

The Fundamental Characteristics of Research

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One of the most serious problems encountered in evaluating research, or researchers, is the dispute about what is and is not research (e.g., Alcorn, Cardno, Fairburn-Dunlop, Jones, O'Brien, Bishop, Crooks, Hattie, Kane, & Stevenson, 2006; Boyer, 1990; COSEUP, 2001; Glassick, Huber, & Maeroff, 1997; New Zealand Qualifications Authority, 1998; OECD, 2002; Tertiary Education Commission, 2004). That is, how is research defined? Or, can it be satisfactorily defined? Of course, there are numerous competing definitions of the term and little apparent consensus (Calvert & Martin, 2001). However, common usage holds that research is *a truth-seeking activity which contributes to knowledge, aimed at describing or explaining the world, conducted and governed by those with a high level of proficiency or expertise.*¹ Some (e.g., Boyer, 1990; Calvert & Martin, 2001; COSEUP, 2001; Glassick, Huber, & Maeroff, 1997; OECD, 2002b) would object to this definition, however, and claim that research should be distinguished and separately defined as basic or applied (i.e., a research purpose or objective). Since both basic and applied research are *a contribution to knowledge*, the need for the

¹ The second part of this definition is that research is also *a particular instance or piece of research.*

distinction is questionable and the proposed definition adequately captures the essential nature of research, is neither too narrow nor too broad, and simply avoids complications.

This definition consists of three distinct and equally significant parts. First, research is truth seeking. Truth seeking is the search, or investigation, of or for a body of real things, events, or facts, or the explanation of them. Second, research describes or explains. To describe involves representing or giving an account of. To explain is to give the reason for or cause of. Combined, or separately, these two parts result in a contribution to knowledge. Third, research is conducted and governed by those who have the requisite proficiency or expertise. To be proficient or to be an expert means that one is well advanced in a branch of knowledge derived from training or experience. There might seem to be some circularity here, however, because one is proficient or an expert does not imply that one contributes to knowledge. It only implies that the latter is necessary, but not sufficient, for doing research. Therefore, it may also be claimed that *the task or duty of researchers* is truth seeking, aimed at describing or explaining, conducted at a high level of proficiency or expertise, which results in a contribution to knowledge.

By contrast, the amalgamation of several typical dictionary definitions (e.g., *Merriam-Webster's Collegiate Dictionary*, 2003; *Oxford American Dictionary* [McKean], 2005; *Oxford English Dictionary* [Soanes & Stevenson], 2004) produces a composite definition of 'studious inquiry or examination, or investigation or experimentation aimed at the discovery and interpretation of facts, revision of accepted theories or laws in the light of new facts, or practical application of such new or revised theories or laws.' While the composite of dictionary definitions lists many of the critical qualities that express the essential

nature of research (e.g., studious inquiry or examination), they also omit one of the key features (i.e., conducted and governed by those with a high level of proficiency or expertise), as well as including an unnecessary one (i.e., that research includes practical application).

It has also been asserted that most definitions of research fail to account for, and exclude, much of the work done in the arts and humanities. In the creative arts alone, it has been argued that these definitions are insensitive, and create anomalies as to what constitutes research (Research Evaluation and Policy Project, 2005; Strand, 1998). For instance, a painter's paper about their own exhibition might qualify as research, whereas the painting does not under the definitions given above. A critical paper on a musical composition might succeed in meeting the definition from standard usage or the typical dictionary definition for being considered research, while the performance of the composition, and even the composition itself, would not (Strand, 1998). Nonetheless, research is a cognitive activity, not an aesthetic one, and, in many instances, the creative arts are not clear cases of research. By contrast, the accumulation of related case histories in law is a research endeavor—and the discipline argues strongly that it is—in that it constitutes both truth seeking as well as description and it is certainly a contribution to knowledge.²

² It could also be reasonably inferred that many cases of evaluation meet the definitional criteria for research, particularly ascriptive evaluation.

Similar problems arise in definitions that define research in terms of research typologies (i.e., basic research, applied research, experimental development).³ For instance, one of the most widely applied definitions of research is from the OECD's *Frascati Manual* (2002), in which research is classified into three categories:⁴

Research and experimental development (R&D) comprise creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications.

The term R&D covers three activities: basic research, applied research and experimental development...*Basic research* is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundation of phenomena and observable facts, without any particular application or use in view. *Applied research* is also original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific practical aim or objective. *Experimental development* is systematic work, drawing on existing knowledge gained from research and/or practical experience, which is directed to producing new materials, products or devices, to installing new processes, systems and services, or to improving substantially those already produced or installed (OECD, 2002, p. 30).

These typologies occur in nearly all definitions of research, except those from standard usage and to some extent the typical dictionary definitions, and their usefulness for evaluating research is uncertain. Research does not require this

³ While not entirely irrelevant, for example, in assessing the needs for research, the typological distinction is not always necessary for determining whether research is good, valuable, or important.

⁴ The *Frascati Manual* was first published in 1963, and is now in its 6th edition. The manual primarily deals with measuring the resources devoted to R&D.

disaggregation in order to meet the definitional requirement of a description, explanation, or contribution to knowledge; it is either a contribution to knowledge or it is not (Scriven, 2006), and the aims and objectives (e.g., basic versus applied), in most cases, are irrelevant.

Other definitions, for instance, the Carnegie Foundation's definition of research, include teaching as part of its definition. The Carnegie definition, from *Scholarship Assessed: Evaluation of the Professoriate* (Glassick, Huber, & Maeroff, 1997), consists of four parts, which are:^{5,6}

- i. *Discovery*. Contributes not only to the stock of human knowledge but also to the intellectual climate of an institution
- ii. *Integration*. Work that seeks to interpret, draw together and bring new insights to bear on original research
- iii. *Application*. Creating new intellectual understandings arising out of theory and practice
- iv. *Teaching*. Transforms and extends knowledge while transmitting an intelligible account of knowledge to the learners

The major conceptual problem with this definition of research is that only the first part approximates the standard definitions of research, however, the second, third, and fourth parts do not. The second and third parts are not conditional requirements for research (i.e., description, explanation, and knowledge generation), they are

⁵ The rationale for this definition is to “ensure that scholarly work in areas both within and outside discovery can be appropriately recognized and rewarded” (University Grants Committee, 2004, p. 22) in Hong Kong's Research Assessment Exercise (RAE).

⁶ This definition is conceptually similar to that from an earlier Carnegie study by Boyer (1990), which appeared in *Scholarship Reconsidered: Priorities of the Professorate*.

aims (i.e., integrating) and uses (i.e., application). The fourth part is an attempt to integrate the teaching and research functions of higher education faculty. Definitions such as this are seductive in that they suggest that if one is a good or productive researcher then one might also be a good or effective teacher (Marsh & Hattie, 2002), and that transferring knowledge as opposed to generating it is a form of research, which it is not.⁷ Teaching and research are two independent tasks or duties; that is, “different enterprises” (Hattie & Marsh, 1996, p. 513).⁸

Unlike other characterizations of research, the United States Committee on Science, Engineering, and Public Policy (COSEUP)—a joint committee consisting of the National Academy of Sciences (NAS), National Academy of Engineering (NAE), and Institute of Medicine (IOM)—has portrayed research in such a way as to make it possible for federally-funded agencies to meet the Government Performance and Results Act (GPRA) of 1993 reporting requirements:⁹

...[research is] a search for the unknown whose outcomes are virtually unlimited, research defies exact definition. Intellectually, it is apparent that the performance of research takes place across a continuum of thought and action, from the abstract reasoning of a single individual

⁷ Hattie and Marsh (1996) in their meta-analysis of 58 studies found only a small positive relationship (weighted $r = .06$) between research and teaching.

⁸ Many nations include not only teaching in their evaluations of federally-funded research, but also in many cases the number of degrees awarded, neither of which are indicators of good research or good researchers; although, the latter might be an indicator of a good research program.

⁹ GPRA requires agencies to produce three documents: a strategic plan, a performance plan, and a performance report (COSEUP, 2001).

to a multi-billion dollar program of technological complexity, such as a mission to Mars.

...[to satisfy administrative and intellectual needs] it has often been convenient to separate “basic” research from “applied” research...

...[in managing and funding research] it is important to understand the open-ended possibilities of any research activity, no matter how it is categorized, and to encourage the freedom of inquiry that leads beyond what is already known (COSEUP, 2001, p. 8).

If research is an indefinable nebulous concept that defies accurate characterization, how is it that nearly \$125 billion of the United States’ budget was allocated to it for 2006 (U.S. Office of Management and Budget, 2005)?¹⁰ Nevertheless, implicit in COSEUP’s (2001) depiction is that, by its very nature, research requires some form of intellectual investigation (i.e., truth seeking) which contributes to understanding.

While the definitional debate appears trivial, or pedantic, the fact remains that the fundamental intent of an accurate definition is not only to describe the essential nature of something, but also to begin the process of identifying merit-defining values and criteria, many of which are drawn from these definitional properties and true characteristics.

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¹⁰ This includes the defense and non-defense research budget allocation, which represents 4.9% of the total United States federal budget for 2006 (U.S. Office of Management and Budget, 2005).

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