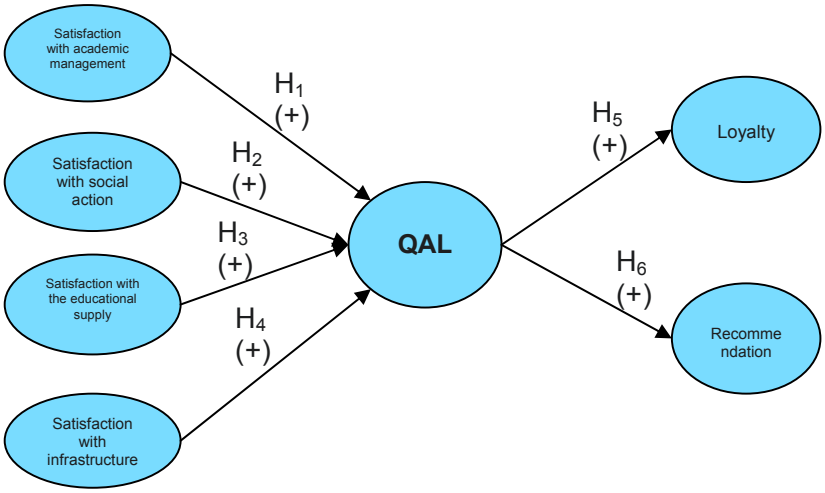


Figure 1. Determinant factors of QAL and their implications for recommendations and loyalty of HEI students.

ESTIMATION METHOD

Sample

In this study, the subject of analysis is the universe of students in Portuguese state universities. The study is based on students belonging to universities that are effective members of CRUP – Council of Rectors of Portuguese Universities. This Council is a coordinating body for university higher education in Portugal, and is a significant nucleus of representativeness of the National System of University Higher Education in Portugal. The selection of this sample is justified by considering the universe of students in Portuguese higher education as a suitable laboratory to test, in simultaneous and structural terms, the different factors determining QAL and the effects of the latter on the loyalty and recommendation of its users, in an international situation of economic and social crisis. This has had a negative effect on the sustainability of the higher education sector, which in the last three decades showed development characterized by exponential growth, often

unplanned in terms of infrastructure and qualified people appointed to this type of public service supply. The effects of this evolution need to be known and understood more thoroughly, in the context of HEI management, following an approach with students as the subject of analysis and taking the determinants and effects of QAL as vectors to analyze their satisfaction.

The final sample consists of 719 individuals, 482 (67%) female and 237 (33%) male. Concerning age-groups, 74.3% of respondents are 18-25 years old; 16.3% from 25-35; 6.5% from 36-45; 16.0% from 46-55; and only 0.7% are over 55. It was also found that 58.1% of students attend the 1st study cycle (19.3% in the 1st year; 15.3% in the 2nd year; and 23.4% in the 3rd year); 33.9% the 2nd cycle (13.8% in the 1st year and 20.2% in the 2nd year) and only 7.9% are in the 3rd study cycle (1.8% in the 1st year; 1.8% in the 2nd year; and 4.3% in the 3rd year). It should be noted that 52.9% of students do not live in the area of the university outside study periods.

Data-collection Method

A questionnaire was prepared, using closed, structured questions and a 7-point Likert scale, which was previously selected from the literature considered to be of reference. Following Hill and Hill (2000), in order to assess the suitability of the questionnaire, 18 pre-tests were carried out between 18 and 23 February 2013, ensuring that all the questions were understood and accepted in the same way by all respondents. After readjustment, it was finally distributed by e-mail to all universities through the Public Relations Office of the University of Beira Interior. The sample was collected in March 2013.

Selection and Characterization of the Variables

The process of selecting variables referred to the literature considered to be of reference in studying student satisfaction in the context of HEIs. From that review, it is possible to justify the design of constructs that serve as a basis for subsequent testing of the determinants and effects of QAL (see Table 1).

Table 1. Constructs and variables.

Authors	*Constructs*	*Variables*	*Acronyms*
Yu & Lee (2008)	Satisfaction with academic management	Services in general	SATAM1
		Good performance	SATAM2
		Expectations	SATAM3
		Academic services	SATAM4
		Academic services organization	SATAM5
		Academic services quality and employee attitude	SATAM6
		Administrative services management	SATAM7
		Administrative services expectations	SATAM8
		Administrative services organization	SATAM9
		Administrative services quality and employee attitude	SATAM10

Author(s)	*Constructs*	*Variables*	*Acronyms*
Sirgy et al. (2007)	Satisfaction with social action	Services in general	SATSA1
		Structure	SATSA2
		Expectations	SATSA3
		Meals on the campus	SATSA4
		Services quality and employee attitude	SATSA5
		International programs and services	SATSA6
		Religious programs and support	SATSA7
		Social associations and organizations	SATSA8
		University sport	SATSA9
		Services of psychological support and social entrepreneurship	SATSA10
		Recreational activities	SATSA11
		Social support fund	SATSA12
	Satisfaction with the educational supply	Quality of educational supply	SATES1
		Expectations	SATES2
		Quality of lecturers' teaching and knowledge	SATES3
		Teaching method	SATES4
		Class environment	SATES5
		Timetable	SATES6
		Subject degree of difficulty	SATES7
	Satisfaction with infrastructure	Library in general	SATI1
		Utility	SATI2
		Structure	SATI3
		Expectations	SATI4
		Library	SATI5
		Transport	SATI6
		Parking	SATI7
		Medical support	SATI8
		Graphic services and bookshops	SATI9
		Network and telecommunications	SATI10
		Laboratories	SATI11
		Study rooms	SATI12
		Areas for relaxation and leisure	SATI13
		Sports facilities	SATI14
Cha (2003); Pilcher (1998); Sam (2001); Yu & Kim (2008); Yu & Lee (2008)	Quality of academic life[1]	Cognitive and affective components	QAL
Yu & Kim (2008); Yu & Lee (2008)		Positive and negative emotions	
Suh, Diener & Fujita (1996)		General emotions experienced in the last three to six months.	
Yu & Lee (2008)	Loyalty	The student will apply once again.	LOY1
		The student will apply again if continuing higher studies.	LOY2
		The student has intention to stay.	LOY3
	Recommendation	The student usually gives a favorable opinion.	REC1
		The student mentioned favorable aspects.	REC2
		The student often reveals the positive factors.	REC3
		When asked, the student usually makes favorable comments.	REC4
		Student recommendation	REC5

Characterization of the study group was also made through: (i) gender; (ii) age; (iii) study cycle attended; and (iv) area of residence outside study periods.

Data Analysis

Data analysis was carried out through a structural equation model, opting for the Partial Least Squares method (PLS) due to the associated advantages, namely by allowing treatment of formative and reflective constructs and by its proven flexibility in relation to the sample size (Henseler & Sarstedt, 2012). The software used was SmartPLS (Ringle & Will, 2005).

PRESENTATION OF RESULTS

Preliminary Data Analysis

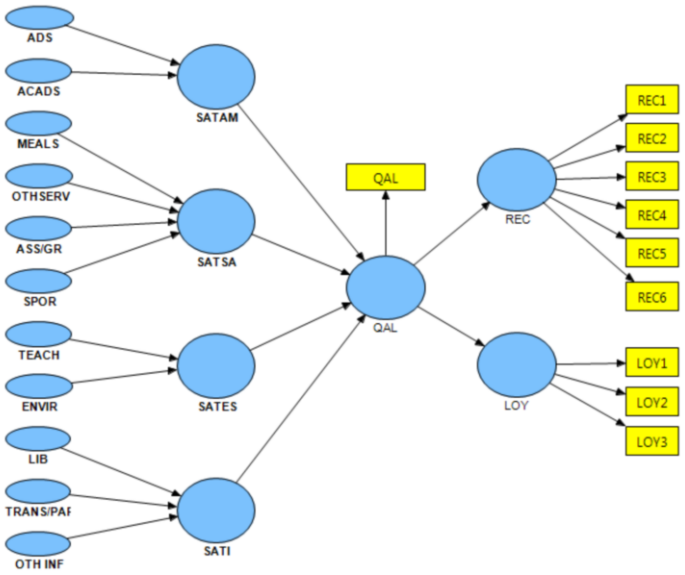
Since data were collected online and it was obligatory to answer the questions, there were no missing values. A test of normality was carried out through the Kolmogorov-Smirnov statistic. As the value of the significance obtained in all variables is under 0.05, the supposition of normality is rejected, a fact contributing to validation of the option to use PLS (Hair, Ringle, & Sarstedt, 2011). Before starting to analyze the model, descriptive statistics of the variables studied were produced, with the result in terms of the mean being shown to be quite homogenous.

Model Estimation

The estimation of a structural equation model usually follows a process in two stages involving different assessments of the measuring model and the structural model (Anderson & Gerbing, 1988; Hair, Anderson, Tatham & Black, 1998; Hair et al., 2011). The first stage consists of examining the reliability and validity of the measures according to certain criteria associated with the specification of the model of formative and reflexive measuring. The second stage involves assessment of the estimates of the structural model (Hair et al., 2011). Thus, the model was estimated according to these stages.

Measuring Model

After determining the values and readjusting the QAL construct, according to the proposal in the literature review, the model took on a final format, as shown in Figure 2. This model is composed of 53 indicators that measure or reflect 18 constructs.



Legend: SATAM–satisfaction with academic management; ADS–administrative services; ACADS–academic services; SATSA–satisfaction with social action; MEALS–meals; OTHSERV–other services; ASS/GR–associations and groups; SPOR–sport; SATES–satisfaction with the educational supply; TEACH–teaching; ENVIR–environment; SATI–satisfaction with infrastructure; LIB–library; TRANS/PAR–transport and parking; OTH INF–other infrastructure; QAL–quality of academic life; REC–recommendation; LOY–loyalty.

Figure 1. Final model of the determinant factors and effects of QAL.

In order to improve the capacity for analysis per construct linked to students' satisfaction, the model was sub-divided as shown in Figures 3 and 4.

The reflexive indicators, according to Hair et al. (2011), should take into account: (i) assessment of the loading value; (ii) assessment of internal consistency; (iii) assessment of the composite reliability; and (iv) assessment of discriminant validity.

Regarding the loading value, in various studies (Bagozzi & Yi, 1988; Barclay, Thompson, & Higgins, 1995; Chin, 1998a, 1998b; Hair et al., 2011; Hulland, 1999; Keil, Tan, Wei, Saarinen, Tuunainen, & Wassenaar, 2000; Sarkar, Echambadi, Cavusgil, & Aulakh, 2001) it was proposed that the indicator loadings should be close to or above 0.70 and in this way ensure they have more than 50% of the variance of the indicator shared with the construct. If there are additional indicators to serve as comparison, the values should be above 0.40 (Hulland, 1999) and 0.50 (Chin, 1998b; Hair et al., 2011; Hulland, 1999).

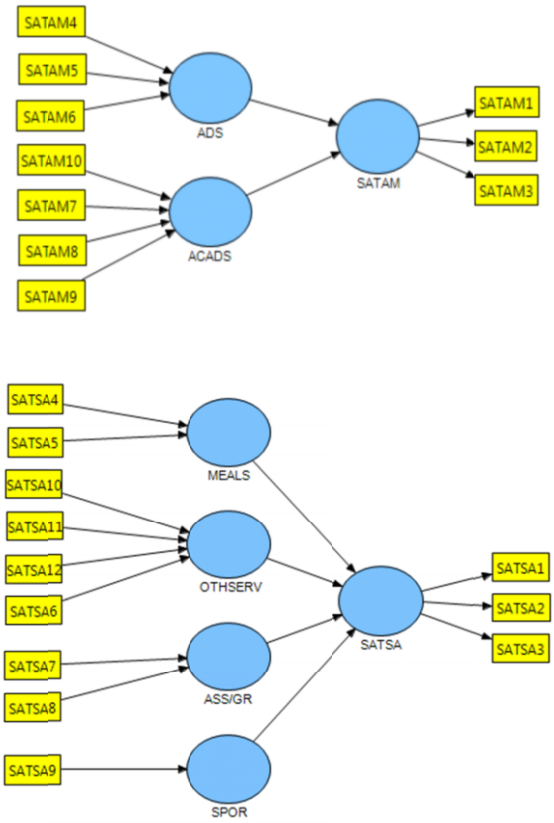


Figure 2. Satisfaction with academic management and satisfaction with social action.

After analysis of loadings (Table 2) and cross-loadings of the final model, only one of the indicators was found to have a loading under 0.70. As this indicator is within the conditions recommended by Chin (1998b), Hulland (1999) and Hair et al. (2011), it was decided to keep it in the selected specification of the model.

Both internal consistency and reliability can be analyzed through the Cronbach Alpha coefficient (Chin, 1998a; Hair et al., 2011; Sarstedt & Ringle, 2010). However, Fornell and Larcker (1981) also propose using the composite reliability coefficient, which is corroborated by Chin (1998a), Sarstedt and Ringle (2010) and Hair et al. (2011).

The composite reliability coefficient (ρ) is defined as follows:

$$\rho_c = \frac{(\sum_{i=1}^{n} \lambda_i)^2}{(\sum_{i=1}^{n} \lambda_i)^2 + \sum_{i=1}^{n} var(\epsilon_i)} \quad (1)$$

where: n = number of indicators associated with the construct c,
λ_i= loading value of indicator i.
$var(\epsilon_i)$ = 1-λ_i2 – error in measuring the indicator i.
c = 1,…,8

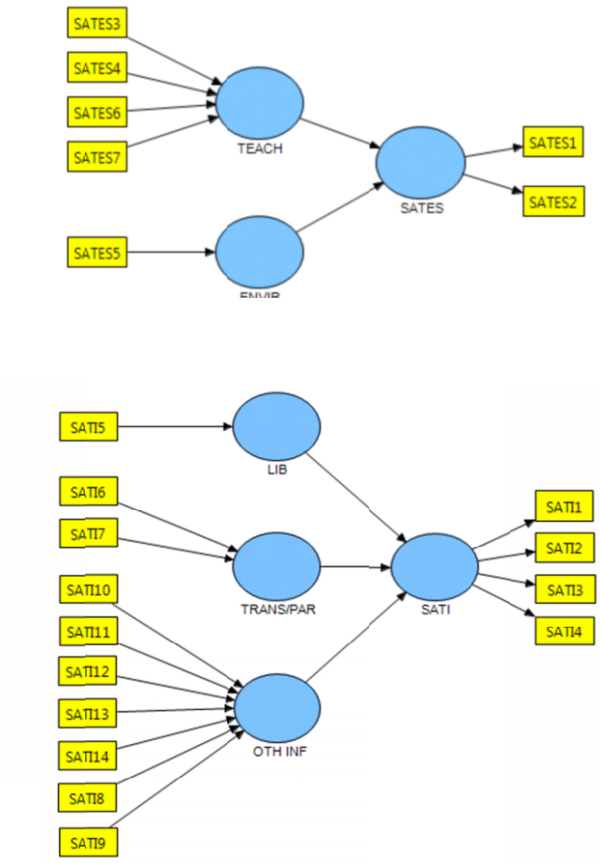


Figure 3. Satisfaction with the educational supply and satisfaction with infrastructure.

Table 2. Weights and loadings of the indicators.

Indicator	*Type*	*Loading*	*Weight*	*Indicator*	*Type*	*Loading*	*Weight*
LOY1	R	**0.862**	0.479	**SATAM5**	F	0.962	**0.477**
LOY2	R	**0.883**	0.359	**SATAM6**	F	0.665	**-0.021**
LOY3	R	**0.828**	0.327	**SATAM7**	F	0.954	**0.376**
QAL2	R	**1.000**	1.000	**SATAM8**	F	0.961	**0.442**
REC1	R	**0.938**	0.203	**SATAM9**	F	0.842	**0.246**
REC2	R	**0.923**	0.205	**SATAM10**	F	0.754	**0.013**
REC3	R	**0.931**	0.202	**SATI1**	R	**0.942**	0.275
REC4	R	**0.945**	0.212	**SATI2**	R	**0.891**	0.254
REC5	R	**0.569**	0.117	**SATI3**	R	**0.947**	0.269
REC6	R	**0.884**	0.188	**SATI4**	R	**0.935**	0.278
SATSA1	R	**0.948**	0.351	**SATI5**	F	1.000	**1.000**
SATSA2	R	**0.956**	0.361	**SATI6**	F	0.812	**0.564**
SATSA3	R	**0.942**	0.342	**SATI7**	F	0.855	**0.634**
SATSA4	F	0.878	**0.602**	**SATI8**	F	0.601	**0.002**
SATSA5	F	0.853	**0.553**	**SATI9**	F	0.568	**0.080**
SATSA6	F	0.664	**0.258**	**SATI10**	F	0.632	**0.098**
SATSA7	F	0.679	**0.233**	**SATI11**	F	0.747	**0.281**
SATSA8	F	0.980	**0.859**	**SATI12**	F	0.913	**0.487**
SATSA9	F	1.000	**1.000**	**SATI13**	F	0.783	**0.216**
SATSA10	F	0.674	**0.114**	**SATI14**	F	0.647	**0.103**
SATSA11	F	0.549	**0.049**	**SATES1**	R	**0.956**	0.540
SATSA12	F	0.956	**0.758**	**SATES2**	R	**0.950**	0.509
SATAM1	R	**0.961**	0.348	**SATES3**	F	0.947	**0.612**
SATAM2	R	**0.962**	0.357	**SATES4**	F	0.849	**0.250**
SATAM3	R	**0.937**	0.344	**SATES5**	F	1.000	**1.000**
SATAM4	F	0.974	**0.570**	**SATES6**	F	0.56908	**0.026**
				SATES7	F	0.75263	**0.256**

Legend: R = Reflexive; F = Formative.

Table 3 presents the results of this analysis, and the corresponding values of the Cronbach Alpha. Interpretation of the coefficients of Tables 2 and 3 is analogue, and values under 0.70 (Hair et al., 2011) should not be found, as is the case here.

Assessment of discriminant validity is carried out through average variance extracted – AVE (Fornell & Larcker, 1981; Hair et al., 2011), and the results are also presented in Table 2, finding that all values are within the reference value, i.e., above 0.50 (Hair et al., 2011). However, Fornell and Larcker (1981) state there should be other criteria to take into account when assessing discriminant validity, as is the case of comparative analysis of inter-construct correlation coefficients and the square root of AVE, with it being necessary for the values of the principal diagonal to be above the other values in the respective rows and columns, as suggested by Barclay et al. (1995). Table 4 confirms that the result agrees with what is recommended in the literature of reference. Hair et al. (2011) also propose careful observation of the loadings and cross-loadings matrix to check whether all loadings are greater than all their cross-loadings.

Table 3. Internal consistency and discriminant validity.

Construct	Associated indicator	*Loading*	$\sum_{i=1}^{n}\lambda_i$	$\left(\sum_{i=1}^{n}\lambda_i\right)^2$	$\text{var}(\varepsilon_i)$	$\sum_{i=1}^{n}\text{var}(\varepsilon_i)$	ρ_c	Cronbach Alpha	AVE
LOY	LOY1	0.862	2.572	6.618	0.258	0.793	0.893	0.824	0.736
	LOY2	0.883			0.220				
	LOY3	0.828			0.315				
QAL	QAL2	1.000	1.000	1.000	0.000	0.000	1.000	1.000	1.000
REC	REC1	0.938	2.793	7.799	0.119	0.400	0.951	0.934	**0.766**
	REC2	0.923			0.148				
	REC3	0.931			0.133				
	REC4	0.945			0.108				
	REC5	0.569			0.676				
	REC6	0.884			0.218				
SATSA	SATSA1	0.948	2.845	8.095	0.101	0.301	0.964	0.944	0.900
	SATSA2	0.956			0.087				
	SATSA3	0.942			0.114				
SATAM	SATAM1	0.961	2.860	8.181	0.077	0.273	0.968	0.950	0.909
	SATAM2	0.962			0.075				
	SATAM3	0.937			0.121				
SATI	SATI1	0.947	2.882	8.304	0.104	0.230	0.973	0.947	0.863
	SATI2	0.935			0.126				
	SATI3	1.000			0.000				
	SATI4	0.812			0.340				
SATES	SATES1	0.947	1.797	3.228	0.102	0.381	0.894	0.900	0.909
	SATES2	0.849			0.279				

Table 4. Correlation between constructs and square root of AVE.

	LOY	*QAL*	*REC*	*SATSA*	*SATAM*	*SATI*	*SATES*
LOY	**0.858**						
QAL	0.479	**1.000**					
REC	0.656	0.639	**0.875**				
SATSA	0.271	0.377c	0.347	**0.948**			
SATAM	0.355	0.423	0.454	0.489	**0.953**		
SATI	0.346	0.455	0.469	0.376	0.456	**0.929**	
SATES	0.468	0.519	0.593	0.366	0.512	0.461	**0.953**

According to Hair et al. (2011), in the formative criteria, the indicators to bear in mind are the following: (i) the value and statistical significance of weights; and (ii) multi-collinearity.

Assessment should focus, first of all, on the value of the weight each one has in forming the construct (Chin, 1998a; Hair et al., 2011). Hair et al. (2011) state that there should be examination of the weight of each indicator (relative importance) and the loadings (absolute importance) and use of bootstrapping to ensure their significance. The minimum number of bootstrap samples is 5000 and the number of cases tends to be equal to the number of observations in the original sample.

The value and statistical significance of the weights are assessed through the t-value, namely, if this is above the value corresponding to statistical significance of 0.05. Of the 47 indicators, only 6 (12.5%) were found not to be statistically significant, with all the remaining t-values being above 1.96, and therefore significant for a confidence level of 0.95 (Hair et al., 2011). This being so, following the recommendation of Chin (1998a), it was decided to keep them, since eliminating them would assume a potential loss of useful and necessary information for defining and characterizing the constructs.

At a second stage, multi-collinearity is analyzed, where the variance value of each indicator (VIF) should be under 5 (Hair et al., 2011). From observation of the values of tolerance and VIF, referring to the formative indicators, the indicators are found not to present problems of multi-collinearity. All tolerance levels are close to zero and VIF values are generally close to 2, except for three indicators. Nevertheless, Hair et al. (1998) state that the maximum VIF can go up to 10, with above 5 possibly meaning a lower R2, since explanation of some variables overlaps. In this study, variables with VIF above 5 were kept, recognizing that the R2 statistic can take on a lower value due to a hypothetical situation of multi-collinearity.

Structural model. For Hair et al. (2011), primary assessment of the structural model is made considering two assessment criteria, namely, the coefficient of determination statistic (R2), which measures the degree of model adjustment, and statistical significances of the path coefficients.

As the objective of structural equation analysis through the PLS method is to maximize the value of the explained variance of the endogenous latent variables,

the R2 value of the constructs should present a high value (Hair et al., 2011). Analyzing Table 5, the coefficient of determination for the endogenous variables is found to be merely reasonable.

Table 5. Coefficient of determination (R2).

Construct	*R2*
LOY	0.229
QAL	0.355
REC	0.408
SATSA	0.483
SATAM	0.652
SATI	0.501
SATES	0.675

Regarding the robustness of the path coefficients, a value above 0.2 is a reference (Chin, 1998a; Hair et al., 2011). From observation of Table 6, 10 of the 18 coefficients present a value above 0.2, meaning that more than 50% of these coefficients show robustness of the relations tested.

Table 6. Path coefficients.

	LOY	*QAL*	*REC*	*SATSA*	*SATAM*	*SATES*	*SATI*
LOY							
QAL	**0.479†**		**0.639†**				
REC							
SATSA		0.131					
MEALS				0.166			
OTHSER				**0.573†**			
ASS/GR				0.105			
SPOR				-0.071			
SATAM		0.097					
ACADS					**0.505†**		
ADS					**0.346†**		
SATES		**0.324†**					
TEACH						**0.760†**	
ENVIR						0.099	
SATI		**0.212†**					
LIB							**0.223†**
TRANS/PAR							0.040
OTH INF							**0.542†**

Legend: † = Robustness of the coefficient because the value obtained is above 0.2.

According to Bollen (1989), the total effects should also be subject to analysis. In this case, it is not possible to analyze the total effects because the determinants of SATSA, SATAM, SATI and SATES do not have direct effects on

REC and LOY. Table 7 was therefore elaborated, revealing that QAL is the mediator of these determinants because the indirect values calculated are relatively low.

Table 7. Direct and indirect effects.

Constructs	*->QAL*	*->REC*		*Constructs*	*->QAL*	*->FID*	
	Direct	Direct	Indir.		Direct	Direct	Indir.
QAL	-	0.639	-	QAL	-	0.479	-
SATSA	0.131	-	0.084	SATSA	0.131	-	0.063
SATAM	0.097	-	0.062	SATAM	0.097	-	0.046
SATI	0.212	-	0.135	SATI	0.212	-	0.102
SATES	0.324	-	0.207	SATES	0.324	-	0.155

Based on the results estimated, we can conclude that the model presents indicators of validity, allowing us to test the hypotheses formed. The final model is presented below in Figure 4.

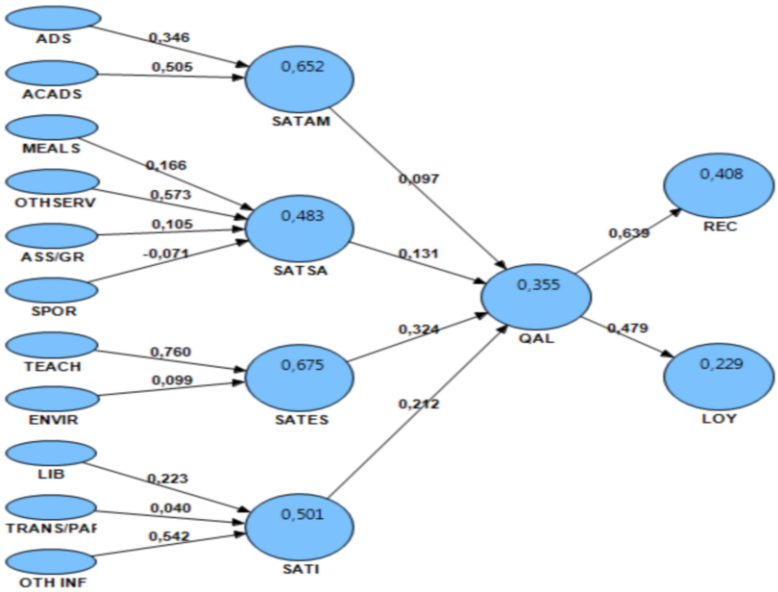


Figure 4. Final model and respective weights.

Using SEM, the proposed conceptual model was tested. The results obtained for the main effects of the model are presented in Table 8. Considering the estimated values of the coefficients and corresponding t-values, a good fit of the data used in model estimation and hypotheses testing was found, with respect to structural relationships.

Table 8. Structural relationships.

Hypotheses	*Structural relationships*	*Estimated value*	*t-value*
H_1	SATSA -> QAL	0.131	3.770***
H_2	SATAM -> QAL	0.097	2.369**
H_3	SATES -> QAL	0.324	8.058***
H_4	SATI -> QAL	0.212	5.180***
H_5	QAL -> LOY	0.479	16.652***
H_6	QAL -> REC	0.639	26.306***

Legend: *** = level of significance 1% (=>2.58)
** = level of significance 5% (=>1.96)

Concerning H1 according to which SATAM has a positive influence on QAL, the result indicates that SATAM interacts positively with QAL (estimate = 0.097, $p<0.05$), confirming the conclusion of Sirgy et al. (2007), Yu and Lee (2008) and Hassan (2011). Academic management was measured in terms of administrative services (ADS) and academic services (ACADS) finding that both have a significant influence on this construct. Regarding administrative services, Yu and Lee (2008) mention that students have limited interaction with these services, which agrees with the result obtained here (0.346), which is less than what was obtained for academic services (0.505), showing, nevertheless, some weight in the context of this research.

As for H2 proposing that SATSA influences QAL positively, the result indicates that this is the case (estimate = 0.131, $p<0.05$), corroborating the studies by Sirgy et al. (2007), Yu and Lee (2008), Yu and Kim (2008) and Hassan (2011). It is worth pointing out that one of the indicators with considerable weight was SATSA12, which refers to social support, of particular importance at times of economic and social crisis.

Regarding H3 proposing that satisfaction with the educational supply influences QAL positively, the result indicates that SATAM has a significant influence on QAL (estimate = 0.324, $p<0.05$), in agreement with the empirical evidence already found by Chadwick and Ward (1987), Simpson and Siguaw (2000), Astin (2001) and Yu and Lee (2008). It was demonstrated that the educational supply is one of the factors with most influence on QAL, i.e., lecturers, teaching method, timetable, the degree of difficulty of curricular units and the physical classroom environment have a strong influence on the quality of academic life.

In relation to H4 according to which SATI influences QAL positively, the results indicate this is so (estimate = 0.212, $p<0.05$), ratifying the previous results

of Sirgy et al. (2007), Yu and Lee (2008), Yu and Kim (2008) and Hassan (2011). It is of note, in this context of analysis, that SATI was revealed to be the second most important factor in determining QAL. This finding suggests that one of the areas to be explored by university managers should be the modernization, upkeep and improvement of the quality of infrastructure.

Hypothesis H5 proposes that QAL has a positive influence on loyalty. The result indicates that QAL has a significant influence on determining loyalty (estimate = 0.479, $p<0.05$). It was demonstrated that SATAM, SATSA, SATES and SATI are factors determining student loyalty, which is in line with the previous results of Pilcher (1998), Schertzer and Schertzer (2004), Sirgy et al. (2007) and Yu and Kim (2008). Students who are satisfied with these factors are more likely to remain loyal to their university.

Concerning H6 which proposes that QAL influences recommendation positively, the result indicates that QAL has a positive impact on recommendation (estimate = 0.639, $p<0.05$), which means that SATAM, SATSA, SATES and SATI are factors determining recommendation, as is found with loyalty. QAL has a mediating effect between these factors and recommendation, supporting the empirical evidence already found (Hassan, 2011; Hennig-Thurau et al., 2001; Yu & Lee, 2008).

CONCLUSIONS AND IMPLICATIONS

The results obtained here provide university managers with lines of action to improve efficient allocation of university resources, inasmuch as different degrees of influence are found for the determinant factors in analysis. Students' satisfaction with the educational supply and university facilities significantly influences QAL. SATAM has a less significant impact, but is nonetheless positive. Satisfaction with academic services shows greater weight in determining QAL, compared with the weight associated with satisfaction of administrative services, a conclusion that can be justified by the fact that students have less direct contact with administrative services. From the above, the results suggest that universities need to prioritize action in improving the educational supply and modernization of university facilities.

Regarding satisfaction with social action, the study indicates that QAL is heavily influenced by services that require interaction with students, as is the case of offices of international programs and relations, psychological support, social entrepreneurship and also the social support fund. Thus, in the current scenario of economic and social crisis, which restricts families' available income and can place students' subsistence and their continued studies at risk, the HEIs have to be able to ensure different forms of direct social support (grants) or indirect forms (integration in the academic community and life, accommodation, meals, sport, volunteerism and social entrepreneurship, and other activities of social and psychological support).

Concerning loyalty and recommendation, the results also suggest that QAL has a positive influence on both variables analyzed. Aiming to reinforce loyalty and

promote student recommendation, university managers should make efforts to ensure satisfaction of all their needs and provide experiences that create affective bonds, not only during the period of study but also after completing higher education. In this connection, university managers should follow a policy of continuous improvement, focusing on periodic monitoring and assessment of students' QAL, both through accompanying current students and through relational management and marketing between the HEI and students after completion of their courses, using tools to manage customer relationships of the CRM (Customer Relationship Management) type, oriented towards strengthening existing loyalty and a return to the institution they were connected to. To this end, there should be an individual record accompanying students' progress after completing their studies, allowing effective extraction of data on students, in order to detect needs and design and adjust campaigns of educational provision directed to customers (students and employers), which would result in effective strengthening of student employability rates.

In recent years, universities have faced growing budget restrictions, with competition between them tending to intensify, since recruitment of more and better students, and holding on to those already enrolled, provides a financial basis favorable to greater sustainability of their basic activities of teaching and research and development (R&D) and opening up to the community. Globally, this competitive scenario encourages the generation of own income to complement direct state transfers, contributing to increased self-financing capacity and maintaining high standards of quality, in terms of educational and scientific activities and also providing services to the wider community. It is therefore recommended that university leaders elaborate management policies based on monitoring the determinant factors of QAL, considering three areas of intervention: (i) attracting students and gaining their loyalty, which is connected to retaining and accompanying the student throughout his/her life; (ii) total quality management, integrated in a policy of excellence recommended in higher education internationally and nationally; and (iii) academic performance, linked to rankings of academic success, employability and visibility of graduates. Furthermore, the results obtained suggest reinforcing students' QAL, not only for the reasons presented here, but also because the academic and social well-being of HEIs depends on QAL, which is fundamental to ensure HEIs' ability to survive and be sustainable, with a universal and tripartite mission, i.e., leadership and excellence in teaching, excellence in R&D, and success in opening up service provision to the community.

The conclusions of this study are not confined to HEIs, in that they have more wide-ranging implications, namely in terms of redesigning public policies for education and research, aiming to provide inclusive experiences of high quality education and research, in environments which integrate all members of their community, whatever their financial and social position, guaranteeing equity (i.e., equal access to educational services, contributing to increased social well-being). Given the drop-out rate, which has been increasing in times of recession, the added

challenge faced by public policies is to follow the path of equity and fair education to ensure successful inclusion of the different social sectors of the population.

LIMITATIONS AND FUTURES LINES OF RESEARCH

The main limitation of this analysis is the low response rate from universities with the greatest total number of students (although for the size of the sample selected it was revealed to be sufficient), which prevented making a comparative analysis between universities.

In terms of future lines of research, expanding the dimension of sub-samples and internationalization of the sample is suggested, by applying the questionnaire in other foreign universities, particularly in English and Spanish, so as to ensure attainment of representative samples, which in turn could make it viable to make comparative analyses between different state universities internationally.

This analysis showed the importance of the effects of QAL on university students' loyalty and recommendation. Other variables could be considered, namely student drop-out rates, despite the recession felt in the job market and lower standard of living experienced in times of economic and social crisis. Other alternative determinant factors, so far unexplored in the literature of reference, could be incorporated, namely the external environment of student reception, student origin, family structure and background, international exposure, religion, ethnicity, participation in top level sports competition, simultaneous professional activity and previous education. Such factors may have an influence on loyalty and recommendation mechanisms taking as a reference the construct of the quality of academic life in HEIs, based on a multi-dimensional concept of relational management and proximity to students and other stakeholders in the academic community.

NOTE

[1] Quality of academic life (QAL) =
= [cognitive QAL + component of affective QAL]/2 =
= [determinants of satisfaction with university life + (PE-NE)]/2
where:
PE = Positive emotions experienced in the domain of university life
NE = Negative emotions experienced in the domain of university life

REFERENCES

Anderson, E., Fornell, C., & Lehman, D. (1994). Customer satisfaction, market share, and profitability: Findings from Sweden. *The Journal of Marketing*, *58*, 53-66.

Anderson, J., & Gerbing, D. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, *103*(3), 411-423.

Astin, A. (2001). *What matters in college? Four critical years revisited*. San Francisco, CA: Jossey-Bass.

Bagozzi, R., & Yi, Y. (1988). On the evaluation of structural equation models. *Journal of the Academy of Marketing Science*, *16*(1), 74-94.

Barclay, D., Thompson, R., & Higgins, C. (1995). The Partial Least Squares (PLS) approaches to causal modeling: Personal computer adoption and use as an illustration. *Technology Studies*, *2*(2), 285-309.

Bhattacharya, C., & Sen, S. (2003). Consumer-company identification:A framework for understanding consumers' relationships with companies. *Journal of Marketing*, *67*, 76-88.

Billups, F. (2008, October). Measuring college student satisfaction: A multi-year study of the factors leading to persistence. *NERA Conference Proceedings* (paper 14).

Bollen, K. (1989). *Structural equations with latent variable*s. New York:John Wiley & Sons.

Bryant, J. (2006). Assessing expectations and perceptions of the campus experience: The Noel-Levitz student satisfaction inventory. *New Directions for Community Colleges*, *134*, 25-35.

Campbell, A., Converse, P. E., & Rodgers, W. L. (1976). *The quality of American life: Perceptions, evaluations, and satisfactions* (Vol. 3508). New York: Russell Sage Foundation.

Cardador, M., & Pratt, M. (2006). Identification management and its bases: Bridging management and marketing perspectives through a focus on affiliation dimensions. *Journal of the Academy of Marketing Science*, *34*(2), 174-184.

Cha, K. (2003). Subjective well-being among college students. *Social Indicators Research*, *62/63*(1-3), 455-477.

Chadwick, K., & Ward, J. (1987). Determinants of consumer satisfaction with education: Implications for college and university administrators. *College and University*, *62*, 236-246.

Chin, W. (1998a). Issues and opinion on structural equation modeling. *MIS quarterly*, *22*(1), VIII-XVI. Retrieved from http://www.jstor.org/stable/10.2307/249674

Chin, W. (1998b). The partial least squares approach to structural equation modeling. In G. A. Marcoulides (Ed.) *Modern methods for business research*. Mahwah, NJ: Lawrence Erlbaum Associates.

Dick, A., & Basu, K. (1994). Customer loyalty: Toward an integrated conceptual framework. *Journal of the Academy of Marketing Science*, *22*(2), 99-113.

Diener, E. (1994). Assessing subjective well-being: Progress and opportunities. *Social Indicators Research*, *31*, 103-157.

Douglas, J., & Douglas, A. (2006). Evaluating teaching quality. *Quality in Higher Education*, *12*(1), 3-13.

Elliott, K., & Healy, M. (2001). Key factors influencing student satisfaction related to recruitment and retention. *Journal of Marketing for Higher Education*, *10*(4), 1-11.

Elliott, K., & Shin, D. (2002). Student satisfaction: An alternative approach to assessing this important concept. *Journal of Higher Education Policy and Management, 24*(2), 197-209.

Fornell, C., & Larcker, D. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, *18*(1), 39-50.

Gustafsson, A., Johnson, M., & Roos, I. (2005). The effects of customer satisfaction, relationship commitment dimensions, and triggers on customer retention. *Journal of Marketing*, *69*, 210-218.

Hair, J., Anderson, R., Tatham, R., & Black, W. (1998). *Multivariate data analysis*. Englewood Cliffs, NJ: Prentice-Hall.

Hair, J., Ringle, C., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *The Journal of Marketing Theory and Practice*, *19*(2), 139-152.

Hassan, K. (2011). Quality of college life (QCL): Validation of a measure of student well-being in the Middle East. *The International Journal of Educational and Psychological Assessment*, *8*(1), 12-22.

Helgesen, O., & Nesset, E. (2007). What accounts for students' loyalty? Some field study evidence. *International Journal of Educational Management*, *21*(2), 126-143.

Hennig-Thurau, T., Langer, M., & Hansen, U. (2001). Modeling and managing student loyalty: An approach based on the concept of relationship quality. *Journal of Service Research*, *3*(4), 331-344.

Hill, M., & Hill, A. (2000). *Investigação por questionár*io (1st ed.). Edições Sílabo, Lda.

Hulland, J. (1999). Use of partial least squares (PLS) in strategic management research: A review of four recent studies. *Strategic Management Journal*, *20*, 195-204.

Joseph, M., Yakhou, M., & Stone, G. (2005). An educational institution's quest for service quality: Customers' perspective. *Quality Assurance in Education*, *13*(1), 66-82.

Keil, M., Tan, B., Wei, K., Saarinen, T., Tuunainen, V., & Wassenaar, A. (2000). A cross-cultural study on escalation of commitment behavior in software projects. *MIS Quarterly*, *24*(2), 299-325.

Leckey, J., & Neill, N. (2001). Quantifying quality: The importance of student feedback. *Quality in Higher Education*, *7*(1), 19-32.

Mavondo, F., Tsarenko, Y., & Gabbott, M. (2004). International and local student satisfaction: Resources and capabilities perspective. *Journal of Marketing for Higher Education*, *14*(1), 41-60.

Miller, R. (2003, May). *Student satisfaction and institutional success*. Paper presented at the 43rd Annual AIR Forum, Tampa, FL.

Oliver, R. (1999). Whence consumer loyalty? *Journal of Marketing*, *63*, 33-34.

Pilcher, J. (1998). Affective and daily event predictors of life satisfaction in college students. *Social Indicators Research*, *43*(1985), 291–306.

Reichheld, F. (2003). The one number you need to grow. *Harvard Business Review*, *81*(12), 46-54.

Richardson, J. (2005). Instruments for obtaining student feedback: A review of the literature. *Assessment & Evaluation in Higher Education*, *30*(4), 387-415.

Ringle, C., & Sven/Will, A. (2005). SmartPLS. Retrieved from http://www.smartpls.de

Roberts, L., & Clifton, R. (1992). Measuring the affective quality of life of university students: The validation of an instrument. *Social Indicators Research*, *27*, 113-137.

Russell-Bennett, R., McColl-Kennedy, J., & Coote, L. (2007). Involvement, satisfaction, and brand loyalty in a small business services setting. *Journal of Business Research*, *60*(12), 1253-1260.

Sam, D. (2001). Satisfaction with life among international students: An exploratory study. *Social Indicators Research*, *53*, 315-337.

Sarkar, M., Echambadi, R., Cavusgil, S., & Aulakh, P. (2001). The influence of complementarity, compatibility, and relationship capital on alliance performance. *Journal of the Academy of Marketing Science*, *29*(4), 358-373.

Sarstedt, M., & Ringle, C. (2010). Treating unobserved heterogeneity in PLS path modeling: A comparison of FIMIX-PLS with different data analysis strategies. *Journal of Applied Statistics*, *37*(8), 1299-1318.

Schertzer, C., & Schertzer, S. (2004). Student satisfaction and retention: A conceptual model. *Journal of Marketing for Higher Education*, *14*(1), 79-91.

Simpson, P., & Siguaw, J. (2000). Student evaluations of teaching: An exploratory study of the faculty response. *Journal of Marketing Education*, *22*(3), 199-213.

Sirgy, M., Grzeskowiak, S., & Rahtz, D. (2007). Quality of college life (QCL) of students: Developing and validating a measure of well-being. *Social Indicators Research*, *80*(2), 343-360.

Sirgy, M., Lee, D., Grzeskowiak, S., Yu, G., Webb, D., El-Hasan, K., … Kuruuzum, A. (2010). Quality of college life (QCL) of students: Further validation of a measure of well-being. *Social Indicators Research*, *99*(3), 375-390.

Suh, E., Diener, E., & Fujita, F. (1996). Events and subjective well-being: Only recent events matter. *Journal of Personality and Social Psychology*, *70*(5), 1091-1102.

Verhoef, P. (2002). The effect of relational constructs on customer referrals and number of services purchased from a multiservice provider: Does age of relationship matter? *Journal of the Academy of Marketing Science*, *30*(3), 202-216.

Wiers-Jenssen, J., Stensaker, B., & Grogaard, J. (2002). Student satisfaction: Towards an empirical deconstruction of the concept. *Quality in Higher Education*, *8*(2), 183-195.

Yu, G., & Kim, J. (2008). Testing the mediating effect of the quality of college life in the student satisfaction and student loyalty relationship. *Applied Research in Quality of Life*, *3*(1), 1-21.
Yu, G., & Lee, D. (2008). A model of quality of college life (QCL) of students in Korea. *Social Indicators Research*, *87*(2), 269-285.

Eugénia Pedro
Department of Management and Economics
University of Beira Interior

Helena Alves
Department of Management and Economics
University of Beira Interior

João Leitão
Department of Management and Economics
University of Beira Interior
CEG-IST, University of Lisbon

PART C

ECONOMICS/POLICY DATA

GEORGE PSACHAROPOULOS

THE RETURNS TO INVESTMENT IN HIGHER EDUCATION

Methods, Data and Policy Implications

INTRODUCTION

The purpose of this chapter is to provide an overview of the rates of return to investment in higher education based on existing data, incorporating where possible a differentiation for socio-economic background. The chapter discusses the shortcomings of the methods and data available. The size and pattern of the returns to higher education are put in the current education policy context.

Before presenting the rate of return evidence, it is essential to understand what these rates are, how they are being estimated and on what kinds of data. The next section presents the available evidence on the returns to higher education; this is followed by the equity dimension. The final section discusses the policy implications of the evidence.

RETURNS SPECIES

There are several types of returns to education, depending on the question one is interested in answering, e.g. how efficient is public spending on education, what is the return to an individual investing in higher education, or how much the state gets back relative to what it spends on education.

Private returns are based on the costs and benefits of education, as those are realized by the individual student, i.e. how much he/she actually pays out of pocket to attend a higher education institution, relative to what he/she gets back, after taxes, in terms of increased earnings, relative to a control group of secondary school graduates who did not pursue tertiary education studies. This is a private spending efficiency question. Private rates of return are used to explain the behavior of students regarding the demand for higher education, or the equity effects of state subsidies to education.

Social returns are based on the costs and benefits of education, as those are realized by the state or society as a whole. The costs are all inclusive, i.e. they refer to what education really costs, rather than just what the students pay out of pocket. Earnings are before tax, as taxes are a zero-sum-game regarding the social calculus. Social rates of return should be based on productivity differentials, rather than earnings. They should also include external effects of education, e.g. a higher education graduate spilling benefits to others by means of being more educated.

M. E. Menon et al. (eds.), Using Data to Improve Higher Education, 121–148.

The social returns to education are used to assess the efficiency of public spending on education, and can be used as a guide on whether to expand or contract a particular university faculty.

Fiscal returns to education are based on a narrow measure of costs and benefits – those relating to the public coffer. They can be used to assess how well the Treasury is doing when spending on education. They relate to the country's public finances and are not estimated as widely as the private and social rates.

Ideally, the benefits part of a social rate of return estimation should include external effects, i.e. benefits that are realized by others than the individual investor. An externalities-inclusive social rate of return is called "wide," vs. the "narrow" social rate of return that includes only benefits internalized by the individual. This distinction is important because, depending on the size of externalities and the differential externalities between levels of education, diametrically opposite policy conclusions could be reached.

The literature contains a plethora of papers purporting to have estimated the returns to education, although the authors have really estimated the wage effect, i.e., the earnings advantage of a particular graduate. A proper rate of return estimation should also take into account the cost incurred for achieving that advantage.

ESTIMATING METHODS

In the empirical literature, two main methods have been used in arriving at rate of return estimates: the "full-discounting" or "elaborate" method, and the "Mincerian" earnings function method. Historically, the elaborate method was used in the beginning of the economics of education in the early sixties, followed by the Mincerian method in the seventies. Both methods try to map observed data, as those illustrated in Figure 1, to a rate of return formula.[1]

The "full-discounting" or "elaborate" method, consists in calculating the internal rate of return based on individual age-earnings profiles that vary over time (*t*), i.e.,

$$\sum_{t=m+1}^{n} \frac{(W_u - W_s)_t}{(1+r)^t} = \sum_{t=1}^{m} (W_s + C_u)(1+r)^t,$$

where (*r*) is the discount rate that equates the benefits from the extra education (proxied by earnings differentials in the economy), to the sum of opportunity costs (foregone earnings of the student while studying), and the direct resource costs of schooling at a given point in time. Thus, $(W_u - W_s)_t$ is the difference in earnings between two levels of education[2] and W_u is the annual earnings of a more educated person.

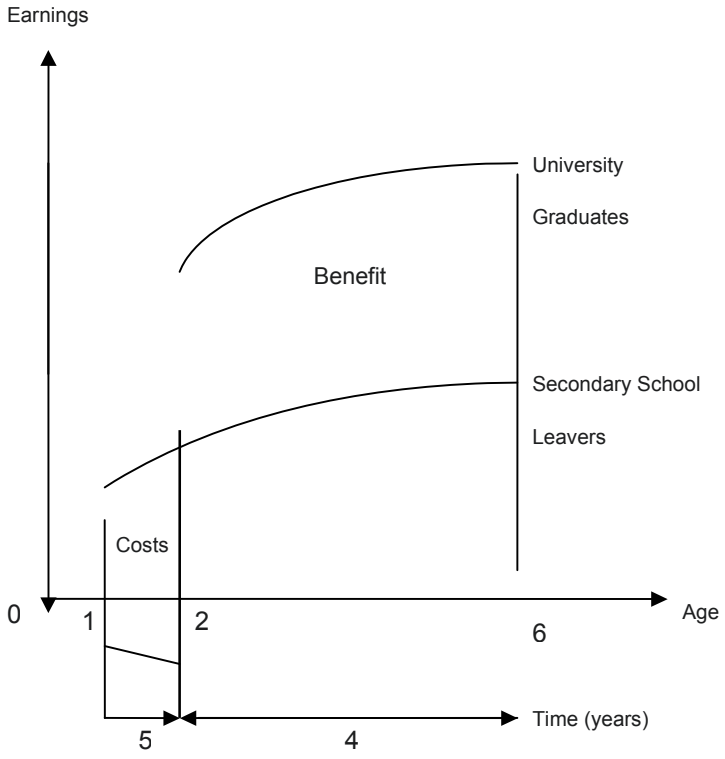


Figure 1. Stylized age-earnings profiles.

The "Mincerian" earnings function method starts by fitting a regression to the data in the form

$$\ln W_i = \alpha + \beta_p D_p + \beta_s D_s + \beta_u D_u + \gamma_1 EX_i + \gamma_2 EX_i^2 + \varepsilon_i$$

where *EX* stands for years of labor market experience, defined as Age – S – School starting age, and *D* is a 0-1 dummy variable corresponding to the subscripted level of schooling (Mincer, 1974). The private rate of return to higher education can then be calculated from the earnings function by the following formula:

$$r_u = \frac{\beta_u - \beta_s}{S_u - S_s},$$

The discounting of actual net age-earnings profiles is the most appropriate method of estimating the returns to education because it takes into account the most important part of the early earnings history of the individual. However, this method requires comprehensive data – one must have a sufficient number of observations in a given age-educational level cell for constructing "well-behaved" age-earnings profiles (that is, not intersecting with each other).

The advantage of the Mincerian way of estimating the returns to education is that it can smooth out and handle incomplete cells in an age-earnings profile matrix by level of education. The disadvantage, of course, is that it requires a sample of individual observations, rather than pre-tabulated mean earnings by level of education.

DATA

The data used for estimating a rate of return to investment in education depend on the type of the returns one is interested in. Private and fiscal rates can be estimated on the basis of observed after-tax earnings in all sectors of the economy and the cost of education to the individual.

In a social rate of return calculation, the costs include the state's or society's at large spending on education. This includes the rental of public school buildings and teachers' salaries. Gross earnings (that is, before taxes and other deductions) should be used in a social rate of return calculation, and such earnings should also include income in kind where this information is available.

A key assumption in a social rate of return calculation is that observed wages are a good proxy for the marginal product of labor. This could be the case in a competitive economy using data from the private sector. Civil service pay scales are irrelevant for a social rate of return calculation as they are unlikely to represent marginal productivity. The pay of civil servants, however, should be used in calculating the private returns to education, as it reflects what people actually get, regardless of productivity.

The "social" attribute of the estimated rate of return refers to the inclusion of the full resource cost of the investment (direct cost and foregone earnings). Ideally, the social benefits should include non-monetary or external effects of education – for example, lower fertility or lives saved because of improved sanitation conditions followed by a more educated woman who may never participate in the formal labor market. Given the scant empirical evidence on the external effects of education, social rate of return estimates are usually based on directly observable monetary costs and benefits of education.

Since the costs are higher in a social rate of return calculation relative to the one from the private point of view, social returns are typically lower than a private rate of return. The difference between the private and the social rate of return reflects the degree of public subsidization of education.

The benefits of education are typically classified into a four-cell matrix, as shown in Table 1 (McMahon, 1997; Wolfe & Zuvekas, 1997). The easiest to document benefits are those in the northwest quadrant, namely private benefits that

manifest themselves in the labor market and can be measured in monetary terms. The hardest to document benefits are those in the southeast quadrant, namely the social benefits that are not directly observed or measured in monetary terms.

Table 1. A classification of the benefits of education.

Benefits type	*Private*	*Social*
Market	– Employability – Higher earnings – Less unemployment – Labor market flexibility – Greater mobility	– Higher productivity – Higher net tax revenue – Less reliance on government financial support
Non-market	– Better consumer efficiency – Better own and family health – Better children quality	– Reduced crime – Less spread of infectious diseases – Lower fertility – Better social cohesion – Voter participation

Sample selection should be random, i.e. being representative of the population as a whole. Data should refer to the individual person, rather than tabulated mean earnings by level of education, as was practiced in the early days of the economics of education. Individual earnings allow for the control of covariates, i.e. factors correlated with education that affect earnings, e.g. differential ability or socioeconomic background.

Randomly generated data, along with covariates, is the exception rather than the rule. It is problematic when the estimated rates of return are based on a survey of firms – rather than households – because firm-based samples are highly selective. In order to control survey costs, such samples focus on large firms with many employees. Second, the questionnaire is typically filled by the payroll department rather than by the individual employee. Typically, this approach leads to the use of samples concentrated only in urban areas.

Data generated by virtue of natural experiment are much better relative to econometric control for covariates, e.g. identical twins separated early in life and receiving different amounts of education. Or, because of a military draft legislation, or month-of-the-year birth date, some people received different levels of schooling than others.

Another problem occurs when rate of return estimates are based on samples that include civil servants. On average, the inclusion of civil service pay flattens the earnings differentials giving lower returns among those working in the public sector (Psacharopoulos, 1983). Of course, in many countries – although fewer now than in the past – the majority of university graduates end up in public sector

employment. However, civil-service-pay based rate of return estimates are useful in private calculations regarding the incentives set by the state to invest in education.

Covariates

Beyond education, there is large list of factors that may affect earnings, such as differential ability. The undisputable and universal positive correlation between education and earnings can be interpreted in many different ways. The causational issue on whether education really affects earnings can only be answered with experimental data generated by assigning at random different people to various levels of education. Given the fact that moral and pragmatic considerations prevent the generation of such pure data sets, researchers have used indirect inferences or natural experiments. Examples of a natural experiment in this context is identical twins who were separated early in life and received different amounts of education (as to control for differences in genetic ability) or differential date of birth and eventual educational attainment. Estimates of the returns to education based on twins samples have corroborated the statistically significant link between education and earnings (Ashenfelter & Krueger, 2004; Ashelfelter & Rouse, 1998).

EVIDENCE

Before presenting the formal rate of return estimates to higher education, let us list two major benefits enjoyed by higher education graduates. As shown in Table 2, there is a negative relationship between holding a university degree and being unemployed. On average, those who have not completed upper secondary education are two and a half times more likely to be unemployed relative to tertiary education graduates.

Table 2. Unemployment rate by level of education (%).

Country	*Below upper secondary*	*Upper secondary*	*Tertiary*
Australia	7.0	4.3	3.0
Canada	10.9	6.5	5.2
France	12.1	7.5	6.1
Germany	18.0	10.2	5.2
Japan	6.7	5.4	3.7
U.K.	6.9	3.9	2.4
USA	9.9	6.1	3.4
OECD mean	10.2	6.2	4.0

Source: OECD (2005), Table A8.4a, p. 113-114
Note: Number of 25-64 year olds who are unemployed as a percentage of the labor force aged 25-64.

Not only higher education boosts employment chances, but once employed graduates have a clear earnings advantage (Table 3). In the United States, the earnings of tertiary education graduates are two and a half times higher than those of high school dropouts.

Table 3. Relative earnings of the population 25-64 year old with income from employment by level of education (Index).

Country	*Below upper secondary*	*Upper secondary*	*Tertiary*
Australia	77	100	132
Canada	79	100	136
France	84	100	150
Germany	87	100	153
Korea	67	100	141
U.K.	69	100	162
USA	70	100	183

Source: OECD (2005), Table A9.1a, p. 130.
Note: Index base, upper secondary education = 100.

There have been several compilations of the returns to education, both at the World scale[3] and for several OECD countries.[4] Annex tables A-1 to A-4 present as a master reference the returns to higher education in a large number of countries classified across several dimensions. The basic pattern that emerges is that:

– The returns to education are higher in developing relative to advanced industrial countries – a reflection of the relative scarcity of human capital in poor countries.
– The private returns exceed the social returns – a reflection of the public subsidization of higher education.
– The returns to higher education have been rising in most dynamic economies in recent years – a reflection of the demand for more educated manpower to complement advances in technology.
– There exists wide differentiation of the returns by university faculty – a reflection of the relative demand and supply for graduates.

Most of the estimates presented in the Annex master tables are dated, and many have been based on very selective samples to be representative of the true recent trends. Table 4 presents private rates of return for a number of OECD countries using a uniform methodology (the Mincerian earnings function) and data set (mainly the European Community Household Panel). Private returns in most countries are of the order of 4-7 percent, and are especially high in Ireland, Luxembourg and Portugal. These private rates certainly exceed the private returns to alternative investment opportunities in OECD countries, e.g. Bank deposits.

Table 4. Private returns to investment in higher education, 2001.

Country	*Rate of return (%)*
Austria	5.9
Belgium	7.0
Denmark	5.8
Finland	6.8
France	5.8
Germany	4.3
Greece	4.8
Ireland	10.7
Italy	5.1
Luxembourg	10.5
Netherlands	5.7
Portugal	14.8
Spain	5.7
Sweden	4.8
U.K.	5.1
USA	7.0

Source: OECD (2006), Table 4.
Note: Studies duration for Belgium, Luxembourg, Portugal and USA not available in original, assumed to be 4.5 years.

The OECD has recently produced comparable narrow social rates of return estimates for some of its member countries (Table 5). These rates range from 4-8 percent in most countries, and are especially high in Finland and the United States.[5]

Again, these rates compare well to any measure of the social opportunity cost of capital in the countries concerned.

Table 5. Social rates of return to higher education, 2002.

Country	*Rate of return (%)*
Belgium	5.6
Denmark	4.8
Finland	11.0
Italy	8.4
Netherlands	8.4
Norway	6.8
Sweden	5.2
Switzerland	6.1
United States	12.4

Source: OECD (2005), p. 143, Tables A9.9 and A9.10, males.

The OECD also presents returns from another point of view, that of the state as collector of taxes. The provision of education at all levels entails loss of taxes from those who are in school or at the university. It also entails higher tax revenue from those who graduate and have higher incomes. As shown in Table 6, the result in all countries is a gain from the fiscal view point (Table 6).

Table 6. Fiscal rates of return in OECD countries by level of education, 2002 (%).

Country	*Rate of return (%)*
Belgium	5.6
Denmark	4.8
France	6.7
Finland	4.8
Italy	9.5
Netherlands	10.7
Norway	4.1
Sweden	1.7
United States	12.3

Source: OECD (2005), p. 143, Tables A9.7 and A9.8, males.

EQUITY

Beyond the private and social efficiency questions, the returns to education can be used to answer equity questions. For example, in the United States there has been increased wage inequality between 1973 and 2005, and this has been attributed to the increase in the returns to investment in higher education (Lemieux, 2006). This in turn is due to the increased demand for skilled workers (Chinhui, Murphy, & Pierce, 1993; Hauser, 1973).

Higher Education Access

To start with, higher socioeconomic (SES) students, as measured by the education of their parents, have a much better chance of entering higher education (Table 7).[6]

Higher education students come from a higher socioeconomic status relative to the rest of the population. The representation index shown in Table 8 is the ratio of the proportion of students whose father has a university degree and the proportion of university degree holders in the population. A value of 1 means equal representation. The higher the index, the more "inequitable" the system. Tables 9 and 10 document a similar "inequitable" situation in Greece and the U.K.

Table 7. Impact of parental education on access to tertiary education (%).

Country	*Parental education*	
	Below upper secondary education	*Tertiary education*
Australia	20.0	39.2
Belgium	15.3	49.7
Canada	23.7	57.2
Germany	16.0	38.4
Ireland	12.0	57.4
Netherlands	12.8	42.6
New Zealand	21.4	45.3
Sweden	18.7	40.2
United Kingdom	16.5	47.0
United States	19.7	64.2

Source: OECD (2001).
Note: Percent of the population 16-65 years who have completed tertiary education, by level of educational attainment of parents.

Table 8. Representation of university students by father's SES, 2005.

Country	*Higher SES representation index*
Germany	2.1
Spain	1.5
France	2.0
Ireland	1.1
Italy	1.8
Netherlands	1.6
Austria	2.6
Portugal	5.4
Finland	1.8

Source: Eurostudent (2005).

Table 9. The inequity of university access, Greece.

Father's occupation (1)	*Labor force share (%) (2)*	*Student entrants share (%) (3)*	*Representation index (4)*
Executive and managerial	21.8	26.0	1.2
White collar worker	31.4	48.0	1.5
Manual worker	29.4	14.0	0.5
Farmer	16.5	5.0	0.3

Source: Psacharopoulos and Papakonstantinou (2005).
Note: Col. (4) = [Col. (3) / Col. (2)]

Table 10. Probability of attaining a university degree by father's occupation, U.K.

Father's occupation	*Probability of child attaining a university degree (%)*
Professional	42
Non-manual worker	27
Unskilled manual	5

Source: Dutta, Sefton and Weale (1999).

One reason for such differentiation is that those coming from higher SES families are better able to pay and prepare for university entry (Table 11).

Table 11. Private expenditure per university student by family income, Greece.

Family income	*Expenditure (€ /year)*
Top 20%	4,215
Bottom 20%	3,467

Source: Psacharopoulos and Papakonstantinou (2005).

Family Background

Another equity issue is how people from different socioeconomic status benefit from public spending on education. Do those who come from poorer families benefit more relative to the offspring of richer families? There are two analytical tools for answering this question – one involving rate of return estimates, and the other the incidence of public spending and benefits on higher education by income group.

Casual empiricism might suggest that what appears to be a return to investment in education is in fact a rent derived from one's socio-economic origins. At the theoretical level, this issue was addressed early on by Becker (2009) who noted that if parents' education influences children's earnings, this is due to the fact that wealthier parents invest more in the education of their children. Thus, the effect of

family background is nothing other than an intergenerational effect of human capital.

Returns to education by SES can be estimated by using the full discounting method within groups of people of different socioeconomic background. A second best is using the Mincerian earnings function, adding an SES independent variable, or interacting it with higher education.

The available literature is not very forthcoming on the returns to higher education by socioeconomic background, although there exist several estimates for the returns to education on average by SES. If the returns in general are increasing by the level of SES, the same pattern should be observed if the researchers had broken down the sample by SES and estimated the returns to higher education within SES groups. Tables 12 and 13 show that in several countries those coming from a superior socioeconomic background enjoy much higher returns.

Table 12. Returns to education by socioeconomic status (%)

Country /Ed. level	*Lower SES*	*Higher SES*
Overall		
Brazil	11.4	13.9
Israel	8.9	13.8
Kenya	6.5	16.7
Tanzania	6.7	9.6
Greece	4.8	5.7
U.K.	3.1	8.4
USA	8.1	9.2
Post-compulsory		
Spain	4.3	6.6
Higher education		
France	16.3	20.9

Source: Patrinos (1992, 1995). Spain from Vila and Mora (1998).

Table 13. The returns to education by father's occupation (%)

Father's occupation	*USA*	*France*
Laborer	6.2	11.9
Farmer	6.4	–
White collar	–	12.9
Manager	7.6	–
Professional	7.2	–

Source: USA from Cohn and Kiker (1986), Table 3. France from Vawda (2003), Table 1.

Several studies have included measures of family background in the Mincerian earnings function, finding minimal effects on the returns to education. For example, Altonji and Dunn (1996), using sibling pairs from the United States Panel Study of Income Dynamics, find mixed evidence on whether parental education

raises the return to education. Using a sample of Australian twins, Miller, Mulvey and Martin (1995, 2006) find no evidence that the returns to education are overestimated by the non-inclusion of family background factors.

Papanicolaou and Psacharopoulos (1979) in the U.K., Patrinos (1995) in Greece, Mora (1999) in Spain and Ichino and Winter-Ebmer (1999) in Germany included an SES and education interaction term in the Mincerian earnings function and found a positive coefficient. This means that a higher SES is associated with a higher rate of return to investment in education.

It should be noted, however, that Card and Krueger (1990) find that holding school quality constant, there is no evidence that parental income or education affects state-level returns to education. But Newman (1991) using Israeli data found that the returns to schooling are higher to those coming from more favorable socioeconomic backgrounds.

Socioeconomic privilege confers many direct benefits, both through a home culture which tends to reinforce the goals of formal education and through the capacity to fund access to education in private schools and post-compulsory education (Dearden, 1998; McPherson & Schapiro 1991, 2000).

Particularly in the post-compulsory phase, systems of educational finance also have an impact on outcomes by virtue of how they distribute the costs of human capital investment between different parties. Overall outcomes for any individual depend not only on the benefits of educational attainment, but also on how much of the cost of that education is born by the individuals who benefit.

Overall, the expansion of tertiary education in OECD appears to have had little impact on the *relative* prospects of young people from less advantaged backgrounds. This is hardly a surprising finding. Parental and school influences are extremely important determinants of participation at the post-compulsory level. In most countries tertiary education requires prior qualifications – generally at upper-secondary level – so that attainment in the compulsory phase of education, as much as anything which occurs subsequently, is a key to tertiary participation. Therefore, the expansion of capacity at the tertiary level will not, in itself, have much impact on these factors. The challenge to public policy of delivering equality of opportunity in tertiary education is sizeable, and falls not only on the system for tertiary education itself, but also on support for children and their families, reaching back to pre-schooling and into compulsory and upper-secondary schooling.

A number of research studies demonstrate that children who grow up in a low-income family typically have lower educational achievements and, subsequently, lower returns to education than children who grow up in a wealthy family (Haveman, Wolfe & Spaulding, 1991). Their findings are consistent with the findings of Card (1999), who associates the mother's higher educational level with a child's higher returns to education.

Wilson (2001) finds that "higher parental education is negatively related to income for late teens and early 20s but positively related at older ages." Her conclusions are supported by the evidence that children of higher-educated parents typically attend college after graduating from high school, and while their initial

earnings are lower during years spent studying, their returns to education significantly increase after they receive a college degree. Wilson also concludes that growing up in a low-income family and having a working mother are associated with lower returns to education. In addition, she determines that "having a higher-educated mother or one that works, increases the likelihood of graduating" (Wilson, 2001).

Incidence of Public Spending

This entails comparing the taxes families of rich and poor students pay, to the education benefits these groups appropriate by attending a subsidized public higher education system. This is called the "distributive incidence" of education subsidies, or who really pays and who really benefits from public education expenditure.

Hansen and Weisbrod (1969) were the first to study the issue exploring the income redistribution effects of the financing of public higher education in California. Since eligibility for the higher-subsidy institutions was positively related to family income, and since university attendance increases as family income rises, the result was that the distribution of subsidies actually favored upper income families. These subsidies were compared with state and local taxes paid. The results showed that families with children enrolled in public higher education received a positive net transfer (subsidy less taxes paid) and that these net transfers were an increasing share of family income. The regressive nature of public financing of higher education has since been documented in many other countries (Vawda, 2003; Yang, 2002).

POLICY

What does the above review mean for designing efficient and equitable higher education policies, bearing in mind the state of available data and methodological shortcomings?

Based on the existing evidence, it is clear and definitive that higher education has a value, both to the individual who invests in education and to society at large. The state of our knowledge today is that the evidence on the private value of higher education is more robust than the social value. This asymmetry has implications for public education finance policies.

Based on Blondal, Field and Girouard (2002) it is possible to construct a summary table on the private and narrow social returns to higher education in a number of OECD countries (Table 14), along with the influence of various components in arriving from the private rate to the social rate. Thus we could conclude that the private and social returns are around the 10% mark, the narrow social rates being lower than the private rates by two percentage points.

Table 14. Rates of return to higher education, 1999-2000 (%)

Country/ Adjustment	*Private pretax return*	*Taxes impact*	*Unemploy-ment risk*	*Tuition fees*	*Public student support*	*Fully adjusted private rate*	*Narrow social return*
Canada	8.4	-0.5	1.3	-2.3	1.8	8.7	6.8
Denmark	7.9	-2.1	1.0	-0.1	4.8	11.5	6.3
France	13.3	-1.6	2.4	-1.1	1.3	14.3	13.2
Germany	7.1	-1.5	1.1	-0.3	2.7	9.1	6.5
Italy	8.0	…	0.3	-0.8	0	7.5	9.7
Japan	8.0	-0.3	0.9	-2.0	1.3	7.9	6.7
Netherlands	11.7	-2.0	0	-0.6	2.9	12.1	10.0
Sweden	9.4	-1.5	1.2	-0.7	3	11.4	7.5
U.K.	18.1	-2.1	1.6	-2.7	3.6	18.5	15.2
USA	18.9	-2.3	0.9	-4.7	2.1	14.9	13.7
Average	11.4	-1.5	1.1	-1.5	2.4	11.6	9.6

Source: Based on Blondal et al. (2002), Tables 3 and 4.

Taking these results at face value, it means that in spite of the explosion of higher education in Europe and the high risk of unemployment among graduates, higher education continues to be a profitable investment opportunity, both privately and socially. This conclusion is based on the assumption that the 10% mark is well above the yield of alternative private investment opportunities (say Bank deposits), and the social opportunity cost of capital. This is a conclusion based on the criterion of efficiency.

Bringing in a concern for equity, the above review suggests that higher education public funding should not be equal across the board, e.g. tuition free for all students, regardless of their socio-economic background. Lower SES students (defined with an objective criterion, such as the tax return of the father) should receive a higher subsidy relative to those coming from more affluent families, the latter required to pay tuition fees. Although such policy is both efficient and equitable, it is very difficult to gain political acceptance (Psacharopoulos, 2003).

The most efficient and equitable financing mechanism for higher education might be to provide the initial fund for a student loan scheme. Student loans contribute to efficiency because they provide incentives to students to choose subjects leading to employment, and study harder. They also contribute to equity, in the sense that those who will later enjoy higher incomes throughout their lifetime will pay themselves for their education, rather than the general taxpayer.

In funding higher education, two additional issues should be taken into account – externalities and other levels of education.

What if the yet unmeasured social externalities of a higher education graduate far exceed the narrow social returns to education? Such case would call for a massive public subsidization of higher education. But higher education is not the only ladder of an education system. What if the social returns (narrow or social) for the lower levels of education exceed those of higher education? This is still an open debate in the empirical literature (Psacharopoulos, 1996).

Public finance priority should be given to the lower levels of education, e.g., to assist those from a lower socioeconomic background to complete secondary school in an industrial country, or primary school in a developing country. Indeed, the lower the level of education assisted by public funding, the higher the efficiency and equity benefits. "Lower" education level means going down to pre-school, as forcefully argued by Nobel Laureate James Heckman (Heckman & Masterov, 2005).

Since the early days of the economics of education, the issue of a possible trade off between efficiency and equity in education arose (see special issue of the *Journal of Political Economy*, 1972). This debate continues today. By attempting to serve equity, education resources might be used in activities that are less efficient. On the other hand, a possible efficiency-equity trade off exists only in cases where, at the initial conditions, education resources are used in a fully efficient way – hardly the case in the actual world.

The consensus today is that all education systems operate at a point X in Figure 2, i.e., well inside the efficient production possibility frontier AB. So there is room for implementing policies that move towards points to Z or Y, i.e., improving both efficiency and equity (Psacharopoulos, 2006).

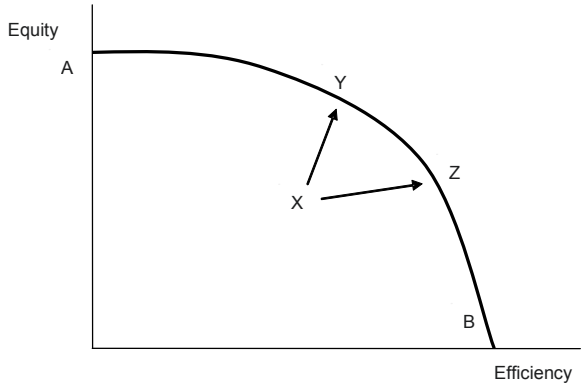


Figure 2. The efficiency-equity trade-off.

Combining efficiency and equity objectives introduces the issue of relative weights one should attribute to the two components of social welfare. How does one arrive at the values of the efficiency and equity weights? This relates to the political economy of distribution and is left to politicians and voters.

In today's world there is an inertia syndrome in the public funding of education. Most education budgets are managed by inertia, i.e., allocations in a given year are more or less equal to last year's allocations adjusted for inflation. This is tantamount to the absence of any policy to serve society's efficiency and equity objectives. As our knowledge progresses on what are the most effective ways to improve social welfare by education, so our policies should be continuously fine tuned to the most effective modes of public funding for education.

NOTES

[1] See Psacharopoulos and Mattson (1998).

[2] In this example, subscripts *u* and *s* stand for university and secondary education, respectively.

[3] Psacharopoulos (1972a,1972b,1972c, 1973, 1981, 1985, 1989, 1994), Psacharopoulos and Patrinos (2004a).

[4] Asplund and Pereira (1999), De la Fuente (2003), Blondal et al. (2002), OECD (2005, 2006).

[5] Rates of return in Tables 4 and 5 are not directly comparable as they are based on different years, datasets and methodology.

[6] See also Haveman and Wolfe (1985), White (1982).

REFERENCES

Altonji, J. G., & Dunn, T. A. (1996). The effects of family characteristics on the return to education. *Review of Economics and Statistics, 78*(4), 692-704.

Ashenfelter, O., & Krueger, A. (2004). Estimates of the economic return to schooling from a new sample of twins. *American Economic Review, 84*(5), 1157-1174.

Ashenfelter, O., & Rouse, C. (1998). Income, schooling and ability: Evidence from a new sample of identical twins. *Quarterly Journal of Economics, 113*(1), 253-284.

Asplund, R., & Pereira, P. T. (1999). *Returns to human capital in Europe: A literature review*. Helsinki, Finland: ETLA, The Research Institute of the Finnish Economy.

Becker, G. S. (2009). *Human capital: A theoretical and empirical analysis, with special reference to education*. Chicago: University of Chicago Press.

Blöndal, S., Field, S., & Girouard, N. (2002). Investment in human capital through upper-secondary and tertiary education: Selected efficiency and equity aspects. *Economics Studies, 34*(1), 41-90.

Card, D. (1999). The causal effect of education on earnings. *Handbook of Labor Economics, 3,* 1801-1863.

Card, D., & Krueger, A. B. (1990). *Does school quality matter? Returns to education and the characteristics of public schools in the United States*. National Bureau of Economic Research (No. 3358).

Chinhui, J., Murphy, K. M., & Pierce, B. (1993). Wage inequality and the rise in the returns to skill. *Journal of Political Economy, 101*(3), 410-442.

Cohn, E., & Kiker, B. F. (1986). Socioeconomic background, schooling experience and monetary rewards in the United States. *Economica, 53,* 497-503.

De la Fuente, A. (2003). *Human capital in a global and knowledge-based economy: Part II: Assessment at the EU country level*. European Commission, DG Employment and Social Affairs.

Dearden, L. (1998). *Ability, family, education and earnings in Britain.* Working Paper No. W98/14. London: Institute of Fiscal Studies.

Dutta, J., Sefton, J., & Weale, M. (1999). Education and public policy. *Fiscal Studies, 20*(4), 351-386.

Eurostudent (2005). *Social and economic conditions of student life in Europe 2005*. Retrieved from: http://www.campuseuropae.org/en/support/docs/bologna/eurostudent/eurostudent2005.pdf

Hansen, W. L., & Weisbrod, B. A. (1969). The distribution of costs and direct benefits of public higher education: The case of California. *Journal of Human Resources*, *4*, 176-191.

Hauser, R. M. (1973). Socioeconomic background and differential returns to education. In L. C. Solmon & P. J. Taubman (Eds.) *Does college matter? Some evidence on the impacts of higher education*. New York: Academic Press.

Haveman, R., Wolfe, B., & Spaulding, J. (1991). Childhood events and circumstances influencing high school completion. *Demography, 28*, 133-157.

Heckman, J. J., & Masterov, D. V. (2005). Skill policies for Scotland. In D. Coyle, W. Alexander, & B. Ashcroft (Eds.) *New wealth for old nations: Scotland's economic prospects*. Princeton/Oxford: Princeton University Press.

Ichino, A., & Winter-Ebmer, R. (1999). Lower and upper bounds of returns to schooling: An exercise in IV estimation with different instruments. *European Economic Review*, *43*, 889-901.

Klazar, S., Sedmihradsky, M., & Vancurova, A. (2001). Returns to education in the Czech Republic. *International Tax and Public Finance, 8,* 609-620.

Lemieux, T. (2006). Postsecondary education and increasing wage inequality. *American Economic Review, 96*(2), 195-199.

McMahon, W. (1997). Recent advances in measuring the social and individual benefits of education. *International Journal of Educational Research*, *27*(6), 447-532.

McPherson, M., & Schapiro, M. O. (1991). Does student aid affect college enrollment? New evidence on a persistent controversy. *American Economic Review, 81*(1), 309-318.

McPherson, M., & Schapiro, M. O. (2000). Financing lifelong learning, trends and patterns of participation and financing in U.S. higher education. *Higher Education Management*, 12(2), 131-155.

Miller, P., Mulvey, C., & Martin, N. (1995). What do twin studies reveal about the economic returns to education? A comparison of Australian and U.S. findings. *American Economic Review, 85*(3), 586-599.

Miller, P., Mulvey, C., & Martin, N. (2006). The return to schooling: Estimates from a sample of young Australian twins. *Labor Economics, 13*(5), 571-587.

Mincer, J. (1974). *Schooling, experience and earnings*. New York: Columbia University Press.

Mora, J. G. (1999). *Socioeconomic background, schooling, and monetary rewards in Spain*. University of Valencia (mimeo).

Newman, S. (1991). Parental background, educational attainments and returns to schooling and to marriage: The case of Israel. *Applied Economics, 23*, 1325-1334.

Organization for Economic Co-operation and Development (OECD). (2001). *Knowledge and skills for life – First results from the OECD programs for international student assessment 2000 (PISA)*. Paris: OECD.

Organization for Economic Co-operation and Development (OECD). (2005). *Education at a glance 2005.* Paris: OECD.

Organization for Economic Co-operation and Development (OECD). (2006). *The policy determinants of investment in tertiary education: Data and methodological issues*. Economics Department: OECD.

Papanicolaou, J., & Psacharopoulos. G. (1979). Socioeconomic background, schooling and monetary rewards in the United Kingdom. *Economica, 46*, 435-439.

Patrinos, H. (1992). Higher education finance and inequality in Greece. *Comparative Education Review*, *36*(3), 298-308.

Patrinos, H. (1995). Socioeconomic background, schooling, experience, ability and monetary rewards in Greece. *Economics of Education Review*, *14*(1), 85-91.

Psacharopoulos, G. (1972a). Rates of return on investment in education around the world. *Comparative Education Review*, *16*(1), 54-67.

Psacharopoulos, G. (1972b). The economic returns to higher education in twenty-five countries. *Higher Education*, *1*(2), 141-158.

Psacharopoulos, G. (1972c). The economics of higher education in developing countries. *Comparative Education Review*, *26*(2), 139-159.

Psacharopoulos, G. (1973). *Returns to education: An international comparison*. Amsterdam: Elsevier, San Francisco: Jossey-Bass.

Psacharopoulos, G. (1981). Returns to education: An updated international comparison. *Comparative Education*, *17*(3), 321-341.

Psacharopoulos, G. (1983). Education and private versus public sector pay. *Labor and Society, 8*(2), 123-133.

Psacharopoulos, G. (1985). Returns to education: A further international update and implications. *Journal of Human Resources, 20*(4), 583-604.

Psacharopoulos, G. (1989). Time trends of the returns to education: Cross-national evidence. *Economics of Education Review, 8*(3), 225-231.

Psacharopoulos, G. (1994). Returns to investment in education: A global update. *World Development, 22*(9), 1325-1343.

Psacharopoulos, G. (1996). Public spending on higher education: Too much rather than too little. *Economics of Education Review, 15*(4), 421-422.

Psacharopoulos, G. (2003). The social cost of an outdated law: Article 16 of the Greek Constitution. *European Journal of Law and Economics*, *16*(3), 123-137.

Psacharopoulos, G. (2006). The value of investment in education: Theory, evidence and policy. *Journal of Education Finance*, *32*(2), 113-136.

Psacharopoulos, G., & Mattson, R. (1998). Estimating the returns to education: A sensitivity analysis of concepts and methods. *Journal of Educational Planning and Administration, 12*(3), 271-287.

Psacharopoulos, G., & Papakonstantinou, G. (2005). The real university cost in a 'free' higher education country. *Economics of Education Review*, *24*(1), 103-108.

Psacharopoulos, G., & Patrinos, H.A. (2004a). Returns to investment in education: A further update. *Education Economics, 12*(2), 111-134.

Psacharopoulos, G., & Patrinos, H. (2004b). Human capital and rates of return. In G. Johnes & J. Johnes (Eds.) *International Handbook on the Economics of Education*. Cheltenham, U.K.: Edward Elgar Publishers.

Vawda, A. (2003). Who benefits from public expenditures? *Economic Affairs*, *23*(1), 40-43.

Vila, L. E., & Mora, J. G. (1998). Changing returns to education in Spain during the 1980s. *Economics of Education Review, 17*(2), 173-178.

White, K. R. (1982). The relation between socioeconomic status and academic achievement. *Psychological Bulletin, 91*, 461-481.

Wilson, R. A. (1983). Rates of return: Some further results. *Scottish Journal of Political Economy, 30*(2), 114-127.

Wilson, K. (2001). The determinants of educational attainment: Modeling and estimating the human capital model and education production functions. *Southern Economic Journal, 67*, 518-551.

Wolfe, B., & Zuvekas, S. (1997). Non-market effects of education. *International Journal of Education Research, 27*(6), 491-502.

Yang, P. (2002). *Incidence of public spending for public and private education*. Human Development Department, World Bank.

APPENDIX

Table A-1. The returns to higher education (%).

Country	*Year*	*Private*	*Social*
Argentina	1989	14.9	7.6
Australia	1976	21.1	16.3
Austria	1981	4.2	
Belgium	1960	8.7	6.7
Bolivia	1990	19.0	13.0
Botswana	1983	38.0	15.0
Brazil	1989	28.2	21.4
Burkina Faso	1982		21.3
Canada	1994	13.0	
Czech Rep.	1997	8.9	
Chile	1989	20.7	14.0
China	1993	15.1	11.3
Colombia	1989	21.7	14.0
Costa Rica	1989	12.9	9.0
Cyprus	1979	5.6	7.6
Denmark	1964	10.0	7.8
Dominican Republic	1989	19.4	
Ecuador	1987	12.7	9.9
El Salvador	1990	9.5	8.0
Estonia	1995		10.3
Ethiopia	1996	26.6	11.9
France	1976	20.0	
Germany (West)	1978	10.5	
Ghana	1967	37.0	16.5
Greece	1993	8.1	5.7
Guatemala	1989	22.2	
Honduras	1989	25.9	18.9
Hong Kong	1976	25.2	12.4
Hungary	1993	13.4	2.6
India	1995	18.2	
Indonesia	1989		5.0
Iran	1976	18.5	13.6
Israel	1958	8.0	6.6
Italy	1969	18.3	

Ivory Coast	1984	25.1	
Japan	1976	8.8	6.9
Korea	1986	17.9	15.5
Lesotho	1980	36.5	10.2
Liberia	1983	17.0	8.0
Malawi	1982	46.6	11.5
Malaysia	1978	34.5	
Mexico	1992	15.7	11.1
Morocco	1970		13.0
Nepal	1999	12.0	9.1
Netherlands	1965	10.4	5.5
New Zealand	1991	11.9	9.5
Nicaragua	1996		14.7
Nigeria	1966	34.0	17.0
Norway	1966	7.7	7.5
Pakistan	1991	31.2	
Panama	1989	21.0	
Papua New Guinea	1986	23.0	8.4
Paraguay	1990	13.7	10.8
Peru	1990	40.0	
Philippines	1988	11.6	10.5
Puerto Rico	1959	29.0	15.5
Sierra Leone	1971		9.5
Singapore	1998	18.7	13.9
Somalia	1983	33.2	19.9
South Africa	1980		11.8
Spain	1991		13.5
Sri Lanka	1981	16.1	
Sudan	1974	15.0	4.0
Sweden	1967	10.3	9.2
Taiwan	1972	15.8	17.7
Thailand	1989	11.8	
Tunisia	1980	27.0	
Turkey	1987	16.2	8.5
Uganda	1965		12.0
U.K.	1986		6.5
U.K.	1995	16.2	11.4
United States	1987		12.0
Uruguay	1989	12.8	10.3

Venezuela	1989	11.0	6.2
Vietnam	1992	3.0	6.2
Yemen	1985	56.0	24.0
Yugoslavia	1986	5.3	3.1
Zambia	1983	19.2	5.7
Zimbabwe	1987	5.1	-4.3
Mean		16.061	8.475

Source: Psacharopoulos and Patrinos (2004b), Czech Republic from Klazar, Sedmihradsky and Vancurova (2001), U.K. 1995 from Dutta el al. (1999).

Table A-2. Returns to investment in higher education over time (%).

Country	*Year*	*Private*	*Social*
Australia	1969	13.9	
Australia	1976	21.1	
Brazil	1970	13.9	
Brazil	1980	16.0	
Brazil	1989	28.2	21.4
Canada	1960	17.4	14.9
Canada	1985	14.0	12.1
Chile	1960	6.8	11.6
Chile	1985	6.9	10.3
Chile	1989	20.7	14.0
Cyprus	1975	8.6	9.7
Cyprus	1979	5.6	7.6
France	1962	9.3	
France	1976	20.0	
Germany	1964	4.6	
Germany	1978	10.5	
Great Britain	1971		10.0
Great Britain	1971		7.0
Greece	1962	14.0	13.7
Greece	1977	5.5	4.5
India	1965	16.2	10.3
India	1978	13.2	10.8
Indonesia	1978		14.8
Indonesia	1989		5.0
Iran	1972		15.0
Iran	1976		13.6
Japan	1967	10.5	
Japan	1980	8.3	
Mexico	1963	29.0	23.0
Mexico	1984	21.7	12.9
Pakistan	1975	27.0	
Pakistan	1979	6.3	
Papua N.G.	1979	11.4	1.0
Papua N.G.	1986	23.0	8.4
Peru	1972		16.3
Peru	1985		9.3
Peru	1990	39.7	
Philippines	1971	9.5	8.5
Philippines	1985	14.0	13.3
Philippines	1988	11.6	10.5
South Korea	1967		5.0
South Korea	1986		15.5
Spain	1981	10.1	
Spain	1991	11.0	

Taiwan	1970	18.4	15.0
Taiwan	1972	15.8	17.7
Thailand	1970	14.0	11.0
Thailand	1985	21.9	13.5
Tunisia	1977	24.1	
Tunisia	1980	27.0	
United States	1939		10.7
United States	1987		12.0
Uruguay	1972	5.4	
Uruguay	1979	20.0	
Uruguay	1989	12.8	10.3
Venezuela	1957	27.0	23.0
Venezuela	1989	11.0	6.2
Yugoslavia	1969	2.6	2.8
Yugoslavia	1986	5.3	3.1

Source: Psacharopoulos and Patrinos (2004b), Spain from Vila and Mora (1998).

Table A-3. Change in the returns to higher education over time (%).

Country	*Period (years)*	*Private*	*Social*
Australia	7	7.2	
Brazil	19	14.3	
Canada	25	-3.4	-2.8
Chile	29	13.9	2.4
Cyprus	4	-3.0	-2.1
France	14	10.7	
Germany	14	5.9	
Greece	15	-8.5	-9.2
India	13	-3.0	0.5
Indonesia	11		-9.8
Iran	4		-1.4
Japan	9	-5.5	
Mexico	21	-2.0	-10.1
Pakistan	4	-9.3	
Papua N.G.	7	11.6	7.4
Peru	13		-7.0
Philippines	17	2.1	2.0
S. Korea	19		10.5
Spain	10	0.9	
Taiwan	2	-2.6	2.7
Thailand	15	7.9	2.5
Tunisia	3	2.9	
USA	48	1.3	-8.2
Uruguay	17	7.4	
Venezuela	32	-16.0	-16.8
Yugoslavia	17	2.7	0.3
Mean	15.0	1.0	-8.25

Source: Based on Psacharopoulos and Patrinos (2004b).

Table A-4. Returns to higher education by subject (%).

Subject/Country	*Private*	*Social*
Agriculture		
Brazil	16.0	
Colombia	22.3	16.4
Greece	3.1	2.7
India	16.2	
Iran	27.4	13.8
Malaysia	9.8	
Norway		2.2
Philippines	5.0	5.0
S. Korea	16.0	
Thailand	19.0	8.2
Social Sciences		
Brazil	8.0	
U.K.		13.0
Canada	10.8	8.8
S. Korea	16.6	
Arts		
Canada	4.0	3.8
Norway		4.3
U.K.	26.0	7.0
Canada	0.7	-0.1
France	2.9	
India	14.3	12.7
Iran	20.0	15.3
Thailand	15.9	11.2
Venezuela	8.0	
Economics		
Belgium		9.5
Brazil		16.1
Canada	13.1	11.4
Colombia	32.7	26.2
Denmark		9.0
Greece	5.4	4.4
Iran	23.9	18.5
Norway		8.9
Philippines	14.0	10.5
S. Korea	20.6	
Sweden		9.0
Venezuela	15.7	
Engineering		
Canada	23.0	11.7
Brazil		17.3
Canada	14.0	10.7
Colombia	33.7	24.8

Denmark		8.0
France	17.5	
U.K.	9.0	5.5
Greece	12.2	8.2
India	21.2	16.6
Iran	30.7	18.2
Malaysia	13.4	
Norway		8.7
Philippines	15.0	8.0
S. Korea	20.0	
Sweden		7.5
Thailand	22.0	10.7
Venezuela	20.3	
Law		
Belgium		6.0
Brazil		17.4
Canada	13.6	11.6
Colombia	28.3	22.7
Denmark		10.0
France	16.7	
Greece	13.8	12.0
Norway		10.6
Philippines	18.0	15.0
Sweden		9.5
Thailand	15.4	12.2
Venezuela	14.1	
Medicine		
Australia	12.2	
Belgium		11.5
Brazil		11.9
Canada	21.6	17.2
Colombia	35.6	23.7
Denmark		5.0
France	12.6	
Malaysia	12.4	
Norway		3.1
Sweden		13.0
Thailand	13.8	5.4
Sciences		
Belgium		8.0
Brazil	20.0	
France	12.3	
Greece	2.1	1.8
U.K.	10.0	6.5
Norway		6.2
Thailand	19.5	9.5
Venezuela	10.9	

Source: Based on Psacharopoulos and Patrinos (2004b,) U.K. engineering from Wilson (1983).

Note: Law includes law and economics, medicine includes health sciences, engineering includes architecture.

George Psacharopoulos
Economics Expert
Former London School of Economics and the World Bank

MARIA ELIOPHOTOU MENON

INVESTIGATING STUDENTS' EXPECTATIONS OF THE ECONOMIC RETURNS TO HIGHER EDUCATION

A Review of Methods and Data

INTRODUCTION

According to human capital theory, education is an investment in human capital, the perceived profitability of which drives individuals to choose additional education over alternative investments. The application of cost-benefit analysis to individual decisions has provided the framework for the investigation of student expectations of the financial returns to education. In this context, the human capital model considers prospective students as economic decision makers who will select additional education after a comparison of anticipated benefits and costs (Becker, 1964; Gordon & Williams, 1977).

The private demand for higher education has been investigated and interpreted in the framework of human capital theory. Blaug (1976) drew attention to the fact that the human capital research program, in its original formulation, was characterized by the idea that the explanation for all social phenomena could be found in the behavior of the individual. Thus, the demand for post-compulsory education can be seen as deriving from the expectations, decisions and choices of young people and their families. However, the underlying assumption that prospective students choose higher education on the basis of a comparison of expected benefits and costs has been investigated in a small number of studies.

In the economics of education, most studies have focused on the measurement of actual as opposed to expected returns (Anchor, Fišerová, Maršiková, & Urbánek, 2011). The first computations of rates of return to education by Mincer (1962) and Becker (1964) were followed by several attempts to measure actual returns in many countries (see, for example, Psacharopoulos, 1973, 1985, 1994; Psacharopoulos & Patrinos, 2004). Studies of actual rates of return have been criticized for failing to provide corroborating evidence for the human capital interpretation of the demand for higher education (Blaug, 1976). In order to address this criticism, data on student expectations can serve as the basis for determining the degree to which individuals consider education to be an investment in human capital.

Evidence on the applicability of human capital theory to individual decisions regarding the choice of higher education can inform planning and policy making in tertiary education. Participation trends in higher education may be difficult to interpret without reference to expected returns or perceptions of economic benefits. If expected returns decline, participation may also decline, irrespective of trends in

M. E. Menon et al. (eds.), Using Data to Improve Higher Education, 149–163.

actual private returns to higher education (Anchor et al., 2011). Given the importance of evidence on the expectations of economic returns to education, the number of studies on the topic may appear surprisingly small. The limited available evidence can be attributed to two main reasons: First, the estimation of expected returns requires the collection of perceived earnings and cost data from individual students, which is a difficult task. Second, economists in general have been reluctant to collect data on individual earnings expectations, relying on aggregate statistical data instead.

The present chapter provides an overview of studies that have investigated students' perceptions and expectations regarding the economic rewards of higher education. It focuses on studies aiming at providing corroborating evidence for human capital theory in relation to individual decision making. While reference is made to studies conducted prior to 1990, the main emphasis of the chapter is on the evidence of research conducted from 1990 to the present day. The methodological aspects of these studies are presented in detail, both in relation to the types of data collected and the methods employed by different researchers. The overview of research on the topic allows for the evaluation of the contribution of such studies to both theoretical and policy frameworks relating to the private demand for higher education. Moreover, the implications of the findings for future investigations of the topic are discussed, especially in relation to methodological approaches used in relevant research.

STUDIES OF THE EXPECTED ECONOMIC BENEFITS OF HIGHER EDUCATION

Studies Conducted between 1970 and 1990

Prior to the 1990s, only a small number of studies attempted to examine expected earnings and rates of return to higher education. In the United Kingdom, Gordon and Williams (1977) conducted a survey among secondary school students in an attempt to examine factors influencing the private demand for higher education. They found that the highest estimate of expected earnings was provided by 18-year old students who intended to go into higher education. All respondents associated higher education with more highly paid jobs.

In the United States, Ferber and McMahon (1979) examined the expected returns to education based on expected returns data from 2580 university students in their first year of studies. Respondents were asked to estimate their expected earnings after their graduation from formal schooling and in 25 years from the time of the interview. They found evidence of an overestimation of the financial rewards of higher education on the part of women, since female respondents reported expected earnings which were as high as, and often higher than, those reported by men. However, a later study of expected returns to education by McMahon and Wagner (1981) produced different findings. This study was also based on expected earnings data for the same points in time (graduation, 25 years thereafter). Expected earnings data provided by a sample of 2766 freshmen were compared to actual salary-offer data after their graduation. Overall, students were found to be

realistic in their estimation of the returns to investment in education and in the appraisal of the relative differences in earnings across fields of study.

A number of studies conducted in the 1980s provided additional evidence on student expectations of economic returns to education both in developed and developing countries. Williams and Gordon (1981) reported the findings of an investigation of the relationship between educational qualifications and average earnings as perceived by English students at the end of their compulsory education. The authors collected data from a survey of 2944 students enrolled in 110 secondary schools in England. Respondents provided their estimates of expected earnings at three points in time (point of starting work, age 26 and age 46). The data were used to construct perceived age-earnings profiles, which were similar to actual profiles based on official data.

Regression analysis was used to estimate earnings functions. Specifically, the students' estimated expected lifetime earnings served as the dependent variable in a multiple regression equation. Higher education was associated with a considerable increase in expected earnings (about 35000 pounds), with boys expecting higher earnings. The earnings function method was used to estimate perceived rates of return to education, which ranged from 9.9% for girls to 13% for boys. These expected rates were found to compare favorably with actual rates reported by Pissarides (1981) and Psacharopoulos and Layard (1979). The fact that students were realistic in their assessment of labor market earnings with higher education was considered to provide evidence in favor of the human capital interpretation of individual decision making.

A second U.K. study was conducted by Bosworth and Ford (1985) who examined the income expectations of higher education entrants. The aim of the study was to identify the reasons for the choice of higher education, in general, and of specific courses and places of study in particular. The authors collected data from a sample of 261 entrants at the Loughborough University of Technology. The methodology adopted in this study differed from the approach of Williams and Gordon (1981): Unlike Williams and Gordon, Bosworth and Ford asked participants to provide estimates of their expected lifetime incomes at various ages at the present point in time based on two possibilities: entering and not entering higher education. The collection of these data made it possible to construct two income streams and to estimate an elaborate (full) perceived rate of return to higher education. The rate of return estimates reported by Bosworth and Ford were much higher than the estimates reported by Williams and Gordon, which can be attributed to differences in samples (actual versus potential students) and methods of estimation (full versus earnings function method).

In the same decade, two studies were conducted in developing countries by Psacharopoulos and Sanyal (1981, 1982). In the first study, Psacharopoulos and Sanyal (1981) compared student perceptions of the labor market and actual labor market conditions in the Philippines. The study was based on survey data from a sample of 9105 students and 4655 graduates. Respondents provided estimates of expected gross monthly earnings at three points in time (labor market entry, 5 years and 10 years thereafter). Initial expected earnings were found to correspond closely

to actual earnings for the same age group. Regression analysis pointed to realistic expectations of the structure of earnings in the labor market by gender, field of study, occupation and academic performance.

Data provided by students and graduates were used to estimate perceived and actual rates of return to higher education. The short-cut method was used in the estimation, which resulted in an expected rate of return estimate of 7.3% without the inclusion of direct costs and 5.2% with the inclusion of such costs. These rates compared well to actual rates, with the latter based on the graduates' actual starting salary and the students' self-assessed foregone earnings. Consequently, students appeared to have realistic expectations of the financial returns to higher education.

The same methodology was used in the second study of student expectations in Egypt (Psacharopoulos & Sanyal, 1982). As in the case of the Philippines, data were obtained from a sample of university students (1935) and employed university graduates (1712). The same methodology was used in data collection and analysis. Similar findings emerged: Student expectations were in line with labor market conditions. The perceived short-cut rate of return to higher education was found to be 14.5% for girls and 15.4% for boys. Differences in fields of study were associated with differences in student expectations. The popularity of different subjects was closely linked to the reported perceived returns to higher education and the structure of expected future earnings.

In Hong Kong, Wong (1989) used a methodology similar to that of the Williams and Gordon (1981) study, in order to examine influences on expected lifetime earnings and estimate perceived rates of return to higher education. Survey data were collected from 1590 Hong Kong pupils in their final year of schooling. The author reported realistic perceptions of expected earnings associated with various educational levels. The perceived rates of return to higher education estimated through the earnings function method stood at 22.05% for boys and 21% for girls. These figures were compared to actual estimates and found to be similar, and hence realistic.

Studies Conducted after 1990

After 1990, studies on student expectations of the financial returns to higher education were conducted in more countries. Their number remained small as the previously mentioned reasons for the limited interest in such research continued to apply. However, the studies conducted after 1990 provided additional evidence on the applicability of human capital theory to individual decision making. An overview of these studies is provided below, with emphasis on the methodological aspects of each study.

Smith and Powell (1990) reported the findings of a study on the income expectations of college seniors in the United States. They made an attempt to determine the degree to which college students had reasonable expectations of the returns to education both in relation to their own earnings and in relation to their college and high school peers. Data were collected from college seniors at two Midwestern state universities. A mail survey was used with questionnaires mailed

to 411 students at the first university and 430 students at the second. Respondents were asked to state how much money they expected to earn in their first year of employment after completing their education, and 10 years from the point of the interview. In addition, they were asked to estimate future incomes for other graduates from the same college, and high school colleagues who did not continue their education.

According to the findings, college seniors were found to have reasonable expectations of the earnings of other college graduates, based on a comparison between expected income data and actual data on the average income of college and high school graduates. However, male respondents were found to self-enhance earnings to a great extent in that their expectations of earnings for themselves exceeded their expectations for their college peers by 40% in the case of the first college and 25% in the case of the second. On the one hand, the findings render support to the human capital interpretation of the demand for higher education in that they show that college students were aware of the earnings differential between high school and college graduates. However, the strong self-enhancement tendencies, especially among male students, show that students did not associate their future earnings with those of their college peers. This indicates that the students' perceptions of the returns to education were not based on an awareness of trends in relative earnings associated with education.

The accuracy of students' knowledge of wages by type of education was examined in a study by Betts (1996), which also took place in the United States. The author collected data through a survey of 1269 undergraduate students at the University of California. Respondents were asked to provide information on estimated starting salaries, and average earnings of full-time workers aged 25-34 with a high school diploma and with a bachelor's degree. Respondents' estimates of starting salaries were compared with actual data reported in the Salary Survey of the College Placement Council.

The study found differences in students' beliefs about the labor market, which were linked to personal characteristics such as year and field of study. Students with lower parental incomes provided significantly lower estimates of earnings for college graduates than students with higher parental incomes. Some students overestimated salaries, while others underestimated them, resulting in a mean raw error of only -6%. Moreover, students in the fourth year of studies were more informed about salary levels compared to first year students. Based on the findings, Betts (1996) concluded that not all students were able to accurately forecast future wages in accordance with the rational economic decision-making model associated with human capital theory. However, overall the findings provided support to the human capital account of information acquisition in that they showed that individuals acquired information about earnings by level of education before deciding to invest in additional education. The information acquired was not necessarily perfect but the evidence suggests that individuals made an attempt to collect it and used it in the decision-making process.

Student expectations of the returns to education were investigated in a study by Dominitz and Manski (1996). Specifically, a computerised questionnaire was

administered to 110 students in the United States, of whom 71 were high school students and 39 college undergraduates. Respondents were asked to provide information on expected earnings under alternative scenarios for future schooling as well as additional data relevant to their expectations. The collected data included the following:

- Unconditional earnings expected at ages 30 and 40.
- Expected earnings at ages 30 and 40 under the scenario of a bachelor's degree acquisition, and under the alternative scenario of a high school diploma without further schooling.
- Schooling expectations in relation to the probability of attending college before age 21, of receiving a bachelor's degree before age 30, and of still being in school at age 30.
- Beliefs about the distribution of earnings among American men and women aged 30 who have earned at least a bachelor's degree and among those who have earned only a high school diploma.

Dominitz and Manski (1996) found that students were able to provide meaningful responses to questions regarding earnings expectations under alternative scenarios and in probabilistic form. They reported a substantial variation in expectations within respondent groups. Despite this variation, there was a general expectation among respondents of positive returns to a college education and an increase in earnings between ages 30 and 40. The authors also noted the following: the tendency among respondents to consider one's own future earnings as rather uncertain; and a tendency to overestimate the extent of earnings inequality in U.S. society.

Wolter (2000) used the model proposed by Dominitz and Manski (1996) and Dominitz (1998) in order to investigate the wage expectations of Swiss students. Data were collected through an interactive, computer-assisted questionnaire administered to 137 students at different institutions, which included high schools, a business college and a University of Applied Sciences in Berne. Like Dominitz and Manski (1996), Wolter asked respondents to provide estimates of expected earnings as well as information on the uncertainty of their expectations through reference to different scenarios (median wage at low educational level at age 30, median wage at low educational level at age 40, median wage at high educational level at age 30, and median wage at high educational level at age 40).

The estimates of future wages were not found to deviate significantly from the observable wage structure, thus pointing to rational expectations on the part of the respondents of the study. The data on the distribution of expectations of individual respondents were indicative of a high degree of heterogeneity and uncertainty. The findings from this study were compared to the findings reported by Dominitz and Manski in earlier U.S. studies. Wolter (2000) concluded that American students expected a greater spread of earnings than was the case in the labor market while the opposite was true of Swiss students. Overall, the rates of return to education estimated on the basis of cross-sectional data were found to be reasonably close to the expected rates of return considered by students when making a choice in relation to the acquisition of additional education.

The accuracy of students' earnings expectations was also investigated in a study by Carvajal, Bendana, Bozorgmanesh, Castillo, Pormasiha, Rao and Torres (2000). They asked a sample of 248 business college students in their senior year and 219 recent graduates of Florida International University to provide information on expected and actual starting salaries, respectively. A comparison of actual and expected earnings showed that students' expectations were generally realistic. However, the analysis of the data revealed certain discrepancies between students' expectations and labor market outcomes. For instance, graduates provided lower estimates of earnings when they worked in large firms, which was not in accordance with seniors' expectations of higher earnings. Similarly, graduates reported lower levels of earnings when they were employed in managerial jobs, while the relevant variable for seniors was not significant. Overall, the authors found their model to describe better the behavior of male respondents rather than the behavior of female respondents for both groups of participants included in the study (seniors and graduates).

Brunello, Lucifora and Winter-Ebmer (2001) examined the wage expectations of college students from 10 European countries (Austria, Denmark, France, Germany, Ireland, Italy, Portugal, Sweden, Switzerland, U.K.). In this study, the expected returns to education were compared to actual returns on the basis of data drawn from the European Community Household panel and in the case of Switzerland, from national surveys. A questionnaire was completed by 6829 students in the 10 countries included in the project. The majority of students were in economics, business and related fields but other fields (e.g. social science and liberal arts, natural science and engineering) were also included in the sample. Respondents were asked to provide their expected earnings in the following cases:

- Starting earnings after graduation from university
- Starting earnings with only a high-school diploma
- Earnings 10 years after university graduation
- Earnings 10 years after graduation from high school

Brunello et al. (2001) found that the students in their sample tended to expect higher college wage gains than the overall estimated average actual wage gain, pointing to a case of overestimation of the returns to education on their part. This applied to both genders and was more marked in certain countries (United Kingdom, Germany and Portugal). The overestimation was higher than reported in the study by Betts (1996). In interpreting this finding, the authors pointed to the composition of the sample which included a high proportion of economics and business school students, who generally have better prospects in the labor market.

Students' expectations of the economic returns to college education were also investigated by Botelho and Pinto (2004) in Portugal. The main aim of this study was to determine the extent to which students had realistic expectations of the returns to education, and to examine the difference, if any, between individuals' beliefs about their own returns and those of typical or "average" students. Data were collected through a controlled laboratory experiment involving 273 freshman and senior students from the College of Business and Economics at the University

of Minho, Portugal. Participants were divided into four groups and presented with different tasks, as follows:

- Prediction of current average monthly salary of college graduates and high school graduates at different points in time/years of experience.
- Prediction as above, with provision of monetary incentives for accuracy.
- Prediction of current average monthly salary of college graduates and high school graduates at different points in time/years of experience as well as the respondents' own monthly salaries.
- Prediction of the respondents' own monthly salaries in the contingencies included in the study.

The analysis points to the following main findings: First, participants were found to be in a position to respond meaningfully to questions regarding their expected earnings. In general, students expected high returns to education, with male students more likely to overestimate actual returns in comparison to their female counterparts. Senior students had more accurate perceptions of the returns to education compared with first-year students. Moreover, students were likely to "self-enhance" in their expectations since they expected higher returns for themselves than their estimates of the average returns to education. As regards the effect of monetary incentives, no significant difference was found between the respondents' appraisal of the returns to education based on the use of monetary rewards. Botelho and Pinto (2004) considered their study to provide evidence in favor of the use of subjective data on earnings expectations in educational research and policy.

Webbink and Hartog (2004) provided additional evidence to support the use of subjective data on earnings expectations through an investigation of the accuracy of students' earnings expectations in the Netherlands. Specifically, they compared students' earnings expectations with realizations for the same students on the basis of data from the longitudinal research project "Continued Education." Students were asked to state their expected starting salary after graduation in 1991, and four years later, the same students provided information on actual earnings. The analysis was based on 657 cases of students who provided information both on expected earnings in 1991 and realized earnings in 1995.

The findings of the Dutch study did not reveal systematic differences between realizations and expectations in that the structure of students' earnings expectations was similar to the structure of realized incomes. Only one case of significant overestimation was reported: Students who scored higher in science subjects were found to overestimate their earnings after graduation. The authors highlighted the remarkable closeness of the effects of the type of education on earnings expectations and realizations. Overall, and in agreement with most earlier studies, students were found to be capable of making realistic estimates of expected earnings at the individual level.

An attempt to estimate perceived rates of return to higher education and examine their influence on the private demand for higher education was made in Cyprus at two points in time, 1994 and 2004 (Menon, 1997, 2008). In the first study, Menon (1997) collected perceived earnings and cost data from 811 Cypriot

students in their final year of secondary education. Survey research was used, with questionnaires distributed to students during school hours. The resulting rates of return were fully based on perceived data on expected earnings with and without higher education, direct costs and the time required to obtain a higher education degree.

Respondents were asked to provide estimates of future expected earnings at the following three points in time, with and without a higher education diploma:

– Point of starting work
– After 4 years of work
– Age 46 years

Students were instructed to state their own expected salaries at the above points in time. They were also asked to state their intentions with respect to entering higher education, which led to the identification of two groups of respondents, those planning to enter higher education after the completion of secondary school and those planning to enter the labor market instead. This led to the estimation of two earnings streams for each respondent, one with and one without higher education.

The lifetime earnings and cost data provided by respondents were used to compute two types of perceived rates of return to higher education: elaborate method rates, and short-cut method rates. The overall rate of return to higher education was 5.7% when estimated with the full method and 6.3% when the short-cut method was applied. Thus, the short-cut rate produced similar estimates to the elaborate rate. Students intending to study perceived much higher rates (6.7% – elaborate, 7.7% – short-cut) compared to those planning to enter employment (1.5% – elaborate, 2.8% – short-cut).

The computed estimates were used as independent variables in logistic regression equations in order to investigate their effect on the student's educational intentions (choice of higher education versus choice of employment). Both the perceived elaborate and short-cut rate were found to have a positive and significant effect on the intention to enter higher education. Overall, the findings provided support to the human capital interpretation of individual decisions with respect to the choice of higher education: Prospective students who considered higher education to be a good investment decided to pursue it, whereas those who did not attach great value to it chose to enter the labor market instead.

New estimates of the perceived rates of return to higher education in Cyprus were provided by a second study, which was conducted 10 years after the first study (Menon, 2008). The same methodology was used in an attempt to identify possible changes in students' perceptions and in the applicability of human capital theory to their decision making. The sample consisted of 611 students in their final year of secondary education. In the second study, the perceived rate of return to higher education was 8.7% under the elaborate method and 7.6% under the short-cut method. As in the previous case, students intending to study perceived much higher rates (9.4% – elaborate, 8.0% – short-cut) compared to those planning to enter employment (3.6% – elaborate, 4.4% – short-cut). The same regression models were used in order to investigate the effect of the rates on the student's

educational intentions. The analysis pointed to the continuing positive and significant effect of economic variables on the intention to enter higher education, once again rendering support to the human capital interpretation of private investment decisions in higher education.

The expected returns to higher education in the Czech Republic and England were investigated in a study by Anchor et al. (2011). Data were collected through a questionnaire administered to first year economics students at three Czech universities and the University of Huddersfield Business School in England. The sample consisted of 3139 students. In the questionnaire, respondents were asked to provide information on their expected earnings with and without higher education at two points in time: immediately after secondary school and after 10 years of employment. Earnings expectations were provided at three levels: minimum, most likely and maximum. The most likely estimates were used in the analysis.

Expected rates of return to education were estimated using the short-cut method. The overall mean rate of return was 15.27% for males and 14.07% for females in the sample. Students in England expected higher rates than those in the Czech Republic. Moreover, the returns to education were expected to grow with experience as most graduates estimated higher returns within 10 years of work than as new graduates. In the Czech Republic, men expected a greater increase in returns, while in England a gender gap in expectations emerged at the point of graduation. Anchor et al. (2011) concluded that students in both countries had acted in accordance with human capital theory in that they had decided to enter higher education in anticipation of significant returns.

Table 1 provides a summary of information on the main published studies on the expected economic returns to education conducted from 1980 to the present. It provides information on the year and the country in which the study was conducted, the methodology used and the main findings in relation to the realism and accuracy of the earnings expectations of the participants. In the following section, the main findings from the overview of the research on the earnings expectations of the economic returns to higher education are presented and discussed.

Table 1. Main studies on the expected economic returns to education (1980-present).

Study	*Country*	*Method/sample*	*Accuracy of predictions*
McMahon & Wagner (1981)	United States	Survey of university freshmen (2766)	Higher education linked with higher earnings
Williams & Gordon (1981)	England	Survey of high school seniors (2944)	Perceived rates of return similar to actual rates
Bosworth Ford (1985)	England	Survey of university students (261)	Link between perceived rates of return and higher education entry
Psacharopoulos & Sanyal (1981)	Philippines	Survey of students (9105) and graduates (4655)	Perceived rates of return similar to actual rates

Psacharopoulos & Sanyal (1982)	Egypt	Survey of students (1935) and graduates (1712)	Perceived rates of return similar to actual rates
Wong (1982)	Hong Kong	Survey of high school seniors (1590)	Perceived rates of return similar to actual rates
Smith & Powell (1990)	United States	Survey of university seniors (388)	Reasonable expectations of the earnings of others; self-enhancement among males
Betts (1996)	United States	Survey of university students (1269)	Senior students more informed about salaries than freshmen
Dominitz & Manski (1996)	United States	Computerised survey of high school students (71) and university students (39)	Expectation of positive returns to education
Menon (1997)	Cyprus	Survey of high school seniors (811)	Link between perceived rates of return and the intention to enter higher education
Wolter (2000)	Switzerland	Computerised survey of high school students and university students (137)	Expected wages similar to actual wages
Carvajal et al. (2000)	United States	Survey of university students (248) and recent graduates (219)	Generally, expected earnings similar to actual earnings, with some discrepancies
Brunello et al. (2001)	10 European countries	Survey of university students (6829)	Overestimation of the returns to education
Botelho & Pinto (2004)	Portugal	Laboratory experiment with university students (273)	Overestimation of the returns to education, especially among males
Webbink & Hartog (2004)	Netherlands	Survey of students and same individuals as graduates (657)	Expected earnings similar to actual earnings
Menon (2008)	Cyprus	Survey of high school seniors (611)	Link between perceived rates of return and the intention to enter higher education
Anchor et al. (2011)	Czech Republic and England	Survey of university freshmen (2011)	Link between perceived rates of return and higher education entry

DISCUSSION

Main Findings

The overview of studies on the earnings expectations of actual and prospective higher education students leads to a number of conclusions in relation to theory and research on the topic. On a theoretical level, the findings of the majority of

published studies are supportive of the human capital interpretation of the private demand for higher education. Overall, prospective and/or actual students were found to expect positive returns to education, which were linked with their presence in higher education or their intention to pursue higher studies. When asked to provide estimates of future incomes with higher education, study participants generally provided estimates which were close to actual figures of graduates' earnings. This points to an accurate and realistic assessment of the expected returns to higher education and provides support for the rational decision-making model advanced by human capital theory. However, it must be noted that in a small number of studies, self-enhancement tendencies were observed as participants tended to overestimate the impact of higher education on earnings.

In this context, an important finding is that both prospective and actual higher education students were in a position to provide meaningful responses to questions on expected earnings. This applies to all studies included in Table 1, irrespective of the type of questions used to elicit information from respondents (e.g. the provision of expected earnings under one or more scenarios). As previously mentioned, the fact that the number of studies in Table 1 is relatively small can be attributed to the reluctance of economists to collect subjective data. However, the overview of available research on the topic suggests that data on the subjective perceptions of higher education students can provide useful information on the impact of economic considerations on the decision to enter higher education.

As regards methodological aspects of the research discussed in this chapter, it is important to note the differences in the methodologies used to elicit information from students on expected earnings. Even though the vast majority of studies are based on survey research, there are important differences in the methodologies used across studies. The most important differences are the following:

- Differences in populations and samples: As previously mentioned, some studies rely on the earnings expectations of high school students (prospective higher education students), while others are restricted to actual higher education entrants. In some cases, differences in findings in the same country are attributed to the use of different populations (see, for instance, Bosworth & Ford, 1985). Moreover, the size of the sample differs considerably across studies, ranging from slightly over 100 to several thousand respondents.
- Differences in the survey questions used: Despite the focus on expected earnings, the questions asked in survey questions on the topic differ considerably. In some cases, participants are simply required to state expected earnings with higher education at one or more points in time. In other cases, alternative scenarios are employed in order to compare expected earnings with and without higher education. Moreover, some studies use questions regarding the participant's own expected earnings as well as questions on the expected earnings of others (e.g. the typical graduate).
- Differences in the type of study: Most studies on the topic are cross-sectional, focusing on student perceptions at one point in time. The comparison between expected and actual earnings, if made, is based on actual earnings data provided from other graduates or other sources. It is not common for studies to investigate

the perceptions and realizations of the same group of students after graduation in order to compare the expected and realized earnings of the same participants (a notable exception being Webbink & Hartog, 2004).

It is also important to note that the majority of studies on the expected earnings of higher education entrants were conducted in Western countries. As shown in Table 1, the only non-western countries in which relevant studies were conducted are Hong-Kong, Philippines and Egypt. After 1982, there appear to be no published studies on the topic from other regions, which points to the lack of evidence on the topic in different cultural and regional contexts.

Implications

The overview of findings of available studies on students' expectations of the economic returns to higher education has important implications for both future research and higher education policy. In relation to research, it is important that future studies investigate the topic to a greater extent since the tendency of economists to reject the use of subjective data does not appear to be justified. The existing body of evidence clearly indicates that students are in a position to provide meaningful responses to questions regarding their expected earnings. Moreover, there is a need for more longitudinal studies on the topic since a comparison of the expected and realized earnings of the same population can provide a more accurate test of the fundamental premise of human capital theory, i.e., the idea that individuals invest in themselves for the sake of future returns. In future research, the investigation of the applicability of human capital theory to individual decisions in education should also focus on possible differences in the choices of students with different backgrounds, especially in relation to gender and social class. At present, there is limited information on the topic.

Future research should also take into account the effect of different methodological approaches on the findings. Sample size and composition can have a significant impact on the findings in that tendencies to overestimate future earnings have been linked to samples with a greater representation of specific fields of study. In addition, samples that include both prospective and actual higher education students may again provide a better basis for the investigation of the applicability of human capital theory to individual decisions regarding the choice between higher education and employment. The inclusion of both groups (prospective and actual) allows for the examination of the decision-making process of high school students who select immediate employment over higher education entry. In a small number of studies and in accordance with human capital theory, this group has been found to anticipate lower returns to education in comparison with higher education entrants. However, more conclusive evidence is needed on this topic.

The investigation of the expected economic returns to higher education can provide the basis for the interpretation of the private demand for higher education and the formulation of relevant policy initiatives and measures. This is especially important in the current era, as the economic downturn limits the career prospects

of university graduates in many countries. There is evidence to suggest that, due to the economic downturn, higher education students place greater emphasis on employability and have higher demands from universities, expecting greater "value for money" and attention to their needs (O' Connell, 2011; Wu, 2011).

In this context, it becomes more important for universities to collect data on both prospective and actual students' needs and especially, on needs relevant to economic and career prospects. According to Sander, Stevenson, King and Coates (2000), in the past, higher education policy makers assumed they knew what students expected or valued in higher education, adopting an "inside out" approach. However, recent economic developments have increasingly resulted in the emergence of an "outside in" perspective, in an attempt to increase student satisfaction. This points to the need for more research on the links between higher education and the labor market, as perceived and/or expected by individual students. The investigation of students' expectations of the economic returns to education can serve as the basis for a strategic approach to the management of student expectations, in the framework of an "outside in" perspective. Thus, beyond its theoretical significance, the systematic collection and utilization of data on the expectations of students regarding the economic returns to education can provide a significant impetus to the strategic management and improvement of higher education institutions.

REFERENCES

Anchor, J. R., Fišerová J., Maršiková, K., & Urbánek, V. (2011). Student expectations of the financial returns to education: Evidence from business schools. *Economics of Education Review, 30*, 673-681.

Becker, G. (1964). *Human capital*. Princeton, NJ: Princeton University Press.

Betts, J. R. (1996). What do students know about wages? Evidence from a survey of undergraduates. *Journal of Human Resources, 36*, 27-56.

Blaug, M. (1976). The empirical status of human capital theory: A slightly jaundiced survey. *Journal of Economic Literature, 14*, 827-855.

Bosworth, D., & Ford, J. (1985). Income expectations and the decision to enter higher education. *Studies in Higher Education, 10*, 21-31.

Botelho, A., & Pinto, L.C. (2004). Students' expectations of the economic returns to college education: Results of a controlled experiment. *Economics of Education Review, 23*, 645-653.

Brunello, G., Lucifora, C., & Winter-Ebmer, R. (2001). *The wage expectations of European college students*. Retrieved from http://ssrn.com/abstract=271709

Carvajal, M. J., Bendana, D., Bozorgmanesh, A., Castillo, M. A., Pourmasiha, K., Rao, P., & Torres, J. A. (2000). Inter-gender differentials between college students' earnings expectations and the experience of recent graduates. *Economics of Education Review, 19*, 229-243.

Dominitz, J. (1998). Earnings expectations, revisions, and realizations. *Review of Economics and Statistics, 80*, 374-388.

Dominitz, J., & Manski, C. F. (1996). Eliciting student expectations of the returns to schooling. *Journal of Human Resources, 31*, 1-26.

Ferber, M. A., & McMahon, W. W. (1979). Women's expected earnings and their investment in higher education. *Journal of Human Resources, 14*, 405-420.

Gordon, A., & Williams, G. (1977). *Attitudes of fifth and sixth formers to school, work and higher education*. Lancaster: University of Lancaster, Institute for Research and Development in Post-Compulsory Education,

McMahon, W. W., & Wagner, A. (1981). Expected returns to investment in higher education. *The Journal of Human Resources, 16*, 274-285.
Menon, E. M. (1997). Perceived rates of return to higher education in Cyprus. *Economics of Education Review, 16*, 425-430.
Menon, E. M. (2008). Perceived rates of return to higher education: Further evidence from Cyprus. *Economics of Education Review, 27*, 39-47.
Mincer, J. (1962). On the job training: Costs, returns and some implications. *Journal of Political Economy, 70*, 50-79.
O'Connell, J. (2011). *Changing student expectations*. Retrieved from http://pearsonblueskies.com/changing-student-expectations/
Pissarides, C. A. (1981). Staying on at school in England and Wales and why nine per cent of the age group did not. *Economica, 48,* 345-363.
Psacharopoulos, G. (1973). *Returns to education: An international comparison*. Amsterdam/New York: Elsevier.
Psacharopoulos, G. (1985). Returns to education: A further international update and implications. *Journal of Human Resources*, *20*, 583-604.
Psacharopoulos, G. (1994). Returns to investment in education: A global update. *World Development, 22*, 1325-1343.
Psacharopoulos, G., & Layard, R. (1979). Human capital and earnings: British evidence and a critique. *Review of Economic Studies, 46,* 485-503.
Psacharopoulos, G., & Patrinos, H. A. (2004). Returns to investment in education: A further update. *Education Economics*, *12*, 111-134.
Psacharopoulos, G., & Sanyal, B. (1981). Student expectations and labor market performance: The case of Philippines. *Higher Education, 10*, 449-472.
Psacharopoulos, G., & Sanyal, B. (1982). Student expectations and graduate market performance in Egypt. *Higher Education, 11*, 27-49.
Sander, P., Stevenson, K., King, M., & Coates, D. (2000). University students' expectations of teaching. *Studies in Higher Education, 25*, 309-324.
Smith, H. L., & Powell, B. (1990). Great expectations: Variations in income expectations among college seniors. *Sociology of Education, 63*, 194-207.
Webbink, D., & Hartog, J. (2004). Can students predict starting salaries? Yes! *Economics of Education Review, 23*, 103-113.
Williams, G., & Gordon, A. (1981). Perceived earnings functions and ex ante rates of return to post compulsory education in England. *Higher Education, 10*, 199-227.
Wolter, S. C. (2000). Wage expectations: A comparison of Swiss and U.S. students. *Kyklos, 53*, 51-69.
Wong, A. (1989). *Perceived earnings functions and ex ante rates of return to higher education*. Unpublished Doctoral Dissertation. University of London, London, England.
Wu, C. (2011). High graduate unemployment rate and Taiwanese undergraduate education. *International Journal of Educational Development, 31*, 303-310.

Maria Eliophotou Menon
Department of Education
University of Cyprus

MARILOU IOAKIMIDIS AND JOOP HARTOG

DETERMINANTS OF THE GENDER GAP IN ANNUAL EARNINGS AMONG COLLEGE GRADUATES

Data from OECD Countries

INTRODUCTION

Tertiary education compensates male and female students more than it financially rewards students who complete only secondary education. These benefits, however, do not apply equally to male and female students. Researchers in the United States have found that the earnings of male college graduates almost always surpass the earnings of female college graduates, a finding that extends to other countries as well. This chapter reports the results of a study that investigated the gender wage gap among male and female college graduates in 28 OECD countries and reasons for this disparity.

Among a range of factors suggested to account for the gender wage gap among male and female college graduates is field of study. More college males than females choose fields of study such as engineering and mathematics, which result in higher-paying jobs. Females more often select fields of study such as the arts or humanities, associated with lower-paying jobs. Thus, it is reasonable to assume that the gender wage gap between male and female college graduates would lessen if females were to choose potentially higher-paying fields of study.

This study explored the relationship between selected fields of study and the gender wage difference between male and female college graduates in OECD countries. The examination of available data is important for understanding the relationship between annual earnings and tertiary education and the link between gender differences in annual and long-term earnings, and the chosen field of study. Education is likely the most important factor in the future annual and lifetime earnings of males and females. The second most important factor may be the selection of a field of study.

BACKGROUND

The median annual earnings of male high school graduates are more than the median earnings of female high school graduates (see Figure 1). These relationships have remained highly stable for many years. College graduates earn as much as 20% more annually than high school graduates (AAUW, 2013), a similar finding reported by Cohn and Hughes (1994) and McMahon (1991). Moreover, researchers have consistently found that the median annual earnings for male college graduates in the United States are higher than the median earnings of female college graduates (AAUW, 2013).

M. E. Menon et al. (eds.), Using Data to Improve Higher Education, 165–180.

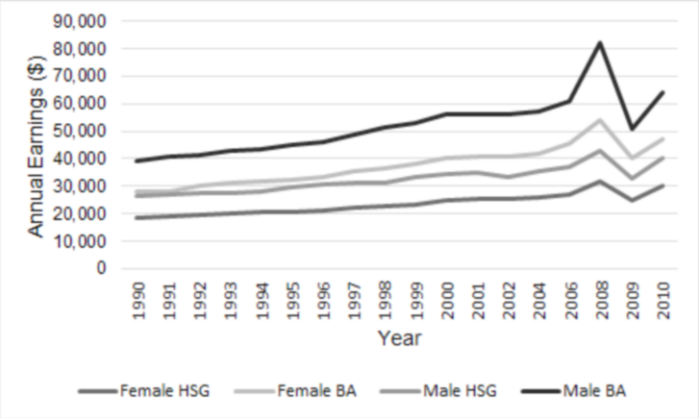


Figure 1. A comparison of annual earnings between female and male high school graduates (HSG) and male and female college graduates with a BA: 1995-2011. (Source: U.S. Dept. of Commerce, Bureau of the Census)

This earnings gap was calculated by subtracting the median earnings of female graduates from the median earnings of male graduates and dividing the difference by the male median earnings. If the female median earnings were $40,000 annually and the male median earnings were $50,000 during the same period, the gap was 20%. This gap has lessened over time, but a gap of approximately 20% remained between female and male graduates (AAUW, 2013). The gap was less among college graduates, who earned approximately $15,000 more annually than high school graduates (see Figure 2).

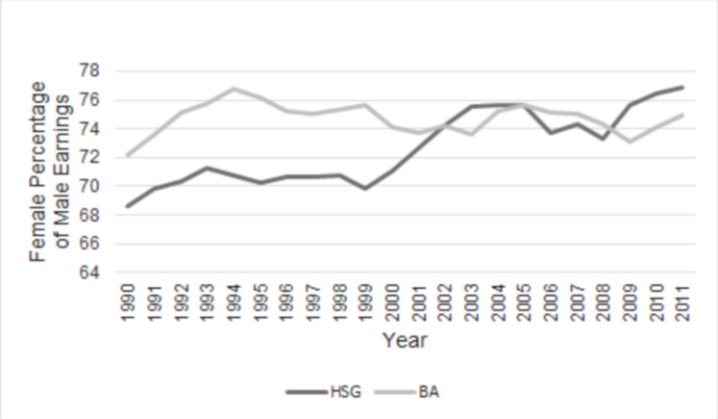


Figure 2. Income gap between female and male colleges graduates with a BA: 1995-2011. (Source: U.S. Dept. of Commerce, Bureau of the Census)

The same general argument has been asserted for the value of higher education among female and male college graduates in OECD countries. The Organization for Economic Cooperation and Development consists of 30 developed countries in North America, Eastern and Western Europe [including Turkey], Australia, Japan, New Zealand, and the Republic of Korea. In fact, education and income in OECD countries are highly related; that is, annual earnings increase with education: "A 25-34 year-old with a tertiary education earns 40% more, on average, than an adult of the same age who has only a secondary education, while a 55-64 year-old earns 73% more" (OCED, 2013, p. 14). Carnevale, Cheah and Strohl (2012) noted that the field of study selected by a student in the United States during 2010 affected earnings because salaries differed among fields. But regardless of the field of study, these researchers concluded that "a Bachelor's degree is one of the best weapons a job seeker can wield in the fight for employment and earnings" (Carnevale et al., p. 3). They noted that 9% of U.S. college graduates were unemployed compared with the unemployment of 23% of high school graduates. The financial advantage of completing a college degree is seen in Figure 3. For females and males, annual earnings are substantively higher for college graduates.

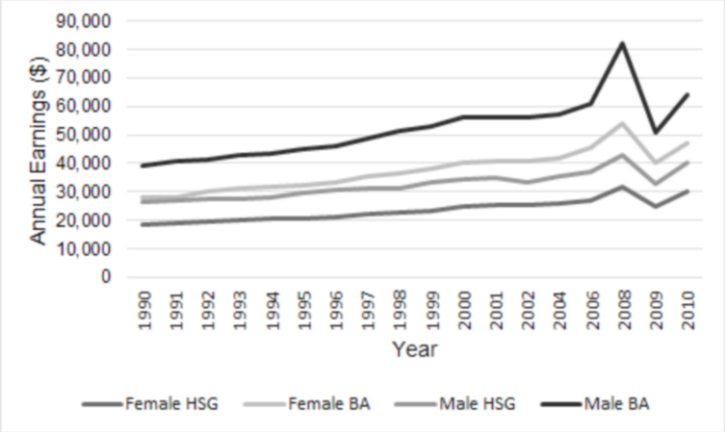


Figure 3. A comparison of income between female and male high school and college graduates with a BA: 1995-2011. (Source: U.S. Dept. of Commerce, Bureau of the Census)

The gender gap in annual earnings and related factors in OECD countries mirror the same factors found in the United States, females earning approximately 16% less annually than males (OECD, 2012a). Females in OECD countries earn less than males, work fewer hours, work more often in low-paying jobs, and more often work as temporary (part-time) employees. Compared to males, employed females also work fewer hours, less frequently progress in their careers, and remain underrepresented in decision-making positions.

Carnevale et al. (2012) described these differences in annual earnings between females and males in OECD countries based on education:

– In Brazil, Canada, Greece, Hungary, Ireland, Japan, the United Kingdom, and the United States, female college graduates or ones with advanced research skills earned approximately 80% more than females without a college education.
– Male college graduates were advantaged similarly in Brazil, France, Germany, Greece, Hungary, Ireland, Israel, Poland, the Czech Republic, the Slovak Republic, and the United States.
– Females without a high school education earned 70% less than female college graduates in Brazil, Greece, Israel, Italy, Luxembourg, Portugal, Turkey, the United Kingdom, and the United States.

In addition to the gender gap in annual earnings, subject matter or field of study has been identified as an important determinant of annual earnings among populations in OECD countries (Carnevale et al., 2012), the same factor that affects employment in the United States (AAUW, 2013; Carnevale & Cheah, 2013). Thus, Carnevale et al. (2012) recommended that first-year college students select academic majors carefully because "the risk of unemployment among recent college graduates depends on their major" (p. 4). Comparisons of selected fields of study are seen in Figure 4.

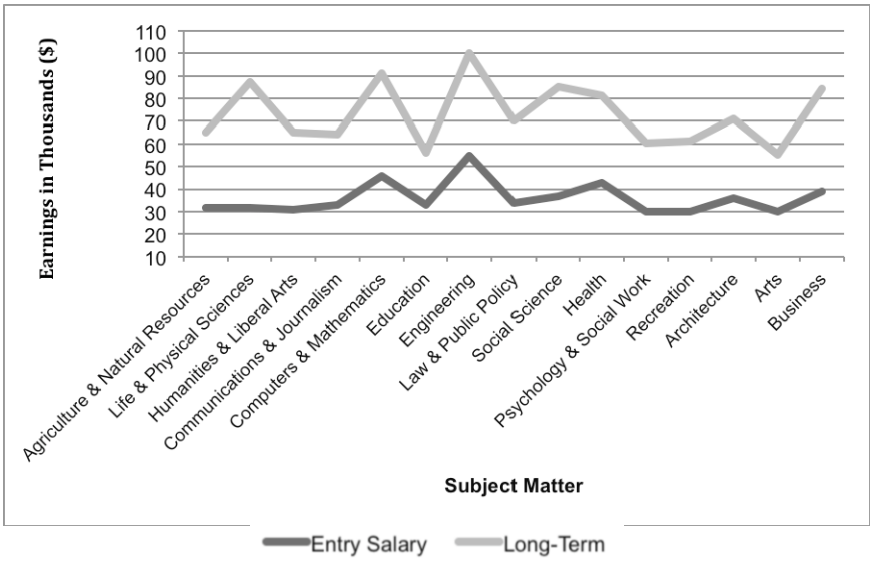


Figure 4. Entry and long-term annual earnings of selected female and male college graduates. (Source: Carnevale et al., 2012)

For males and females in the United States, college graduates earned the highest relative salaries with degrees in technical fields such as engineering, computer

science, the natural sciences, business, law, and the health professions. The mean annual entry income for engineers is approximately $55,000, and long-term annual earnings are highest among all technical specialties (see Figure 4). Students majoring in computers or mathematics can expect to begin work at approximately $45,000 annually. Students majoring in the arts, education, psychology or social work, or recreation will initially earn approximately $30,000 annually. Earnings for male and female graduates in education, the arts and humanities, and social sciences have traditionally earned the lowest salaries (Finnie & Frenette, 2001; Rumberger, 1984; Rumberger & Thomas 1993). In fact, college graduates majoring in business, engineering, natural sciences, and technical fields continue to earn more than graduates in education, humanities, and the social sciences (Angle & Wissmann, 1981).

With few exceptions, females with the same education as males typically earn substantially less than male counterparts. Rumberger and Thomas found this relationship for each field of study they examined in 1993. The AAUW (2013) reported that females working full-time in the United Stated earned 77% of the salary males earned—a 23% earnings gap. This gap was confirmed by the U.S. Bureau of Labor (2012), U.S. Census Bureau (2011), and the U.S. Office of Education (AAUW, 2013). Moreover, Dey and Hill (2007) found that females earned 69% of the salaries paid to males a decade following college graduation. Corbett and Hill (2012) reported a corresponding figure of 82% a year after college graduation.

As far as OECD countries are concerned, the gender gap between earnings and employment remains (OECD, 2012a). Currently in OECD countries, females on average earn 16% less than their male counterparts, a gap that widens to a 21-point difference in earnings for experienced workers (OECD, 2012a). Overall, the gender gap in earnings has decreased 9 percentage points during 1990–2010. Gender preferences among females regarding careers have remained stable, limited to fewer occupations than males. Females must also cope with the "glass ceiling," encountering fewer options for better jobs and higher earnings. Two factors contributing to the gender gap in earnings are that females work in fewer occupations, and in the majority of countries females constitute only 30% of managers in the work force (35% in France, 21% in Luxembourg).

It was believed that during the 1990s new technologies would contribute to increasing occupational choices for females (OECD, 1994). Females in OECD countries, however, continue to choose lower-paying occupations than males and work less frequently in scientific and technical fields. In many OECD countries, females more often work part-time, but part-time employment does not usually result in full-time employment. Less than 5% of females and males who work six years part-time become full-time employees. In the United States, females who work part-time eventually work full-time (Macunovich, 2010). Hourly earnings vary markedly between part-time and full-time employees in OECD countries. Part-time workers also receive fewer opportunities for promotion, lower retirement benefits, and less job security.

Because field of study is related to earnings, the question arises whether gender differences exist in selecting a college major, and, if so, to which extent this difference accounts for the gender gap in earnings. Angle and Wissman (1981) examined this question using ordinary least squares (OLS) regression modeling and eight waves of data collected from college-age young students during the National Longitudinal Surveys of Labor Market Experience (1967-1975). Young American females often chose degree programs in education and the humanities; young American males more often selected degree programs in engineering, mathematics, or technical fields. These researchers found that females with at least some college education earned two-thirds of the income of males with similar backgrounds. This gap in the choice of a field of study between genders remains wide.

Females remain under-represented in engineering, mathematics, science, and technology, particularly in science. The need exists in OECD countries for females in computing and engineering, but few females enter either field. In fact, in the majority of OECD countries, the number of females in computer science has decreased since 2000, a period during which widespread increases have occurred throughout OECD countries in females enrolling in health-related programs (OECD, 2012a).

The research literature noted previously identified the selection of field of study as an important factor affecting annual earnings. A principal question addressed in this chapter is the extent to which field of study among college graduates is a global factor and one useful to explain the phenomenon of the gender gap in annual earnings. Field of study was found to contribute to explaining the gap in gender earnings in Western Europe (Machin & Puhani, 2002). Schneider (2013) examined field of study of three degrees and short-term certificates in the United States: associate (2-year degree), BA, and MA. Graduates with degrees in engineering received the highest entry earnings in each state. Graduates in business, nursing, and health-related fields were also highly paid. The lowest earners among college graduates with a BA majored in music, philosophy, photography, or the liberal arts. Schneider found that graduates with an MA in technical fields earned higher salaries than graduates in education. Regardless of field of study, graduates in the liberal arts received the lowest earnings. Reporting results from the state of Texas, Schneider showed the benefit in annual earnings for completing a degree in engineering, mathematics, or technology (see Figure 5).

Although differences in field of study or occupation may explain a portion of the gender gap in annual earnings, additional factors affect employment and income among females. For example, females generally acquire less work experience than males (Blau & Kahn, 2003). This factor may, in part, result from the maternal and familial roles they play within the global society, limiting full-time employment when a female raises a family. Moreover, females generally work less than males in OECD countries (OECD, 2012b). In particular, females work part-time (26%) approximately three times more frequently than males (7%). The gender gap in full-time employment also favors males by a differential of

almost 20% (OECD, 2009). Females are also more limited than males in occupations they can pursue.

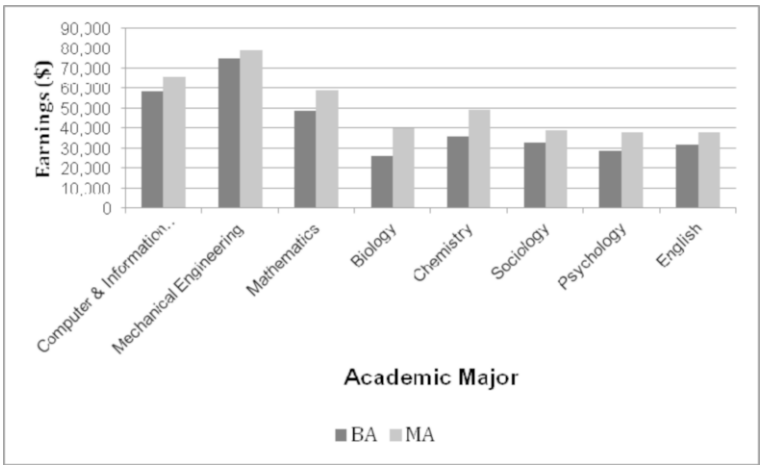


Figure 5. Average annual earnings of graduates with a BA or MA in selected fields of study. (Source: Schneider, 2013)

Employment rates for college educated populations in the OECD countries are high, averaging 81-84%, although the employment rate among female college graduates averages 10 percentage points less than that of college educated males (OECD, 2013). Among women as a whole, however, maternal employment rates are markedly lower. For mothers with children aged 1–3 years, the average employment rate in OECD countries was 51% in 2009. Among mothers with children aged 3-5 years, the corresponding employment rate averaged 62% (OECD, 2012b).

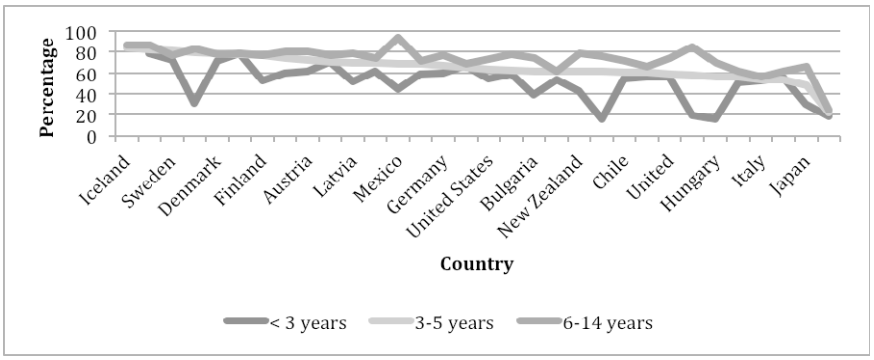


Figure 6. Percentage of maternal employment rates for children aged 3-14 years. (Source: OECD, 2012b)

Younger females (aged 25-34 years) in OECD countries have overtaken males within the same age range in completing tertiary education. The gender gap in tertiary education is principally found among persons aged ≥ 45 years (OECD, 2011). Tertiary completion rates were higher among males than among females in 2000; however, in 2011, 33% of females and 30% of males completed tertiary education.

METHOD

This research examines the influence of field of study in explaining the gender gap in annual earnings among college graduates in OECD countries. In particular, the study examines whether gender differences provide a more global explanation about the phenomenon of the gender gap in annual earnings. Also explored is whether other factors related to employment contribute to explaining the role played by field of study.

Thirty six predictor variables were selected from the OECD online library to use with data from 25 OECD countries and three partner countries to assess the use of average annual earnings of females as a percentage of male earnings. Earnings data for completing tertiary education attainment were factored by extent of educational attainment for persons aged 25 to 64 years (OECD, 2009). For these 28 OECD countries, the outcome variable selected was the mean of the time series for tertiary attainment during 1997-2007. The predictor variables chosen from the OECD online library of Excel worksheets were assumed to have the potential to explain the gender gap in annual earnings. Data from Excel worksheets were copied directly into this study's database or transformed to create the desired metric (e.g., a difference score or a ratio score between females and males). Missing data were imputed using the sample mean or the OECD average for a particular variable.

Participants

The average annual earnings of females as a percentage of earnings of males aged 25-64 years with tertiary attainment were collected from the OECD online library for 28 countries and three partner countries: Australia, Austria, Belgium, Brazil, Canada, Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Israel, Italy, Korea, Luxembourg, Netherlands, New Zealand, Norway, Poland, Portugal, Slovenia, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States. Brazil, Israel, and Slovenia were the partner countries. Countries had a median of six earnings data points during 1997-2007.

Procedure

Following the exploratory data analysis of the database, 11 predictor variables were entered into a series of stepwise OLS multiple regression equations to provide a global explanation of the gender gap in annual earnings. Three predictor variables were constructed to model the gender gap in the percentage of university graduates

awarded degrees in (a) the arts, education, and humanities; (b) engineering, manufacturing, and construction; and (c) mathematics and computer science. Four predictor variables were created to measure differences in employment rate between males and females. Two predictor variables measured different aspects of maternal employment rates, and two predictor variables measured different aspects of tertiary completion. The 11 predictor variables used are as follows. Data were retrieved from the annual editions of the OECD publication *Education at a Glance* for a given year:

- Gender gap as a percentage of females minus percentage of males awarded degrees in the arts, education, and humanities (2004)
- Gender gap as a percentage of females minus percentage of males awarded degrees in mathematics and computer science (2004)
- Gender gap as a percentage of females minus percentage of males awarded degrees in construction, engineering, and manufacturing (2004)
- Difference in employment rate between male and female college graduates aged 25-64 years (2008)
- Maternal employment rate for females with children aged 3-5 years (2007)
- Percentage of single mothers in paid employment (2007)
- Percentages of males and females employed in occupations accounting for half of an OECD member's total employment, a measure of female occupational opportunity (2007)
- Gender gap as a percentage of part-time employment (2007)
- Gender gap as a percentage of full-time employment in an OECD member's population (2007)
- Percentage of an OECD member's population aged 25-64 years with a college education (2007)
- Gender gap between male and female college graduates aged 45-54 years (2006)

The 11 predictors were analyzed using a stepwise linear regression with a probability of .05 as the criterion for inclusion in the model and a probability of ≥.10 as the criterion for exclusion. The analysis sought to explain the variance in the annual earnings of female college graduates as a percentage of the earnings of male graduates. Data in the model were subsequently re-run using only statistically significant predictors.

RESULTS

The average annual earnings among female college graduates as a percentage of male earnings was 65.58%, an amount equivalent to less than the corresponding earnings among male college graduates during the same period (1997-2007). Table 1 displays the two factors identified in this study that explained the gender gap in annual earnings, two of the three predictors measuring choices in field of study: (a) gender gap as the percentage of college graduates in arts, education, or humanities, and (b) gender gap as the percentage of college graduates in engineering, manufacturing, or construction.

Table 1. Summary of hierarchical regression model.

Model	*Adjusted R^2*	*B*	*SE*	*Beta*	*p*	*Partial correlation*
Step 1 (Constant)	75.670		4.866		.05	-.39
Gender gap in percentage of college graduates in arts, education, or humanities	.12	-.233	.109	-.386	.04	-.39
Step 2 (Constant)		97.461	10.504		.05	
Gender gap in percentage of college graduates in arts, education, or humanities		-.349	.113	-.578	.01	-.53
Gender gap in percentage of college graduates in engineering, manufacturing, or construction	.24	.24	.328	.143	.431	.03

Note: Dependent variable: Annual earnings of female college graduates as a percentage of male earnings.

Females in the sample completed a BA in the arts, education, or the humanities two-and-a-half times more frequently than males completed a degree, a disparity of more than 43 percentage points (see Table 2). Thus, females in the sample often pursued careers in lower-paying careers, which means that the more females pursue a career in the arts, education, or humanities, the greater their loss in income. The opposite result often held for males who completed a college degree in engineering, manufacturing, or construction, pursuing careers in these fields three times more frequently than females, a gender disparity of -51% (see Table 2). These two field variables accounted for approximately 25% of the variance in the gender gap in annual earnings and had opposite effects on female earnings.

Table 2. Gender gaps in field of study.

Field of study	*Female percentage*	*Male percentage*	*Difference in earnings gap*
Arts, education, and humanities	71.66	28.34	43.32
Engineering, manufacturing, and construction	24.49	75.51	-51.03
Mathematics and computers	29.66	70.34	-40.68

Note: Gender gap in percentage of annual female earnings minus male percentage.

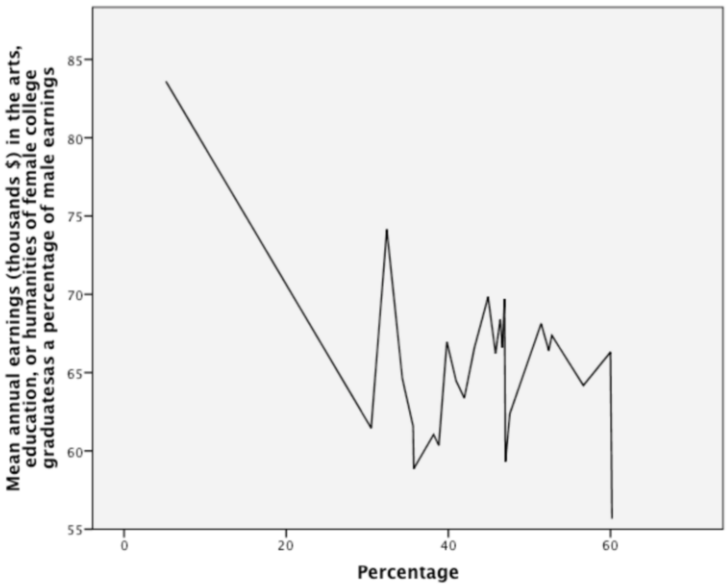


Figure 7. Gender gap as a percentage of college graduates awarded degrees in the arts, education, and humanities.

As more females pursued careers in the arts, education, or the humanities, earnings became less than male earnings (see Figure 7). Annual earnings decreased as persons selected the arts, education, or humanities, which corresponds to the regression statistic in Table 1. It is important to note the right-leaning trend in the graphic, the increase in percentage on the *y*-axis. As this proportion increases, annual earnings decreased, and the effect of the arts, education, and humanities is

slightly stronger than the effect of engineering, construction, and manufacturing (see Table 1).

The gender gap among college graduates pursuing careers in the arts, humanities, or education had the stronger effect on the gender gap in annual earnings, as seen by the standardized regression coefficient and the partial correlation coefficient (see Table 1). Alternatively, as the gender gap in earnings among college graduates in engineering and related fields lessened, the earnings gap among females began to close (see Figure 8). Note that the Beta and partial correlation coefficients in Table 1 are positive only for engineering and related fields of study, supporting the interpretation of the results.

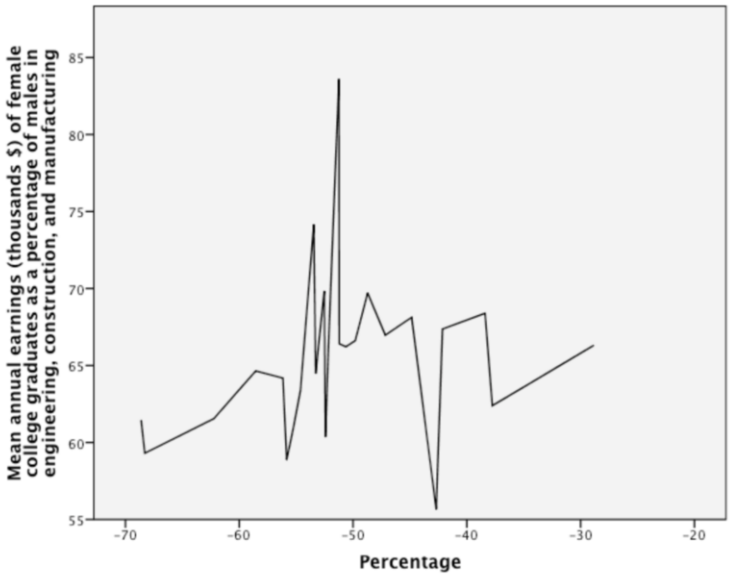


Figure 8. Gender gap as a percentage of college graduates awarded degrees in engineering, construction, and manufacturing.

Table 3 presents descriptive statistics for the study's dependent variable (annual earnings of female graduates as a percentage of male earnings) for each of the 11 predictor variables. No other predictor variable investigated contributed markedly to explaining the gender gap in earnings. Although a substantial gender gap was found in mathematics and computer science favoring males, it was apparent that greater gender-equitable, long-term earnings are possible in these fields. It was unexpected that the gender-ratio gap in part-time employment did not contribute more to explaining the gender gap in annual earnings. Almost four times (3.93) as many females than males in the sample worked part-time (see Table 3, gender ratio

as a percentage of part-time employment). This variable, although not statistically significant (p = .12), almost qualified for inclusion in the final regression model. Female part-time employment was substantively significant with a partial correlation of +.31. Similarly, occupational opportunities for females were approximately half that of males in OECD countries, but this factor also failed to qualify for inclusion in the final model despite its relatively strong partial correlation (r = -.21) with the gender gap in annual earnings.

Table 3. Descriptive statistics of variables.

Variables	*M*	*SD*	*N*
Female earnings of college graduates as a percentage of male earnings	65.58	6.44	28
Gender gap in arts, education, and humanities	43.32	10.67	28
Gender gap in engineering and related fields	-51.03	8.44	28
Gender gap in mathematics and computer science	-40.68	15.77	28
Gender ratio as a percentage of part-time employment	3.93	2.48	28
Employment rate for females with children aged 3-5 years	63.14	11.02	28
Percentage of single mothers in paid employment	65.86	11.22	28
Female occupational opportunity: Ratio of female-to-male occupations	.53	.11	28
Gender gap in percentage of full-time employment	-18.79	10.08	28
Percentage of college graduates aged 25-64 years	27.78	10.29	28
Gender gap among college graduates aged 45-54 years	-.13	7.68	28

DISCUSSION

The results of this study provide evidence that the gender gap in annual earnings among college graduates partially results from the field of study selected. This finding for explaining the gender gap in earnings seems global, transcending its presence in the United States and Western Europe. Based upon the data available for analysis, the results fit almost all OECD countries. The exception was Turkey, whose data were an outlier in the study's model.

The selection of a field of study for college students has financial consequences for long-term earnings in the career pursued. Choices result in different gender-related effects (also known as gender bias). Females overwhelmingly choose the arts, education, or the humanities as a field of study more often than males; thus, their subsequent annual earnings are significantly less than males earn, who often pursue higher-paying careers in engineering and technical fields. As the gender gap in engineering and related fields lessened, the gender earnings gap began to close. This finding offers evidence that the underlying basis for the gender gap in annual earnings lies less with gender bias than society's valuation of different career fields. The parsimonious explanation is that societies in developed countries often value engineering and related technical fields more than

the arts, education, or humanities. This conclusion is reflected in differences in annual earnings associated with these fields, which often have differential gender appeal.

Mathematics and computer science were fields of study not associated with the gender gap in annual earnings. A gender gap in the study of mathematics and computer science was found: Markedly more college males than females selected a career in one of these fields. The annual earnings for females who chose mathematics or computer related fields were closer to the amount annually earned by males. This finding provides indirect support for the conclusion that gender gap in annual earnings is associated more with society's valuation of particular fields of study and related occupations than the effect of gender bias.

A limitation in this study was the sample size of 28 countries. It is difficult to find more than a few significant predictors when analyzing data using multiple linear regression. It is more likely that a larger sample would have established an effect of the part-time employment of females on the gender gap in annual earnings. Disaggregating fields of study into more categories would provide a better basis for data analysis, a practice that OECD has begun in recent studies.

This research was also limited by reliance on data only from OECD countries, data that represent at most 34 of the world's developed countries. It is desirable, for example, to factor data related to the gender gap in annual earnings by career, occupation, and extent of educational attainment. This extent of granularity, however, is not yet present in the OECD database.

Limitations notwithstanding, a contribution of this study is establishing the importance of field of study in understanding the relationship between a college education and the gender gap in annual earnings. This gap is real: Females often earn significantly less than males overall, and females often earn significantly less than males when both work in the same field or occupation. Pursuing a career in the arts, education, or humanities is more likely to exacerbate the gender gap in annual earnings for females, whereas pursuing a career in engineering or a related technical field is more likely to minimize this gap. Fields of study such as mathematics and computer science seem to be more gender neutral in their effect on annual earnings. Long-term, because annual earnings are usually based upon initial salaries, lower starting wages often means lower salaries and less comprehensive retirement benefits (AAUW, 2013).

REFERENCES

Angle, J., & Wissman, D. A. (1981). Gender, college major, and earnings. *Sociology of Education*, *54*, 25-33.

AAUW (American Association of University Women). (2013). *The simple truth: About the gender pay gap*. Washington, DC: AAUW. Retrieved from http://www.aauw.org/files/2013/03/The-Simple-Truth-Fall-2013.pdf

Blau, F. D., & Kahn, L. M. (2003). Understanding international differences in the gender pay gap. *Journal of Labor Economics, 2*, 106-144.

Carnevale, A., & Cheah, B. (2013). *Hard times: College majors, unemployment and earnings*. Washington, DC: Center on Education and the Workforce, Georgetown University. Retrieved from http://www.georgetown.edu/ grad/gppi/hpi/cew/pdfs/HardTimes.2013.2.pdf

Carnevale, A., Cheah, B., & Strohl, J. (2012). *Hard times: Not all college degrees are created equal*. Washington, DC: Center on Education and the Workforce, Georgetown University. Retrieved from http://www.georgetown.edu/grad/gppi/hpi/cew/pdfs/Unemployment.Final.update1.pdf

Cohn, E., & Hughes, W. W. (1994). A benefit-cost analysis of investment in college education in the United States: 1969-1985. *Economics of Education Review*, *13*, 109-123.

Corbett, C., & Hill, C. (2012). *Graduating to a pay gap: The earnings of women and men one year after college graduation*. Washington, DC: AAUW. Retrieved from http://www.aauw.org/files/2013/02/graduating-to-a-pay-gap-the-earnings-of-women-and-men-one-year-after-college-graduation.pdf

Dey, J., & Hill, C. (2007). *Behind the pay gap*. Washington, DC: AAUW Educational Foundation. Retrieved from http://www.aauw.org/files /2013/02/Behind-the-Pay-Gap.pdf

Finnie, R., & Frenette, M. (2001). Earnings differences by major field of study: Evidence from three cohorts of recent Canadian graduates. *Economics of Education Review*, *22*, 179-192.

Machin, S., & Puhani, P. A. (2002). *Subject of degree and the gender wage differential: Evidence from the U.K. and Germany*. Bonn, Germany: Institute for the Study of Labor.

Macunovich, D. (2010). Reversals in the patterns of women's labor supply in the U.S.: 1976-2009. *Monthly Labor Review, 133*(11), 16-36.

McMahon, W. W. (1991). Relative returns to human and physical capital in the U.S. and efficient investment strategies. *Economics of Education Review*, *10*, 283-296.

Organization for Economic Co-operation and Development (OECD). (1994). *Education at a glance: OECD indicators*. Paris, France: OECD.

Organization for Economic Co-operation and Development (OECD). (2009). *Education at a glance: OECD indicators*. Paris, France: OECD.

Organization for Economic Co-operation and Development (OECD). (2011). *Difference in the proportion of younger and older adults with tertiary education*. Paris, France: OECD. Retrieved from http://dx.doi .org/10.1787/888932846291

Organization for Economic Co-operation and Development (OECD). (2012a). *Closing the gender gap: Act now*. Paris, France: OECD. Retrieved from http://www.oecd.org/inclusive-growth/Closing%20the%20Gender%20Gaps.pdf

Organization for Economic Co-operation and Development (OECD). (2012b). *Maternal employment rates*. Paris, France: OECD. Retrieved from http://www.oecd.org/els/family/38752721.pdf

Organization for Economic Co-operation and Development (OECD). (2013). *Education at a glance 2013: OECD indicators*. Paris, France: OECD. Retrieved from http://www.oecd.org/edu/eag2013%20(eng)-FINAL%2020%20June%202013.pdf

Rumberger, R. W. (1984). The changing economic benefits of college graduates. *Economics of Education Review*, *3*, 3-11.

Rumberger, R. W., & Thomas, S. L., (1993). The economic returns to college major, quality of performance: A multilevel analysis of recent graduates. *Economics of Education Review*, *12*, 1-19.

Schneider, M. (2013). *Higher education pays: But a lot more for some graduates than for others*. Rockville, MD: College Measures. Retrieved from http://www.air.org/files/Higher_Education_Pays_Sep_13.pdf

U.S. Bureau of Labor Statistics. (2012). *Current population survey*. Table 39. Washington, DC: U.S. Dept. of Labor. Retrieved from http://www.bls .gov/cps/cpsaat39.pdf

U.S. Census Bureau. (2011). *Selected economic characteristics: 2011 American Community Survey 1-year estimate.* Retrieved from http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_11 _1YR_DP03&prodType=table

U.S. Dept. of Commerce, Bureau of the Census.(1995-2011). *Current population reports, series P-60*. Retrieved from http://www.nces.ed.gov /programs /digest/d12/tables/dt12_439.asp

Marilou Ioakimidis
University of Peloponnesus and
University of Athens

Joop Hartog
Amsterdam School of Economics
University of Amsterdam

SOFIA N. ANDREOU AND CHRISTOS KOUTSAMPELAS

HIGHER EDUCATION AND EQUALITY OF OPPORTUNITY

A Review of Findings and Data Sets

INTRODUCTION

Amartya Sen (1992), in the prologue of his well appreciated book "Inequality Re-examined," sets forth the most fundamental question in the study of inequality: "equality of what?" Irrespectively of someone's ideological predispositions, we can expect that most people will condemn inequality on the grounds of unfairness. Yet, trying to figure out the "proper" concept of inequality is far more elusive. We get diverse responses, sometimes thought provoking and sometimes contradictory, which, in the end, map almost the entire landscape of moral philosophy. Utilitarians, the tradition of John Stuart Mill and Jeremy Bentham, argue that individual utilities and their distribution is what matters. Collectivists demand the equalization of wealth. Rawlsians define an array of primary goods (social rights, liberties, self-respect as well as income) whose allocation should be as fair as possible, while Amartya Sen and more recently Martha Nussbaum have propagated equality of capabilities. Certainly there are points of intersection between these lines of thought, as well as points of departure, and each approach has its own zealots and foes. Yet today it is equality of opportunity that enjoys the wider allegiance among contemporary societies.

Equality of opportunity presupposes social settings that enable people to compete in equal terms. Usually these settings are referred to as "level playing fields" and have been associated with employment, political participation and education. Broadly speaking, human achievements depend on two broad classes of factors: (i) factors associated with the individual's internal locus of control and (ii) factors associated with the individual's external locus of control. In the field of education, equality of opportunity has a simple formulation; education achievement should be a function of individual's effort, responsibility and talent. This ideal situation would mark perfect education mobility as well as elimination of any mechanism of transmission of (dis)advantages. A neat definition of the concept, which proved conducive to empirical research, is found in Roemer (1993, p. 149): "Equality of opportunity for X holds when the values of X for all those who exercised a comparable degree of responsibility are equal, regardless of their circumstances." Evidently, circumstances refer to events or aspects of the environment which are outside individual control, such as gender, age, education of the parents, ethnicity and religiosity. This definition helps operationalize an otherwise vague philosophical concept. For example as we will see later, a large

M. E. Menon et al. (eds.), Using Data to Improve Higher Education, 181–193.

number of empirical studies have used parental education as a proxy of the human and financial capital of the family and consequently of the socioeconomic background of the prospective student. It is further indicated that, in terms of policymaking, good practices are those that eliminate the relative importance of such factors.

Over the last decades, the world has undoubtedly witnessed substantial progress in fighting the most outrageous inequities that marred humanity for centuries. Today, in most places of the world, various notions of egalitarianism are well embedded in the social dialogue, influencing the political agenda. Most educational systems offer, at least in principle, equal opportunities to all children, irrespectively of their background, to educate themselves and have fair chances to climb up the social ladder. Meanwhile, inequities in educational access or achievement are considered unacceptable and are combated through targeted policies. Yet, inequalities are still existent and persistent even in the most advanced post-industrial societies, as the empirical evidence presented in this review shows. Inequalities have not vanished. They have become more refined and difficult to track down compared to the egregious inequities of the past.

Perhaps this should come as no surprise. Pierre Bourdieu's seminal work explains how the economic and intellectual elites incessantly seek ways to hold their advantages and transmit them to their dynasties through improvising or preserving mechanisms of reproduction of social hierarchies. In this context, education systems emerge as a pivotal field in which a constant struggle takes place between egalitarianism and the elites' tendency to safeguard their status quo. In this respect, Bourdieu (1996) wrote very critical lines against the French education system. Similar outcries have been voiced against other post-industrial educational systems.

It is extremely interesting to scrutinize the existing empirical findings in the relevant fields of the literature to assess whether modern educational systems are impinged with inequalities reproducing social hierarchy or whether inequalities have ameliorated as education expanded and gradually became more accessible to an increasing number of students. Our focus in this chapter is on higher education, but in acknowledgement that inequities in other educational stages also matter. Many studies demonstrate that inequities in the early stages of pupils' educational development accompany them in their adult lives. Nonetheless, higher education is more immensely associated with higher earnings, power and social status. In the modern world, higher education institutions screen, train and certify people for a variety of highly prestigious jobs. Those who fail to acquire tertiary qualifications will be excluded from the privileges conferred by these desirable occupations. Within this context, it is clear that life chances will not be fair until opportunities for tertiary education are equalized.

The aspiration of this chapter is to provide a brief overview of the findings of the relevant literature on these matters. First, we provide a very short review of the theoretical economic literature on human capital and intergenerational mobility. Many of the theoretical insights of this literature have inspired a plethora of empirical studies. Then, we move to review the empirical literature on

intergenerational earnings and education mobility. A short section is devoted to the issue of expansion of higher education and on how it influences opportunities. A discussion of the findings follows.

LITERATURE REVIEW

The Theory

Human capital theory postulates that education is an investment in human capital that takes place among self-interest rational individuals in the context of competitive markets (Becker, 1964). This basic framework disregards intrinsic motivation for education as well as other altruistic or idealistic motives in the sense that students are considered profit-maximizing decision makers that choose between alternative options meticulously weighing the benefits and costs of each choice. Later, Becker and Tomes (1979, 1986) provided a further refinement to human capital theory by constructing an intergenerational model by which parents make investment decisions on behalf of their children, thus introducing an element of altruism within the family. Furthermore, parents were assumed to transmit their endowments to their children through genetics and/or family environment. Among others, the influential Becker-Tomes model rationalized how nature and nurture affect intergenerational mobility. Since then, this model has provided a theoretical point of departure for a plethora of studies on the origins of educational inequalities and the mechanics of under-education traps. Credit constraints have been highlighted as the root of evil by many authors. Due to market imperfections, some families cannot invest optimally in the education of their offspring, thus trapping their children in an under-education trap. We discern Galor and Zeira's (1993) analysis on the role of capital market imperfections. Individuals from wealthy families can invest in education, whereas poor individuals need to borrow from capital markets. However, capital market imperfections result in high interest rates (for example, creditors overestimate risks due to asymmetric information) that may deter potential borrowers. Thus, even if poor families can estimate with accuracy the economic returns of education, they still fail to avoid undereducation.

Benabou (1994, 1996) provided a fresh perspective by showing that besides the obvious suspects – family, markets and the state – communities also play a crucial role. A child's educational development is influenced by the wider environment in which he/she is raised. This point portrays: (i) social spillovers, such as peer effects, local crime, norms of behavior and (ii) fiscal spillovers (the geographical distribution of public spending on education may be unequal). Benabou's analysis has been influenced by sociologists who have emphasized the importance of group interactions (see for example, Coleman, 1988), thus proving how fertile the interdisciplinary exchange of ideas can be. Das (2007) suggested that the transmission of inequalities can be linked with parents' willingness to invest in their children's human capital. Of course the idea is not new[1]; however Das postulated that poor parents may have less concern about their children's future income position. This is called "limited parental altruism" in economists' parlance.

Finally, a promising literature points to the structure of the educational system and how it can generate social segmentation (Brezis & Hellier, 2013; Chusseau & Hellier, 2011; Shavit, Arum, & Gamoran, 2007).

Latest Developments in Intergenerational Mobility

Intergenerational mobility has long been of great interest for economists and social scientists with an emphasis on parents' and children's outcomes persistence. The main research question raised in this literature is *what could be considered an "optimal" amount of intergenerational mobility?* In order to answer the above question adequately, it is important to examine the underlying determinants of the intergenerational correlation in earnings or education before determining a socially optimal level of mobility. The idea that poor children should have the same opportunities for success as rich children comes for many as an underlying goal of society, aiming at equality of opportunity. Those who work hard should be able to succeed, regardless of family background. Solon (2004) suggests that children of wealthy parents earn higher incomes partly because they invest more in human capital and have more education.

This highlights the importance of understanding the mechanisms underlying the observed intergenerational correlations. If in fact they are due to differential human capital investment, this would suggest a role for public provision or financing of education to equalize opportunities. Similarly, genetic differences in ability that are transmitted from parent to child can also exist, leading to intergenerational persistence in income or education (Sacerdote, 2002). If genetic differences are the underlying cause of the intergenerational correlation in income or education, then a more limited role for policy can be suggested. In such an occurrence, differences in ability and human capital will tend to lead to an intergenerational correlation of greater than zero in any well-functioning market economy. The fact that recent studies on intergenerational mobility find no truly equivalent estimates makes comparisons across studies problematic. Differences among researchers' concerning variable choice, sample selection and estimation methods, mean that it is difficult to know whether differences in findings are a consequence of fundamentals or a lack of comparability.

The impact of parents' social position upon children's has typically been estimated, either by intergenerational elasticities of earnings and education, or by the intergenerational correlation coefficient. This has been a key concern of sociologists for a long time. In the economics literature, there has been increasing interest in the influence of parental status on child education since the seminal works of Becker and Tomes (1986). They found a weak correlation between parents' and their children's income. The simple correlation averaged 0.15 and therefore suggested a quite high level of intergenerational mobility.[2] Solon (2004) developed a stylised version of the Becker-Tomes model and showed that progressive public spending on education can alleviate sub-optimal parental investment in education so far as the children of households with limited liquidity benefit relatively more from these public programmes.

The level of intergenerational mobility in society is seen by many as a measure of the extent of equality of economic opportunity. Intergenerational mobility is often measured as (1-β) where β is the estimated coefficient (or elasticity) of the relationship between two variables: a child's log economic status (earnings or income) and the same measure of his parents' status.[3] The early literature (e.g. Atkinson, 1981; Solon, 1992) on this topic suffered from interpretation difficulties; it was not clear whether a particular estimate of the intergenerational elasticity (for instance, 0.4) constituted an indication of a large or small amount of mobility. This issue has been illuminated through the use of comparisons on the extent of intergenerational mobility across countries.

An abundant volume of empirical studies has analyzed the impact of parental income upon the child's income through the intergenerational *earnings* elasticity (IGE). A major finding of this literature is that IGEs critically differ across countries, the lowest values (less than 0.3) found in Nordic countries (Björklund & Jäntti, 1997; Österberg, 2000) and the highest (between 0.4 and 0.6) in the U.S. (Mazumder, 2005; Solon, 1992, 2002), with the U.K. and France in-between (Ben-Halima, Chusseau, & Hellier, 2014 for France; Blanden, Goodman, Gregg, & Machin, 2004 for the U.K.; Nicoletti & Ermisch, 2007).

A similar diagnosis can be drawn from calculating correlation coefficients (Björklund, Lindahl, & Plug, 2006, for Sweden; Chadwick & Solon, 2002, for the U.S.). As regards correlation coefficients, Couch and Dunn (1997) find a father-son intergenerational elasticity of 0.42 in the U.S. and 0.24 in Germany. Behrman and Rosenzweig (2002) find a coefficient of 0.45 between father and sons in the U.S. and Björklund et al. (2006) a coefficient of 0.24 in Sweden. Dustmann (2004) looks at correlations between parental characteristics, child schooling and earnings for German birth cohorts for the period 1920 through 1966. He confirms that parental background affects child outcomes. Hertz, Jayasundera, Piraino, Selcuk, Smith and Verashchagina (2007) provide a survey of correlations and regression coefficients for a sample of 42 countries. They find that the correlations are highest in South America (about 0.6), moderate in Western Europe and the U.S. (about 0.4) and lowest in Nordic countries (about 0.2).[4]

Compared to earnings, there have been fewer advances in the estimation of intergenerational education correlations and elasticities since 1999, in part because there are fewer difficulties associated with timing and measurement. Education has some advantages in terms of measurement, because it is much more stable over the lifecycle whereas income is relatively volatile and reaches its peak at different ages for different occupational groups (see Black & Devereux, 2011). In these works, education is typically measured by the number of schooling years and the Ordinary Least Squares (OLS) method is used to estimate intergenerational human capital elasticity. The two most influential U.S. studies were by Solon (1992) and Zimmerman (1992). These studies provoked a turning point in the way intergenerational persistence was measured and understood by showing how using representative samples and reducing measurement issue problems, increases measured intergenerational mobility dramatically.

Early estimates of intergenerational mobility in the U.S. from the 1970s and 1980s ranged between 0.2 and 0.4. In accordance, Mulligan (1997) reported an intergenerational elasticity of 0.32 between father and son and 0.33 between father and child in the U.S. For the U.K., Atkinson (1981) used a homogenous sample composed of fathers resident in York and collected only a single week's information on earnings. He found an estimated β of the magnitude of 0.36, which is considered high by international standards. Dearden, Machin and Reed (1997) found 0.424 for the father-son elasticity and 0.415 for the father-daughter elasticity. Chevalier, Denny and McMahon (2009) found generally similar results using European countries and the U.S.

With regard to intergenerational education, empirical findings across countries seem to differ. For example, Checchi, Fiorio and Leonardi (2013) using Italian data, demonstrate that the high persistence of educational attainment found in the data is due to a much larger probability of children of highly educated fathers obtaining a college degree. Heineck and Riphahn (2009) find no significant change in the intergenerational persistence in education in Germany for over half a century. Guell, Rodriguez-Mora and Telmer (2007) take a particularly creative approach in investigating changes in intergenerational education mobility in Spain. They suggest that there has been an increase in educational inequalities despite the large increase in educational attainment.

Finally, Corak (2006) provides a review of the international evidence from a variety of studies. Building upon Grawe's approach (2004), he attempts to account for the biases introduced by different methodologies by studying how results from different approaches are compared to the U.S., for which the most estimates are available. Corak then scales estimates from other countries up or down depending on the likely biases compared to a "best estimate." He concludes that for the U.K. and the U.S. β is around 0.5, for France 0.4, for Germany and Sweden 0.3 and that Canada and the other Nordic countries have βs of around 0.2. Holmlund, Lindahl and Plug (2011) also review the empirical literature that estimates the causal effect of parent's schooling on child's schooling and conclude that estimates differ across studies. They consider three main explanations of why this is the case: (i) differences in data, (ii) differences in remaining biases between different identification strategies and (iii) differences across identification strategies in their ability to make out-of-sample predictions.

Equality of Opportunity and the Effect of Expansion

The empirical evidence presented in the previous section suggests a strong relationship between family and social background and the children's educational attainment. In turn, higher educational attainment will translate into higher levels of income and/or well-being during their life cycle. These findings suggest that equality of opportunity is violated to the extent that achievement depends not only on effort but also on circumstances outside of individuals' reach. A question arising is whether the so-called "massification of higher education" that took place

during the last decades has expanded opportunities for the underprivileged or benefited disproportionately the privileged.

Higher education has expanded in several ways. In some countries, the available number of positions for students increased, through either geographical expansion or enhancements in existing institutions. Other educational systems diversified by offering a broader variety of degrees and investing in post-secondary vocational education. In some cases, these developments have been accompanied by the involvement of the private sector.

Yet, the existing empirical evidence casts doubts on whether the expansion of higher education has significantly promoted equal opportunities. Some authors have investigated the extent to which this expansion was equally or unequally distributed across the income distribution and whether there were shifts in the participation rates and qualification attainment across income groups. For instance, Blanden and Machin (2004, p. 247), in their study on the distributional consequences of the expansion of higher education in Britain, state that: "The results are clear and show that, over this period, higher education expansion has not been equally distributed across people from richer and poorer backgrounds. Rather, it has disproportionately benefited children from relatively rich families."

In a similar empirical inquiry in the context of Italy, Bratti, Checchi and de Blasio (2008), suggest that the expansion of higher education in Italy had only limited effects in terms of reducing educational inequalities. On the one hand, it increased the probability of university enrollment for students from less educated parents. On the other hand, this development was not translated into increased likelihood of attaining a degree. This is an interesting finding because it shows that higher education expansion may improve equality of access, but that does not mean necessarily that other dimensions of equality of opportunity (with respect to completion, performance, access to post-graduate studies and successful transition in the labor market) will improve alongside. Indeed, Bernardi and Ballarino (2012) using two European-wide data sets (EU-SILC 2005 and European Social Survey for 2002 to 2008), analyze the consequences of higher education expansion in advancing equity of educational opportunities. They conclude that the increase in equality of educational opportunities is likely to be accompanied with smaller returns to higher education. What if this reduction in the value of tertiary qualifications is not the same across the board, with some groups of graduate students experiencing higher devaluation of their diplomas?

Nevertheless, data limitations, methodological differences and limited comparability suggest that these analyses should not be interpreted as conclusive evidence on the effect of the expansion of supply on equality of opportunity. The institutional contexts vary considerably from one country to the other and it is very hard to move from the singularity of a case study to conjectures about universal prepositions. However, these findings are indicative of potential problems with the way in which the expansion of higher education is carried out. Empirical evidence suggests that the expansion of educational levels is not an equalizer per se. Educational policies should not only emphasize issues of access or enrollment, but

also the effectiveness of the educational process and how this process affects indirectly or directly students from disadvantaged backgrounds.

In order to identify the effects of the expansion more accurately (such as the effects of different selection criteria used by different types of universities, the structure of the educational system and how it responds to increasing demand for tertiary studies), further studies and meta-analyses are required. Finally, more studies that explore the hierarchically differentiated higher education systems, and the resulting stratification of students, are needed. The research question arising here is whether expansion creates new opportunities or whether it may have a detrimental effect to some groups of students.

DISCUSSION

Our navigation through a varied landscape of methodologies, datasets and institutional contexts characterizing these streams of the literature, returned a number of conclusions and suggestions in relation to empirical research and policy. A number of common findings emerge. First, most empirical findings support the theoretical insights of the Becker and Tomes model regarding the transmission of human capital across generations. Overall, access to education, and specifically to higher education, is influenced by the socioeconomic background of the family. In general, families with affluence of human, financial and social capital tend to produce highly educated children. In turn, educational inequalities transform into income disparities and social segmentation. This is a stylized fact that characterizes most societies in Europe and beyond. Yet, we should highlight the considerable cross-country variation. Scandinavian countries are more egalitarian than Anglophone countries, while continental and southern Europe states stand in-between despite large within-cluster variations.

This taxonomy is not surprising as it permeates almost all types of cross-country comparisons with respect to inequalities (income inequalities, poverty, material deprivation, access to education and health, etc.). This means that the establishment of a level playing field in higher education may not be a sector-specific errand. Perhaps, embracing holistic approaches in fighting inequalities produces the best results. This might be due to the existence of important spillovers between combating inequalities with respect to education, access to public services, income or even health. For example, the reduction of income inequalities through progressive social policy may indirectly ameliorate educational inequalities, or societies characterized by low income inequality may develop a collective ethos which is hostile to social hierarchies. In turn, these institutional contexts facilitate the implementation of sector-specific policies such as reducing ethnic segregation in schools (thus increasing the future chances of children from migrant background to continue their studies).

Another stylized fact that merits attention is the persistence of inequalities in opportunity in most post-industrial societies. Especially, in the context of the recent economic downfall, this finding may be alarming. The past years of economic abundance facilitated the expansion of higher education as well as the

implementation of income and social policies designed to increase life opportunities for people across income levels. The economic crisis and the austerity measures that were imposed in many countries introduce two new elements. First, families' budget constraints tighten. Secondly, the capacity of states to fight inequalities is restricted. In brief, there is a widening gap between social needs and the capacity to meet them. Would the adverse effects of the crisis cancel out any progress that has taken place over the past decades? To what extent slashing public spending on education is likely to affect disadvantaged groups and therefore equality of opportunity? Does the crisis cause ideological shifts towards more pro-market policies across all spheres of public policy and if yes, how is equality of opportunity influenced in the long run? Inescapably, the majority of studies we reviewed refer to the pre-crisis period. As new datasets will gradually become available, we expect that many authors will focus on the potentially detrimental effects of crisis and austerity in educational opportunity.

The field of educational opportunities also has a distinct interdisciplinary hue. Sociologists and economists have shown keen interest in identifying, measuring and explaining inequalities as well as suggesting policies. Indeed, Coleman's (1988) contribution largely influenced economists and sociologists by attempting to marry these two approaches in explaining how family and wider societal environment influence the creation of human capital. In general, both intellectual streams, economics and sociology, interpret human action from different angles. Sociologists tend to view individuals as particles of the social fabric, governed by social norms, beliefs and obligations. Economists of the tradition of Gary Becker tend to de-socialize individuals by modeling human action as a rational self-interested utility maximizing process. Both approaches, in their extreme, suffer from a degree of superfluous reductionism. However, as our brief review of the theoretical literature indicates, fusing ideas from one field to the other brings about fruitful results. Inevitably, these theoretical insights metastasize in empirical research.

We also found captivating Bourdieu's fierce attacks against the social hierarchies and their effort to preserve the status quo. That is not to say that we embrace Bourdieu's pessimism about the exclusivity of human and social capital, yet the French sociologist showed that the transmission of inequalities occurs through the most subtle and elusive routes. In terms of empirical research, this means that analysts need more detailed and rich datasets in order to identify sources and causes of inequality which otherwise may escape their attention. For example, many analyses regarding access to higher education do not take into account the large heterogeneity among tertiary institutions. Yet this variation among institutions may conceal inequalities in opportunities insofar as the children from low-income families have few chances to study in elite universities. Non-elite universities have lenient admission procedures while elite universities are highly selective. Yet, the latter provide the best chances for following the most rewarding career trajectories. Koutsampelas and Tsakloglou (2014) in their attempt to measure the distributional effects of education in Greece distinguish between high-cost tertiary institutions (universities) and low-cost tertiary institutions

(technological institutions). They find that students from low-income families are under-represented in the high-cost institutions. Meanwhile, graduates of high-cost institutions are mostly located in the upper part of the income distribution.

These issues should be analyzed in the context of the massification of higher education that took place over the last decades. Indeed, the expansion of higher education has increased the number of available slots thus giving more access to higher education to an increasing number of people. Yet, it is likely that pupils from low income families face considerable barriers to access the highest echelons of tertiary education. Expansion of education may have resulted in a decrease of the economic value of tertiary qualifications which in turn may result in stratification within educational systems, enhancing the value of titles acquired by elite universities which afford to be very selective in choosing students. From this perspective, higher education can be seen as a positional good (Hirsh, 1977). In this case, the value of educational qualification diminishes, but not for all.

CONCLUSION

Intergenerational mobility and equality of opportunity are widely accepted moral prescripts in all modern post-industrial societies. However, much should be done to reach these standards. Inequalities in opportunities exist and persist in most educational systems despite the fact that there is large cross-country variation, with some countries achieving better egalitarian outcomes. Expansion of higher education exerts an ambiguous effect on equality which depends on the definition or on the perspective through which equality of opportunity is seen. The recent economic crisis is likely to have changed the landscape. New analyses are needed, utilizing fresh data, aiming at identifying the effects of crisis on equality of opportunity in the context of higher education.

Yet, the empirical research on inequalities is constrained by the lack of detailed data. More refined datasets (in terms of variables describing the socioeconomic status of the family, the type and quality of tertiary studies, the quality of post-graduate studies, the transition and achievements in the labor market) would enable us to identify unexplainable inequalities and trace the origins of social stratification. In this respect, the fusion of insights from economics to sociology and vice versa has already provided interesting contributions. Further emphasis on interdisciplinary understanding could provide even more fruitful outcomes.

NOTES

[1] For example, Becker and Tomes (1979) model formulates parents' altruism by inserting children's utility function into parent's utility function.

[2] However, there were mainly two kinds of problems in the data: There were mistakes in reporting income in particular when people were asked to recall the income of their parents and the current income was uncorrelated with underlying permanent income.

[3] High intergenerational elasticities and correlation indicate low mobility.

[4] A separate literature addresses whether it is the inheritance of genes that drives intergenerational correlation patterns ("nature") or whether a productivity effect of parental education matters ("nurture") (e.g. Black, Devereux, & Salvanes, 2005; Sacerdote 2002).

REFERENCES

Atkinson, A. (1981). On intergenerational income mobility in the U.K. *Journal of Post Keynesian Economics*, 3, 194-218.

Becker, G. S. (1964). *Human capital*. Princeton, NJ: Princeton University Press.

Becker, G. S., & Tomes, N. (1979). An equilibrium theory of the distribution of income and intergenerational mobility. *Journal of Political Economy, 87*(6), 153-189.

Becker, G. S., & Tomes, N. (1986). Human capital and the rise and fall of families. *Journal of Labor Economics*, *4*(3), 1-39.

Behrman, J. R., & Rosenzweig, M. R. (2002). Does increasing women's schooling raise the schooling of the next generation? *American Economic Review*, *92*, 323-334.

Ben-Halima, B., Chusseau, N., & Hellier, J. (2014). Skill premia and intergenerational education mobility: The French case. *Economics of Education Review,* 39, 50-64.

Benabou, R. (1994). Human capital, inequality, and growth: A local perspective. *European Economic Review*, *38*, 817-826.

Benabou, R. (1996). Equity and efficiency in human capital investment: The local connection. *Review of Economic Studies*, *63*, 237-264.

Bernardi, F., & Ballarino, G. (2012). Participation, equality of opportunity and returns to tertiary education in contemporary Europe. *European Societies*, DOI: 10.1080/14616696.2012.750729.

Black, S., & Devereux, P. (2011). Recent developments in intergenerational mobility. In O. Ashenfelter & D. Card (Eds.) *Handbook of labor economics 4B*. Amsterdam: Elsevier, North-Holland.

Black, S. E., Devereux, P. J., & Salvanes, K. G. (2005). Why the apple doesn't fall far: Understanding intergenerational transmission of human capital. *American Economic Review*, *95*, 437-449.

Blanden, J., & Machin, S. (2004). Educational inequality and the expansion of U.K. higher education. *Scottish Journal of Political Economy*, *51*(2), 230-249.

Blanden, J., Goodman, A., Gregg, P., & Machin, S. (2004). Changes in intergenerational mobility in Britain. In M. Corak (Ed.) *Generational income mobility in North America and Europe.* Cambridge: Cambridge University Press.

Bjorklund, A., & Jantti, M. (1997). Intergenerational income mobility in Sweden compared to the United States. *American Economic Review*, *87*, 1009-1018.

Björklund, A., Lindahl, M., & Plug, E. (2006). The origins of intergenerational associations: Lessons from Swedish adoption data. *Quarterly Journal of Economics*, *121*, 999-1028.

Bourdieu, P. (1996). *The state nobility: Elite schools in the field of power*. Stanford: Stanford University Press.

Bratti, M., Checchi, D., & De Blasio, G. (2008). Does the expansion of higher education increase the equality of educational opportunities? Evidence from Italy. *Labor*, *22*(s1), 53-88.

Brezis, E. S., & Hellier, J. (2013). *Social mobility at the top: Why are elites self-reproducing?* Working Paper No. 312. Israel: Department of Economics, Bar-Ilan University.

Chadwick, L. & Solon, G. (2002). Intergenerational income mobility among daughters. *American Economic Review,* 92, *335*-344.

Checchi, D., Fiorio, C., & Leonardi, M. (2013). Intergenerational persistence in educational attainment in Italy. *Economic Letters*, *118*(1), 229-232.

Chevalier, A., Denny, K., & McMahon, D. (2009). A multi-country study of inter-generational educational mobility. In P. Dolton, R. Asplundh, & E. Barth (Eds.) *Education and inequality across Europe.* London: Edward Elgar.

Chusseau, N., & Hellier, J. (2011). Educational systems, intergenerational mobility and social segmentation. *European Journal of Comparative Economics*, *8*, 255-286.

Coleman, J. S. (1988). Social capital in the creation of human capital. *American Journal of Sociology*, *94*, S95-S120.

Corak, M. (2006). Do poor children become poor adults? Lessons from a cross country comparison of generational earnings mobility. In J. Creedy & G. Kalb (Eds.) *Research on economic inequality*. Amsterdam: Emerald Group Publishing Limited.

Couch, K. A., & Dunn, T. A. (1997). Intergenerational correlations in labor market status: A comparison of the United States and Germany. *Journal of Human Resources*, *32*, 210-232.

Das, M. (2007). Persistent inequality: An explanation based on limited parental altruism. *Journal of Development Economics*, *84*, 251–270.

Dearden, L., Machin, S., & Reed, H. (1997). Intergenerational mobility in Britain. *Economic Journal*, *107*, 47-66.

Dustmann, C. (2004). Parental background, secondary school track choice, and wages. *Oxford Economic Papers*, *56*, 209-230.

Heineck, G., & Riphahn, R. T. (2009). Intergenerational transmission of educational attainment in Germany: The last five decades. *Journal of Economics and Statistics, 229*(1), 36-60.

Hertz, T., Jayasundera, T., Piraino, P., Selcuk, S., Smith, N., & Verashchagina, A. (2007). The inheritance of educational inequality: International comparisons and fifty-year trends. *The B.E. Journal of Economic Analysis & Policy*, *7*(2), 1935-1682.

Hirsch, F. (1977). *The social limits to growth*. London: Routledge & Kegan Paul.

Holmlund, H., Lindahl, M., & Plug, E. (2011). The casual effect of parents schooling on children's schooling: A comparison of estimation method. *Journal of Economic Literature*, *49*, 615-651.

Galor, O., & Zeira, J. (1993). Income distribution and macroeconomics. *Review of Economic Studies*, *60*, 35-52.

Grawe, N. D. (2004). Reconsidering the use of nonlinearities in intergenerational earnings mobility as a test for credit constraints. *Journal of Human Resources*, *39*, 813- 827.

Güell, M., Rodríguez-Mora, S., & Telmer, C. (2007). *Intergenerational mobility and the informative content of surnames* (Discussion paper No. 6316). London: Center for Economic Policy Research.

Koutsampelas, C., & Tsakloglou, P. (2014). The progressivity of public education in Greece: Empirical findings and policy implications. *Education Economics*. DOI:10.1080/09645292.2014.884999.

Mazumder, B. (2005). Fortunate sons: New estimates of intergenerational mobility in the U.S. using social security earnings data. *Review of Economics and Statistics*, *87*, 235-255.

Mulligan, C. B. (1997). *Parental priorities and economic inequality*. Chicago: University of Chicago Press.

Nicoletti C., & Ermisch, J. (2007). Intergenerational earnings mobility: Changes across cohorts in Britain. *The B.E. Journal of Economic Analysis and Policy*, *7*(2), 1-38.

Österberg, T. (2000). Intergenerational income mobility in Sweden: What do tax data show? *Review of Income and Wealth*, *46*, 421-436.

Roemer, J. E. (1993). A pragmatic theory of responsibility for the egalitarian planner. *Philosophy and Public Affairs*, 22(2), pp.146-166.

Sacerdote, B. (2002). The nature and nurture of economic outcomes. *American Economic Review*, *92*, 344-348.

Sen, A. K. (1992). *Inequality reexamined*. Oxford: Oxford University Press.

Shavit, Y., Arum, R., & Gamoran, A. (Eds.). (2007). *Stratification in higher education: A comparative study*. Stanford, CA: Stanford University Press.

Solon, G. (1992). Intergenerational income mobility in the United States. *American Economic Review*, *82*, 393-408.

Solon, G. (2002). Cross-country differences in intergenerational earnings mobility. *Journal of Economic Perspectives*, *16*, 59-66.

Solon, G. (2004). A model of intergenerational mobility variation over time and place. In M. Corak (Ed.) *Generational income mobility in North America and Europe*. Cambridge: Cambridge University Press.

Zimmerman, D. J. (1992). Regression toward mediocrity in economic stature. *American Economic Review*, *82*, 409-429.

Sofia N. Andreou
Department of Economics and Economics Research Center
University of Cyprus

Christos Koutsampelas
Economics Research Center
University of Cyprus

PART D

ETHICAL/CORRECT USE OF DATA IN HIGHER EDUCATION

PAUL PRINSLOO AND SHARON SLADE

STUDENT DATA PRIVACY AND INSTITUTIONAL ACCOUNTABILITY IN AN AGE OF SURVEILLANCE

INTRODUCTION

Modern higher education is accountable to a range of stakeholders – typically to national governments, sponsors and other authorities and, increasingly, to employers and students (Burke, 2005; Lauen & Gaddis, 2012; Marope, Wells, & Hazelkorn, 2013). This accountability extends to the use of resources, quality of teaching, and also higher education responses to meet socio-economic demands and needs. Higher education has always used a range of historical student data sources, such as school leaving marks, to plan institutional responses to support student learning. In the context of student retention and success, higher education institutions progressively rely on the real-time information trails left on institutional learning management systems and other platforms to support student intervention strategies and determine the subsequent allocation of resources (Long & Siemens, 2011). The harvesting and analysis combined with dynamic data sets from disparate sources offers huge potential to both provide increasingly complete student profiles, and to offer specific and relevant real-time guidance and customized support (Bichsel, 2012; Booth, 2012; Crow, 2012; Diaz & Brown, 2012; Siemens, 2011). As a result, accountability in higher education is likely to extend to more explicit information regarding which data are harvested and how they are analyzed, but also how they are used within institutions to influence decisions which aim to make teaching and learning more effective and appropriate.

The harvesting and use of individuals' data may be compared to an Orwellian Big Brother or a Foucaultian Panopticon where individuals are watched and then profiled, resulting in a Kafkaesque labyrinth where students may not know what data are harvested, for what purposes and by whom (Prinsloo, 2013; Solove, 2004). This may lead to a perception of students as producers of data and passive recipients of services. In such an unequal relationship, those institutions grant themselves unrestrained rights to harvest, analyze and employ student data. Further, based on a belief that bigger data must be, by definition, better data, higher education institutions often assume that the more data they collect, the more reliable and complete are the resulting student profiles.

While the notion of surveillance is an integral element in the discussion of the harvesting and use of student data, the issue of student data privacy can be approached from a number of different discourses such as institutional accountability, and legal and social definitions of privacy. Our intention is not to

M. E. Menon et al. (eds.), Using Data to Improve Higher Education, 197–214.

analyze and compare (inter)national legal frameworks and legislation, nor to consider the implications of different institutional policies relating to the uses of student data.

While many of the discourses on surveillance focus on concerns regarding an individual's right to privacy (Haggerty & Ericson, 2006; Lanier, 2013; Lyon, 2006; Morozov, 2013a; Solove, 2004), and the moral justification of surveillance (Bauman & Lyon, 2013; Haggerty & Ericson, 2006; Marwick, 2014; Mayer-Schönberger & Cukier, 2013), surveillance is much more than just watching and monitoring; it is also a "calculated practice for managing and manipulating human behavior" (Henman, 2004, p. 176). Surveillance should therefore also be understood within the discourses on governmentality. Focusing exclusively on surveillance is "too narrow" and an exploration of "surveillance as governance" provides a more "analytics capacity for understanding the rationale, operation, effects and transformations of surveillance" (Henman, 2004, p. 177).

In this chapter we aim to explore some of the assumptions and approaches to the use of student data in the context of the discourses of surveillance and specifically raise a number of concerns in the broad area of privacy. Having mapped some of the key issues, the chapter goes on to review a selected number of frameworks regarding the use and analysis of personal data. Based on this analysis, we explore a number of elements that could form the basis for a *student-centered* learning analytics.

PROBLEMATIZING THE HARVESTING, ANALYSES AND USE OF DATA

In any system with noisy data and underdeveloped theory, one of the many dangers associated with data analysis and the resulting predictions is to mistake the noise for the signal. Noise has the ability to pollute "journals, blogs, and news accounts with false alarms, undermining good science and setting back our ability to understand how the system really works" (Silver, 2012, p. 162).

In the wider context, the increasing amount of data noise often results in the creation of "an electronic collage … a life captured in records, a digital person composed in the collective computer networks" (Solove, 2004, p. 1). "Shards of data" are used, often out of context and without reference to timeframe, to create digital dossiers, and these may be used by a huge range of interested parties without necessarily taking into consideration the original purpose and context of data harvested. The producers and owners of these data often know very little about how that personal information is used, and lack the power to do much about it. This "elaborate lattice of information networking" (Solove, 2004, p. 3) consists of information flows between the different computer databases of both private sector and public sector organizations.

Many individuals willingly share personal information on an unprecedented scale, contributing to this "elaborate lattice of information networking" (Solove, 2004, p. 3) without knowing how the information will be used and with very little power to affect its use. Such information is unthinkingly shared through social networking, loyalty cards and online purchasing and browsing. This creates both

the opportunity for various stakeholders to create individual "digital biographies" (Solove, 2004, p. 44), and a presumption that these digital biographies may be taken as complete, up-to-date and reliable sources of information. Solove (2004, p. 46) warns that "we are more than the bits of data we give off as we go about our lives. Our digital biography is revealing of ourselves but in a rather standardized way." These personal overviews are not explicitly authorized, and are to some extent reductive, partial and often inaccurate (Solove, 2004).

Disturbingly, not only do commercial and geopolitical entities increasingly harvest and share data sets (Marwick, 2014; Mayer-Schönberger & Cukier, 2013) but consumers and individuals also increasingly voluntary give up certain elements of privacy for commercial or egoistical gain (Datoo, 2014). This results in "big data-as-a-service" becoming a very lucrative enterprise (Datoo, 2014; Marwick, 2014). "Data about your online and offline behavior are combined, analyzed, and sold to marketers, corporations, governments, and even criminals" (Marwick, 2014, para. 1). "A stupendous amount of information about our private lives is being stored, analyzed and acted on in advance of a demonstrated valid use for it" (Lanier, 2013, p. 69).

While this chapter will focus on the role of the institution in harvesting and analyzing student data, it is important to note that present day surveillance has changed from being uni-directional to a "mutual, horizontal practice" (Albrechtslund, 2008, para. 46). The changed nature of surveillance now also includes social and "playful aspects." In the typology of surveillance developed by Knox (2010), it is clear that surveillance has evolved from being panoptic to synoptic – where everyone is engaged, in one way or another, in watching another (also see Lyon, 2001, 2006, 2007; Varvel, Montague, & Estabrook, 2007).

Boyd and Crawford (2013, p. 2) suggest that

> With the increased automation of data collection and analysis – as well as algorithms that can extract and inform us of massive patterns in human behavior – it is necessary to ask which systems are driving these practices, and which are regulating them.

They moot the following six propositions regarding the use of Big Data:

- Automating research changes the definition of knowledge
- Claims to objectivity and accuracy are misleading
- Bigger data are not always better data
- Not all data are equivalent
- Just because it is accessible, it doesn't make it ethical
- Limited access to big data creates new digital divides.

Danaher (2014) and Morozov (2013a, 2013b) explore the dangers of being ruled by algorithm and the threat of algocracy. Morozov (2013a) points to the fact that both capitalism and bureaucratic administrations "thrive on information flows" and that legislation, technology and markets are active participants in maintaining the demand for data and sustaining capitalism (para. 8). Morozov (2013a) therefore petitions that there is more at stake than protecting the privacy of individuals. The solution to addressing the concerns regarding big data does not lie in more laws, or

tools (ensuring privacy), but in placing the interrogation of big data into the political arena and linking "the future of privacy with the future of democracy in a way that refuses to reduce privacy either to markets or to laws" (para. 46). We therefore need to "politicize the debate about privacy and information sharing," learning to "sabotage the system" by refusing to share information through loyalty cards or participation in the "quantified self" movement and employ "provocative digital services" that reveal who benefits from tracking our digital footprints (Morozov, 2013a, para. 49). Such technologies and services may "help to equalize the balance of power between ordinary humans and epistemologically elite humans" (Danaher, 2014, para. 29).

Despite or amidst the hype around Big Data, Johnson (2013, p. 2) warns that

> the constructed nature of data makes it quite possible for injustices to be embedded in the data itself …. Whether by design or as unintended consequences, the process of constructing data builds social values and patterns of privilege into the data.

Sadowsky (2013, para. 4) therefore advises that "when data is used to allocate resources or anticipate needs, it can perpetuate injustices by over representing privileged groups of people." Solove (2004, p. 48) agrees and states that "databases do not cause the disempowering effects of bureaucracy; they exacerbate them – not merely by magnifying existing power imbalances but by transforming these relationships in profound ways that implicate our freedom." Rosen (2000, in Solove, 2004, p. 48) observes

> Privacy protects us from being misdefined and judged out of context in a world of short attention spans, a world in which information can easily be confused with knowledge. True knowledge of another person is the culmination of a slow process of mutual revelation.

According to Solove (2004, p. 51), privacy also "involves the ability to avoid the powerlessness of having others control information that can affect whether an individual gets a job, becomes licensed to practice in a profession, or obtains a critical loan."

Crawford (2013) warns against the inherent biases in Big Data often ignored by proponents in "data fundamentalism": "Data and data sets are not objective; they are creations of human design. We give numbers their voice, draw inferences from them, and define their meaning through our interpretations" (Crawford, 2013, para. 2). Crawford (2013) continues to warn that we stand the risk of misunderstanding and misallocating resources, because we presume that "big data's numbers …speak for themselves" (para. 5). She closes with the statement "raw data is an oxymoron" (para. 7).

New technologies that "transcend the physical, liberty-enhancing limitations of the old" (Marx, 1998, p. 171) are fast emerging, resulting in permeable boundaries around issues such as privacy, the public good, national security and corporate interests. Current frameworks which guide surveillance in terms of data protection and/or human rights do "not necessarily protect privacy" (Pounder, 2008, p. 1).

Current European legislation applying to surveillance, is spread over "a minimum of three separate pieces of legislation – data protection, human rights and the surveillance legislation," leaving aggrieved individuals with "three possibly divergent routes of redress" (Pounder, 2008, p. 2).

Student Data: Issues to Consider

There is considerable hype and excitement surrounding the potential of learning analytics in higher education, with mounting claims made of how it will assist institutions in, inter alia, making more informed choices in resource allocation and improving student success (Booth, 2012; Long & Siemens, 2011; May, 2011; Oblinger, 2012; Siemens, 2011; Wagner & Ice, 2012). Learning analytics has the potential to assist higher education institutions to find patterns in random noise and to isolate significant signals amidst the increasing levels of data "noise" (e.g. Silver, 2012). Some authors though have flagged concerns regarding the preparedness of current institutional policies and frameworks to provide an enabling and ethical environment for the institutionalization of learning analytics (Bichsel, 2012; Ferguson, 2012; Prinsloo & Slade, 2013), and raise a number of ethical dilemmas associated with the move toward an unthinking automation of the harvesting, analysis and use of student data (Bollier, 2010; Ess, Buchanan, & Markham, 2012; Slade & Prinsloo, 2013).

Diaz and Brown (2012) state that in the broader genre of learning analytics, learners generate "digital footprints, or digital breadcrumbs" as they study and that these may be "supplemented or augmented by data about the learner, such as previous coursework, demographics, and other data that might exist in the student information system" (p. 2). The combination of these data trails and other datasets then allows analysts to "detect patterns and make predictions" (p. 2). Further, these patterns of sensemaking may be informed by comparing individual learners' activities to others in a current or previous cohort, and also to their own activity in earlier courses, whether at the same institution or at a different institution. This raises a number of interesting points, namely:

- The implication that there be inter and intra-institutional integrated course platforms and data that allow comparisons within and between different student cohorts.
- An individual learner's activity in one context is transferable to a different (disciplinary) context.
- Consideration of the different stages of students' learning and life trajectories and the validity of comparing students at different stages.
- The need to understand student identity as a transient concept which ought not to be fully defined by current or earlier activity or data.

In contemplating the ethical dimensions of learning analytics, we find ourselves in the nexus (or liminal space) between a number of debates and discourses such as surveillance studies, the promise and perils of Big Data, and issues of governmentality and privacy. In this nexus, the various discourses often overlap, and the issues raised in one discourse often constitute a response in another.

Reflecting on the issue of ethics in learning analytics can take, as points of departure, elements from bioethics and patient privacy and the ethics in clinical trials; the debates and voices in ethics and morality; national security or legal perspectives on privacy and the ownership of data (Slade & Prinsloo, 2013). None of these approaches are necessarily mutually exclusive.

A review conducted by Prinsloo and Slade (2013) found that, in the case of two mega distance education institutions, the current policy frameworks regarding student data and privacy did not address crucial ethical issues with regard to the harvesting, storage, use and governance of student data and thus did not create an enabling environment for the institutionalization of learning analytics.

FRAMEWORKS FOR REALIZING THE POTENTIAL OF LEARNING ANALYTICS

In this section we explore a selected number of frameworks in an attempt to create a discursive space around the harvesting, and use of, personal information.

In 1973, a Code of Fair Information Practices was formulated which contained the following five principles (in Solove, 2004, p. 104):

- There may be no personal-date record-keeping systems whose existence is secret.
- There must be a way for an individual to find out what information about him (sic) is in the record and how it is used.
- There must be a way for an individual to prevent information obtained about him for one purpose from being used or made available for other purposes without his consent.
- There must be a way for an individual to correct or amend a record of identifiable information about him.
- Any organization creating, maintaining, using, or disseminating records of identifiable personal data must assure the reliability of the data for their intended use and must take reasonable precautions to prevent misuse of the data.

Based on the 1973 Code of Fair Information Practices, Marx (1998) developed a set of 29 questions (see Table 1) dealing with the approach, context and purposes of information gathering, with an emphasis on "the watchers rather than the watched, on avoiding harm rather than doing good, on the individual more than the group, and on the short rather than the long run" (Marx, 1998, p. 173).

Marx recognized that the questions would not satisfy those who "lust after a Rosetta stone of clear and consistent justifications" but aimed to provide the basis for "an imperfect compass than a detailed map" (Marx, 1998, p. 182). Due to the complex nature and interrelationships of the issues involved in the harvesting and use of data in particular contexts, Marx (1998) states that a detailed map "can lead to the erroneous conclusion that ethical directions can be easily reached or to a statement so far in the stratosphere that only angels can see and apply it" (p. 182) and proposed "simple coordinates and rough estimates" to guide ethical data harvesting and use (p. 174).

Table 1. Questions to help determine the ethics of surveillance (Marx, 1998, p. 174).

Means	1. Harm: Does the technique cause unwarranted physical or psychological harm? 2. Boundary: Does the technique cross a personal boundary without permission (whether involving coercion or deception or a body, relational, or spatial border)? 3. Trust: Does the technique violate assumptions that are made about how personal information will be treated, such as secret recordings? 4. Personal relationships: Is the tactic applied in a personal or impersonal setting? 5. Invalidity: Does the technique produce invalid results?
Data collection context	6. Awareness: Are individuals aware that personal information is being collected, who seeks it, and why? 7. Consent: Do individuals consent to the data collection? 8. Golden rule: Would those responsible for the surveillance (both the decision to apply it and its actual application) agree to be its subjects under the conditions in which they apply it to others? 9. Minimization: Does a principle of minimization apply? 10. Public decision-making: Was the decision to use a tactic arrived at through some public discussion and decision-making process? 11. Human review: Is there human review of machine-generated results? 12. Right of inspection: Are people aware of the findings and how they were created? 13. Right to challenge and express a grievance: Are there procedures for challenging the results, or for entering alternative data or interpretations into the record? 14. Redress and sanctions: If the individual has been treated unfairly and procedures violated, are there appropriate means of redress? Are there means for discovering violations and penalties to encourage responsible surveillant behavior? 15. Adequate data stewardship and protection: Can the security of the data be adequately protected? 16. Equality-inequality regarding availability and application: (a) Is the means widely available or restricted to only the most wealthy, powerful, or technologically sophisticated? (b) Within a setting is the tactic broadly applied to all people or only to those less powerful or unable to resist? (c) If there are means of resisting the provision of personal information, are these means equally available, or restricted to the most privileged? 17. The symbolic meaning of a method: What does the use of a method communicate more generally? 18. The creation of unwanted precedents: Is it likely to create precedents that will lead to its application in undesirable ways? 19. Negative effects on surveillants and third parties: Are there negative effects on those beyond the subject and, if so, can they be adequately mediated?

Uses	20. Beneficiary: Does application of the tactic serve broad community goals, the goals of the object of surveillance, or the personal goals of the data collector? 21. Proportionality: Is there an appropriate balance between the importance of the goal and the cost of the means? 22. Alternative means: Are other, less costly means available? 23. Consequences of inaction: Where the means are very costly, what are the consequences of taking no surveillance action? 24. Protections: Are adequate steps taken to minimize costs and risk? 25. Appropriate vs. inappropriate goals: Are the goals of the data collection legitimate? 26. The goodness of fit between the means and the goal: Is there a clear link between the information collected and the goal sought? 27. Information used for original vs. other unrelated purposes: Is the personal information used for the reasons offered for its collection and for which consent may have been given, and do the data stay with the original collector, or do they migrate elsewhere? 28. Failure to share secondary gains from the information: Are the personal data collected used for profit without permission from, or benefit to, the person who provided it? 29. Unfair disadvantage: Is the information used in such a way as to cause unwarranted harm or disadvantage to its subject?

More recently, Pounder (2008) proposed a number of principles to support the harvesting and use of personal data. The principles range from considering the rationale for the surveillance (principle 1), the process and elements required in getting approval to collect data (principle 2), the need to separate the authority who does the surveillance and the authority who oversees the surveillance (principle 3), adherence to agreed upon principles by those who do the surveillance (principle 4), rules and guidelines to ensure transparent and accountable reporting (principle 5), the need for independent supervision of surveillance activities (principle 6), the protection of the privacy rights of individuals (principle 7), procedures to ensure compensation should surveillance activities cause harm (principle 8), and the principle that ensures that surveillance is ceased if conformity to the previous eight principles is compromised (principle 9).

Table 2. A summary of Pounder's (2008) nine principles.

Principle 1: The justification principle	An assessment must be possible to ensure that "surveillance can be justified in terms of pressing social needs and measurable outcomes" (p. 11-12). Information regarding the surveillance policy (e.g. justification, complaints procedures) "should be made proactively available by the public authority performing the surveillance (e.g. on an appropriate web-site)" (p. 12).
Principle 2: The approval principle	Surveillance must be limited to lawful purposes based on legislation/policy that "has been thoroughly scrutinized" and

	"where appropriate, informed public debate has taken place" (p. 13). The first two principles "are likely to draw out any alternatives to the surveillance, and thereby strengthen the justification for, and the public acceptability of, any surveillance that is eventually authorized" (p. 13).
Principle 3: The separation principle	The authority that authorizes the surveillance cannot be the same authority that sets the procedures for surveillance and monitors the surveillance – "the more invasive the surveillance, the wider the degree of separation" (p. 14).
Principle 4: The adherence principle	Surveillance should be managed in a professional way and audited; staff should be adequately trained and the training assessed; and "any malfeasance in relation to a surveillance activity can be identified and individuals concerned suitably punished" (p. 15). Should individuals raise legitimate concerns, the appointed regulator should "possess sufficient clout to resolve and investigate any problem" (p. 16).
Principle 5: The reporting principle	An appointed regulator shall "determine what records, … are retained and maintained concerning a surveillance activity to ensure transparency and accountability" to appropriate structures (e.g. the public, Parliament) (p. 16).
Principle 6: The independent supervision principle	This principle emphasizes that the surveillance activity is independent of, e.g. the Government, "well-financed, and has effective powers of investigation and can delve into operational matters." Also, "the more invasive the surveillance, the more important it is for the powers of the Regulator to be available" (p. 17).
Principle 7: The privacy principle	This principle protects individuals' right to the privacy of personal data and includes "the right to object to the processing of personal data in appropriate circumstances" (p. 18).
Principle 8: The compensation principle	In the case where individuals suffer damage, distress or detriment caused by surveillance, individuals have the right to compensation.
Principle 9: The unacceptability principle	In the event where the previous eight principles cannot be complied with, the surveillance should cease, or alternative measures should be taken to ensure conformity, or an appropriate regulatory or legislative body should approve non-compliance.

While the above two frameworks do help to highlight a number of relevant issues relating to surveillance, Solove (2004) warns that current structures represent an "architecture of vulnerability, one with large holes, gaps, and weak spots" (p. 119). The harm is not only due to the gaps and holes, but "caused by the architecture itself" (p. 119). The only way out of this impasse is through implementation of the two general aims of the Fair Information Practices, namely participation and responsibility (Solove, 2004). Solove (2004) suggests as a requirement the participation of individuals and groups in the harvesting and use of their own personal information, and secondly, that the "collection and use of personal information is an activity that carries duties and responsibilities" (Solove, 2004, p. 121).

In following Diller (1996), Gilligan (1982) and Held (2005), we propose an ethics architecture or an "ethics of care" as a basis for a moral approach to learning analytics that may stand in stark contradiction to the governmental and "technocratic predictive logic" inherent in much of the current discourses in learning analytics. An ethics of care is a counter-narrative to the dominant neoliberal discourses providing a basis for the hegemony of managerialism and performativity in higher education (Hennessy & McNamara, 2013; Peters, 2013). Many of the discourses on the impact of surveillance practices focus on individuals' right to privacy, often juxtaposed to the moral justification of surveillance by state agencies (Bauman & Lyon, 2013; Marwick, 2014; Mayer-Schönberger & Cukier, 2013). An ethics of care focuses on "the responsibility of people to others in caring for relationships" (Patton, 2000, para. 24). Seeing learning analytics as a *relational* practice means that we should never separate the practice of learning analytics from the consequences of conflating information about a person with the inherent worth and future potential of an individual (Bauman & Lyon, 2013). The technocratic logic in Big Data and learning analytics often results in disembodied information profoundly shaping, often irrevocably, the futures of individuals and groups of people.

An ethics of care will involve individuals and groups in the gathering and use of their personal information; providing individuals and groups with access to the stored information and insight into how it may be used, and would go some way to addressing many concerns. Indeed, it might be suggested that a more responsible approach would be to offer a default option to opt in to the harvesting and use of personal information rather than the more usual default option to opt out. "The architecture should empower people with an easy, quick, and convenient way to challenge inaccuracies about their personal information as well as fraudulent entries …" (Solove, 2004, p. 121).

The second element of an ethics architecture is the principle that the harvesting, storage and use of personal information entails clear duties of stewardships and responsibilities. Ethics architectures for learning analytics should address specific issues in different contexts in response to an institution's "understanding of the scope, role and boundaries of learning analytics and a set of moral beliefs founded on the respective regulatory and legal, cultural, geopolitical, and socioeconomic contexts" (Slade & Prinsloo, 2013, p. 9). Slade and Prinsloo (2013) therefore developed a set of principles that are, on the one hand, broad enough to allow for context and institution-specific responses, and on the other, offer sufficient clarity on foundational issues regarding ethical issues in learning analytics. They list the following principles:

1. Learning analytics as moral practice: Amidst the increasing technocratic pressures to harvest and report on data, education, per se, should focus on appropriate and desirable outcomes, not only on those interventions that prove effective. Interventions can be effective, but neither appropriate nor desirable (e.g. Biesta, 2007). Learning analytics as moral practice is a counter-narrative to attempts to justify the harvesting and analysis of data, often without consent, on the basis that the end justifies the means.

2. Students as agents: Students are much more than passive recipients of services and/or producers of data. Students can and should be seen as agents making informed decisions regarding, inter alia, the number of courses they take, and decisions to dropout. Stage and Hossler (2000) suggest that students are active agents in the whole process of making choices regarding persisting with or cancelling their studies. Students are therefore not "passive recipients of experiences" (Stage & Hossler, 2000, p. 172). Students' self-efficacy is furthermore not linear and only progressive, but often spiral and cyclical (Prinsloo, 2009; Stage & Hossler 2000; Subotzky & Prinsloo, 2011).

   Learning analytics as moral and student-centered practice should involve students in proactively sharing information as well as co-interpreting and updating outdated data (see also Kruse & Pongsajapan, 2012). Students should therefore be equal partners in learning analytics as a discursive and disclosive space (Stoddart, 2012) and be enabled to see learning analytics as serving their learning and development. Diaz and Brown (2012, p. 7) emphasize that we must realize "that students are not univariate actors. Students engage in various activities related to learning, making it difficult to arrive at definitive conclusions, especially for the middle band of students, as opposed to the high- and low-performing students."
3. Student identity and performance as temporal dynamic constructs: Slade and Prinsloo (2013) point to student identity and their trajectories of becoming as central to learning analytics as moral practice. "Students should be allowed to evolve and adjust and learn from past experiences without those experiences, due to their digital nature, becoming permanent blemishes on their development history" (p. 11). While digital dossiers and biographies (Mayer-Schönberger, 2009; Solove, 2004) do not have expiry dates and often function as "digital tattoos" (Mayer-Schönberger, 2009, p. 14), student records should have "an agreed-upon life span and expiry date, as well as mechanisms for students to request data deletion under agreed-upon criteria" (Slade & Prinsloo, 2013, p. 11).
4. Student success is a complex and multidimensional phenomenon: Student success is often portrayed as a one-sided affair where the full responsibility for success (or failure) rests on students. Student success is the result of mostly non-linear, multidimensional, interdependent interactions at different phases in the nexus between student, institution and broader societal factors (Subotzky & Prinsloo, 2011). One of the dangers in learning analytics as an act of harvesting and analysis of student data is that we can forget that success or failure often results from a mismatch between personal and institutional dispositions and processes and the dynamic interaction with macro-societal factors (Subotzky & Prinsloo, 2011). This is in stark contrast with the proposal made by Willis, Campbell and Pistilli (2013, para. 13) that emphasizes ethical principles that are "actionable for the student."
5. Transparency: A recurring theme of the metaphors discussed in this paper, is the lack of transparency not only in the methods used for the collection of data, but also its use. Slade and Prinsloo (2013, p. 11) state that "higher education

institutions should be transparent regarding the purposes for which data will be used, under which conditions, who will have access to data and the measures through which individuals' identity will be protected."

6. Higher education cannot afford to not use data: The first five principles suggested by Slade and Prinsloo (2013, p. 12) form the basis for the use of student data in learning analytics. The sixth principle "makes it clear that higher education institutions cannot afford to *not* use learning analytics." Learning analytics allows higher education institutions to be more accountable to all stakeholders (including students) and allows institutions to be more transparent with regard to the allocation of resources and pedagogical decisions taken. Willis et al. (2013, para. 1) also highlight the responsibility that comes from "knowing" – "once an administration 'knows' something about student performance, what ethical obligations follow?" (also see Diaz & Brown, 2012).

Based on these principles, Slade and Prinsloo (2013) continue to moot a number of considerations for learning analytics as moral practice, namely:

- Who benefits and under what conditions? This question is the most important question to clarify and forms the basis for considering the ethical implications in learning analytics' regimes. This does not, however, mean that because learning analytics is seen as serving the interests of students, other considerations with regard to consent, privacy, etc. are disqualified. Trust between the institution and students is of extreme importance and Stoddart's (2012) proposal of a discursive-disclosive regime is appropriate.
- Conditions for consent, de-identification, and opting out, including considerations regarding vulnerability and harm. Slade and Prinsloo (2013) ask whether there are any conditions where the notion of informed consent as default may be waived, and what would be the criteria for doing so. This also raises the issue whether the waiving of the (current) default position of "opting out" should not be changed to "opting in." Students may then be consulted with regard to which data are included and excluded by "opting in" and made to understand the implications of "opting out."
- Vulnerability and harm involve the consequences of being profiled as, for example, a student who is "at risk" based on a number of characteristics and harvested data. This also raises the question regarding the validity of the combination of criteria and the epistemologies on which certain algorithms are based (see, for example, Hickman, 2013). Based on the dangers of stereotyping or classifications based on incomplete data, Slade and Prinsloo (2013, p. 14) suggest that "institutions should provide additional opportunities for these students either to prove the initial predictive analyses wrong or incomplete, or to redeem themselves despite any initial institutional doubt regarding their potential." There is also a need to provide mechanisms for redress for students and institutions alike (Slade & Prinsloo, 2013).
- Data collection, analyses, access and storage. Student learning and progress involves much more than the digital breadcrumbs left on an institutional learning management system (LMS), and there is a need to review expectations regarding the predictive value of such data. Should institutions also harvest and

combine data from sources outside of the LMS, students have not only the right to know, but also the right to provide consent and have access to the analyses and profiling in their digital dossiers. Slade and Prinsloo (2013) stress that data harvested in one context do not necessarily transfer to other contexts. Diaz and Brown (2012) warn that "…while the LMS may be the starting point for much early learning analytics work, learning is a complex and highly contextualized activity" (p. 7-8). Online algorithms furthermore also create the possibility for "autopropaganda" resulting in an incestuous cycle of recycling past actions and search histories (Pariser, 2011).

Student-centered learning analytics (as suggested by Kruse & Pongsajapan, 2012; Slade & Prinsloo, 2013) enshrines access to the processes involved in the harvesting of data, the epistemologies, assumptions and evidence on which algorithms are based, as well as the scope and content of students' digital dossiers. Students have the right to know how data are stored, who has access to their digital dossiers (and under which conditions) and be informed regarding the process of redress in case of a breach of trust and violation.

- Governance and resource allocation. The adequate allocation of resources and providing an enabling and protective policy environment is an essential requirement for learning analytics as moral practice.

TOWARDS A STUDENT CENTERED LEARNING ANALYTICS CONTRACT

The idea of a social contract is not new – although applied to the context of learning analytics, the application of the notion of a social contract between students and the institution is novel. Since its origins in the classical Greek and Roman periods, throughout the work of Hobbes, Locke and Rosseau, the social contract between the individual and the state entails, in broad strokes, mutual agreement that the individual agrees to forego or cede some of his or her rights for a range of other protections and services.

A number of authors (e.g. Bauman, 1998, 2011, 2012; Bauman & Lyon, 2013; Henman, 2004; Mayer-Schönberger & Cukier, 2013) discuss how the nature of the social contract between state and corporate capital and individuals has irrevocably changed with ubiquitous surveillance as one of the defining characteristics of the 21st century (Lyon, Haggerty, & Ball, 2012). In this new social contract, the collection, and analysis of information and the resulting segmentation of populations and profiling of individuals have become naturalized (Henman, 2004; Marwick, 2014; Webster 2004).

Against this backdrop, we petition for a new social contract based on an ethics of care. The following elements are, in our opinion, the minimum requirements for a fair and student-centered approach to learning analytics.

a. The harvesting and analysis of aggregated, non-personalized data is essential for the rendering of effective and appropriate teaching and learning opportunities and pathways, and is therefore a justified and integral part of the mandate of a higher education institution (e.g. see, Pounder, 2008, first principle; Prinsloo & Slade, 2013; Slade & Prinsloo, 2013). Even though higher education institutions

have access to data of individual students, students should be given an opportunity to make informed decisions regarding whether to opt in to specialized, customized services and support (see, Marx, 1998, questions 6-19). It is crucial that the institution and student understand the role of students as agents, and not merely as the producers of data and passive recipients of services (Diaz & Brown, 2012; Slade & Prinsloo, 2013; Stoddart, 2012).

b. Students are informed regarding the scope of data harvested, the purpose of the harvesting, the conceptual models informing the algorithms used to analyze the data, the individuals and departments that have access to the data, the life span of their digital records (Slade & Prinsloo, 2013) or "digital tattoos" (Mayer-Schönberger, 2009), and procedures to have access to their digital dossiers (Kruse & Pongsajapan, 2012; Marx, 1998, question 12; Pounder, 2008, principle 6).
c. Students accept the responsibility to inform the institution of any change in life circumstances that affects not only the relevance/accuracy of students' digital dossiers, but also the effectiveness and appropriateness of the services which the institution renders (Diaz & Brown, 2012). Slade and Prinsloo (2013) emphasize that student identities are temporal and dynamic constructs necessitating procedures to ensure the relevance and accuracy of student data.
d. The institution should ensure that the surveillance of activities and the harvesting of data will not harm, in any way, students' progress in their studies (see, Marx, 1998, questions 1-5). Students do not have the option to opt in to the harvesting and analyses of aggregated student data, but can opt out of having their personalized data shared with some stakeholders. In choosing to opt in or out, students understand and accept the implications of their choices. The university commits itself to adequate data stewardship and data security.
e. The university commits to having human review of machine-generated results and should there be any possibility of different interpretation of the data, students themselves will have the opportunity to confirm the analysis (Boyd & Crawford, 2013). There are furthermore established procedures for challenging the result of an analysis. In the event of unfair treatment or violation of trust or procedures, students have access to redress (see, Marx, 1998, questions 11-14).
f. Higher education institutions accept the reality that the available data, algorithms employed, and analyses provide context and time-specific, provisional and incomplete pictures of students (Crawford, 2013; Johnson, 2013). Institutions will, therefore, take reasonable steps to ensure that the algorithms used to analyze data are frequently reviewed and validated (Boyd & Crawford, 2013; Slade & Prinsloo, 2013).

CONCLUSIONS

Exploring learning analytics against the backdrop of increased accountability in an age of surveillance opens a necessary discursive space offering a much-needed critical lens on the issue of student data privacy in higher education.

Current frameworks and architectures exploring the complexities and ethical dilemmas in the harvesting and analyses of data are mostly incomplete with a number of "large holes, gaps, and weak spots" (Solove, 2004, p. 119). Acknowledging the gaps and vulnerabilities in these architectures can be addressed through participation and responsibility (Solove, 2004). Should higher education realize the immense potential of learning analytics (Booth, 2012; Long & Siemens, 2011; Oblinger, 2012; Siemens, 2011), the effort must be driven through as a result of the active engagement of students – not as producers of data but as full participants – with rights as well as duties (Kruse & Pongsajapan, 2012).

A student-centered learning analytics contract based on an ethics of care acknowledges that higher education institutions cannot afford not to harvest, integrate and analyze disparate data sets in order to plan more effective and appropriate learner support. Realizing the potential of learning analytics can be enhanced when students know the scope and purpose of data harvesting as well as have access to their digital dossiers. Where students' personalized data are used and shared, students furthermore have a right and responsibility to make informed decisions to consciously opt in or out of personalized and customized support.

Student identities are dynamic, temporal, context and time-specific constructs. A student-centered learning analytics contract therefore requires students to accept a responsibility to contribute relevant and correct information and institutions of higher learning to use this information with care.

While Big Data clearly offer considerable opportunities for tailored and directed support, the provision of a student-centered learning analytics approach should also provide the necessary checks and balances to protect both students and higher education institutions from data fundamentalism, the dominance of technocratic predictive logic, and from confusing noise as signal.

REFERENCES

Albrechtslund, A. (2008). Online social networking as participatory surveillance. *First Monday, 13*(3). Retrieved from http://firstmonday.org/htbin/cgiwrap/bin/ojs/index.php/fm/article/viewArticle/2142/1949

Bauman, Z. (1998). *Globalization: The human consequences*. Cambridge, U.K.: Polity Press.

Bauman, Z. (2011). *Collateral damage: Social inequalities in a global age*. Cambridge, U.K.: Polity Press.

Bauman, Z. (2012). *On education: Conversations with Riccardo Mazzeo*. Cambridge, U.K.: Polity Press.

Bauman, Z., & Lyon, D. (2013). *Liquid surveillance*. Cambridge, U.K.: Polity Press.

Bichsel, J. (2012). *Analytics in higher education: Benefits, barriers, progress and recommendations*. Louisville, Colorado: EDUCAUSE Center for Applied Research.

Biesta, G. (2007). Why ''what works'' won't work: Evidence-based practice and the democratic deficit in educational research. *Educational Theory, 57*(1), 1-22. Retrieved from http://www.vbsinternational.eu/files/media/research_article/Evidencebased_education_Biesta1.pdf

Bollier, D. (2010). *The promise and peril of big data*. Washington, DC: The Aspen Institute. Retrieved from http://www.aspeninstitute.org/sites/default/files/content/docs/pubs/The_Promise_and_Peril_of_Big_Data.pdf

Booth, M. (2012, July 18). *Learning analytics: The new black*. Retrieved from http://www.educause.edu/ero/article/learning-analytics-new-black

Boyd, D., & Crawford, K. (2013). *Six provocations for big data*. Retrieved from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1926431

Burke, J. S. (2005). *Achieving accountability in higher education: Balancing public, academic and market demands.* San Francisco, CA: John Wiley & Sons.

Code of Fair Information Practices. (1973). Retrieved from http://simson.net/ref/2004/csg357/handouts/01_fips.pdf

Crawford, K. (2013, April 1). The hidden biases in big data. *Harvard Business Review*. Retrieved from http://blogs.hbr.org/cs/2013/04/the_hidden_biases_in_big_data.html

Crow, M. M. (2012, July 18). No more excuses: Michael M. Crow on Analytics. Retrieved from https://net.educause.edu/ir/library/pdf/ERM1241P.pdf

Danaher, J. (2014, January 7). *Rule by algorithm? Big data and the threat of algocracy*. Retrieved from http://ieet.org/index.php/IEET/more/danaher20140107

Datoo, S. (2014, January 14). *Big data: 4 predictions for 2014*. Retrieved from http://www.theguardian.com/technology/datablog/2014/jan/14/big-data-4-predictions-for-2014

Diaz, V., & Brown, M. (2012). *Learning analytics: A report on the ELI focus session*. Retrieved from http://net.educause.edu/ir/library/PDF/ELI3027.pdf

Diller, A. (1996). Ethics of care and education: A new paradigm, its critics, and its educational significance. In A. Diller, B. Houston, K. P. Morgan, & M. Ayim (Eds.) *The gender question in education: Theory, pedagogy and politics*. Boulder, Colorado: Westview Press.

Ess, C., Buchanan, E., & Markham, A. (2012). *Ethical decision-making and internet research: 2012 recommendations from the AOIR ethics working committee*. Unpublished draft.

Ferguson, R. (2012). *The state of learning analytics in 2012: A review and future challenges* (Technical Report KMI-12-0). Milton Keynes, U.K.: Knowledge Media Institute, The Open University. Retrieved from http://kmi.open.ac.uk/publications/techreport/kmi-12-01

Gilligan, C. (1982). *In a different voice: Psychological theory and women's development*. Cambridge, MA: Harvard University Press.

Haggerty, K. D., & Ericson, R. V. (Eds.). (2006). *The new politics of surveillance and visibility*. Toronto, Canada: University of Toronto Press.

Held, V. (2005). *The ethics of care: Personal, political, and global*. New York: Oxford University Press.

Henman, P. (2004). Targeted! Population segmentation, electronic surveillance and governing the unemployed in Australia. *International Sociology, 19*, 173-191.

Hennessy, J., & McNamara, P.M. (2013). At the altar of educational efficiency: Performativity and the role of the teacher. *English Teaching: Practice and Critique, 12*(1), 6-22.

Hickman, L. (2013, July 1). How algorithms rule the world. *The Guardian*. Retrieved from http://www.guardian.co.uk/science/2013/jul/01/how-algorithms-rule-world-nsa

Johnson, J. A. (2013, April). *From pen data to information justice*. Paper presented at Midwest Political Science Association Annual Conference, Chicago, Illinois, USA. Retrieved from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2241092

Knox, D. (2010, October). *Spies in the house of learning: A typology of surveillance in online learning environments*. Paper presented at Edge2010, Memorial University of Newfoundland, St. Johns, Newfoundland, Canada. Retrieved from http://www.mun.ca/edge2010/wp-content/uploads/Knox-Dan-Spies-In-the-House.pdf

Kruse, A., & Pongsajapan, R. (2012). *Student-centered learning analytics*. Retrieved from https://cndls.georgetown.edu/m/documents/thoughtpaper-krusepongsajapan.pdf

Lanier, J. (2013). How should we think about privacy? Making sense of one of the thorniest issues of the digital age. *Scientific American, 309*(5) 64-71.

Lauen, D. L., & Gaddis, S. M. (2012). *Accountability pressure, academic standards, and educational triage*. Society for Research on Educational Effectiveness. Retrieved from http://files.eric.ed.gov/fulltext/ED530122.pdf

Long, P., & Siemens, G. (2011). Penetrating the fog: Analytics in learning and education. *EDUCAUSE Review*, September/October, 31-40.

Lyon, D. (2001). Facing the future: Seeking ethics for everyday surveillance. *Ethics and Information Technology, 3*, 171-181.

Lyon, D. (Ed.). (2006). *Theorizing surveillance: The panopticon and beyond*. Devon, U.K.: Willan Publishing.

Lyon, D. (2007). *Surveillance studies: An overview*. Cambridge, U.K.: Polity Press.

Lyon, D., Haggerty, K. D., & Ball, K. (2012). *Routledge handbook of surveillance studies*. New York, NY: Routledge.

Marope, P. T. M., Wells, P. J., & Hazelkorn, E. (Eds.). (2013). *Rankings and accountability in higher education: Uses and misuses*. Paris, France: UNESCO. Retrieved from http://unesdoc.unesco.org/images/0022/002207/220789e.pdf

Marwick, A. E. (2014). How your data are being deeply mined. *The New York Review of Books*. Retrieved from http://www.nybooks.com/articles/archives/2014/jan/09/how-your-data-are-being-deeply-mined/?pagination=false

Marx, G. T. (1998). Ethics for the new surveillance. *The Information Society: An International Journal, 14*(3), 171-185. DOI: org/10.1080/019722498128809.

May, H. (2011). *Is all the fuss about learning analytics just hype?* Retrieved from http://www.loomlearning.com/2011/analytics-schmanalytics

Mayer-Schönberger, V. (2009). *The virtue of forgetting in the digital age*. Princeton, NJ: Princeton University Press.

Mayer-Schönberger, V., & Cukier, K. (2013). *Big data: A revolution that will transform how we live, work, and think*. New York, NY: Houghton Mifflin Harcourt Publishing Company.

Morozov, E. (2013a). The real privacy problem. *MIT Technology Review*. Retrieved from http://www.technologyreview.com/featuredstory/520426/the-real-privacy-problem/

Morozov, E. (2013b). *To save everything, click here: Technology, solutionism, and the urge to fix problems that don't exist*. London, U.K.: Penguin Books.

Oblinger, D. G. (2012). Let's talk analytics. *EDUCAUSE Review*, July/August, 10-13.

Pariser, E. (2011). *The filter bubble: What the Internet is hiding from you*. London: Viking.

Patton, J. W. (2000). Protecting privacy in public? Surveillance technologies and the value of public places. *Ethics and Information Technology, 2*, 181-187.

Pounder, C. N. M. (2008). Nine principles for assessing whether privacy is protected in a surveillance society. *Identity in the Information Society, 1*, 1-22. DOI 10.1007/s12394-008-0002-2.

Peters, M. A. (2013). Managerialism and the neoliberal university: Prospects for new forms of 'open management' in higher education. *Contemporary Readings in Law and Social Justice, 5*(1), 11-26.

Prinsloo, P. (2009). *Modeling throughput at Unisa: The key to the successful implementation of ODL*. Retrieved from http://umkn-dsp01.unisa.ac.za/handle/10500/6035

Prinsloo, P. (2013). *Ethics and learning analytics as a Faustian pact: Between Orwell, Huxley, Kafka and the deep blue sea*. Presented at the LASI13 conference, Pretoria, South Africa. Retrieved from http://www.up.ac.za/telematic/sahela2013/day2-9h30-sahela2013-paul_UNISA_ethics_and_learning_analytics_as_a_fuastian_pact.pdf

Prinsloo, P., & Slade, S. (2013, April). An evaluation of policy frameworks for addressing ethical considerations in learning analytics. In *Proceedings of the Third International Conference on Learning Analytics and Knowledge* (pp. 240-244). New York: ACM. Retrieved from http://dl.acm.org/citation.cfm?id=2460344

Rosen, J. (2000). *The unwanted gaze: The destruction of privacy in America*. New York, NY: Random House.

Sadowsky, J. (2013). *The injustices of open data*. Retrieved from http://www.slate.com/blogs/future_tense/2013/06/28/open_data_can_promote_social_injustice.html

Siemens, G. (2011). *Learning analytics: Envisioning a research discipline and a domain of practice*. Paper presented at 2nd International Conference on Learning Analytics and Knowledge (LAK12), Vancouver, Canada. Retrieved from http://learninganalytics.net/LAK_12_keynote_Siemens.pdf

Silver, N. (2012). *The signal and the noise: The art and science of prediction*. London, U.K.: Allen Lane.

Slade, S., & Prinsloo, P. (2013). Learning analytics: Ethical issues and dilemmas. *American Behavioral Scientist, 57(*10), 1509-1528. DOI: 10.1177/0002764213479366.

Solove, D. J. (2004) *The digital person: Technology and privacy in the information age*. New York, NY: New York University Press.

Stage, F. K., & Hossler, D. (2000). Where is the student? Linking student behaviors, college choice, and college persistence. In J. M. Braxton (Ed.) *Reworking the student departure puzzle*. Nashville, TN: Vanderbilt University Press.

Stoddart, E. (2012). A surveillance of care: Evaluating surveillance ethically. In K. Ball, K. D. Haggerty, & D. Lyon (Eds.) *Routledge handbook of surveillance studies.* London, U.K.: Routledge.

Subotzky, S., & Prinsloo, P. (2011). Turning the tide: A socio-critical model and framework for improving student success in open distance learning at the University of South Africa. *Distance Education, 32*(2), 177-193.

Varvel, V. E., Montague, R. A, & Estabrook, L. S. (2007). Policy and e-learning. In R. Andrews & C. Haythornthwaite (Eds.) *The Sage handbook of e-learning research.* London: Sage.

Wagner, E., & Ice, P. (2012). *Data changes everything: Delivering on the promise of learning analytics in higher education.* Retrieved from http://www.educause.edu/ero/article/data-changes-everything-delivering-promise-learning-analytics-higher-education

Webster, A. (2004) State of the art, risk, science and policy – Researching the social management of uncertainty. *Policy Studies, 25*(1), 5-18. DOI: 10.1080/0144287042000208206.

Willis, J. E. III, Campbell, J. P., & Pistilli, M. D. (2013). Ethics, big data, and analytics: A model for application. Retrieved from http://www.educause.edu/ero/article/ethics-big-data-and-analytics-model-application

Paul Prinsloo
The Institute for Open and Distance Learning
University of South Africa

Sharon Slade
Faculty of Business and Law
Open University (United Kingdom)

PAUL GIBBS

PRIVACY, ANALYTICS AND MARKETING HIGHER EDUCATION

INTRODUCTION

Marketing of higher education may be an appropriate response by an institution to the induced competitiveness of globalization's commoditization, but it is hard to justify in terms of demand. Higher education certainly does seem to be a provision for which there is unlimited demand, when offered at the right price and to the right people. Moreover, in a consumerist world its value is one that is tradable, as is any other investment. This commoditization is a process of conversion of the implicit personal and social good of education, as a source of well-being, into a saleable product with a financial return on investment. This has morphed how we understand education and edification. The result is the creation of a means to an end, where the intrinsic good of education has been replaced by the effectiveness of its ability to act as a means to something else. The transactions involved in this process are codified in terms of money: fees, starting salaries and rates of return. They are expressed and measured in terms of data that take on a credibility of their own. In such a context, it is hardly surprising that the rich tapestry of what higher education offered in the recent past, albeit exclusively, as liberal education, civic duty and contribution to the common good, has been instrumentalized. Managerialism has trivialized the edification of the process, replacing it with pseudo-measures of efficiency. These measures of the processes are based most frequently on hard, measurable financial metrics instead of what is more difficult to conceptualize but that accurately represents personal well-being. The metrics used achieve the goal of simplicity but at the cost of summarizing and dehumanizing the human condition (Arendt, 1998).

Competition for student fee revenue is central to almost all universities' sustainability, other than those elite institutions whose justified brands and reputation secures research grants and endowments, of course. Such independence from fees enables them to use the elasticity of prices to continue to invest in providing high quality education. It leaves the majority of other institutions trying to find sustainable positioning in the higher education arena. It is an arena articulated in terms of a market and defined by the activities and resources of the elite institutions, leaving them to compete without the capability to react appropriately in a market not of their making. These non-elite institutions compensate with mission statements based upon employment and occupationalism that have clear work and income-generation connotations. Yet even here they fail

M. E. Menon et al. (eds.), Using Data to Improve Higher Education, 215–228.

at the top level, for the elite institutions provide privileged employment within our society. For example, in the U.K. the best vocations attract graduates from the highest ranked and oldest universities. This is an entrenched problem, supported by a private as distinct from state education and graduation from specific universities. A recent survey (Milburn, 2012) shows the concentration of certain universities in the senior legal profession and journalism. It found that the U.K. judiciary remains solidly socially elitist, with 15 of the 17 Supreme Court judges and heads of division educated at private schools (paid education, rather than State-provided or supported) before going on to study at the universities of Oxford or Cambridge. Moreover, 43 per cent of barristers attended a fee-paying secondary school, with almost a third going on to study at Oxbridge. Of the country's top journalists, 54 per cent were privately educated, with a third graduating from Oxbridge (Milburn, 2012). Certainly, redressing this imbalance challenges higher education marketers yet, so far, this seems beyond their capabilities or inclinations.

Mittal (1999) argues that numbers help to "meet the challenge of intangibility" when marketing something that cannot be examined before purchase, and this is reflected in texts on experimental approaches to advertising, where "numbers" are cited at the top of the list of "what persuades" (Armstrong, 2010). In much of this marketing literature, numerical information is treated as inherently objective – as if numbers "speak for themselves" rather than being devices deployed in support of an argument. Data use in university marketing, and the question of whether it can be misleading, does not appear to have been studied in any depth. However, there have been recent accusations that some institutions have been adjusting their numbers to influence their audiences. There has been a disturbing shift in university advertising to use data that are deliberately misleading (Bradley, 2013).

Cloud and Shepherd (2012) and Murray (2012) report that leading U.S. law schools have fabricated data to improve their position in league tables. Similarly, a prominent U.S. university admitted to inflating data over a ten-year period as part of a strategy to improve its league table position (Supiano, 2012). In the U.K., Bradley's own paper, which considers the use of data and statistics by universities in their advertising, examined misleading marketing claims in U.K. university prospectuses. From a sample of U.K. university prospectuses, a typology of nine categories of misleading data-based marketing claims is proposed: omission of facts and selective reporting; misleading wording; misleading inferences about an attribute; misleading associations between attributes; misleading endorsements; claim – fact discrepancies; falsehoods; carefully crafted comparisons; and claims without a reference point.

There has been a growing literature on the nature of marketing of higher education, for example from Kotler and Fox (1995), Gibbs and Knapp (2002), Hassan (2003), Bok (2003), Kirp (2004), Hemsley-Brown and Oplatka (2006), Hayes (2009), and Maringe and Gibbs (2009), plus contributions to the *Journal of Higher Education Marketing*. The aim of this chapter is to add directly to the emergent literature on the integrity of higher education marketing and the use of data within it. The task I set myself is about personal privacy and the role of marketing analytics in the marketing of higher education. Although I accept the

economic importance of the development of higher education marketing as a specialist discipline, this chapter is not an implied critique of marketing but an extension of the argument I have made elsewhere (Gibbs, 2006, 2011; Gibbs & Murphy, 2009). I will concentrate here on the use of marketing analytics, not to improve the performance of student learning, but to profile, match and design marketing communication that may either best inform or potentially entrap students into joining universities and undertaking courses. The pivotal questions concern: For whose benefits do marketing analytics act: the profile and objectives of the university or the best interests of the students? To do this, I explore the notion of privacy not as an abstract notion but as a notion of those compliant to the consumerization of higher education. That is, are there different issues and obligations where education is marketized than when it is not?

I have been struck before about the seemingly obvious contradiction of how marketing might work to attract students whose purpose in joining an institution is to exercise and develop their judgement and critical faculties (Gibbs, 2006). I argue in that paper that advertising has a primary intent to persuade, rather than to inform and that, by being intrusive, invasive and manipulative, it is potentially exploitative and can thus harm the goal of an education for the common good by denying autonomous thought. In this sense it is the antithesis of education and acts as a counter to critical thought by encouraging passive acceptance; for it may well be conceptualized as destroying educational values rather than encouraging them.

I would like to focus my concerns with analytics on precise, perceptive analytics rather than trend, or academic analytics. This is a helpful distinction provided by Baepler and Murdoch (2010). The distinction concerns the *a priori* and *a posteriori* use of the data. In academic analytics, the nature of data is data used to predict trends, and this produces models where the main goal is to characterize the general tendencies in a dataset. In contrast, predictive analytics, are designed to characterize specific cases, generating a predicted value or classification of each case without regard to the utility of the model for understanding the underlying structure of the data. Basically, the difference is that data are used in aggregate form in the former and at individual level in the latter. In and of itself, this raises critical questions regarding the use of data that revolve around the notion of invasion of privacy and integrity, and obligations of not harming recipients. This is especially relevant where data are offered up for one use, yet are considered personal and deemed private in another use. Crossing the criteria of use without permission must be carefully justified in contexts where it is generally unacceptable. To use this information is a form of deceit if the intended use is different from that offered to an individual for the release of the information. This is the basis of my argument and one I try to answer by considering the intention of manipulation rather than persuasion; thieving rather than gifting; and contextual justification rather than violation of rights.

I will propose that this is a case which only predictive analysis has to answer, not academic analytics. While the latter tends to collectivize students by treating them all identically to the central tendency case, data mining has a tendency to disaggregate the whole individual into nothing more than the sum of a specified set

of characteristics. Johnson's (2013) comprehensive analysis discusses and begs ethical questions of those who make decisions based on predictive analytical techniques. His examples are based not on marketing but on educational advising and they highlight the danger to a core tenet of higher education: autonomous decision making and responsibility taking. This is especially a concern for their use in the practice and form of formal education learning where electives, courses and individual learning groups are recommended on the basis of these techniques, but they do not concern me here (see Chapter 11). Gathering information to enable an algorithm to reveal patterns for use other than that for which the information was offered up may raise a number of questions about the moral legitimacy of such an invasion of privacy and subsequent usage.

ISSUE OF PRIVACY

The Problem

Scholars have considered the nature of privacy for many years. Some see it as individuals' central and inalienable right to retain control of any information that is captured by others about themselves, as a kind of personality property right (after Locke). Others find the imposition of a notion of privacy rights to be a fallible concept and unworkable, because of the range of conditions and normative variations in what is acceptable in terms of personal privacy, or assumed under communal ownership (as collective participation), which is difficult to determine. Indeed, on reflection and given the variety of privacy conditions evoked by individuals, it is difficult to support a notion of a universal right that can work for all, regardless of social and cultural status. For me it seems that in our everyday engagements within our world and with those within it, any issue of privacy has to be discussed in terms of the prevailing context. For example, it seems reasonable that there are institutions of government that have an interest or stake in that which might be private to us, when considered in terms of the collective good. Unguarded, this might seemingly give government and its agencies the right to surveillance and intrusion in what we might consider private communications and activities, so there need to be limits and justifications. So it might also be argued that, in our consumerized world, the sophistry of marketing has become normatively intrusive in so many ways (including marketing calls–telephone, social media, spam on our internet or discounted offers from our supermarkets or the data mining of blogs to review information) that to worry about privacy is to worry about something already forgone in the pursuit of consumption.

It does, however, seem acceptable that for all of us there are things we would prefer others not to know in general terms, although these terms may be suspended when the "others" are those with whom we have a professional relationship and they have an obligation to us. Our doctors, lawyers and priests may be at the core of these professional exceptions but supermarkets, educational institutions and governments' tax departments might not. Reluctance to show such fears might be due to concerns of embarrassment, shame and the impact on our reputation (films

in hotel rooms), disallowing us from a job (investigation into undeclared disability, sexual orientation, potential drug habits through DNA sequencing) and denying or increasing our insurance rates (generic fingerprinting). To draw a line, one needs criteria that normatively work for all. This might sound straightforward but, as Frey suggests, since there "appears to be no inherent limit on what individuals can think will adversely affect their well being, there seems to be no easy way to circumscribe the kinds of information that individuals want to keep to themselves" (2000, p. 46).

Panoptician surveillance of our daily habits, checking our texting, cookies, blogs and telephone conversation or intrusive CCTV, although seemingly reported regularly in the press seem not to concern most of us, most of the time. The benefits these accrue to the protection of our well-being are accepted, often with little resistance, for we "trust" in the powerful and the control they exert. Moreover, it is very difficult for us to discriminate between what information should be available to others and what should not. That is, others act for their interest, or for those who control them but, more Orwellian, they also act in their prediction of our behavior in ways we ourselves do not yet anticipate. This ought to be a greater fear; it might be sorcery to predict the future but, if, through persuasive messaging it can be causal, we need to be more confident of the trust we invest in these institutional usages.

So what can we say about the data we generate, in respect of the stakes that those who use them, as well as those who create them, have once they have been offered up to them? Clearly, in many societies we have gone past the point of ensuring *a priori* that requests to use bits of information, directly or in combination, are made to use such information and that we give formal consent to use it. Whether this has been caused by our laziness, convenience or ineptitude is rather beside the point. We do allow our privately generated information to be accessed (even if we often sign or tick those consent forms without reading them), for we see the gain as more than the loss, and to claim that we have a right in some way to privacy has to be tempered by this. Even so, is it appropriate for consumer organizations to have free range on how they reconstitute us, almost as de-humanised consumers, without our permission? Can there be any justification that it is done for our own well-being? If such a presumption has validity (and this entails understanding our entitlement to privacy), then it follows that there might be a need to find a moral justification for the methods used to find and reconstitute this information. But talk of rights might be overstated, as yet.

Definition

Privacy is a difficult notion to define. Used as a right of privacy, its history is relatively short for all those other than those who have been rich, for they have been privileged throughout history. There is an extensive literature from many disciplines on the subject and Kemp and Moore (2006) provide a swift and clear summary of the topic. They call upon Solove (2002) to help put order into the expansive theoretical position on privacy. Solove (2002) conceptualized a

taxonomy of the meanings of privacy, which includes six general approaches to the topic. These were: "1) the right to be let alone; 2) limited access to the self; 3) secrecy; 4) control of personal information; 5) personhood; and 6) intimacy" (Solove, 2002, p. 1094). It is the conceptualization of privacy in 1, 2 and 4 that is taken to be most important with regard to the way in which marketing and marketing predictive analytics can most impinge on personal privacy.

The privilege to be let alone, to be autonomous and separated from others, views privacy as a type of immunity or seclusion. This conception recognizes the individual's desire for concealment and for being apart from others. Limited access is closely related to the right-to-be-let-alone conception, and is perhaps a more sophisticated formulation of that right. For Bok (1983), privacy comprises being protected from unwanted access by others – physical access, personal information, or attention – but perhaps the most predominant theories of privacy and most relevant to marketing analytics are those of control over personal information. This includes claims of individuals, groups or institutions to determine for themselves when, how, and to what extent information about them is communicated to others. Clearly this cannot be all-embracing. As I have mentioned above, from a utilitarian perspective it can be claimed that there is some information that should be accessible for government planning, even if one is disinclined to offer it, but for the most part these exemptions are accepted when needed to make life better for all. Solove sums up this concern well when he suggests that:

> The privacy as control-over-information theory at most says that we protect as private all information over which individuals want to retain control. Privacy, however, is not simply a matter of individual prerogative; it is also an issue of what society deems appropriate to protect. (Solove, 2002, p. 1111)

I support this position and hold that the limits of privacy are found in what is acceptable by a society and reflect cultural and sub-cultural norms. This position on privacy does not require a generalizable definition of privacy, which is separate from the context of its provision, but is dependent on what space for privacy is acknowledged and in what ways this might be violated. It necessarily follows from this position that I do not support a notion of privacy that is a human right, for my notion is relative and comparative in nature. Rights imply a duty (positive or negative) to something that spans all humanity, which is difficult to justify in regard to privacy, as are negative rights of non-interference. The argument for non-Kantian rights has a distinctive utilitarian perspective. This does not mean that personal preferences should be ignored, nor that respect for one's privacy should not be upheld, but that the argument does not allow for an entitlement to some form of privacy requiring one to have a clear universal duty to uphold. It allows for laws on privacy, but it is the principle of law that needs to be respected and not any principle of privacy. Cultures can have policies on privacy and individuals do have a right to privacy as far as this defines the relationship between members within that society. Clearly, it would be more equitable if unto each the same level of privacy was afforded, but that just may not be the case. It seems that the best we can do is to seek to understand privacy under the notion of personal desire which,

wherever possible, should be respected by other stakeholders. The power of stakeholders can be disputed, but envisioning one's personal information as not exclusively one's own but jointly produced provides a conceptual framework. This is important to make clear, as it is the premise upon which my arguments for analytics are made.

It is this issue, I believe, that is at the core of privacy and marketing. Property rights could only pertain to personal information if justified by, and viewed as an extension of our own autonomously created self, and autonomously created selves, but this is not the reality. Personal information is formed in relationships with others, defying a stakeholder claim upon it. Indeed, a claim could be made by all parties to that relationship as co-producers of the information and, because of the interwoven nature of such a relationship, it seems implausible to define rights rather than an "interest-in." For example, the value of personal information for advertisers and marketers emerges in part from their consolidation and categorization of that information, given freely in the act of purchase. The conversion of this spasmodic and haphazard information into a coherent entity with predictive agentic characteristics is not explicitly sanctioned by the generator of this information, but within the credo of better value it might be expected to be. This is central to my argument. Reconceptualized information from discrete elements given in consumptive behavior and then used subsequently is not owned by the consumer but by those who create the consumer society in which the consumer engages and benefits. Using the technologies of consumption, that is, credit cards, store cards and the benefits of retailers' electronic logistics, feeds customer desire for satisfaction. Once we have accepted this Faustian pact, the limits to what can be considered to be personal and private are gone. Participation and acceptance of the utilitarian benefit of easier, cheaper consumption are tacit recognitions that others cannot merely satisfy our desires, but predict and even create them.

This may not be a widely held view but it seems to be a reality for many. Indeed, in a recent paper on marketing and database marketing, Patterson, O'Malley and Evans find that, increasingly, "consumers see their control (the essence of consumer sovereignty) being eroded by the actions of organizations" (1997, p. 171). The marketer interrogates information stored on a multitude of databases and reveals, through the use of algorithms, the self we never knew we were; a self that is the *predicted consumer*. It is created by marketers and is owned by them and, when higher education is part of this world, then any notion of standing outside it is lost. It is, in my opinion, a loss not recognized by society; nevertheless, control is in the process of being lost.

All or Nothing

Certainly, this argument is predicated on a functional engagement of those who can legitimately warrant a stake in a consumerized society. That is somehow captured within the collective ethos of consumption that we all, at least tacitly, tend to accept. This, however, seems too crude; there is a more subtle argument that might

consider the type of relationship between the collective (and its two distinctive forms, community or association) and the individual. It raises issues of privacy in each of these public and private domains of our existence and leads to differing levels of collective control of privacy. It could be argued, for instance, that in the public domain there is a difference of alignment, control, trust, and responsibility between a community and an association to whom we owe a small allegiance and from whom, in equity, we expect little in return. The links to community are envisioned as deeper, wider and incurring mutual obligation. In a community there is more concern for the well-being of others one identifies with, and it offers more sustainable reasons to forgo personal desires on behalf of the collective. It gives reasons to assume a collective "we." It seems important that these differences need to be articulated clearly, for the "we" of the community is surely something more substantial than a supermarket's "loyalty" program or a sponsorship of a soccer team. These are associations and do not warrant the same level of acquiescence of personal privacy as, say, issues of national security and family relationships.

This argument is based on the equity principle in Rawls' notion of social justice. It is clear that some use of information that might be considered private but that has consequences for the security of a community has a *prima facie* justification to be shared whereas the identification of equality of benefit when the power and the profit incentive reside in commercial transactions is less easy to justify. Both take data and reconfigure them, and might claim this reconfiguration as their own, so that personal privacy is not at stake, but this seems to be a contrived argument for the association. This relationship goes further than the free, knowing and voluntary disclosure of information; it enables the development and ownership of profiles that determine the nature of the individual within the commercial and unequal association. A "predicted consumer's identity" is ascribed to the individual as a commercial avatar, disconnected from the individual. It is not generated consciously by the individual, for this is self-identity, at least in theory, deserving of solitude and protection, but it actually is a cyber-identity: disembodied, controlled and created by algorithms. The owner of the information for this "being" is the commercial organization, and can be terminated at any time (credit card voided, product offers stopped, incentives not forthcoming), with no agentic direction other than that imposed by the mechanism of the marketing mix. What is the justification for such a Kafkan manufactured entity? The market of course, stupid! Like the courts in *The Trial*, the judges are best ignored – for to worry is to bring disruption, as their decision on what will, can never be an avatar's. Let the powerful Others be, keep one's head down and concentrate on functioning and surviving rather than changing and exploring one's social context. To resist the market (and demanding some privacy could be interpreted as such) only brings alienation – or authenticity. This approach is based on an assertion that in a consumer society marketing performativity is the way of being that creates values not about benevolence towards consumers but consumer consumption, hedonism, procession and profit, through the development of desires and their satisfactory resolution.

Ethics?

To talk of ethics against such a background is problematic; as Bauman describes (2008), this world of consumers is reflective of, rather than resistant to, this emerging human condition. For Bauman, consumerization creates a deferral of discussions from the political to the tenets of the market, resulting in a world as insecure as our own in terms of personal freedom of word and action, including respect for privacy and access to truth. The upshot is "all those things we used to associate with democracy and in whose name we still go to war – need to be trimmed or suspended. Or this at least is the official version, confirmed by official practice" (Bauman, 2008, p. 249). In such circumstances of unstable futures, unpredictability and super-complexity, can we really make an argument for special rights to privacy and why do we really care when comfort is provided by and through the consumer markets? Such possession of the self by the market tends to occur through our apathy, indifference and tacit support for privacy erosion, endorsed for the greater good. Indeed, if the power of the market determines what is appropriate to self-disclose and what is sufficient to represent our transactional self, then in support of market efficiencies it might be considered an inhibitor of the market mechanism to withhold data, causing a blockage in its perfect knowledge by failing to offer up personal data. It might be deemed a form of deception! This is clearly absurdum and so draws the marketing ideal also into question. This is another discussion (and my brief detour into the different states of association and community might offer one specific direction), and clearly mischievous. The greatest risk to transparency in the market is not from consumers but from the suppliers and the commercial organizations who take from consumers and yet fail to divulge their own knowledge, arguing for special exemptions on the basis of security or concerns for competitive confidentiality.

MARKETING ANALYTICS

In the light of my argument that we have given up ownership of our privacy, how then do marketers use analytics to benefit themselves? Greater computing ability has meant more real time analytics; and analytics help to configure data in order to build a relationship from which the holder of the information can influence the actions of the consumer. This clearly has issues of privacy, manipulation, control, exploitation and risk. Such clear ethical issues are not well dealt within the general marketing literature (Perret & Holmlund, 2013), let alone the higher education literature, and it is against this background that I locate this discussion of marketing analytics. In the commercial world, predictive analytics can help cross-selling, up-selling, reducing fraud, product promotion, enhancing customer profitability and enabling customer cost-profiling. As Wible (2011) has suggested, this is the area in which marketing is most likely to be culpable of deception. He argues that marketing deception is most focused on:

> … two main areas: first are cases that involve the intentional deception of people who tend to have compromised intelligence, such as children or the elderly, and second are cases that involve intentional falsehoods or the withholding of vital information. (Wible, 2012, p. 17)

It can also act to exclude people, unbeknown to them, from certain opportunities that others enjoy. In an early study, Patterson et al. (1997) found that the customers' concern about privacy in marketing was information privacy, physical-interaction privacy and accuracy, and also suggested other antecedents such as culture, control and customer knowledge of the techniques used to target them. The authors concluded that practising marketers (and some academics) often contend that compelling arguments can be made in favor of attending to moral/ethical issues, because it does not make good business sense in a marketing environment not to, although this was not evident in the marketing managers whom they investigated!

The exchange of information, as suggested by Rapp, Hill, Gaines and Wilson (2009), surely should be fair and might be considered to be so if what it allows is an institution's use of data to provide tailored offers of needs and wants – but not at a significant cost to the customer in terms of loss of privacy resulting in unsolicited invasion (suggesting that telemarketers pay compensation for the hassle of, say, being interrupted). This privacy issue implies that the consumers have a depth of understanding of the collection process and some perceived control over the use of their private data. However, this is problematic; for instance when computer cookies, as completely unsolicited electronic tracking devices, provide Web utilization records of consumer shopping behaviors (Culnan & Bies, 2003).

For Hauser (2007) marketing analytics focus on coordinating every marketing touch point to maximize the customer experience, as customers move from awareness, to interested, to qualified, to making the purchase. Implicit in this approach is that marketing analytics requires coordination. And here the problem can begin. Who gives permission for data to so be collected and used? Even if they are to be taken and used for one's benefit, without one being able to autonomously intend this to be done, is this illegal and/or unethical? And how should we relate to marketing approaches with which we are familiar, such as loyalty cards or social networks, where the risk of exploitation usually confined to intriguing product offers yet can be much more serious? These are questions one would consider central to the development of any marketing activity in a democratic state, but in the summary article by Hauser, ethics, morality and fairness are not mentioned once. Data mining is the basis of the emergence of data that can reveal certain behavior dispositions and attributes. By definition, this means that it is an all-encompassing process that is continuously monitored and updated.

Ethical concerns have been raised by Nissenbaum (2011) concerning both the privacy of the individual and subsequently the ethics of those organizations that collect and transform the reconstituted information unknowingly revealed by the subject into data. The most important of these concerns is an understanding of the moral privacy rights or conventions that uninvited intrusions contravene, and it is

this discussion that forms the substantial issue of this chapter. The potential of data mining to violate personal privacy in the pursuance of marketing objectives spans a range of applications. Dominant, I suspect, is the notion of intrusion that allows the development of dossiers relating to a range of aspects of personal interactions within individuals' worlds. The inferences made from supplied data are unlikely to have been first sanctioned – unlike medical histories, where the abductive inference of medical professionals is sanctioned as it might save our life. Unsanctioned privacy violations allow for manipulation or discrimination. Danna and Gandy (2002) suggest examples in the marketing of goods in terms of price discrimination and restrictive marketing.

Marketing the Business of Higher Education

In business, predictive analytics are often used to answer questions about customer behavior. Companies want to know whether or not a particular customer is interested in a particular offer. Ultimately, businesses want predictive analytics to suggest how best to target resources for maximum return. Is this how we should behave as higher educational institutions? Why should an educational institution worry about the habits, predilections and interests of students before they engage with them? How do analytics support the recommendation by a leading U.K. higher education association (CIHE, 2005) that the student recruitment and admissions process should be transparent, fair, clear, explicit and implemented consistently? When the institutional role was central to the edifying process, the students held this information and offered as much as they felt worthwhile to secure them a place at an institution where they would be taught and would learn. The ethos of the institution was matched rather carelessly by most students with their own (notwithstanding institutional visits) and a decision taken. It was a seller's market. This has changed. The assumption that the consumer is sovereign, is supported in many cases where fees follow the choices of students. In response, student satisfaction takes a more central stage: Students become the consumer (George, 2007) or at least co-producers.

Conceptualizing higher education as a market then requires institutions to respond to the needs of the market and to allow students to become customers, academics to become service providers and pedagogical development to satisfy economic skills needs. Marketing becomes the process that both enables and shapes educational goals in terms of consumption and immanence. In so doing, marketing totalizes higher education as a technical endeavor whose utility is to provide the shortest time for the acquisition of skills. The danger of this is that it closes off notions of education as a future of imagination and hope, replacing it with an educational endeavor based on the immanence of our being in a world of work designed for the benefit of others. Moreover, it undermines the premise that education is itself, albeit in some Socratic idea, virtuous and leading to an understanding of right conduct, because the inducement to join is potentially ethically questionable through deceit and manipulation. It does seem ironic that at institutions where criticality, reason and the public good have a heritage that has

brought its members respect, marketers (and educationalists) may now disenfranchise the trust they have developed for the state of the market and its inherent unfairness.

It may be difficult, indeed impossible, to change what has happened to us in accepting the market is the determinant of how we will be. Even Marx thought that there was no way back from where we are. A retreat from the human dependency on technology and economic activities towards a more primordial analysis of our conditions is no longer possible. The blunt use of rights, where obligations are unable to be delivered, reduces their values almost to a cry for protection that has no greater strength than the interests that they serve. Bauman (2008) calls upon a truly global political intervention to halt and evaluate the globalized rush toward consumerism. The universities seem unable to hold fast to a freethinking autonomous ethos as they move from ivory towers of thought to factories of employment. This participation in the market and the use of data to drive market technologies and marketing practice does little to indicate that they can hold a moral position on the human condition. Marketing for higher education does little more than reflect the state we are in, whereas it should resist it.

The advance of marketing, with its analytics reshaping our being, is moving us towards our avatars in a self-fulfilling prophecy, feeding on the ideal consumer who is being taught apathy, required conformity and compliance. If the university is marketing itself as a participant in consumer markets and structuring its learning response to the metrics of the few through the imaginary and debased notion of a common good, it is failing in its duty of care. The university is there, I submit, to question rather than to be compliant to the market. Reductions in government funding, students controlling the fees budgets and capital funding becoming more dependent on the generosity of those who have succeeded in the consumerized world merely reinforce dependencies on the views and the knowledge of the powerful. The university ought to be about powerful knowledge and the right to know when to keep it private.

REFERENCES

Arendt, H. (1998). *The human condition.* Chicago: University of Chicago Press.

Armstrong, J. S. (2010). *Persuasive advertising: Evidence-based principles*. New York: Palgrave-Macmillan.

Baepler, P., & Murdoch, C. J. (2010). Academic analytics and data mining in higher education, *International Journal for the Scholarship of Teaching & Learning, 4*(2), 1-9.

Bauman, Z. (2008). *Does ethics have a chance in a world of consumers?* Cambridge: Harvard University Press.

Bok, D. (2003). *Universities in the marketplace*. Princeton: Princeton University Press.

Bradley, J. (2013). Integrity in higher education marketing? A typology of misleading data-based claims in the university prospectus. *The International Journal for Education Integrity*, *9*(1), 74-88.

Cloud, M., & Shepherd, G. (2012). Law deans in jail? *Legal Studies Research Paper Series, Emory University School of Law* No. 12 – 199.

Council of Industry and Higher Education (CIHE). (2005). *Ethics matters: Managing ethical issues in higher education*. London: CIHE & Institute of Business Ethics.

Culnan, M. A., & Bies, R. J. (2003). Consumer privacy: Balancing economic and justice considerations. *Journal of Social Issues, 59*(2), 323-342.

Danna, A., & Gandy Jr., O. H. (2002). All that glitters is not gold: Digging beneath the surface of data mining. *Journal of Business Ethics, 40*(4), 373-386.

Frey, R. G. (2000). Privacy, control, and talk of right. *Social Philosophy and Policy, 17*(2), 45-67.

George, D. (2007). Market overreach: The student as customer. *The Journal of Socio-Economics, 36*, 965-977.

Gibbs, P. (2006). Does advertising pervert higher education? Is there a case for resistance? *Journal of Marketing for Higher Education*, *17*(1), 3-11.

Gibbs, P. (2011). An Aristotelian model for ethical higher education marketing: The role of practical wisdom. *Journal of Marketing for Higher Education, 21*(2), 203-214.

Gibbs, P., & Knapp, M. (2002). *Marketing higher and further education*. London: Kogan Page.

Gibbs, P., & Murphy, P. (2009). Implementation of ethical higher education marketing. *Tertiary Education and Management*, *15*(4), 341-354.

Hassan, R. (2003). *The chronoscopic society: Globalization, time and knowledge in the network economy*. New York: Peter Lang.

Hayes, T. (2009). *Marketing colleges and universities: A services approach*. Washington, DC: Council for the Advancement and Support of Education.

Hauser, W. J. (2007). Marketing analytics: The evolution of marketing research in the twenty-first century. *Direct Marketing: An International Journal*, *1*(1), 38-54.

Hemsley-Brown, J. V., & Oplatka, I. (2006). Universities in a competitive global marketplace: A systematic review of the literature on higher education marketing. *International Journal of Public Sector Management, 19*(4), 316-338.

Johnson, J. A. (2013, May). *Ethics of data mining and predictive analytics in higher education*. Paper presented at the Association for Institutional Research Annual Forum, Long Beach, California. Retrieved from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2156058

Kemp, R., & Moore, A. D. (2006). Privacy. *Library Hi Tech*, *25*(1), 58-78.

Kirp, D. L. (2004) *Shakespeare, Einstein and the bottom line*. Cambridge: Harvard University Press.

Kotler, P., & Fox, K. (1995). *Strategic marketing for educational institutions*. New York: Prentice Hall.

Maringe, F., & Gibbs, P. (2009). *Marketing higher education*. London: Open University Press.

Milburn, A. (2012). *Fair access to professional careers*. Retrieved from https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/61090/IR_FairAccess_acc2.pdf

Mittal, B. (1999). The advertising of services: Meeting the challenge of intangibility. *Journal of Service Research*, *2*(98), 98-116.

Murray, J. (2012). Professional dishonesty: Do U.S. law schools that report false or misleading employment statistics violate consumer protection laws? *Journal of Consumer & Commercial Law*, *15*(3), 97-108.

Nissenbaum, H. (2011). A contextual approach to privacy online. *Daedalus, 140*(4), 32-48.

Patterson, M., O'Malley, L., & Evans, M. (1997). Database marketing: Investigating privacy concerns. *Journal of Marketing Communications*, *3*(3), 151-174.

Perret, P., & Holmlund, M. (2013). Ethics and responsibility in relationship marketing: The business school and the next generation of managers. *Marketing Intelligence & Planning*, *31*(7), 746-763.

Rapp, J., Hill, R. P., Gaines, J., & Wilson, R. M. (2009). Advertising and consumer privacy: Old practices and new challenges. *Journal of Advertising*, *38*(4), 51-61.

Solove, D. J. (2002). Conceptualizing privacy. *California Law Review*, *90*(4), 1087-1155. Retrieved from http://scholarship.law.berkeley.edu/californialawreview/vol90/iss4/2

Supiano, B. (2012). Emory University intentionally misreported admissions data, investigation finds. *Chronicle of Higher Education.* Retrieved from http://chronicle.com/blogs/headcount/emory-uintentionally-misreported-admissions-data-investigation-finds/31215

Wible, A. (2011). It's all on sale: Marketing ethics and the perpetually fooled. *Journal of Business Ethics, 99*(1), 17-21.

Paul Gibbs
Department of Education
Middlesex University

IAN R. DOBSON

USING DATA AND EXPERTS TO MAKE THE WRONG DECISION

The Rise and Fall of Journal Ranking in Australia

INTRODUCTION

Managing Australian universities is far more complex than in the past. Universities now have to deal with a massified student body, competition for students and funding, government pressures to diversify their funding base and demands for "accountability." In the modern world, universities have sought to be attractive to students, improve their operations, develop and protect their "brand," and optimize their place in world university league tables. They also need to deal with irregular cycles of what governments tend to call "reform," reform that will rarely, if ever, be reviewed to test its success and whether it brought about the change or changes defined as desirable. As Redden (2008, p. 18) puts it, "reform is endless in an era bent on the incessant search for greater value for money."

Much of what has been imposed on Australian higher education in the last couple of decades could be roughly described as "new public management." As defined by Hood (n.d., p. 12553) new public management is "a term coined in the late 1980s to denote a new (or renewed) stress on the importance of management and "production engineering" in public service delivery, often linked to doctrines of economic rationalism." In fact, it has been noted that there is an increasing tendency for governments, government agencies and even those responsible for internal university governance and administration to exert "control" over all levels of university life, including research. Various terms have been used to describe these control mechanisms, including the "culture of audit" (Cooper & Poletti, 2011, p. 57), "calibrating academic work" (Hardy, Heimans, & Lingard, 2011, p. 6), and according to Redden (2008, p. 18), "the cut-off culture" and "… hijacking … by those who apply narrow economistic models of human behavior to complex organizational operations" (Redden, 2008, p. 13).

Change has affected the way in which universities deal with their main responsibilities to society: the provision of teaching and undertaking research. On the teaching front, universities now need to cope with many more students than in the past, work in an environment of reduced funding per student, increased competition with research for funds and a highly casualized teaching workforce (Coates, Dobson, Goedegebuure, & Meek, 2009; Junor, 2004; Kimber, 2003). In 1990, there were about 485,000 students (DETYA, 2001), which by 2012 had increased to about 1.2 million.[1] Of this total enrollment, the proportion of foreign

M. E. Menon et al. (eds.), Using Data to Improve Higher Education, 229–242.

students had increased from 3% to 26%, one reflection of the increasing need to fund teaching from other than public sources. All but a few students pay tuition fees. In the case of domestic undergraduates, most of whom have subsidized places, tuition fees are levied in the form of an income contingent loan which is repayable once they have entered the work force. Such students (whether they have graduated or not) start to repay an additional 4% income tax once their annual earnings cross a threshold of about $52,000,[2] increasing progressively to 8% on annual income above $95,000. These additional income tax payments are made until such time as the debt has been paid off (ATO, 2014). Other students, including nearly all foreign students, pay up-front full cost-recovery tuition fees. For a summary of the evolution of the tuition fees environment in Australia, readers could refer to Dobson (1997, 1998), Smart and Ang (1993), and Wikipedia (n.d.), among others.

Between 1990 and 2012, the government-sourced payments did increase from about $13,000 to just over $15,000[3] per domestic student in a "Commonwealth supported place" (NTEU, 2013), but the government proportion of university income fell from 68% to 46%, as the proportion coming from student fees increased from 17% to 40% (DEET, 1992, table 56; DIISRTE, 2012, table 1). This expansion in student numbers has led to a teaching cohort of "casual" teachers that are increasingly hired on short-term and often precarious contracts.[4] In 2002, these teachers represented 23% of the total of all teachers; in 2011, they made up 27%.[5]

On the research front, complexities for universities have also increased considerably. The pressure to apply for, and win, research grants has become extreme. As noted by Goldsworthy (2008, p. 17)

> [Government] funding formulae have caused Australian universities to become obsessed with maximizing external research funding. Considerable pressure is applied to faculties, departments and scholars to apply for funding, and relative success in attracting it is given excessive weight in evaluating research performance.

Goldsworthy also notes that for academics in non-laboratory disciplines, applying for competitive research grants is not a good use of the time that would have been better spent writing books and journal articles. Applications to the two major research funding bodies (see below) typically take many weeks to complete, and the success rate is low, in the order of 25%. This focus on research has also seen much of the growth in university staffing being directed towards research rather than teaching. Between 2002 and 2012, the proportion of teachers declined from 78% to 70% of all academic staff members, compared with an increase in the proportion of research-only academics from 19% to 27%.[6]

Much of Australia's university research is funded through competitive grants, particularly through two statuary authorities, the National Health and Medical Research Council (NHMRC) and the Australian Research Council (ARC). About 41% of research funding comes from these sources. The balance of research funding comes from other government sources (approximately 31%) and private sources provide about 27%. The Australian Research Council's role is to provide

funding under a number of competitive schemes and to administer a program known as the Excellence in Research for Australia (ERA) initiative. The ERA represents one of the "reforms" mentioned above, in that it replaced a program called the *Research Quality Framework*, a scheme eventually criticized for being too labor intensive.

The Australian Research Council website informs that the "excellence in Research for Australia (ERA) initiative assesses research quality within Australia's education institutions using a combination of indicators and expert review by committees comprising experienced, internationally-recognized experts" (ARC, n.d., p. 1). ERA's objectives included laudable practices such as taking stock of national areas of research strength and identifying excellence in research performance and emerging research areas, with some of the processes introduced to make these assessments leaving much to be desired.

The specific coverage of the NHMRC is explicit from its name, but the ARC has a broad role as adviser to the government on research matters. Although research grants are not the focus of this chapter, they are mentioned because of their place in overall research metrics. There have been criticisms of ERA because it treats the winning of grants as a research "output," even if they are really inputs to research (Martin, 2011). Allan has noted that the Australian system rewards an academic that requires an ARC grant to produce research outputs over one producing the same quantity and quality of outputs without requiring a research grant:

> … Australian universities treat the getting of a research grant, and especially a government or Australian Research Council one, not as an input that might possibly lead to some worthy or notable output but *as an output in and of itself, and perhaps the most important output*. It was like deciding which car manufacturer was the best one based on how much money it got from the government. (Allan, 2014, p. 47; emphasis in the original)

Not only have universities had to improve their self-management, they have also needed to deal with the "red tape" elements of governmental accountability requirements. Even if universities now receive a lower proportion of their income from the government, the extent of compliance and reporting has increased. The annual compliance cost for universities has been estimated at $280 million, of which about $120 million are "direct compliance costs," and $160 million are "total reporting costs" (Grattan, 2013).

THE ADVENT OF DATA-DRIVEN HIGHER EDUCATION

Australian universities have become competitors in a national and global marketplace. They must compete for students, particularly full-fee-paying students (both foreign and domestic) and are now more likely to base their decisions on the analysis of masses of data. They aspire to make the best possible decisions in the highly competitive contemporary world of higher education, and a greater emphasis on planning and marketing in order to maintain an inflow of students and

an outflow of contended graduates has become the norm. Within Australian universities, such work is typically undertaken by *planning* or *statistics* offices with duties which in North America would usually be described as *institutional research*.[7] The responsibilities of such offices typically cover the collection, analysis, storing and reporting on their university's students, academic staff and general staff,[8] courses, subjects, results and student experience. This is also usually the office responsible for collecting and reporting information to government bodies in order to meet legislative requirements. Australian universities typically have quite large research support offices, and most aspects of research data gathering and analysis will be performed there.

JOURNAL RANKING: JUDGING A BOOK BY ITS COVER?

This chapter's main focus is on one aspect of the ERA initiative: journal ranking, and specifically on how a data-driven quest for quality led to the establishment of an unscientific and highly subjective system of placing journals into tiers, with the intention of assessing the alleged quality of the papers published within those journals. However, it is difficult to see how such a list of journals could ever achieve an objective measure of research output.

The procedure for the 2012 "ERA Ranked Outlets Consultation" had the ranked list of journals from 2010 as the starting point. The first phase of this was a public consultation, scheduled for 14 February to 4 April, 2011. This was to be followed by final recommendations being made by the peak bodies and academic groups consulted by the ARC (2011). The ARC's Fact Sheet stated that individuals who wish to submit feedback to the ARC should be able to justify their knowledge of the journal they were submitting feedback about. The process did not get as far as final recommendations from the contracted peak bodies and academic groups, because the minister responsible for research scrapped the ARC ranked list of scholarly journals on 30 May 2011 (Carr, 2011). The Minister's announcement about the end of ranking included statements to the effect that institutions were using the rankings in ways not originally intended, including trying to manage the performance of staff. With hindsight, it seems naive for the ARC not to have realized that this could happen. In effect, they created a new measurement system, but seemed surprised when universities started to use it. Martin (2011) notes that although university managers should not have used any ERA measures inappropriately, part of the problem was that the process was so susceptible to abuse.

According to the ARC (n.d, p. 1), "a journal's quality rating represents the overall quality of the journal. This is defined in terms of how it compares with other journals and should not be confused with its relevance or importance to a particular discipline." Unfortunately, "overall quality" was never defined.

Under the scheme, scholarly journals were ranked into one of four tiers dubbed A*, A, B and C, representing the top 5%, the next 15%, the next 30% and the bottom 50% of journals, respectively. In effect, there was also a fifth group of journals – those not listed at all. The very act of placing journals into relative

positions on a scale is fraught with problems. How can the journal a paper is published in guarantee the quality of that paper? No one could have any qualms about the quest for "quality" and continuous improvement, but it is important for the assessment of relative quality to be built on objective grounds, whereas the subjectivity of the ARC's scheme was clear from the outset.

The ARC said that ERA was built on "a combination of indicators and expert review…" (n.d.), but assessments based on such premises are problematic. Authors of papers on journal ranking commented on the inadequacy of assuming paper quality on the basis of the journal the paper was published in: "It's a bit like judging a person by the school they went to, rather than who they are …" (Royle, 2010). As Tourish (2011) noted, "… as various studies have documented, many excellent articles are published in lower-ranked journals, while poor work is not infrequently published in top journals."

Another factor was the absence of details about "how" journal ranking was undertaken, despite frequent references to "transparency" by the minister and various spokespeople for the ARC. The initial rankings were undertaken by learned academies and discipline groups, but as noted by Genomi and Haddow, "it is apparent from the available evidence that these organizations handled the task very differently," (2009, p. 5) and "in the absence of a standard process, disciplines … [adopted] a method for journal ranking that is suited to their own research culture" (2009, p. 6). For example, the original rank order of education journals was compiled by the Australian Association for Research in Education (AARE), about which there is more below (Genomi & Haddow, 2009; Hardy et al., 2011). Other discipline-based bodies focused more on metrics (such as was done by the Computing Research and Education Association of Australia), and another method was used by the Australian Political Studies Association, involving provisional ranking by a small panel, responses from members, collation/adjudication, and final revision (Genomi & Haddow, 2009). However, making the process transparent was not a requirement.

Many authors have seen journal ranking as more than just an inappropriate metric for assessing research performance; many saw it in truly negative terms. According to Tourish (2011),

> … such lists are flawed, and are a threat to traditional university values. They demoralize academics, damage scholarship and infringe academic freedom … Increasingly, these lists are used to micro-manage the academic research effort. Academics are steered towards publications in preferred journals, and lambasted for their inadequacy if they do not.

Hardy et al. (2011, p. 7) noted that "journal rankings have become a key part of how governments have sought to manage research in higher education in Australia through a system of research accountability with the ERA."

WHY THOSE PANELS AND THOSE EXPERTS?

The articles and other commentary published on the topic each mentioned several of the problems inherent in journal ranking systems, with some issues being mentioned almost across the board. First, there is an issue of the panels granted authority to place journals into tiers in the first place. In its 2010 review of scholarly journals, the ARC consulted 62 learned academies and discipline-specific bodies, and sought comments from more than 700 experts (Moodie, 2010). Even if the panels were truly comprised of "experts," it is always difficult to avoid the impact of subjectivity and self-interest. What could be more natural than for an expert to favor a journal with which they were familiar over a journal they were less familiar with? Would a relatively new or unknown journal (even one with the highest of qualities) have the chance to be compared favorably with older, esteemed journals better known to experts? How could an expert be objective in ranking relatively new journals? A related point was made by Martin (2011), who suggested that if ARC panel members had published their own work in some journals, they might have a favorable inclination for those journals compared with others which they had not been published in. Why seek to minimize the rating of journals one's own work is in?

In any case, the expertise of "experts" outside their immediate disciplinary purview is dubious, to say the least. For example, the journals closest to my involvement in higher education and those I have mainly published in, attract few submissions from teaching and research academics from education faculties, yet the closest thing to a mouthpiece for all journals identified as "education" was the aforementioned Australian Association for Research in Education (AARE). While in no way criticizing AARE, it is an association of university education academics, but it would not seem to be the right body to speak for journals with a focus on higher education management, policy or planning. In the varied approaches involved in creating journal ranks in the first place, Genomi and Haddow (2009, p. 5) advise that "members of the AARE were asked to complete a survey which collects respondents' opinions on the 10 best journals; journals you publish in or read and journals that impact on policy or professional practice."

In the Australian context, the appropriate "peak discipline bodies" to assess the relative quality of the journals within my sphere of interest would have been the Association for Tertiary Education Management (ATEM), the Australasian Association for Institutional Research (AAIR), and the National Tertiary Education Union (NTEU). None of these was consulted. In the context of the type of journal someone involved in university management, governance, planning and policy might seek to be published in, the AARE does not seem like an appropriate peer review body at all. Among the many differences between AARE and these other organizations is that AARE members will almost invariably be academics from education faculties. By contrast, ATEM and AAIR are almost universally populated by university workers who do not hold academic appointments and who work in central, faculty or departmental administration offices. The third is the 28,000-strong trade union that represents all types of university staff, whether they

hold an academic appointment or not. One thing these three bodies have in common is that each publishes a scholarly journal.[9]

It is unlikely that an author who is an administrator or manager would write papers about teaching pedagogy or academic assessment. Nor would they be likely to submit their papers to a journal that focuses on university teaching. In fact, there are relatively few higher education journals world-wide that a university manager could seek publication in. On the other hand, a career education faculty academic whose research area is teaching-related would not usually expect to be published in a journal devoted to university management, administration, or institutional research. Therefore, an academic from a faculty of education is likely to judge as superior journals that publish articles in their own fields of interest. They are unlikely to have a very high opinion about journals that fall outside their own area, and even less knowledge about the type of material such journals do publish.

A related factor that shows the weakness of ranked lists of journals as a measure of research output is the intended or unintended self-interest of the panel members. Paragraphs above related to whether the discipline bodies given the power to rank one journal against others had enough knowledge about the whole breadth of a research group (such as education). According to some commentators, the relative importance of some Australian journals was exaggerated by the ARC panels. For example, in a news item about the ERA journal ranking, Moodie (2010) noted a general over-rating of Australian journals. Moodie (2010) also noted that disciplines managed to provide their own "examples of apparently anomalous journal ratings which seem to reflect the personal preferences of the people consulted by the ARC."

Another related problem is that a journal's reputation in the minds of experts could be based on a high citation rate, but that high rating might have been due to the very high impact of a relatively small number of papers (Martin, 2011). The lower suitability for impact metrics in assessing relative journal quality was mentioned earlier. This situation is closely related to experts' subjective impressions for other reasons. As noted by Hardy et al. (2011, p. 5), "ranking provides a surrogacy for the actual quality of research and its reporting."

HOW "REGULAR" IS A GIVEN JOURNAL?

A second assumption on which any ranking system is built is that a journal's relative place will remain immutable, until formal reassessment takes place. The creators of journal ranking assume a unitary rating (Martin, 2011), but many journals are less than regular in their treatment of submissions. Sometimes an issue of some journals will be given over to a collection of papers given at the conferences sponsored by the organizations that publish the journal in question. In fact, some journals, or at least specific editions of journals, are produced almost exclusively from conference papers. Even if there is a review process for assessing the better papers from a conference to be published in the journal, there can be no guarantee that the published content of that journal has been the same over time. Other journals have special editions on specific topics with guest editors from time

to time, and these could be assembled according to criteria that are different from those used in assessing relative quality for "normal" issues of the journal. Papers could be solicited rather than randomly submitted by authors and might therefore be subjected to a less stringent process of review. The main issue is that no matter the rating afforded a given journal, the procedures followed between submission and publication will not always be the same.

DISCRIMINATION: ARE SOME DISCIPLINES MORE EQUAL THAN OTHERS?

Journal ranking schemes encourage publication in disciplinary journals and in fact, they discriminate against interdisciplinary research and interdisciplinary journals. The higher-rating journals tend to be high-status within disciplinary fields and are therefore oriented towards other researchers. They are inward-looking, and promote inward-looking behavior. In effect, public engagement is discouraged. However, as Martin (2011, p. 100) has noted, "many of today's most pressing issues cut across traditional academic boundaries. By sending a signal that interdisciplinary research is less valued, the ERA is encouraging a retreat from engaging with real-world problems."

Redden (2008) noted that public intellectualism collaboration and interdisciplinary research are undervalued. What this also means is that specialized journals that are read by relatively few scholars working in the same area tend to out-rank less specialized journals that are more outward oriented.

If journal ranking is in any way linked to the journal's impact, it has been noted that the usefulness of bibliometric tools "differs considerably between disciplines, and that they are of least value in the humanities … citation-based metrics are considered to have validity in the sciences, but far less so … in the humanities …" (Genomi & Haddow, 2009, p. 8).

Because ERA's prime focus in research assessment was "international," Australian research that was not pitched at international matters was in effect downgraded. Therefore, work by scholars dealing with issues that do not lend themselves to international comparison can be work down-played because it was not written in an international context. Some journals were afforded a low rank, because their aim was to promote Australian domestic matters rather than delving into the international issues favored by the ERA program.

A useful case study that exposes the short-sighted nature of journal ranking can be found with *People and Place*, which had an extraordinarily high media and policy impact in Australia. Four issues a year were produced for 18 years, focusing on Australian regional and national social policy, welfare and education issues. Papers from this journal made a major media splash most times an issue was released, and were responsible for many policy shifts in Australian political life. As noted in the editorial of its last issue

> Almost all of the A* journals are elite international journals [in demography] with little interest in research focused on Australian conditions. While People and Place has had a significant influence on public policy in Australia, it does not have an international profile. (Betts & Birrell, 2010, p. 1)

Initially listed as a B-ranked journal, it was subsequently demoted to C in a manner that did not match the ARC's rhetoric about transparency. The impact of being rated as C was "that research published in People and Place by academics actually diminishes the possibility of their university gaining a high rating …" (Betts & Birrell, 2010, p. 1).

People and Place was not the only victim in the de facto attack on domestic rather than international research. As noted by Betts and Birrell (2010, p. 2)

> In the social sciences and humanities, research relating to local issues is of huge importance, as is research contributing to the solution of social problems in Australia. Such work is unlikely to be rewarded in the current journal-classification scheme, since few international journals will have any interest in such issues.

In fact, People and Place was spawned out of "a desire to publicize and promote debate about issues important to the development of Australian society" (Betts & Birrell, 2010, p. 1), yet in the end, for it to survive, People and Place would have needed to go against its original philosophy and become an internationally-focused "conventional" journal. The editors chose not to do so.

Further analysis of the bias theme can be found in analysis undertaken by Hardy et al. (2011) in a study that examined the impact of discipline. Focusing on the education field, they "argue that journal ranking is not benign; that in its quest for apparent transparency, it obscures more than it reveals" (Hardy et al., 2011, p. 5). They argue that ranking is a surrogate for quality of research, and that only 5% of journals fall within the A* category in what is a zero-sum game. Further, research is skewed towards utility and they note "the restrictions which ranking demands engender a narrowing and reparochializing of the research imagination" (2011, p. 5). In other words, research will become restricted to "safe" areas of practical endeavor, rather than take a broader "blue skies" approach.

The overall question that must be asked is whether the quality of a paper goes down just because it was published in a C-ranked, rather than an A* journal? As Martin (2011) put it, will one's income drop if they move to live in a lower-status suburb? It must be remembered that placing things into a percentile ranking is a zero-sum game: A journal that finds itself at the margin between the fifth and sixth percentiles, 19th and 20th percentiles, or 49th and 50th percentiles, could be promoted or demoted for completely exogenous reasons, the next time the process is reviewed.

Hardy et al. (2011) examined the distribution of education journals by ERA ranking and world region. They found that 3.2% of education journals were ranked A*, 12.8% were ranked A, 32% were ranked B and 52% were ranked C or were unranked, indicating a mismatch between the putative ERA distribution and the actual. They also noted a strong regional bias towards the U.S. and the U.K. among editors, with over three-quarters of editors of A* and two-thirds of A-ranked journals affiliated with universities in the U.S. or U.K. As to publishers, most A* and A journals were published by the major international publishing houses:

Routledge/Taylor & Francis (34%), Sage (19%), Wiley (13%), 13% by other international publishing houses and 21% by U.S. societies or universities.

They further noted that only one education journal was linked to the region Australia is located in, namely, the Asia-Pacific Journal of Teacher Education, edited by an Australian. This point links back to one made earlier: Someone writing about educational policy and planning is unlikely to be published in the Asia-Pacific Journal of Teacher Education. Those that ranked education journals found no A* journals that had a focus on management, policy or planning, and relatively few ranked A that would be a reasonable target.

Journal ranking would seem to inflict a double blow to humanities and social science researchers in Australia, and create a chicken and egg scenario. The international journals awarded the highest status are overwhelmingly located in the northern hemisphere, and Australia-focused research in the humanities and social sciences is less likely to be considered relevant to these major international journals (Young, Peetz, & Marais, 2011).

There is also the matter of impact in terms of how many people are exposed to a scholarly paper. Most journals, particularly the older, well-established ones are published by international publishing houses. Copies of journals, and even individual papers, tend to be expensive, although many in scholarly communities have access to a wide range of journals electronically through university libraries. However, one could argue that a paper that is freely available through the internet will have the opportunity to influence more people than one that must be paid for. In this sense, the "impact" of the freely available journal will be higher.

UNINTENDED CONSEQUENCES

"Unintended consequences" became an oft-repeated expression in commentary about the ARC's journal ranking and its use started long before journal ranking was abolished. During the public consultation phase, some journals involved themselves in a process of indirect lobbying of the ARC. Some journals contacted everyone on their mailing lists (such as the authors of previously published articles) alerting them to the process available for "the public" to lobby the ARC to boost the ranking of that journal. We are unlikely to find out which journal was the first to contact its author base in that way, but the practice quickly spread, with many journals asking their constituencies to promote that journal. It is unlikely that the Australian Research Council would have expected the volume of direct lobbying that followed. Perhaps this also occurred in Britain during its own Research Selectivity Exercise in 1986 or in subsequent Research Assessment Exercises from 1989.

The unintended consequences arose because those designing the ARC's journal ranking failed to think laterally about the possible consequences of what they were doing. Perhaps the major unintended impact has been that universities quickly started to use journal ranking as a way to increase their control over academic staff. As predicted by Redden (2008), ranking tiers become the source of micromanagement of research within institutions, with publication of research

results (whether ground-breaking or not) becoming secondary to the artificial rank attributed to the journal in which it was published. In the Australian setting, many reward systems came to be based on the level of the journal, not the quality of the paper, as such a scheme valorizes journal ranking as a measure of quality (Cooper & Poletti, 2011; Redden, 2008).

Even though the Minister responsible for the education and research portfolios, announced the ARC's abandonment of its journal ranking at the end of May, 2011, in many places the use of that list continues. As Allan (2014, pp. 48-49) puts it, "… universities … had incorporated this list into how they judged academic output within the university. So an abandoned list – one that could no longer be changed – was still being used to assess excellence …." An unfortunate on-going result of journal ranking has been that some faculties in some universities started to require their staff to publish only in journals ranked as A* or A. In particular, this scheme has been promoted strongly by the Australian Business Deans Council. At least their website notes that

> There is considerable variability in the average quality between marginal journals at either end of each rating category. Journal lists should be a starting point only for assessing publication quality. There is no substitute for assessing individual articles on a case by case basis. (ABDS, 2013, p. 1)

However, it is nonsensical and even bizarre to expect young or early career scholars to target only the top-ranked journals. Desk rejection, whereby papers are not sent for peer review is becoming more and more common, because of the pressure that editors and blind peer reviewers find themselves under. If novice scholars were to target "lesser journals," they might be more likely to get peer review comments about their papers, and even if not accepted for publication, there would be some career growth to be enjoyed. Is it reasonable to expect novices to target only the so-called top journals in their field?

Arguably, another unintended consequence was the loss of faith in the ARC itself, and something like the loss of face by the ARC. Before and during the consultation process, it was difficult to get answers to direct questions: People who could respond to queries were not in the office and telephone calls went unreturned. Written responses also failed to respond to direct questions, were slow in coming and were typically built around tracts copied and pasted from the ARC website. Obfuscation was the order of the day. Transparency and accountability are always demanded of universities, but there seems to be little reciprocation of either by government departments and their agencies.

CONCLUSION

A data-strong approach should lead to a greatly improved capacity to make good decisions. However, just having data does not guarantee a good outcome unless those data are accompanied by sensible management and genuine transparency. If the ARC had started with a more open-minded research question, then perhaps

there would not have been an assumption that journal ranking was a scientific way to assess performance in the first place.

How is it that a scheme that was so clearly flawed could be entertained at all by those connected with policy development in and for universities? Why did universities and their representative organizations acquiesce to such a patently subjective scheme? Similarly, once the media was filled with commentary on the undesirable aspects of the process, how could the Australian Research Council continue to advocate the scheme? Such things will forever remain part of life's rich tapestry.

The biggest harm done by the ARC's creation of a ranked list of journals is that part of many academics' performance into the future will be based on a subjectively-assembled list that has been abandoned. Universities and discipline-based groups that allow this situation to continue should also be asked to rethink their position.

Perhaps the final word can be left with Martin (2011, p. 102), who speaking more broadly than just the journal ranking scheme noted that

> The ERA is all about promoting research, but curiously enough there is little research foundation for the ERA itself. It is not evidence-based; indeed, there seems to have been no systematic comparison with alternatives. Rather than the government imposing a competitive measurement scheme, a different approach would be to open up space for diverse proposals to improve research.

NOTES

1 Calculated from uCube (Department of Education, 2013).

2 As at August, 2014, A$52,000 was approx. €35,000 (approx. 1:0.67).

3 Expressed in 2009 values.

4 Such staff are hired on "casual" contracts, paid on an hourly or sessional basis, and have no access to paid annual, sick or long-service leave.

5 Calculated from uCube (Department of Education, 2013).

6 Calculated from uCube (Department of Education, 2013).

7 Few of Australia's 35 or so multi-disciplinary universities have a so-named *institutional research office* due to some extent to resistance to the use of the word "research" in anything other than an academic context.

8 "General staff" (increasingly referred to as "professional staff") are those staff not occupying academic posts. Although referred to as "non-academic" staff by the government and various others, it is no longer appropriate to refer to any group in oppositional terms. In 2012, general staff comprised 55% of all university staff (Department of Education, 2013).

9 The author hereby declares his "interest" in these matters. He was a career university administrator when in formal employment in Australia until 2005, is a member of the three organizations mentioned, is currently editor of the scholarly journals of two of these bodies (ATEM and the NTEU) and is a past editor of the journal published by the third (AAIR).

REFERENCES

Allan, J. (2014). Why universities are just not good enough. *Quadrant*, *LVIII* (3). Retrieved from http://quadrant.org.au/magazine/2014/03/australian-universities-just-good-enough/

Australian Business Deans Council (ABDC). (2014). *ABDC journal quality list 2013*. Retrieved from http://www.abdc.edu.au/pages/abdc-journal-quality-list-2013.html

Australian Research Council (ARC). (n.d.). *The excellence in research for Australia (ERA) initiative*. Retrieved from http://www.arc.gov.au/era/journal_list_dev.htm

Australian Research Council (ARC). (2011). *ERA 2012 ranked outlets consultation fact sheet*. Retrieved from http://www.canberra.edu.au/ucresearch/attachments/pdf/n-z/ERA_2012_Ranked_Outlets_Consultation_Fact_Sheet1.pdf

Australian Tax Office (ATO). (2014). *Help repayment thresholds and rates*. Retrieved from http://www.ato.gov.au/rates/help-repayment-thresholds-and-rates/

Betts, K., & Birrell, B. (2010). Editorial [online]. *People and Place*, *18*(4), 1-2.

Carr, K. (The Hon.). (2011). *Improvements to excellence in research for Australia*. Retrieved from http://minister.innovation.gov.au/Carr/MediaReleases/Pages/IMPROVEMENTSTOEXCELLENCEINRESEARCHFORAUSTRALIA.aspx

Coates, H., Dobson, I., Goedegebuure, L., & Meek, L. (2009). Australia's casual approach to its academic workforce. *People and Place, 17*(4), 47-54.

Cooper, S., & Poletti, A. (2011). The new ERA of journal ranking. *Australian Universities' Review, 53*(1), 57-65. Retrieved from http://www.aur.org.au

Department of Employment, Education and Training (DEET). (1992). *Selected higher education statistics 1991*. Canberra: AGPS.

Department of Education. (2013). *uCube statistical database*. Retrieved from http://www.highereducationstatistics.deewr.gov.au/Default.aspx

Department of Education, Training and Youth Affairs (DETYA). (2001). *Higher education students time series tables*. Canberra: Commonwealth of Australia.

Department of Industry, Innovation, Science, Research and Tertiary Education (DIISRTE). (2012). *Finance 2010*. Retrieved from http://www.innovation.gov.au/highereducation/ResourcesAndPublications/HigherEducationPublications/FinanceReports/Pages/Finance2010.aspx

Dobson, I. R. (1997). HECS – The rise & rise of "user pays" in Australian Higher Education, Perspectives. *Policy & Practice in Higher Education, 1*(4), 116-122.

Dobson, I. R. (1998). Overseas students in Australian higher education: Trends to 1996. *People and Place*, *5*(1), 24-29.

Genomi, P., & Haddow (2009). ERA and the ranking of Australian humanities journals. *Australian Humanities Review, 46*. Retrieved from http://www.australianhumanitiesreview.org/archive/Issue-May-2009/genoni&haddow.htm

Goldsworthy, J. (2008). Research grant mania. *Australian Universities' Review, 50*(2), 17-24. Retrieved from http://www.aur.org.au

Grattan, M. (2013, April 8). Australian Universities tied up in $280 million red tape. *The Conversation*. Retrieved from http://theconversation.com/australian-universities-tied-up-in-280-million-red-tape-13308

Hardy, I., Heimans, S., & Lingard, B. (2011). Journal rankings: Positioning the field of educational research and educational academics. *Power and Education*, *3*(1), 4-17.

Hood, C. (n.d.). Public management, new. *International Encyclopedia of the Social & Behavioral Sciences*, 12553-12556. Retrieved from http://www.christopherhood.net/pdfs/npm_encyclopedia_entry.pdf

Junor, A. (2004). Casual university work: Choice risk and equity and the case for regulation. *Economics & Labor Review 14*(2), 276-304.

Kimber, M. (2003). The tenured "core" and the tenuous "periphery": The casualization of academic work in Australian universities. *Journal of Higher Education Policy and Management, 25*(1), 41-50.

Martin, B. (2011) ERA: Unintended consequences. *Australian Universities' Review, 53*(2), 99-102. Retrieved from http://www.aur.org.au

Moodie, G. (2010, February 17). Too much parish pump in ranking of journals. *The Australian*.

National Tertiary Education Union (NTEU). (2013). *Submission to review on base funding.* Retrieved from https://www.nteu.org.au/basefundingreview

Redden, G. (2008) From RAE to ERA: Research evaluation at work in the corporate university. *Australian Humanities Review, 4*, 7-26. Retrieved from http://www.australianhumanitiesreview.org/archive/Issue-November-2008/redden.html

Royle, G. (2010). *The ARC, the ERA and the EJC*. Retrieved from http://symomega.wordpress.com/2010/10/30/the-arc-theera-and-the-ejc

Smart, D., & Ang, G. (1993). The origins and evolution of Commonwealth full fee paying overseas student policy 1975-1992. In A. Peachment & J. Williams (Eds.) *Case studies in public policy*. Perth, Australia: Curtin University.

Tourish, D. (2011, March 2). Why lists are a flawed approach to assessing excellence. *The Australian*.

Wikipedia. (n.d.). *Tertiary education fees in Australia*. Retrieved from http://en.wikipedia.org/wiki/Tertiary_education_fees_in_Australia

Young, S., Peetz, D., & Marais, M. (2011). The impact of journal ranking fetishism on Australian policy-related research. *Australian Universities' Review, 53*(2), 77-82. Retrieved from http://www.aur.org.au

Ian R. Dobson
School of Education and Arts
Federation University
Educational Policy Institute Pty Ltd (Australia)

PAUL GIBBS

CONCLUSIONS AND POLICY IMPLICATIONS

In this book, we have discussed the use of data in a range of forms and levels of rigour and validity. We have looked at how data sets might be of use in the flourishing of the University and its many stakeholders, and have specifically considered the place of students at the core of higher education. This we think is worthwhile, enhancing the use of the data in strategic planning, pedagogy and policy. Yet there are concerns about the power of those who collect and use the data, and the passive way in which stakeholders in the University might give up personal information without fully understanding its potential use. Now, in this short final chapter, we think it is the time to draw our conclusions.

We recognize that many of the papers deal with a specific university type or specific geography. Here, we delineate what we think transcends these peculiarities under the four headings of the book. We try to synthesize what our authors have highlighted, using what seems to us to be a coherent platform for policy recommendations.

Planning and Management of Higher Education

The main thrust is to be sure of what you want before you ask for it! Complex planning need not require complex data, but the data do need to be fit for purpose. We conclude the following:

1. Prior to collecting data, the university needs a clear strategic vision. It is toward this end that a strategic plan is developed by competent people, able to ascertain what data they need and how to use them when they have them.
2. The credibility of the collection and the issue of the data should be conceptually in tune with the university mission. If the mission is edification, then the data collected must be transparently able to contribute to that.
3. Collected data that seem to support an instrumental strategy for the university will, most likely, be doing just that. This might alienate both faculty and trustees. So, do not use data to focus on a strategy that is not clear and honestly communicated.
4. Data can be used for synthesis and analysis, but when they are used to direct the actions of others they need to make sense to them and to be directly relevant to the context.
5. We should build a team for strategic and management planning, and work hard to define what data are required; where they will come from; how regularly

M. E. Menon et al. (eds.), Using Data to Improve Higher Education, 243–246.

they are needed; and who will use it. This may require investment in a market information management system. This may not be cheap and, as Voorhees and Cooper tell us, we should approach any software acquisition cautiously. A team dedicated to securing robust data is often an asset.

6. When adopting surveys, use the results. Not to use that information from staff, students and other stakeholders is both disrespectful and inefficient. Also, communicate actions from evidence-based data. Terkla et al. in this book, offer illuminating insights into the type of surveys that might be useful and how best to use the data.
7. Ensure the university is ready to realize the benefits of metrics. If it has not been done before, this is an organizational change and change management principles should be adopted when introducing the process.
8. Take seriously the university's approach to benchmarking, whether driven internally or by external agencies for rankings. It is important to determine the degree to which rankings will drive your strategy. Think this through, for there are dangers in assuming everything will be satisfactory and that we can ignore them or go our own way.

Marketing and Stakeholder Data

Knowing your audience is as much a pedagogical principle as it is one for a successful university. Moreover, the audience need to know with whom they are engaging. Perhaps the most important audience is the students. There is a long history of student surveys, mainly dealing with the issue of the perceived quality of the student experience and student satisfaction. We conclude:

1. It is important that the survey type matches the survey's purpose; obvious, but not always adhered to. Ensure that what you ask is relevant and that it is asked of the right people. Using surveys to make claims for "happiness," when surveys are designed for "desire satisfaction" can be problematic.
2. Ensure you have a survey strategy, so national and institutional surveys of existing students do not create "questionnaire fatigue." Remember, academics are using the student body for their research, so be aware of how the student body is being approached; manage it.
3. Be genuine with students. Work with them in partnership to develop the data that you need, and it will be of interest to them.
4. Ensure you have a plan for using the data obtained from students. Williams provides such an approach using a matrix approach.
5. Pedro et al.'s idea of understanding the quality of life of students is a key example of how concern for the student body and the interests of the institution can be married.
6. Students come to university for a wide range of purposes and from many backgrounds. Successful institutions know what these are, monitor them and build a robust but reflective brand. They also know that students, researchers and academics have choices and are acutely aware of the offerings of their

competitors, both within the academic and the commercial world. To create a sustainable brand, Chapleo suggests that data are needed to ensure that:

- The reality of the image of the university fits that desired by the brand holders.
- The performance of the university is clear to all audiences of the brand.
- In a diverse marketplace, the specific educational ethos of the university is clear.
- The brand has an integrity amongst all its stakeholders. Faculty members as well as students need to want to be part of the brand.
- A competitive advantage is found that fits the strategy.

Economic and Policy Data

1. The internal good of education is self-evident in service to the community, in civic responsibility and in the enhancement of society and its culture. Yet students need to work, and understanding the impact of the formalization of their education through the degree awarded is critical to investment by both students and governments. We conclude that institutions need to know:
   - The potential for a student to achieve a satisfying job.
   - The financial and employment returns of the degrees you offer; this is required in some countries, but prudent in all.
2. Economic considerations also need to influence policy. An understanding of the economic gains to society, and well as to individuals, enables better negotiation for resources. Competitive collaboration helps here.

Ethical Use of Data

The issues here are more basic than in the previous conclusions, but perhaps less obvious. We recommend that institutions:

1. Assure that data usage is restricted to those permissions given for use, when its use might bring unforeseen benefits.
2. Do not compromise the ethical status of the university to achieve dubious gains such as manipulating data for league tables.
3. Retain the institution's dignity and a respect for all stakeholders.

All 19 conclusions drawn from the text will not guarantee good decisions, good processes or good management, but awareness of them will help. The sector and the individual institutions must decide upon the metrics they need, the depth and extent of the data, the levels of tracking and the approach to analytics. We also feel that these conclusions can contribute to the development of broader policy recommendations.

Policy Recommendations

The conclusions discussed above serve as guidelines for the formulation of educational policy in relation to data collection and use in higher education. In the

book, different authors have provided relevant policy recommendations from various backgrounds and perspectives. A general overview of the contents of the book points to some wider recommendations regarding the management of data collection and use in higher education.

- Higher education planners and policy makers need to have a clear and transparent policy of data use. This policy should be part of a strategic plan to be communicated to all stakeholders in relevant documents. It should guide all attempts to collect and utilize data in the organization and provide the basis for informed organizational planning and policy making.
- It is important for those engaged in data collection and use to systematically evaluate data collection processes and practices. As seen in the book, the collection and usage of data comes with many challenges. Questions regarding the effectiveness and efficiency of data-collection and data-management systems need to be raised and addressed. For instance, organizational units must be asked to provide a list of changes implemented or considered *as a result of new information.* This would ensure that data collected are in fact data used.
- Ethical issues in the collection and use of data must be recognized. This recognition, however, should lead to specific actions and not remain at a theoretical level, as is often the case. For instance, an analysis of the consequences of specific approaches to data utilization should be conducted in relation to different stakeholders. Moreover, awareness of past mistakes and cases where things did not go as planned can result in more comprehensive and ethical approaches to the use of data.
- In addition to providing a basis for data planning and management in higher education, the book has drawn attention to major issues linked to the aims and priorities of higher education systems. These include social class and gender differences in the pursuit of higher education. Equality of access and opportunity remains a major challenge for higher education institutions in both developed and developing countries. On a policy level, it is important that data collected in higher education are linked to attempts to promote equality of opportunity by addressing factors which prohibit or limit access among prospective students.

Paul Gibbs
Department of Education
Middlesex University

CONTRIBUTORS

Helena Alves is Assistant Professor of marketing at the Business and Economics Department, University of Beira Interior, Portugal. She is also researcher at NECE – R&D Centre for Business sciences. Her areas of expertise include Customer Satisfaction, Services marketing, Tourism marketing and public and nonprofit marketing, having authored and co-authored several articles and book chapters on these themes. Currently, she is the editor of the *International Review on Public and Nonprofit Marketing*, and is also in the editorial review boards of several journals.

Sofia Andreou is currently a Senior Research Officer at the Economics Research Centre of the University of Cyprus and an Adjunct Lecturer at the Department of Economics of the University of Cyprus. Her research mainly focuses on the evaluation of state schooling (and other private goods freely provided by the state), on the equality of opportunity in education and generally on household behavior regarding children's education. She has experience working with large scale quantitative and longitudinal survey data having been involved in several research programmes. She has also published several articles in academic journals.

Christina Butler is a Business Analyst with the Office of Institutional Research and Evaluation (OIR&E) at Tufts University. As a Business Analyst, Christina serves as a liaison between OIR&E and the Tufts' Enterprise Data Warehouse Team. In this role, she is responsible for verifying data quality and reporting accuracy. In addition, Christina oversees both quantitative and qualitative research projects and responds to internal and external data requests. Christina received her B.A. in Computer Science from Clark University in 2006. She also received her M.B.A. from Clark and a Graduate Certificate in Higher Education Administration from Northeastern University. Before joining the staff at Tufts, Christina worked as an investment analyst at an independent financial research firm.

Chris Chapleo is a consultant and academic at Bournemouth University, where his expertise is in marketing and branding in the non-profit sector, particularly education and charities. He has published numerous referred papers, consulted and spoken widely on aspects of higher education branding. Prior to academia he was a partner in a marketing agency and has held senior marketing roles in the publishing and leisure sectors and higher education, where his interest in the topic first began.

Lauren M. Conoscenti is a Research Analyst in the Office of Institutional Research and Evaluation at Tufts University. Lauren received her B.A. in Psychology from Princeton University in 2000 and her Ph.D. in Psychology from Harvard University in 2007. Her interests include assessment of learning outcomes, predictive modeling, survey research, health and risk behaviors in college populations, and data visualization.

John D. Cooper's background includes training and human resource positions in business in industry in addition to serving as doctoral level faculty at Walden University, NOVA Southeastern University, and Regis University. Dr. Cooper also has consulted widely with colleges seeking to improve their student success rates and has coached colleges in Oregon, Texas, and Arkansas. Dr. Cooper has taught extensively throughout his professional career and consulted in organizational development, systems thinking, human resource management, governance, and program evaluation. He is a graduate of Rutgers-College of South Jersey, holds an MBA from Indiana University and a Ph.D. in Educational Administration from Michigan State University.

Ian R. Dobson was a career administrator in Australia from 1971 until 2005, working for much of that time in planning, analysis and institutional research. Since then, he has co-resided in Australia and Finland and worked at the University of Helsinki between 2010 and 2012. He has been undertaking commissioned analytical research since the mid-1990s, with recent clients including Australian Council of Deans of Science, the Office of the Chief Scientist, the Australian Academy of the Humanities and the Australian Council of Learned Academies. He is editor of the *Australian Universities' Review* and the *Journal of Higher Education Policy and Management*.

Paul Gibbs is Professor of Education at Middlesex University. He is Director of Research at the Centre for Education Research and Scholarship at Middlesex University and his interests and publications span higher education marketing, happiness, philosophy, professional practice and time. He is Series Editor of *Educational Thinker* for Springer, holds positions on a number of international higher education journals and has participated in a number of European projects. His most recent books include *Thinking about Higher Education* edited with Ronald Barnett, *Transdisciplinary Professional Practice and Learning*, and *Work and Practice: New Understandings*, all published by Springer.

Joop Hartog is Professor of Economics at the University of Amsterdam, since 1981. He is specialised in labour economics, and he published, alone or with co-authors, some ten books, about a hundred articles in international journals and over a hundred contributions to books and journals in Dutch. He co-founded the journal *Labour Economics* and was a member of several government advisory committees, including the Council of Economic Advisors. A detailed CV is available at http://www1.fee.uva.nl/pp/jhartog/

Marilou Ioakimidis is Assistant Professor of Economics and Management of Human Resources at the University of Peloponnesus and visiting professor at the University of Athens and Harokopio University, Greece. She is Director of National-International Research at the Hellenic Institute of Economics of Education and Life Long Learning. She holds a BSc in Economics from University of Piraeus, Department of Economics, an MA in Industrial Relations and

Organisational Behaviour, from University of Warwick Business School and a PhD in Economics with specialisation in Economics of Education. Her research interests are focused mainly on economics of education and life long learning.

Christos Koutsampelas is a Senior Research Officer at the Economics Research Centre of the University of Cyprus. He holds a BSc degree in Economics, a MSc degree in International Economics and Finance and a PhD in Economics from Athens University of Economics and Business. His current research interests include income distribution analysis, economics of education and issues of redistribution. He has been involved in several research programmes, published articles in academic journals as well as authored numerous national reports on social policy issues.

João Leitão is Assistant Professor at the University of Beira Interior and invited as a Coordinator Professor at the Polytechnic Institute of Portalegre, lecturing entrepreneurship, international finance, macroeconomics and microeconomics for undergraduate and graduate economics, engineering and management students since October 1, 1999. He is associate researcher of the CEG-IST, University of Lisbon. His research interests include: entrepreneurship; innovation; market dynamics; and public policy.

Maria Eliophotou Menon is an Associate Professor in Educational Administration and Policy at the University of Cyprus. She is the co-ordinator of the postgraduate program in Educational Administration and Evaluation. Her research interests include educational leadership, job satisfaction in education, student decision making processes in higher education, and the link between education, training and the labour market. She has published widely in refereed journals and has participated in several European research projects.

Eugénia de Matos Pedro is a doctoral student in Management at University of Beira Interior-Portugal. She is now working at the Office of Teaching Quality and Evaluation Methodology, Faculty of Health Sciences of University of Beira Interior. Her research interests are in the areas of Quality Management, Quality of Life, Relationship Management, Relationship Marketing and Customer Relationship Management. Her recent works are related to student satisfaction issues and quality management practices in higher education.

Paul Prinsloo is a research professor in open distance learning at the University of South Africa. His academic background and interests include higher education, online learning, theology, art history, and religious studies. He is currently the Editor of *Progressio, the South African Journal of Open Distance Learning Practice* and serves on several editorial review panels. Paul is a recognized and established researcher and has published numerous chapters and articles as well as papers in refereed conference proceedings. His passion and research interests

include online learning and curriculum development, student success and retention, and learning analytics.

George Psacharopoulos. After obtaining his Ph.D. in economics from the University of Chicago he taught at the London School of Economics, the University of Hawaii, the University of Illinois and the University of Athens. Between 1981 and 1998 he served at the World Bank as Research Manager and Senior Advisor for education and human resources. Between 2000 and 2004 he was State MP in the Greek Parliament. His research focuses on the role of education in economic and social development. He has published over 20 books and 300 articles in academic journals and much of his work has been translated in many languages. He has received several prizes and world recognition for his contributions in the field of the economics of education and labor markets.

Peter Reader is currently Director of Marketing and Communications at the University of Portsmouth. He has worked in five other UK universities (Sheffield Hallam, Plymouth, Loughborough, Southampton and Bath), mainly in externally-facing roles from fundraising and marketing to communications and government/community relations. Peter has contributed substantially to his profession both nationally and internationally. He was the founding chair of the steering committee of the Association of Commonwealth Universities' Public Relations, Marketing and Communications Network, is a past President of the European Universities Public Relations and Information Officers (EUPRIO), and was the founding chair of the Higher Education External Relations Association (HEERA). He has given numerous presentations in the UK and internationally, and writes in the professional press.

Jessica Sharkness is the Associate Director of Institutional Research and Evaluation (OIR&E) at Tufts University. As Associate Director, Dr. Sharkness assists Dr. Terkla in the management of OIR&E; conducts and oversees research on students, alumni, faculty, and staff at Tufts' seven schools; organizes response to internal and external data requests; and provides guidance and training in statistical methodology. In addition, Dr. Sharkness serves on a variety of university committees, including the Institutional Review Board tasked with reviewing social, behavioral science, and educational research at Tufts. Dr. Sharkness' doctoral training was in Higher Education and Organizational Change at the University of California, Los Angeles. Her primary research interests are in the field of survey methodology, but she also has expertise in evaluation and assessment, measurement, college student development, college impact, and the role of institutional research in higher education.

Sharon Slade is a senior lecturer at the Open University in the U.K. with a background in mathematical modelling. She is a member of several committees, including Senate, and is actively involved in developing learning analytics within the Open University. Recent contributions include papers and chapters establishing

an ethical framework for the use of learning analytics within Higher Education, examining the concept of educational triage and broader issues around an ethics of care. She is leading work within the Open University on the development of a new policy regarding the ethical use of student data to shape their support and learning and improve retention and progression.

John Taylor is Professor of Higher Education Management at the University of Liverpool, U.K. A historian by origin, John spent over 20 years in university management before moving into an academic career, teaching and researching policy and management in higher education. His main interests lie in organization and strategy (including leadership and planning), the management of research (including the assessment of research quality), internationalization, staff development, the student experience and the history of higher education (especially in the late nineteenth century). In each of these areas, he is especially interested in comparative, international studies.

Dawn Geronimo Terkla is an Associate Provost at Tufts University. As Associate Provost, Dr. Terkla oversees the management of the Office of Institutional Research & Evaluation (OIR&E); provides guidance on issues relating to institutional research, outcomes assessment, and evaluation; and provides critical management information to senior administrators. In addition, Dr. Terkla is the University Accreditation Liaison Officer. Her research interests include college-choice decisions, retention, management information, quality assurance, assessment and evaluation.

She has held several leadership positions: President of both the North East Association for Institutional Research and the Association for Institutional Research, and Chair of the NPEC Executive Committee. In addition, she has served on the HEDS Board of Directors, the UCLA/ACE Cooperative Institutional Research Program Advisory Committee, NAICU Commission on Policy Analysis, and several NPEC technical review panels.

Richard A. Voorhees is principal and senior scientist at Voorhees Group LLC, a networked higher education consultancy. He has consulted extensively with colleges, foundations, and state systems of higher education in the areas of strategic planning, outcomes assessment, evaluation, and student success initiative. Widely published, Dr. Voorhees has held appointments at the University of Colorado-Denver, Colorado State University, University of Texas, and National American University. He is past president of the Association for Institutional Research, a 4,000 member international professional organization seeking to help higher education in converting data into information for intelligent decision-making.

James Williams is Senior Researcher in the Faculty of Education, Law and Social Science at Birmingham City University. His main focus of research is the student experience of higher education and the use of feedback surveys as part of the

quality enhancement process. His interests range widely and he has published not only on subjects relating to student feedback surveys but also the history of higher education in the local education sector, university art collections and on the history of sport. He is a member of the Executive Committee of the European Association of Institutional Research and has worked on a range of European-funded projects. He is a reviewer for several leading journals and is Associate Editor of the international journal *Quality in Higher Education*.

INDEX

GLOBAL PERSPECTIVES ON HIGHER EDUCATION

Volume 1
WOMEN'S UNIVERSITIES AND COLLEGES
An International Handbook
Francesca B. Purcell, Robin Matross Helms, and Laura Rumbley (Eds.)
ISBN 978-90-77874-58-5 hardback
ISBN 978-90-77874-02-8 paperback

Volume 2
PRIVATE HIGHER EDUCATION
A Global Revolution
Philip G. Altbach and D. C. Levy (Eds.)
ISBN 978-90-77874-59-2 hardback
ISBN 978-90-77874-08-0 paperback

Volume 3
FINANCING HIGHER EDUCATION
Cost-Sharing in International perspective
D. Bruce Johnstone
ISBN 978-90-8790-016-8 hardback
ISBN 978-90-8790-015-1 paperback

Volume 4
UNIVERSITY COLLABORATION FOR INNOVATION
Lessons from the Cambridge-MIT Institute
David Good, Suzanne Greenwald, Roy Cox, and Megan Goldman (Eds.)
ISBN 978-90-8790-040-3 hardback
ISBN 978-90-8790-039-7 paperback

Volume 5
HIGHER EDUCATION
A Worldwide Inventory of Centers and Programs
Philip G. Altbach, Leslie A. Bozeman, Natia Janashia, and Laura E. Rumbley
ISBN 978-90-8790-052-6 hardback
ISBN 978-90-8790-049-6 paperback

Volume 6
FUTURE OF THE AMERICAN PUBLIC RESEARCH UNIVERSITY
R. L. Geiger, C. L. Colbeck, R. L. Williams, and C. K. Anderson (Eds.)
ISBN 978-90-8790-048-9 hardback
ISBN 978-90-8790-047-2 paperback

Volume 7
TRADITION AND TRANSITION
The International Imperative in Higher Education
Philip G. Altbach
ISBN 978-90-8790-054-4 hardback
ISBN 978-90-8790-053-3 paperback

Volume 8
THE PROFESSORIATE IN THE AGE OF GLOBALIZATION
Nelly P. Stromquist
ISBN 978-90-8790-084-7 hardback
ISBN 978-90-8790-083-0 paperback

Volume 9
HIGHER EDUCATION SYSTEMS
Conceptual Frameworks, Comparative Perspectives, Empirical Findings
Ulrich Teichler
ISBN 978-90-8790-138-7 hardback
ISBN 978-90-8790-137-0 paperback

Volume 10
HIGHER EDUCATION IN THE NEW CENTURY: GLOBAL CHALLENGES AND INNOVATIVE IDEAS
Philip G. Altbach and Patti McGill Peterson (Eds.)
ISBN 978-90-8790-199-8 hardback
ISBN 978-90-8790-198-1 paperback

Volume 11
THE DYNAMICS OF INTERNATIONAL STUDENT CIRCULATION IN A GLOBAL CONTEXT
Hans de Wit, Pawan Agarwal, Mohsen Elmahdy Said, Molatlhegi T. Sehoole, and Muhammad Sirozi (Eds.)
ISBN 978-90-8790-259-9 hardback
ISBN 978-90-8790-258-2 paperback

Volume 12
UNIVERSITIES AS CENTRES OF RESEARCH AND KNOWLEDGE CREATION: AN ENDANGERED SPECIES?
Hebe Vessuri and Ulrich Teichler (Eds.)
ISBN 978-90-8790-479-1 hardback
ISBN 978-90-8790-478-4 paperback

Volume 13
HIGHER EDUCATION IN TURMOIL: THE CHANGING WORLD OF INTERNATIONALIZATION
Jane Knight
ISBN 978-90-8790-521-7 hardback
ISBN 978-90-8790-520-0 paperback

Volume 14
UNIVERSITY AND DEVELOPMENT IN LATIN AMERICA: SUCCESSFUL EXPERIENCES OF RESEARCH CENTERS
Simon Schwartzman (Ed.)
ISBN 978-90-8790-524-8 hardback
ISBN 978-90-8790-523-1 paperback

Volume 15
BUYING YOUR WAY INTO HEAVEN: EDUCATION AND CORRUPTION IN INTERNATIONAL PERSPECTIVE
Stephen P. Heyneman (Ed.)
ISBN 978-90-8790-728-0 hardback
ISBN 978-90-8790-727-3 paperback

Volume 16
HIGHER EDUCATION AND THE WORLD OF WORK
Ulrich Teichler
ISBN 978-90-8790-755-6 hardback
ISBN 978-90-8790-754-9 paperback

Volume 17
FINANCING ACCESS AND EQUITY IN HIGHER EDUCATION
Jane Knight (Ed.)
ISBN 978-90-8790-767-9 hardback
ISBN 978-90-8790-766-2 paperback

Volume 18
UNIVERSITY RANKINGS, DIVERSITY, AND THE NEW LANDSCAPE OF HIGHER EDUCATION
Barbara M. Kehm and Bjørn Stensaker (Eds.)
ISBN 978-90-8790-815-7 hardback
ISBN 978-90-8790-814-0 paperback

Volume 19
HIGHER EDUCATION IN EAST ASIA: NEOLIBERALISM AND THE PROFESSORIATE
Gregory S. Poole and Ya-chen Chen (Eds.)
ISBN 978-94-6091-127-9 hardback
ISBN 978-94-6091-126-2 paperback

Volume 20
ACCESS AND EQUITY: COMPARATIVE PERSPECTIVES
Heather Eggins (Ed.)
ISBN 978-94-6091-185-9 hardback
ISBN 978-94-6091-184-2 paperback

Volume 21
UNDERSTANDING INEQUALITIES IN AND BY HIGHER EDUCATION
Gaële Goastellec (Ed.)
ISBN 978-94-6091-307-5 hardback
ISBN 978-94-6091-306-8 paperback

Volume 22
TRENDS IN GLOBAL HIGHER EDUCATION: TRACKING AN ACADEMIC REVOLUTION
Philip G. Altbach, Liz Reisberg and Laura E. Rumbley
ISBN 978-94-6091-338-9 hardback
ISBN 978-94-6091-339-6 paperback

Volume 23
PATHS TO A WORLD-CLASS UNIVERSITY: LESSONS FROM PRACTICES AND EXPERIENCES
Nian Cai Liu, Qi Wang and Ying Cheng
ISBN 978-94-6091-354-9 hardback
ISBN 978-94-6091-353-2 paperback

Volume 24
TERTIARY EDUCATION AT A GLANCE: CHINA
Kai Yu, Andrea Lynn Stith, Li Liu and Huizhong Chen
ISBN 978-94-6091-744-8 hardback
ISBN 978-94-6091-745-5 paperback

Volume 25
BUILDING WORLD-CLASS UNIVERSITIES: DIFFERENT APPROACHES TO A SHARED GOAL
Qi Wang, Ying Cheng and Nian Cai Liu
ISBN 978-94-6209-033-0 hardback
ISBN 978-94-6209-032-3 paperback

Volume 26
INTERNATIONALISATION OF AFRICAN HIGHER EDUCATION – TOWARDS ACHIEVING THE MDGS
Chika Sehoole and Jane Knight (Eds.)
ISBN 978-94-6209-309-6 hardback
ISBN 978-94-6209-310-2 paperback

Volume 27
THE INTERNATIONAL IMPERATIVE IN HIGHER EDUCATION
Philip G. Altbach
ISBN 978-94-6209-337-9 hardback
ISBN 978-94-6209-336-2 paperback

Volume 28
GLOBALIZATION AND ITS IMPACTS ON THE QUALITY OF PHD EDUCATION: FORCES AND FORMS IN DOCTORAL EDUCATION WORLDWIDE
Maresi Nerad and Barbara Evans (Eds.)
ISBN 978-94-6209-568-7 hardback
ISBN 978-94-6209-567-0 paperback

Volume 29
USING DATA TO IMPROVE HIGHER EDUCATION: RESEARCH, POLICY AND PRACTICE
Maria E. Menon, Dawn Geronimo Terkla and Paul Gibbs (Eds.)
ISBN 978-94-6209-793-3 hardback
ISBN 978-94-6209-792-6 paperback