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Research methods: What's in the name?

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A B S T R A C T

Research methods are applied in all kinds of studies, though no consensus exists regarding what constitutes a research method and how research methods should be categorized. Over 1900 research articles were obtained from three major journals published between 2001 and 2010 in library and information science (LIS). Each selected article was coded using a schema of research methods developed in this study. The coded data, along with related publications, were analyzed qualitatively and quantitatively. This exploration shows that research methods comprise data collection techniques (e.g., interview, observation) and data analysis techniques (e.g., qualitative, quantitative). Research methods should perhaps be categorized by data collection technique, as it makes more sense than if research methods are labeled as qualitative or quantitative. This study is one of the many efforts to facilitate a better understanding of research methods in LIS and help scholars make more informed decisions about research method selection in their endeavors. Its implications can be extended to LIS research education, training, and advocacy. Because research methods themselves are not discipline-specific, researchers beyond the LIS field would benefit from this study as well.

1. Introduction

Researchers need to consider and choose one or more methods for their scholarly endeavors based on what they intend to study. This is true for all scientific disciplines, including library and information science (LIS). Although a good number of studies have explored the topic of research methods adopted in the LIS field in past decades, three kinds of variations are commonly observed in practice and discourse.

First, a variety of terms other than *research methods* are used in the literature to refer to this concept. Sample terms include research strategies (Järvelin & Vakkari, 1990), research frameworks (White & Marsh, 2006), research designs (Luo & McKinney, 2015), and research methodologies (Hildreth & Aytac, 2007; Peritz, 1977).

Second, different criteria are applied in categorizing research methods. Some studies (Chu, 2015) categorize research methods by data collection technique (e.g., interview, observation, questionnaire) while others (Powell, 1999) use data analysis technique (e.g., quantitative, qualitative). It should be noted that the words *methods* and *techniques* are essentially used synonymously. In the present study, for the purpose of clarification, methods is used to cover the entire research process while techniques is used to refer to specific procedures for data collection or analysis. In most reported research, additional criteria are often applied when categorizing research methods. For instance, Järvelin and Vakkari (1990) group research methods by research strategy (e.g., empirical, conceptual). The temporal criterion is sometimes employed to have cross-sectional studies and longitudinal studies (Chen & Hirschheim, 2004). Case study appears in many research reports as one type of research method (Bernhard, 1993; Gelber, 2013) although it only denotes that the research involves one or several cases (i.e., sampling units) as research subjects.

Third, assorted lists of research methods are developed in different studies due to the two kinds of variations depicted above. Each study creates its own unique array of research methods unless, for example, a later study adopts the same classification scheme developed for an earlier project (e.g., Kumpulainen, 1991, used a scheme developed by Järvelin & Vakkari, 1990).

All of these variations are results of different understandings and interpretations of what constitutes a research method and how research methods should be categorized. They can cause confusion or even be a hindrance to LIS scholars in the selection and implementation of methods for research projects. Likewise, there are implications for LIS education in research methods. The present study attempts to examine those variations and suggest some measures for handling them.

2. Problem statement

There is apparently little consensus as to what constitutes a research method and how methods should be categorized. Determining the

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actual connotation of the term *research method* would help researchers differentiate research methods from other terms (e.g., research designs, research methodologies) often seen in research publications. Scholars studying research methods usually develop their own lists by adopting various categorization criteria. Typically, no two inventories are identical unless a later study shares the research method categories formed in an earlier investigation. It may be feasible to choose one criterion for categorizing all research methods so that a uniform list of research methods can be created. Additionally, research methods are traditionally labeled as qualitative or quantitative to conform to the qualitative and quantitative research paradigms that have received much attention in the scholarly community. Such a division may be reasonable, but it also may not be able to withstand scrutiny.

LIS scholars now use a greater number and wider variety of research methods in their inquiries than they did before (Chu, 2015; Park, 2004). Performing a systematic examination of research methods applied in the LIS field will assist LIS researchers in understanding research methods. It would help researchers select appropriate methods when conducting scholarly efforts. It might also enable LIS educators to determine which research methods should be taught in degree programs, especially at the doctoral level.

The current study focuses exclusively on research methods in the field of LIS and addresses three research questions:

1) What constitutes a research method?
2) Which criterion is appropriate for categorizing and naming research methods?
3) Can research methods be classified exclusively as quantitative or qualitative?

3. Literature review

Studies of the research dimension of scholarly publications cover many variables in addition to research method, including author affiliation, research topic, and the relationship between research topic and method. To a large extent, some of the variables belong to the domain of bibliometrics and scientometrics, where key authors, core publications, top research topics, and similar variables are examined (Peritz, 1977). This study concentrated solely on the research method component.

Studies on research methods have typically been conducted through content analyses of a set of research publications, somewhere between 100 and several hundred, from selected journal titles. The time span involved usually covers several years either consecutively (e.g., Hildreth & Aytac, 2007) or selectively (e.g., Tuomaala, Järvelin, & Vakkari, 2014). Occasionally, non-journals have been chosen as data sources, including textbooks (Bernhard, 1993) and dissertations (Blake, 1994). Some studies focus on a single journal title (Luo & McKinney, 2015; Ngulube, 2015) while others cover several (Chu, 2015; Greifeneder, 2014) or a few dozen (Peritz, 1977; Tuomaala et al., 2014). Turcios, Agarwal, and Watkins (2014) examined 105 titles, but included only the latest issue of each title in the chosen time period in their study.

Studies of this nature have not only been done in the broadly defined discipline of LIS, but also in specific areas such as information behavior (Greifeneder, 2014; Julien, Pecoskie, & Reed, 2011), knowledge management (Ngulube, 2015), technical services (Gelber, 2013), information systems (Palvia, Mao, Salam, & Soliman, 2003), and health informatics (Dimitroff, 1992).

3.1. Research methods and associated concepts

Different scholars have different understandings and interpretations of what constitutes a research method. Peritz (1977), in one of the early studies on the topic, identified 11 research methodologies, including theoretical-analytic, information system design, and surveys on the public, without grouping them by any subcategory. Research methodology in Hildreth and Aytac (2007), however, was defined as containing research type (i.e., descriptive, exploratory, explanatory, and evaluative), data collection methods (e.g., survey questionnaire, survey interview) and data analysis approaches (e.g., quantitative, qualitative). Research methodology (or methodologies) was taken to mean research methods in Peritz (1977) as well as in Hildreth and Aytac (2007). Likewise, Palvia et al. (2003), researchers in information systems, treated research methodology as a synonym for research method.

From the perspective of Järvelin and Vakkari (1990) research methods consist of research strategy (e.g., empirical, conceptual), data collection method (e.g., interview, observation, questionnaire), type of analysis (e.g., qualitative, quantitative), and type of investigation (e.g., empirical, descriptive, comparative, conceptual). The same classification scheme was followed in Kumpulainen (1991) as well as Hider and Pymm (2008). Almost 15 years after the Järvelin and Vakkari (1990) study, a slightly modified classification scheme was applied in Tuomaala et al. (2014) where, for example, IR experiment was added as a data collection method. Redundancy occurred among the four specified facets of research methods in these reports. For instance, citation analysis was listed both as a research strategy and data collection method. The same could be said about experiment and IR experiment, found respectively under research strategy and data collection method. Other identical pairs in dimensions relating to research methods in the classification scheme included qualitative method in research strategy and type of analysis, and empirical or conceptual in both research strategy and type of investigation. A noticeable degree of redundancy was also observed between research strategy and data collection method, as well as between research strategy and type of investigation. Research methods in the studies by Järvelin, Vakkari, and associates had broad connotations that encompassed research strategy, data collection method, type of analysis, and type of investigation.

Luo and McKinney (2015) considered research design (e.g., time dimension, research framework/paradigm), research model (e.g., platform market model), and research theories (e.g., sense of community theory) as separate elements. On the other hand, Ngulube (2015) regarded research methods and techniques as being synonymous; research approach and design (e.g., interview, survey), research methodology (i.e., quantitative, qualitative, mixed), and research paradigm (e.g., positivism, pluralism) were among the terms chosen for examining research. Taking a different approach, Feehan, Gragg, Havener, and Kester (1987) focused on research methods and analytical methods, and Gelber (2013) and Greifeneder (2014) adopted a similar practice.

Data collection techniques and data analysis techniques are the two components present in most, if not all, studies on research methods. All other terms were employed either as a synonym of research method (e.g., research strategy in Järvelin & Vakkari, 1990) or to represent dimensions other than research methods (e.g., research paradigm).

3.2. Categorization of research methods

Multiple categorizing conventions have been applied to research methods. Data collection technique, data analysis technique, research paradigm, research design, and more have all been used as criteria in categorizing research methods. Usually, more than one criterion has been selected in creating a taxonomy or list of research methods.

Peritz (1977) identified 11 research methods used in a selected set of LIS documents: bibliometric and similar studies, comparative studies, content analysis, descriptive bibliography, historical methodologies, information system design, secondary analysis, surveys on the public, surveys or experiments on libraries and others, theoretical-analytic, and other and multiple as one category for studies whose methods did not fit into one of the existing categories (p. 49). As Peritz (1977) is one of the early studies on the topic, her list of research method categories varies from that of more recent studies (Järvelin & Vakkari, 1990;