

QUALITATIVE RESEARCH IN OM: CRITERIA FOR EVALUATION

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ABSTRACT

The paper presents a reference set of research-quality evaluation criteria for qualitative research in Operations Management. The typical research process is presented and enhanced by making explicit the role of the criteria in both the design and evaluation phases. The paper highlights the importance of having such criteria not only to strengthen the research outcome, but also as means of control and self-correction during the research process. This paper concludes with a review of potential methods to provide support to the research-quality evaluation criteria.

Keywords: research design, research evaluation criteria and qualitative research.

INTRODUCTION

Finding the right combination of methodological strategies, methods and tools to support the qualitative research process and its criteria of evaluation is not simple. A researcher is faced with a vast number of choices when selecting a research methodology. Traditionally, in the research design, strong effort is placed on the selection of research methods and little attention is paid on the selection and implementation of the research quality evaluation criteria.

This paper is directed to those researchers who practice qualitative research in operations management (OM). It proposes generic criteria for the evaluation of qualitative research in OM and potential research tools to support the performance of each criterion.

QUALITATIVE RESEARCH IN OPERATIONS MANAGEMENT

Van Maanen (1993:9) defines qualitative methods as an array of interpretative techniques, which seek to describe, decode and translate the meaning, not the frequency, of certain phenomena in the social world (Easterby-Smith, 1999:71).

To search for understanding, qualitative researchers perceive the phenomenon in key episodes or testimonies, represent happenings with their own direct interpretation¹ e.g. narratives to provide to the reader an experiential understanding of the case (Stake 1995:40).

Qualitative research has an inherited difficulty to be evaluated (Easterby-Smith et al, 1999:22,71), so it needs more explicit mechanisms to do this evaluation. The evaluation of qualitative research needs to assess the quality and rigour of the research and its outcomes. In doing research, it is not enough to create novel approaches, but the research and its outcomes have to be evaluated to improve not only the constructs but also the researcher's skills in doing research.

In the field of operations management, a quantitative approach has been traditionally prevalent. Easterby-Smith et al (1999:42) state "one would expect the areas of operational research and management to be dominated by a concern with numbers and 'things'. But a number of well-known people have deviated markedly from the right and narrow... using concepts rather than numbers to understand the complexity of organisational systems." Meredith (1998) contrasts the traditional rationalistic (and predominantly quantitative) approach to OM that aims to *explain* "what and how" with the emergent interpretivistic (and increasingly qualitative) that aims to *understand* "why". Beach et al (2001) argue that using quantitative methods alone cannot capture the complexity exhibited in the problems encountered in OM and advocate the use of a qualitative approach.

Morse et al (2002) suggest that qualitative findings are still not regarded as solid empirical research, causing difficulty in getting funding and are ignored by policy makers and practitioners. Proving the validity of the findings and the quality of qualitative research with well established methods can help change these perceptions.

RESEARCH METHODOLOGY PROCESS

An important characteristic of research is that it is carried out in a structured way, follows a certain process and this process ensures that the variable effects that can influence such research can be accounted for. As Karlsson (2002) states: "Methodology is there to make it credible to the reader that you have planned and carried through your study as well as analysed and drawn conclusions in a way that we can rely on what you write... the idea is quality assurance in research".

A number of approaches have been proposed to structure the research process (Croom, 2002; Lehaney and Clarke, 1995). However, most of the proposed approaches place little attention on the research-quality evaluation phase of the research process. Very little published research in Operations Management makes explicit whether the proposed research fulfils the criteria of quality research. One of the reasons for this may be because a comprehensive set of research quality evaluation criteria does not exist.

The classical approach of research process starts with the identification of the research issue and the research questions through an exploratory analysis², followed by the research

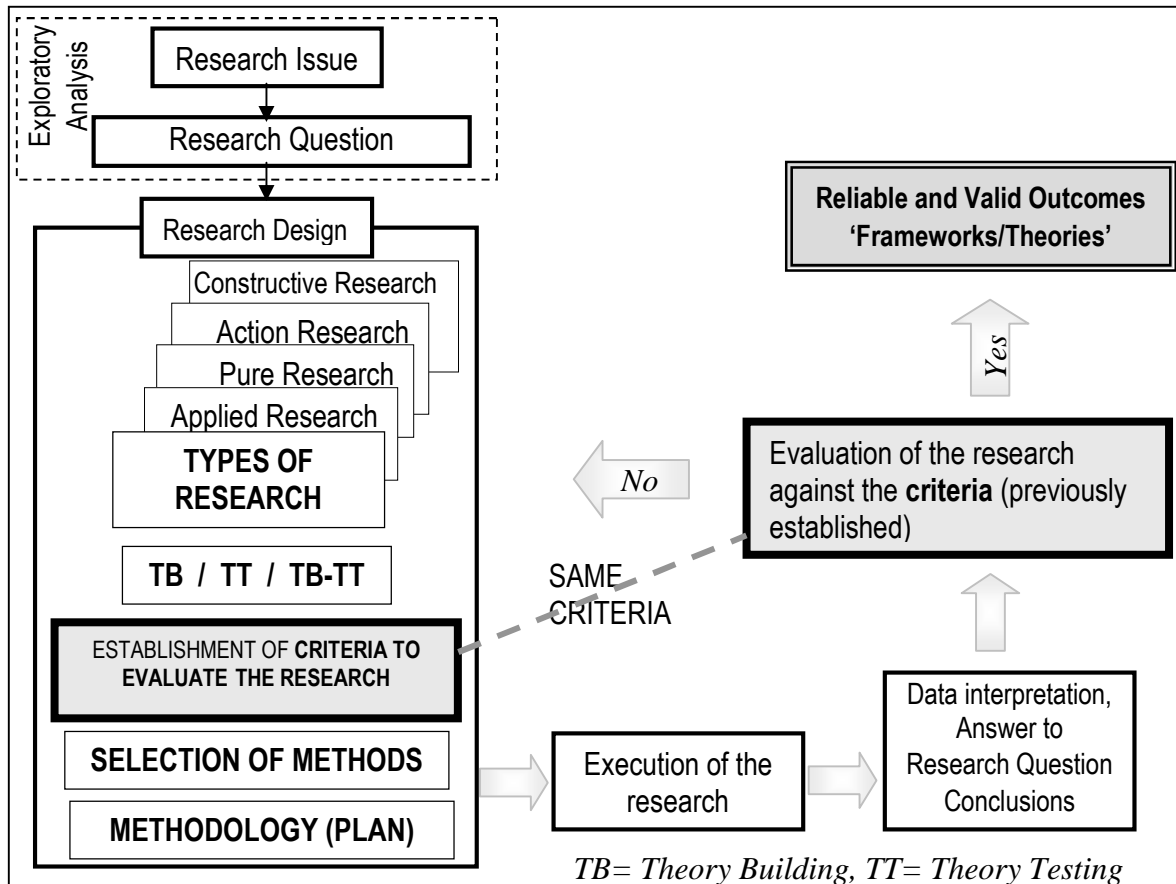
1 The interpretations are done on the basis of observation and other data such as testimonies, written stories (Stake, 1995:9).

2 The exploratory analysis aims to provide an understanding of the research issue; it is achieved by the literature review and/or initial field studies (e.g. initial case studies, surveys, etc.).

design, the execution of the research methodology and the data analysis, finally the research questions are answered, thus conclusions are drawn (Eisenhardt, 1989:533). At the end of the research process, very few researchers judge the quality of their research; and those who do it use the typical basic tests, i.e. construct validity, internal validity, external validity and reliability (Yin, 1996:32-38). This classical research process is shown in Figure 1 in white boxes.

This paper proposes a structured approach to evaluate qualitative research by using 'the research-quality evaluation criteria', which are discussed in the following section. The adoption of the criteria impacts the research process, from research design to the outcomes. In Figure 1 the grey boxes highlight the impact of the criteria in the research process. There are two strategic places where *the criteria* make its greatest impact: at the beginning of the research, in the definition of *the research design* and at the end, in *the evaluation of the total research*. By using the criteria in these phases of the research process, a more integrated and credible research process can be attained.

Figure 1. Role of 'the research criteria' into the research process



Research Design

The research design is the logical model of proof that allows the researcher to draw inferences concerning casual relationships among the variables under investigation (Yin, 1994:19). Research design covers different issues, all of them inter-related: research type,

methods to build and/or test theory, data analysis and data interpretation and methodology (as an execution plan) (White, 2000:25).

Since this paper is focused on qualitative research in operations management, it is assumed that the research design follows a qualitative approach; otherwise, this issue should be also addressed during the research design. During the definition of the research design, the researcher faces a number of options, which impact the overall research and its outcomes and the first is the selection of research type.

This paper is focused on the identification of criteria (controls) to evaluate qualitative research. In particular controls for research based on:

- theory building (TB)
- theory testing (TT)
- theory building-theory testing (TB-TT)

Theory Building

Voss et al (2002) identified the main aims of a theory building research: "Identify/describe key variables, identify linkages between variables and identify why these relationships exist". This is how a model is built. However, it is difficult to define when a model becomes theory. Meredith (1993) proposes the normal cycle of research, in which methods evolve into frameworks and frameworks evolve into theories by following the normal cycle for research. This cycle is an iterative process 'explanation-description-testing' that drive models into theories. In order to evaluate when a theory becomes such, several authors have proposed a number of criteria (See Table 1)

Table 1. Qualities of theory

Qualities of Theory	<i>Dubin (1969)</i>	<i>Thomas & Tymon (1982)</i>	<i>Eisenhardt (1989)</i>	<i>Meredith (1993)</i>	<i>Wacker (1998)</i>
1. Allow predictions.	◆			◆	◆
2. Increase understanding/explanations	◆			◆	◆
3. It is interesting (i.e.non-trivial)	◆	◆	◆	◆	
4. Includes attributes, variables	◆	◆		◆	
5. Explain the interaction / relationship among variables and attributes		◆	◆	◆	◆
6. Do not include composite variables (i.e. undefined elements)	◆			◆	
7. Domain where it is applied (i.e. Includes boundary criteria)	◆			◆	◆
8. Uniqueness (contribution)			◆		◆
9.Application of the theory to other environments (i.e. generalisability)			◆		◆
10. Theory simplicity and parsimony ³			◆		◆
11. Logically coherent		◆	◆		
12. Linking existing theory with theoretical novelty of the construct		◆	◆		

³ Parsimony is the simplicity in explaining the construct or phenomena (Sekaran, 1992; Wacker, 1998)

Theory Testing

According to Forza (2002), theory testing evaluates "the adequacy of the concepts and models developed in relation to the phenomenon.... It takes place when knowledge of a phenomenon has been articulated in a theoretical form". The researcher is then faced with the task of translating this theoretical form into well designed measurement tools. Such tools should fulfil with the qualities of theory testing (See Table 2).

Table 2. Qualities of testing theory

Qualities of Theory Testing	<i>Eisenhardt (1989)</i>	<i>Kasanen et al, (1993)</i>	<i>Yin (1994)</i>	<i>Easterby-Smith (1999)</i>	<i>Kekale (2001)</i>	<i>Voss (2002)</i>
1. Provide evidence to answer the research questions/ support a proposed theory - Relevant samples - Provide sufficient evidence to substantiate the conclusions that have to be drawn	◆			◆	◆	
2. Show a proof of logic and mastery of research methodology process - Internal validity - Construct validity - External validity - Reliability	◆	◆	◆	◆	◆	◆
3. Show practical functionality of the construct (proposed) theory		◆		◆		
4. Gives a work reality			◆			◆
5. Provides precise information				◆		◆
6. Provides new insights			◆			

The literature review on research methodology in OM shows that there are of a lot of methods, techniques, tools and even software focused on theory-testing (e.g. Voss, 2002; Barnes, 2001; Miles and Huberman, 1984). There are fewer theory-building methods and techniques (e.g. Meredith, 1993, Wacker, 1998; Johnston et al, 1999), but too little has been developed on the criteria of evaluation of a research (e.g. Thomas and Tymon, 1982; Kasanen et al, 1993).

EVALUATION CRITERIA: IMPORTANCE AND SELECTION

As previously mentioned, generally, the criteria for research evaluation are not taken into consideration when designing research. Morse et al (2002) describe of current research practice that "the emphasis on strategies that are implemented during the research process has been replaced by strategies for evaluating trustworthiness and utility that are implemented once a study is completed". They continue arguing that "...qualitative researchers should reclaim responsibility for reliability and validity by implementing verification strategies integral and self-correcting during the conduct of inquiry itself".

Having such criteria is important because it provides:

- *Validity and credibility to findings and whole research process.* Having a well-thought research design is a prerequisite to ensure research quality. However, such design must be

evaluated against some established criteria that indicate the appropriateness of the research design and its outcomes.

- *Feedback to research design.* As a continuation from the previous point, the availability of criteria to evaluate research quality can help identify strengths and weaknesses of the research design and its outcome. The research-quality evaluation criteria are also useful as a framework in which to carry out research "post-mortems".
- *A learning tool to enhance research skills.* Having the ability to critically analyse the research process and research outcome by means of a defined framework should increase the researcher skills for future projects.

A reference point for research design and outcomes. The establishment of the research-quality evaluation criteria from the beginning of the research project serves as a guide for the researchers during the project development. Having certain goalposts along the research line helps evaluating the direction of the research and can identify in early stages if the research design is flawed or if the expected outcome will fail any of the criteria, allowing corrective actions to be taken

Selection Process of evaluation criteria

The selection of the criteria for the evaluation of research is done through the analysis of the characteristics that are desirable in theory building or theory testing and analysing their generalisability. This selection followed a logical and systematic process to search the research criteria, as suggested by Strauss and Corbin (1990:22); i.e. identification, selection and aggregation of research criteria. The analysis is based on literature review and empirical research and on the observation of requirements for the different types of research. For a research quality evaluation criterion to be selected, it must fulfil a number of requirements:

- *Must be applicable to qualitative research TB, TT or both.* Since the focus of this paper is on the evaluation of qualitative research, the criteria must have been identified as contributing to the soundness of this specific type of research, in both forms, theory building and theory testing
- *Supported by a variety of methods.* In order to ensure the applicability of the quality criteria, a number of methods should be available to support the criterion. This will ensure that the researcher is not restricted/forced to use a single method in order to ensure the fulfilment of the criterion.
- *Measurable.* The criterion should be objectively measured and not open to confusion.

Once the selection criteria was identified, it was applied to the characteristics of theory building and theory testing previously addressed in Table 1 and Table 2

RESEARCH-QUALITY EVALUATION CRITERIA

Based on the conditions of selection of 'controls', Table 3 shows the list of criteria to evaluate qualitative research in operations management. These are:

The construct increases understanding. The proposed constructs should enhance the comprehension of existing knowledge and/or new knowledge by providing a logic and reasonable explanation of the phenomena.

The construct allows predictions. Based on certain inputs, constructs should estimate or model different scenarios.

The construct is non-trivial. It refers that constructs should avoid the obviousness and bareness, although, this does not imply that constructs should be complicated.

Table 3. Criteria for the evaluation of qualitative research

	Generic Criteria of Evaluation 'controls'	TB	TT	TB- TT
1	The construct allows predictions or increases understanding	✓	*	✓
2	The construct is non-trivial	✓	*	✓
3	The construct includes attributes, variables, etc.	✓	*	✓
4	The construct does not include undefined variables	✓	*	✓
5	Provides research boundary 'scope of the construct'	✓	*	✓
6	Rigour of the research methodology process a) shows proof of logical research methodology design b) Internal validity c) Construct validity d) External validity e) Reliability	✓	✓	✓
7	Contains evidence to support the construct a) Select relevant samples and cases b) Provide sufficient evidence to substantiate the conclusions that have been drawn	*	✓	✓
8	Contribution to knowledge	✓	*	✓
9	Contribution to practice a) practical relevance b) practical functionality	*	✓	✓
10	Linking existing theory with theoretical novelty of the construct	✓	*	✓
11	Application of the construct on other environments	*	*	✓

✓ criteria that must be included
 * criteria that may be included

The construct does not include undefined variables. Technically, every variable used should explicitly state how and why it is related or unrelated to each and every variable in the model (Wacker, 1998).

Provides research boundary (scope of the construct) Constructs should define their area of applicability by establishing the environment where it can make accurate predictions. The use of different surveys, interviews and/or case studies on different fields are some methods suggested to defined the boundary of the research (Dubin 1996).

Rigour of the research methodology process The rigour of the research process is demonstrated through:

- a) A proof of logical research methodology design. It is concerned with the evidences that show a mastery research process, research protocol and a rational selection of research methods tools and techniques, which address the research issue (Sekaran, 1992). Croom (2002) proposes a set of questions to explore the research processes.
- b) Internal validity is the extent to which the researcher can establish a causal relationship; whereby certain conditions are shown to lead to other conditions as distinguished from spurious relationships (Easterby-Smith et al, 1999; Yin, 1994:33,35). Some techniques used to ensure the internal validity are: methodological triangulation (action research, case study, interviews, surveys, etc.), use of different respondents, cross case analysis, pattern matching logic, explanation building and use a systematic process in building theory (decomposing, composing and interpreting) amongst others.
- c) Construct validity is concerned with the idea that the research design fully addresses the research questions and the research objectives (Thomas and Tymon, 1982; White, 2000:25, Kasanen, 1993; Easterby-Smith et al, 1991:41;). The common techniques used to ensure construct validity are: triangulation of data, use of different source of evidence, selection of multiple data collection techniques, use of codes, standard data reduction tools and enfolding theory.
- d) External validity establishes the domain to which a study's findings can be generalised (Yin, 1994:33). Replication logic and use of multiple case studies are two techniques widely used to support external validity.
- e) Reliability is the extent to which a study's operations can be repeated. It is also about consistency of research, and whether another researcher could use the same research design and obtain similar findings. The common techniques used to build reliability on the research are: implementation of controls to evaluate the research outcomes, use of case study protocol, pilot cases and use of standard databases (White, 2000:25; Kekale, 2001; Easterby-Smith et al. 1999:41; Thomas and Tymon, 1982; Serakan, 1992).

Contains evidence to support the construct. It is concerned with the support data or proof that fully address the research issue 'construct' (Kekale, 2001). This is achieved by:

- a) Selecting relevant samples and cases. It is concerned with the quality of samples. Examples should rigorously test the features of the propose construct.
In building theory from case studies, Voss et al (2002) recommend case selection by using replication logic. i.e. cases should be selected to predict similar results (literal replication) or produce contrary results but predictable reasons (theoretical replication).
In theory testing, Miles and Huberman (1994) suggest sample selection by finding typical samples, or negative/disconfirming samples or polar samples that contrast the characteristics being studied.
- b) Providing sufficient evidence to substantiate the conclusions. This is concerned with the quantity of evidence to support the construct.
This issue not just addresses the sample size e.g. number of case studies, survey samples, etc. but also, the different methods used to test a construct within the same sample e.g. interviews, documentation, observation, etc. (Forza, 2002, Stake,1995).

Contributions to knowledge. The final objective in doing research is to make a contribution either to theory or practice or both by proposing something new, not known before the research. The contribution to knowledge underpins the development of constructs to simplify the understanding of the world and /or make predictions.

Contribution to practice. The aim is to provide:

- a) Practical relevance. i.e. provide important information.
- b) Practical functionality. i.e. provide something useful such as a tool, framework or process to simplify the understanding, or efficiently arrive to conclusions by saving time, making it easier, etc.

Linking existing theory with the theoretical novelty of the construct. It strengthens the research findings by supporting them with previous theories, and potentially it increases the importance of the research (Kasanen, 1993; Voss et. al, 2002).

Application of the construct in other environments. As Albert Einstein (1879-1955) estates 'a theory is more impressive the greater the simplicity of its premises is and the more extended is its area of applicability'. It is concerned with the generalisability of the research and the applicability of the research in others fields (Forza, 2002; Wacker,1998; Thomas and Tymon, 1982).

This section has pointed out the criteria to evaluate research in addition it has suggested some methods and techniques to fulfil with the criteria. However, as Arbnor and Bjerke (1997:6) state, the research methods and techniques in building and/or testing research should be done based on the rationalisation of the individual research needs.

CONCLUSIONS

This paper contributes to theory by providing a new, comprehensive framework of research-quality evaluation criteria. For practitioners, it provides a tool to ensure the quality of the research, by taking into account the evaluation criteria when designing the research, hence building validity and reliability from the beginning to the outcomes of the research.

The benefits of the proposed framework of research-quality criteria are:

- it establishes a reference point for the research design process and research outcomes.
- it can help strengthening the validity of the construct and outcomes
- it enhances the researcher capabilities and skills to develop a rigorous, logical and rational thinking in doing research.

The criteria are focused on operations management, but they may be equally useful for other areas such as business and social sciences.

Future work will include carrying out an extensive survey in reported research (PhD thesis and grant reports) in OM in order to identify best practices that could improve the proposed research quality evaluation criteria.

As a closing note, we refer to the theme of the conference and ask: One world, one view of OM?. From the methodological point of view, fortunately the answer is: one world, many different views that bring diversity and richness to the field.

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