Basic Research[1]

Ted Palys
Simon Fraser University

Some concepts are more easily explained by contrasting them with their opposites, and that is certainly the case with "basic research," which is most commonly contrasted with "applied research."

Both these terms speak to the immediate motivation of the researcher rather than to any necessary outcome of one's research. "Basic research" refers to research that is undertaken for its own sake – to advance knowledge; to develop theory; to solve an interesting theoretical puzzle; to address a curiosity of the researcher – without any immediate concern for whether doing so will produce anything "useful" or "practical" or "generalizable." "Applied research," in contrast, specifically aims to do something "practical" about a relatively immediate problem.

One should not be overly rigid in this dichotomization of "basic" and "applied," however, which is both a simplification and tied to an older view that basic research comes first, and that a separate process of generating applications – done by completely different groups of people sometimes even generations removed from the original work – comes later. More recent discussions of the topic, while on the one hand acknowledging the continuing existence of these two "pure" types, also now include recognition that the time sequence need not be so unidirectional and linear, and that the two interests need not be seen as mutually exclusive.

These changing conceptions of basic and applied research and the relations between them reflect broader changes in society and our academic institutions. It once may have been the case that basic research was undertaken in the university by independent academics while realizing the implications of these developments were the domain of the private sector, but more than two decades of government promotion of academic-private sector partnerships have further blurred any lines that might have existed between the two (e.g., Horn 1999; Menand 1996; Tudiver 1999).

Given the pressing nature of many social problems (e.g., crime, abuse, poverty, prejudice and discrimination, injustice), health concerns (e.g., finding causes and cures for everything from the common cold to cancer), and other physical, social and technological challenges (e.g., how to send people to Mars so they can survive the trip and return; dealing with global warming), it is perhaps not surprising that some have viewed basic research as an esoteric academic pursuit and criticized research that is *not*

[1] From Lisa M. Given (Ed.) (2008). *The Sage Encyclopedia of Qualitative Research Methods*. Sage: Thousand Oaks, CA, Vol.1, pp.57-59.

“applied” in its focus as no more than mental masturbation by ivory tower academics. In its most extreme form, “applied” research that is worthwhile is taken to refer only to research whose products are in keeping with government-defined priorities and are potentially money-generating through patents, inventions and commissions. Canada’s federal government would seem to be walking this policy path: the last several decades have seen more and more “targeted” funding for research deemed in the national interest; most recently, while the Social Sciences and Humanities Research Council (SSHRC) was granted an increase in research funds in the most recent federal budget, the increased funding was tied to projects dealing with management, business and finance (e.g., Church 2007).

Perhaps trying to appease this view, the granting councils continue to support basic research in all disciplines, but have actively encouraged applicants for grants to choose project titles that do not sound too esoteric, and to address issues of potential applicability even if this involves no more than complete speculation on possible areas of application. As Chad Gaffield, the new President of Canada’s Social Sciences and Humanities Research Council (SSHRC) is quoted in a recent newspaper article as saying, “If we cannot compellingly articulate the value of what we do in 2007, we do not deserve a penny.”

In contrast, James Turk, Executive Director of the Canadian Association of University Teachers (CAUT) – an organization that, like the American Association of University Professors (AAUP), has for many years extolled the virtues of and vigorously defended academic freedom, warns about the myopia of this view. He questions the wisdom of trying to appease politicians by using language that buys into the view that the only “valuable” research is research that can promise a payoff:

> “I have little tolerance for those who respond to these kinds of pressures by trying to dress ourselves up as if we too can pay off commercially,” he said. “They do a disservice to themselves and lend credibility to the approach that what is really important is that which we can predict can pay off.” (Turk, quoted in Church 2007)

Even if one were to grant that some variant of “social value” is a desirable criterion, we sell our possibilities short if all our emphasis is on the here and now and consider nothing but practical problems. A limitation of applied research is that it is grounded in current (and often very short term) conceptions, assumptions and understandings. This confuses what is with what might be; discourages novel approaches and viewpoints that can put contemporary understandings in broader perspective; and fails to consider new ways of dealing with contemporary issues, or even to be open to new issues, products and considerations. As astrophysicist and Nobel Prize recipient George Smoot of the University of California at Berkeley stated, "People cannot foresee the future well enough to predict what's going to develop from basic research. If we only did applied research, we would still be making better spears" (quoted in Mullane 2006 and several other sources). As this statement suggests, basic

research that is undertaken for its own sake is often the foundation upon which future knowledge – and future applied research – rests.

It is thus not that basic research does not have social value, but rather that it encourages the pursuit of knowledge for its own sake in the belief that it is only by also encouraging research that is "outside the box" – even though this involves incurring all the dead ends and false leads that such research inevitably will include – that one also finds jewels of understanding that can open new doors and new possibilities that applied researchers, operating within a limited frame of reference are unlikely to have considered. Any comprehensive research strategy will include both.

Examples of research abound where the unique curiosity of individuals later provided the basis for technological marvels and entirely new fields of inquiry. Who would have thought, for example, that Michael Faraday's study of electromagnetic induction in the 1830s would lead to the development of virtually everything electronic we have today? Or that Gregor Mendel's study of the characteristics of pea plants in the 1860s would form the basis of our understanding of the basics of genetics and heredity? Or that Albert Einstein's 1917 "theory of stimulated emission" would decades later be used to produce the laser -- which itself was initially thought to be a technological marvel with no practical use -- but now is a powerful tool used in communication, industry, physics, chemistry, biology and medicine and does everything from generating holographic representations to performing eye surgery to playing CDs and DVDs?

But all of these examples are from the natural and physical sciences. What of the relation between basic research and the social sciences and humanities, particularly in the realm of *qualitative* research? Fascinatingly enough, a review of the literature undertaken in preparation for this encyclopaedia entry revealed that virtually nothing has been written about this relationship prior to this entry. One reason we may hear less about "basic research" in the context of qualitative research is that the fruits of social research – even when they are used as a foundation for the development of new policies or practices -- are less direct and more ephemeral. There is something very concrete about a laser or a space station or a drug like penicillin that we can point to and appreciate. In contrast, even when the results of social research on such topics as social cognition or leadership styles or child development are used to generate improved policies and/or practices with respect to human-computer interfaces, corporate decision-making or educational policies, they are less likely to be written about in the newspaper, be awarded Nobel Prizes, or be sold at Future Shop.

But there *is* "basic research" conducted within the domain of qualitative research. Indeed, one could even argue that two aspects of qualitative research imply that "basic research" and "qualitative research" are made for each other. One that comes to mind is the qualitative dictum expressed by methodologians such as Howard Becker (e.g., 1998) that the first obligation of any piece of qualitative research is to the milieu/people one is studying, i.e., to ensure one's research has inductive integrity by

taking the research site and its inhabitants on their own ground and understanding them on their own terms for their own sake. Similarly, the "intrinsic case study" – a case study undertaken for no other reason than the curiosity of the researcher (e.g., see Stake 1995) – also has strong traditions in the qualitative realm. Both these authors affirm that the first priority in qualitative research is to the integrity of the case – analogous to the priority that quantitative/experimentalist researchers attach to internal validity – because it is the foundation without which all else is irrelevant. To thine own case be true; generalizability, if it is a concern at all, comes later, and is likely to be more a theoretical than a statistical exercise (e.g., see Becker's 1998 discussion of the "part to whole" problem).

Notwithstanding the compatibility of qualitative research and basic research outlined above, qualitative research is also strongly associated with a commitment both to applied research and to mixed-motive research that is designed to contribute to social theory as much as it is intended to improve peoples' lives. Indeed, strong traditions in qualitative research – its emergent character; its commitment to examining and providing "voice;" and the frequently collaborative processes these principles activate and involve (e.g., see Palys & Atchison 2008) – as well as entire methodological traditions such as participatory action research (e.g., Reason & Bradbury 2001) and political activist ethnography (e.g., Frampton, Kinsman, Thompson and Tilleczek 2006) all have an inherent applied focus in their explicit desire both to contribute to knowledge and theory and to improve the human condition.

References

Becker, H.S. (1998). *Tricks of the Trade: How to Think about Your Research While You're Doing It*. Chicago: University of Chicago Press.

Church, E. (2007). "Humanities seek greater understanding: Tired of all the praise and money going to the sciences, arts researchers are out to prove the value of their work." *The Globe and Mail* (18 June), p.A7.

Frampton, C, Kinsman, G., Thompson, A. K. and Tilleczek, K. (Eds.) (2006). *Sociology for Changing the World: Social Movements/Social Research*. Halifax: Fernwood Publishing.

Horn, M. (1999). *Academic Freedom in Canada: A History*. Toronto: University of Toronto Press.

Menand, L. (Ed.) (1996). *The Future of Academic Freedom*. Chicago: University of Chicago Press.

Mullane, L. (2006). "Beyond basic: Applied research brings real-world solutions to real-world problems." Public Purpose (September/October), pp. 2-5. Online at http://www.aascu.org/public_purpose/sept_oct_06.pdf . Accessed 21 June 2007.

Palys, T., and Atchison, C. (2008). *Research Decisions: Qualitative and Quantitative Perspectives* (4th Edition). Toronto: Thomson Nelson Publishers.

Reason, P., and Bradbury, H. (Eds.) (2001). *Handbook of Action Research: Participative Inquiry and Practice*. Sage: Thousand Oaks, CA.

Stake, R.E. (1995). *The Art of Case Study Research*. Sage: Thousand Oaks, CA.

Tudiver, N. (1999). *Universities for Sale: Resisting Corporate Control over Canadian Higher Education*. Toronto: Lorimer and Company.

Basic research is sometimes blamed for not giving proper attention to real-world problems and criticized as a funding hog. In fact, both basic and applied research can be costly, but investing in basic research actually saves money in the long run by promoting the exploration of new important scientific knowledge that provides ways for application. As Dr. George Smoot says, "People cannot foresee the future well enough to predict what's going to develop from basic research. If we only did applied research, we would still... Basic Research can be explained as research that tries to expand the already existing scientific knowledge base. On the contrary, applied research is used to mean the scientific study that is helpful in solving real-life problems. While basic research is purely theoretical, applied research has a practical approach. The applicability of basic research is greater than the applied research, in the sense that the former is universally applicable whereas the latter can be applied only to the specific problem, for which it was carried out. Basic research is a type of research approach that is aimed at gaining a better understanding of a subject, phenomenon or basic law of nature. This type of research is primarily focused on the advancement of knowledge rather than solving a specific problem. Basic research is also referred to as pure research or fundamental research. The concept of basic research emerged between the late 19th century and early 20th century in an attempt to bridge the gaps existing in the societal utility of science. Basic research focuses on the search for truth or the development of theory. Because of this property, basic research is fundamental. Researchers with their fundamental background knowledge â€œdesign studies that can test, refine, modify, or develop theories.â€ Generally, these researchers are affiliated with an academic institution, and they perform this research as part of their graduate or doctoral works. Gathering knowledge for knowledgeâ€™s sake is the sole purpose of basic research. Basic research, also called pure research or fundamental research, is a type of scientific research with the aim of improving scientific theories for better understanding and prediction of natural or other phenomena. In contrast, applied research uses scientific theories to develop technology or techniques which can be used to intervene and alter natural or other phenomena. Though often driven simply by curiosity, basic research often fuels the technological innovations of applied science. The two...