CAPACITY BUILDING IN EDUCATIONAL RESEARCH: SKETCHING AN INTERNATIONAL PICTURE

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ABSTRACT

The paper approaches the analysis of capacity-building from a broad international perspective.[1] Drawing mainly on Organisation for Economic Co-operation and Development (OECD) data, it looks at overall investment in R&D (which covers development as well as research), including the movement of research capacity across borders; describes some innovations in capacity-building; and concludes by suggesting pathways for building a more accurate picture.

INTRODUCTION

This paper addresses the issue of capacity-building in educational research from an international perspective.[1] I begin with some reflections on the ways in which debate around 'knowledge-based economies' (KBEs) has brought greater attention to education as the primary state-sponsored producer of research capacity and of research of all kinds (Ozga, Seddon and Popkewitz, 2006; OECD, 2006a Ch.1). Somewhat confusingly, this research includes research about education itself as a key component of the KBE; and there is now a growing literature of knowledge or even research about educational research itself. Big fleas have little fleas upon their backs to bite em: the process does not necessarily go on ad infinitum, but it can come close. In Section 1, I give a broad overview of OECD work on R&D. These are mainly quite crude input figures, but give us some kind of context. They do not identify educational research as such. Section 2 deals with cross-border movement in higher education, which includes research capacity. In Section 3 I draw on OECD work over the last decade or so, covering knowledge management, national reviews of educational R&D and work on the relationship between educational research and policy. I select some specific instances of innovation, to invite reflection on how capacity-building is to be assessed in this particular field. Section 4 concludes.

SECTION 1: THE RESEARCH CAPACITY BACKGROUND

Why is there a mounting interest in the performance of educational research? Summarily put, it stems from the role education is perceived to play in economic performance and social development; from a growing concern with the accountability of educational systems against a background of increasing pressure on public expenditure; and from a perception that in many countries the current capacity of educational research, at least as identified in public institutions, does not match up to the challenges it faces.

One does not need to swallow all the rhetoric about KBEs to argue that understanding our education systems better should be a key component of improving them – including how far they achieve the various social and economic goals set for them, and what the processes are of making progress towards these goals. At a very general level, it is true that countries that make rapid social and economic strides also see their investments in education rise sharply. Of course the direction of causality may be uncertain, so that it is in fact their mounting prosperity which enables them to expand their education systems rather than or as much as vice-versa, but generally it is accepted that investment in education helps drive things long: it raises productivity, it increases mobility, within and between countries, and promotes innovation (Kahin and Foray, 2006). At the same time education has other

objectives, notably those of promoting personal growth, and equipping people with the competences to become adult citizens; often, too, education is also charged with fostering social cohesion so that members of different communities can live together in reasonable mutual tolerance (see www.learningbenefits.net, www.oecd.org/edu/socialoutcomes, and Schuller, et al., 2004).

Research — the process of knowledge generation and dissemination — is, obviously, a major factor in the evolution of KBEs. Universities are the primary locations for research, at least for that funded by the public sector, and so the capacity of higher education to conduct good quality research is a significant matter of public interest. To get a full picture of a nation's capacity we need to distinguish several different elements. First, there is the overall volume of research, in all disciplines. Secondly, there is the distribution of that research across different disciplines, and the effectiveness of it. Thirdly, there is the quality of educational research, i.e. knowledge creation about the processes and structures of teaching and learning, and about the functioning of the education system. And, fourthly, there is the capacity of the education system to produce researchers, both across disciplines and in education itself. These are all to some extent independent of each other; in other words, it would be possible for any country to score highly in one of the dimensions but poorly on all the others, or vice-versa. Finally, it is worth noting the possibility — not purely hypothetical — that a country may have a poorly performing education research set-up and still have a well-functioning education system.

But, if we focus on capacity-building in educational research, the picture becomes further complicated, for two reasons. First, the capacity may not be neatly located in single disciplinary structures, as is the case with some other knowledge areas. Education is arguably a field rather than a discipline, though the distinction between these two is not always clearcut. More than in most other areas of social scientific activity, educational research potentially draws on many different disciplines, including from the natural sciences; and it probably has a less well-defined core body of knowledge than most. Secondly, and very differently, capacity-building is not only about capacity on the supply side, i.e. the ability of researchers to produce research. It is also about the capacity of the users of research to be aware of, comprehend and draw on existing research, and to be able to formulate effective demands for further research. Moreover, capacity is not only a function of individuals and their personal competences. It also has a collective, communicative character: how well does the system allow or encourage its constituent members to communicate with each other, sharing in the development as well as the application of research?

R&D expenditure generally stagnated across OECD countries in the early years of the millennium, but is now growing more rapidly, at an annual rate of 3.6% in 2003–4, amounting to 2.26% of Gross Domestic Product (GDP). But this is still well short of the Lisbon goal of 3%, and there is considerable variability in these patterns. Countries with high levels of R&D intensity tended to see expenditure increasing fastest, followed by those with low intensity, whilst those in the middle, including large European countries such as France, Germany and the United Kingdom (UK), saw modest gains at best. By way of contrast, China's R&D investment doubled between 1995 and 2006, to 1.6% of GDP, paralleling its extremely rapid expansion of higher education. In volume terms this puts it in second place globally, behind only the United States (US). Governments' recognition of the importance of R&D funding as a public good meant that their share of total R&D support increased. Higher education R&D rose from 0.36% to 0.39% of GDP between 2000 and 2004, with particularly large increases in Canada and the Scandinavian countries. As a consequence of this increased expenditure, the number of researchers in higher education in European Union-25 countries grew from 350,000 in 1997 to more than 430,000 in 2003.

These expenditure figures are highly aggregated and heavily weighted towards the natural sciences. The distribution of researchers across sectors — business,

government and within government higher education — varies widely: in Poland, New Zealand, Spain and Australia over 70% of all researchers are found within the public sector, with the large majority in higher education, whereas for Japan and the US the figure is below 30% (UK is around 40%) (source: OECD MSTI database 2005).

Capacity issues include the effective nurturing and utilisation of researchers. Recent work in the OECD's Directorate of Science, Technology and Industry (OECD, 2006b) identifies some salient points. Wastage rates for PhD students vary very widely: in the UK and Belgium (Wallonia) under 10% of doctoral students fail to complete, compared with 20–25% in Norway and Spain. Further along the track a dual academic labour market is emerging in research careers, with some researchers achieving permanent status (as civic servants or tenured academics) whilst a growing number are on temporary posts, often for long periods. Incentives for effective performance vary. Women are predictably underrepresented in the research community as a whole (25–35% of the total); this is especially the case in the natural sciences, but is less the case in the social sciences, and although international data are not available for education as such, it is probably even less the case there.

If we look at research output as measured by scientific articles, there was a growth in publications from 516,000 in 1996 to nearly 584,000 in 2003, a jump of nearly 15%, with Japan and Europe growing faster than the US. There is an overall trend away from life science outputs towards engineering and technology, although countering this has been a decline in engineering and technology graduates as a share of total graduate output. Social and behavioural sciences form a rather small proportion of scientific output: 6.1% in 1996, dropping to 5.4% in 2003, mainly because of a decline in the US figures. The actual social and behavioural science output therefore remained almost exactly constant. There are no figures available for education's share of this; we can reasonably assume that it forms only a very small part, but this is an area where more work is needed for an accurate picture to emerge.

In short, there is a strong rhetorical commitment to research as an engine of economic development, backed up by some growth in the resources committed to it. Measures of research quality remain very uncertain. Attempts to apply such measures, for example through global university rankings, attract enormous attention, often far outstripping the validity of the exercise (see Salmi and Saroyan, 2006). It is against this very broad background that I move to focus on educational research.

SECTION 2: CAPACITY-BUILDING: DOMESTIC OR TRANSNATIONAL?

Capacity-building as a term is now quite common currency, but its origins lie in international development literature of the late 1980s. It was a response to critiques of aid and overseas assistance which may have produced a short-term lift in the living standards of poorer countries but which did little or nothing to enhance their capacity to manage their own affairs and lift themselves out of poverty on a sustainable basis. The focus therefore shifted to developing indigenous skills and leadership, as opposed to the transfer of technology or technical assistance.

Although the term has now broadened from this application, we cannot ignore the international dimension. Global mobility has increased enormously over the past decade. It takes very varying forms, from the desperate attempts of impoverished sub-Saharans to land on European soil to the smooth intercontinental criss-crossing of elites. In the total OECD area about 4% of people with higher education are immigrants, ranging from over 20% in Switzerland through to Japan and Korea with under 1%, but with highly varying educational profiles. Some countries are both significant importers and exporters of qualified personnel, for example Austria and the UK. There is enormous variation in the proportions of doctoral students who come

from other countries: the latest figures currently available (2001) showed the UK very near the head of the list, with foreign students an important component, though we do not know how many return to their country of origin, and with what delay.

The movement of higher education students has become a significant cultural and economic phenomenon, as well as a major educational issue. Overall, the numbers of students crossing frontiers within the OECD area has grown by 70% between 1998 and 2004 to reach 2.3 million people, with countries such as Australia now regarding higher education as a major component of their service economy. The OECD analysis of this phenomenon identified four discrete policy rationales (OECD 2004). One was simple revenue-earning: the desire of systems or institutions to generate income from the fees and other expenditures of foreign students. A second was the traditional one of developing mutual understanding, specifically through the higher education of elites. The two other rationales, each in evidence in a number of countries (and, incidentally, not necessarily excluding the other rationales) both make a link between student mobility and capacity-building. One deals with the capacity of sending countries. Historically, many countries which have themselves lacked the infrastructure or expertise to educate their own populations to higher levels have sent numbers abroad. Often they return as highly qualified people, including as researchers or users of research, and will contribute to the further development of research capacity in their own country. Conversely, the fourth and final rationale, 'skilled migration', means that countries may seek out qualified knowledge workers or potential knowledge workers in order to fill gaps which they cannot supply from their own populations. The source of these may be other advanced countries, or poorer ones, some of which (notably the Caribbean countries) can ill afford to lose such human capital.

Of course, not all such movements occur as a result of government policy; instead, they represent individual initiatives as people seek to better themselves or their families. These rationales apply to the movement of higher education students generally and not specifically to researchers, but they define an important factor in the development and distribution of research capacity. In some countries particular subject areas are heavily populated by immigrants, the strongest example being science and technology areas in the US, where the clampdown on visas following 9/11 choked off much of the supply of science and engineering capacity.

Cross-border higher education therefore plays a significant role in capacity-building in educational research, though this will vary across countries (OECD/World Bank, 2007, forthcoming). How effective it is depends on a number of factors: the costs involved, to students and their families and to the countries; the level of support provided; the mutual recognition of qualifications; and the presence or absence of strategies for encouraging emigrant researchers to return and deploy their skills.[2] In addition to the actual numbers, there is the impact of cultural diversity in the educational research community: at least up to a certain point, the infusion of foreign perspectives and even methodologies should invigorate research communities.

SECTION 3: REVIEWING CAPACITY

My 2005 SERA lecture (Schuller, 2006) reported on some general conclusions from OECD educational R&D reviews: that there was underinvestment in research; concerns about the balance in the research portfolio; weak dissemination; and low capacity (OECD, 2003). I concluded by suggesting that the Scottish research community might ask itself what their priorities are for capacity-building. Where are the main areas where there are general lessons to be learnt from transnational work? I propose to do no more than illustrate this by referring to some interesting current cases of innovation.

Building capacity is not only about training individuals. It can be pitched at several levels, through organisational and sectoral up to and including the national.[3]

My cases cover rather diverse approaches. They are descriptive, even anecdotal, but I hope will serve the purpose.

a. Skills and methodologies for 'robust' research

One issue which tends to provoke hot debate is whether certain kinds of research methodology are inherently superior, at least in terms of providing robust evidence of a causal nature. In particular are experimental designs, or still more specifically randomised controlled trial (RCT) techniques, a gold standard for educational researchers as they are in other disciplines? There are very sharply contrasting national positions on this, as well as sharp divisions within countries. For the US Office of Education, RCTs are, indeed, the gold standard, with very material effect: in order to qualify for a grant from the very substantial OECD research budget, proposers must include an RCT in their research design.[4] Other countries dissent from this view, in some cases quite strenuously, whilst acknowledging that there is a debate to be had about our understanding of robustness, and about how far the performance of educational research matches up to those standards. The key issue in my view is not whether there is an absolute standard of robustness, or an ideal portfolio of research approaches, but how far a country's current portfolio is adequate for both theoretical and empirical purposes; it should be possible to have a substantive debate on this latter issue without necessarily having to strain to reach preliminary agreement on the first two.

The key skillsets identified as generally lacking in the OECD reviews were quantitative, especially in the use of existing large-scale datasets. However these are not the only weaknesses; and it is not a straightforward matter of training up more researchers in these skills. A crude manpower planning approach would be inappropriate, if it ignored the interactions between different methodologies, and the nature of the system within which they all operate. As Stephen Gorard argues, it is equally important to get quantitative researchers to reflect on the appropriateness of their techniques; and to get all parties to develop the ability to communicate their own work lucidly and accessibly, and to be open to the merits of others' different skillsets (Cook and Gorard in OECD/CERI, 2007, forthcoming).

Training initiatives are burgeoning in different countries. The UK's Teaching and Learning Research Programme has a major capacity-building component (see www.tlrp.org.uk), and other countries have their own variants. These may be part of a research programme, or tied to an institution or consortium. For example, the NIN (New Investigators Network) at the University of New Brunswick in Canada was established in 2002 with the aim of enhancing capacity for multidisciplinary work involving sophisticated quantitative methods of analysis and interpretation (see www.unb.ca/crisp). Evaluation of the effects of these training programmes on capacity would be very welcome – though not easy to construct.

b. Institutional innovation: brokerage agencies

If capacity-building is not only about enhancing individual competences, what institutional or systemic aspects need attention? There are a number of components to this, such as the quality of leadership exhibited within institutions or research units, or the maintenance or introduction of reasonable career paths for researchers. If these are absent, capacity-building efforts will be like pouring water into a leaky bucket. In a different field, the UK's Clinical Research Collaboration identifies 'developing, funding and implementing a new integrated and flexible training pathway for clinical academics' as part of its L134 million initiative (www.ukcrn.org.uk). But I focus here on a different component: the creation of agencies with the specific function of improving communication and exchange between researchers on the one hand and policy-makers and/or practitioners on the other. The UK has been at the forefront

on this, with the creation of the EPPI Centre and its systematic reviews (see http://eppi.ioe.ac.uk/cms), and the endeavours of network-building outfits such as CUREE – the Centre for Use of Research and Evidence in Education (see www.curee-paccts.com). But I give here two brief examples from other countries (see OECD 2007 forthcoming for more detail on these and other cases).

i. Iterative Best Evidence Syntheses (BES) (New Zealand)[5]

The BES programme operates from within the New Zealand Ministry of Education, as part of its commitment to strengthening the evidence base for policy. The goal is to build the capability of a national research community, transforming relevant but fragmented evidence into a more coherent whole.

The BES programme synthesises bodies of research that provide credible evidence on a range of educational outcomes such as the impact of poverty on educational outcomes, teacher professional development, and the teaching of mathematics in primary schools. It has a number of distinctive features. It stresses fit-for-purposeness as a basis for selection of methodologies and does not impose a single methodology – a 'rigorously pluralist approach'. It aims to maximise accessibility without sacrificing meaning or theory; is future-oriented and respects local contextual variables – particularly important in respect of indigeneity, i.e. the relationship between Maori and Pakeha educational outcomes. And it takes great pains to involve all the stakeholders in an extensive dialogue, especially teachers and teacher union representatives, and school principals and their representatives (significant in a system with a high level of devolved management).

The iteration involves consultation and testing of outcomes with a range of people, including external experts, for example through day-long formative assessment meetings on initial drafts; but also the continual refinement of the overall BES framework in the light of experience. The Guidelines for Generating Iterative Best Practice Syntheses are continuously reviewed as part of this process.

The capacity-building dimension is clear in all this. In addition, strong emphasis is given to seeking out teacher educators as generators of syntheses, in order to embed the process in tertiary education and training.

ii. Knowledge Chamber (Netherlands)

In contrast to the BES programme, which has been running for several years, the Netherlands 'Knowledge Chamber' is only just coming off the drawing board. Moreover it is avowedly a top-down initiative. The Knowledge Chamber is a consultative body of top-ranking officials drawn from a range of research institutions and ministry officials dealing in educational, culture and science policy. It derives from a perception that there is a risk of excess knowledge and information, creating difficulties in selecting and interpreting relevant information. This is accentuated by the compartmentalisation of knowledge. The initiative is designed to help officials deal with the content rather than the process of policy-making, and recognises that this requires specific skills. The structural consultation processes are likely to involve innovative techniques designed to foster creativity, such as digital 'storytelling'.

Other brokerage agencies exist or are emerging, for instance in Denmark, Switzerland and, in multiple forms, in the US. Some are concerned simply with the dissemination of research results, in a one-directional mode. But others have as part of their remit the fostering of a two-way (or multi-way) conversation between the producers and consumers of research, which may or may not be underpinned by deliberate capacity-building activities. Analysis of the roles of such brokerage agencies and the extent to which they have impact would be very timely.

c. Network building and knowledge validation

As is already implied in the above examples, building capacity in educational research is likely to succeed only if it builds links between individuals and between organisations. This is less of an obvious platitude than it may appear. In the first place, it challenges professional roles and identities: the more successful the collective capacity-building, the more transparent to the outside world (or at least parts of it) are the professional practices of particular groups, and this may not always be easily accepted on grounds of occupational identity. Moreover, whilst it may be the case that a plurality of methodologies is a necessary feature of general capacity-building, this may result in wearing and time-consuming clashes of paradigm or epistemological position. We can expect there to be more debate over what counts as valid knowledge; the debates may be healthy, even invigorating, but they may also consume energies which might otherwise have been devoted to actual research itself. So, the costs as well as the benefits of such linkages should be assessed, or at least their possibility borne in mind.

d. Building a 'scorecard'

It is obvious from the above that the knowledge base for understanding current capacity and trends in capacity-building remains very patchy. In the latest OECD review of educational R&D, on Switzerland, we began to develop some indicators. For instance, we compiled provisional data which compared countries on the following:

- number of educational researchers, as a proportion of university staff and as a proportion of staff employed within education overall;
- amount spent on education research, including both direct grants and salaries and associated expenditure on university staff assumed to be engaged in educational research;
- ratios of expenditure to researchers, indicating the level of support given to individual researchers at different levels;
- proportions of research council grants which go to education, indicating the competitiveness of educational researchers against their peers;
- distribution of educational research across different areas, for example, primary, secondary, tertiary, adult; or by type, for example, empirical, theoretical, applied/development, indicating the balance of the educational research portfolio.

In fact, the data from the five reviews conducted to date turned out to be not sufficiently comparable for us to be able to include this in the published report on Switzerland. But for an individual country (or group of countries where comparability is likely to be relatively high, such as the 'home countries') these might be a useful basis for beginning to put together an overall picture of capacity – and at the same time to develop an agenda for action. A scorecard which went beyond a snapshot to give a picture of evolving trends, with different elements of qualitative evaluation, could be an extremely valuable tool.

SECTION 4: CONCLUDING NOTE

It is ironic that the knowledge base for knowledge-based economies is so thin. The growth of interest in educational research capacity as a policy but also a research issue is welcome. There is much to be done in sketching out, and reaching agreement on, the key parameters within which reasoned debate can take place on the adequacy of this capacity. This should involve not only the kinds of statistics and indicators to which this article has mainly been devoted, but a closer understanding of the

way research systems work, and the extent to which the articulated or implicit goals of the system are achieved. A key component in this should be a closer, and preferably multi-disciplinary, investigation of the relationships between researchers (of different kinds) and policy-makers (at different levels), looking for example at the quality of communication, the levels of trust and the extent to which norms are shared – in other words, a social capital approach This is quite a challenge, not just in itself but for the obvious reason that it is difficult for members of the educational research community to engage in this with a reasonable degree of objectivity. But that should be no reason for not trying.

NOTES

1. The first item which comes when I recently Googled 'capacity-building in educational research' is a 2004 bulletin from the Scottish AERS programme!
2. The government of the autonomous region of Andalusia, for example, is introducing scholarships for 1000 high-performing students to do graduate work at any of the world's top 100 universities, with a contract that they should return either to a research institute or to create a new company.
3. The TLRP programme offers the following definition: "Research capacity is about the resources available in the education system for carrying out research as well as using it. For research providers, capacity includes the following dimensions: sufficiency of researchers to undertake commissioned research speedily and giving value for money and high quality; diversity of approaches and methods; ability to innovate, reflect on existing practice and seek continual improvement. Capacity issues for users include: ability to identify where existing research can be used; research gaps and devise ways of seeking to fill these; ability to distinguish good research from bad and understand the need to reconcile different research studies where these give contrasting results. There is an increasing focus on boosting research capacity in response to perceived weakness in the system. Developments are at national level, sectoral level e.g. within university departments, as well as via practitioner and researcher networks and systems."
4. An OECD meeting in Washington where the role of RCTs was discussed prompted an interesting response from the Danish delegation. On the one hand they were not at all convinced about RCTs; on the other hand the force of the argument about the lack of robust educational results spurred them to significant innovation in their provision of graduate research training, with much more emphasis being placed on careful empirical design.
5. This section draws directly on Alton-Lee (2007 forthcoming).

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