The Validity and Utility of Participatory versus databased Research Strategies*

Inge Bleijenbergh, Hubert Korzilius, Piet Verschuren
Institute for Management Research, Nijmegen, the Netherlands
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Abstract

Participatory research strategies, where researchers involve experts or stakeholders in knowledge production, are of increasing importance in social science research. These research strategies are especially used to support practice oriented research, where decision-making needs to be supported or solutions for practical problems need to be found. Methodological criteria are formulated for evaluating the practical utility and the validity of the research results with the help of a Delphi study using research methodologists as experts. Moreover, different categories of participatory and data based research strategies are compared to these criteria. Experts agree upon the criteria of controllability, comprehensiveness and acceptance of the results, as well as holism. Practice based research and qualitative data based research are classified as best equipped to to fulfill these criteria.

1. Introduction

Research that aims at the solution of practical problems, i.e practice oriented research, is of growing importance. For this type of research traditional research strategies may be used, such as the quantitative survey and the qualitative case study. However, a new class of research strategies that is increasingly used for this purpose includes so called participatory research strategies, like Group Model Building, Delphi, and Gaming. Up till now we know little about the validity and utility of these strategies.

Elaborate methodological criteria are available for assessing the validity of data based research strategies (Cook & Campbell; Dillman, 2000; Nunnally & Bernstein, 1994; Yin, 2003), which are also available for individual participatory research strategies like modeling

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(Barlas, 1989; Forrester & Senge, 1980), Delphi (Engels & Kennedy, 2007) and gaming (cf. Duke, 1974). However, there is a lack of criteria to evaluate the quality of practice oriented research in general. Moreover, we argue that also the utility of practice oriented research should be translated in terms of methodological criteria. We aim to contribute to filling this gap by developing criteria for assessing the validity and utility of the results of participatory and data based research strategies, both within the category of practice based research. The development of methodological criteria is directed towards the community of practice oriented researchers and methodologists, either working in universities or in professional research agencies. They may be specialists in a specific field of participatory strategies such as Group Model Building and System Dynamics Modeling, Delphi and Gaming, or they may have a broader orientation. Criteria for assessing participatory research may help them to make more deliberate choices for a specific research strategy in a particular situation, based on its strengths and weaknesses.

We intend to answer the following two research questions. (1) What are relevant criteria for evaluating the validity and utility of practice oriented research? (2) How do experts evaluate the research strategies for practice oriented research on the criteria developed?

The following issues will be presented. First, a definition of participatory research strategies is given that distinguishes it from traditional data based strategies. We also make a rudimentary taxonomy of (classes of) data based and participatory research strategies (section 2). Next, we propose product criteria that can be used to evaluate the validity and utility of practice oriented research (section 3). In the method section we shortly describe the Delphi study that we used to evaluate the two classes of research strategies as to these criteria (section 4). In section 5 we discuss the results of the Delphi evaluation. We end our paper with some conclusions (section 6).

2. A taxonomy of practice oriented research strategies

In this section we make a distinction between *data based* research strategies on the one hand and *participatory* research strategies, based on *knowledge* of the participants on the other. Of both classes the two most important subclasses are shortly described (see Figure 1).

Participatory strategies

In the last decades social scientist increasingly use so called participatory techniques and strategies for investigating practical problems and supporting solutions. With a *practical* problem, as contrasted to a theoretical problem, we mean a problem that calls for an intervention or a new artefact, in order to change reality in a desired direction. The problem to

be solved or decision to be taken may exist in the context of either (public) policy of a public authority, or of strategic management in an organization. The strategies vary from workshops using brainstorm techniques where stakeholders actively generate ideas about a specific problem, to the development of participatory management games where complex processes in organizations are simulated (cf. Geurts & Joldersma, 2001; Vissers, Heyne, Peters & Geurts, 2001). There are two types of purposes in two kinds of domains where these strategies can be used: (a) Supporting *decision making* i.e. for producing a set of *recommendations* for solving practical problems (Mayer & De Jong, 2004; Eden, 1992). (b) Producing new knowledge that can be implemented by practitioners in solving practical problems (Verschuren & Hartog, 2005). Ideal typically, in case (a) the participants are stakeholders who are selected on the basis of their own involvement and experience with the problem at hand. In case (b) the participants are experts who are selected on the basis of their different expertise with regard to the problem to be addressed. Another difference is that in case (a) the knowledge and insights that are produced are context-bound, whereas in case (b) the knowledge to be produced may have a more general character. For these two types of use we coin the terms *Practice Based Research* (PBR) and *Expert Based Research (EBR)* respectively.

On the basis of this characterization we define participative strategies as follows: *A strategy where a group of either (a) stakeholders of a problem to be solved or a decision to be made (PBR), or (b) experts in relevant domains (EBR), tackles a problem or a research question by means of confrontation and discussion of their ideas concerning this problem or question, in order to support decision making, a set of recommendations or knowledge that can be used for solving practical problems.*

Practice Based Research

Practice Based Research (PBR) aims at a group of problem owners or stakeholders of a problem in their task of taking an adequate decision or formulating an efficient solution to a problem by means of making use of participatory strategies. Examples are Group Model Building, where managers are involved in building a causal loop diagram of a practical problem (Anderson & Richardson, 1997; Vennix, 1997), and gaming with decision-makers (Mayer& De Jong, 2004).

The need for supporting decision-making with participatory strategies derives from critics of traditional decision-making. Traditional decision-making, based on voting procedures, is supposed to represent the different interests of the stakeholders. The assumption is that proposals that get the majority of votes represent the interests of the majority of stakeholders, and thus is the best decision. The prescriptive theory behind participatory methods questions these assumptions. It presupposes that not all relevant options are recognized, articulated or are taken into account equally (Janis, 1982; Rouwette, 2003; Sterman, 2000). It also questions the idea that the different interests are represented equally or even *are* represented at all (Janis

& Mann, 1977).

Expert Based Research

Expert Based Research (EBR) belongs to the larger category of *Knowledge Based Research (KBR)* that indicates a distinction with so-called *data based research*, which is the mainstream type of empirical research in the social, policy and management sciences. Characteristic for knowledge based research is that *knowledge and information* is the input, as opposed to traditional social science research where *data* is the input. Knowledge can be derived either from literature or from experts.

In participatory research strategies only the involvement of experts is relevant. Data based research is *directly* empirical as it is fully based on sensory observation, whereas knowledge based research is either *indirectly* empirical or even mainly logical, and not empirical at all. An example is a Delphi study, where a researcher assembles expert knowledge regarding a practical problem (Rescher, 1998). In every day practice, Delphi studies are also used to involve stakeholders in organizations (Van Dijk, 1989), so the difference between the two participatory research strategies is not always strict. Nevertheless, we consider experts as outsiders to an organization and stakeholders as insiders and therefore want to maintain the conceptual difference between expert and practice based research strategies. Also System Dynamics model building with experts can be considered an example of expert based research strategies.

Expert Based Research has four typical characteristics. Firstly, EBR is based on the assumption that a skilful and interactive confrontation of different kinds of expertise can lead to new and useful insights and knowledge. In turn this assumption is primarily based on the fact that expert knowledge nowadays is highly specialized and has a narrow scope whereas most practical problems have a multidisciplinary character that ask for a broad scope. Secondly, compared to data based research, knowledge based research can be very quick. The reason for this is that the knowledge experts have can be elicited and confronted relatively quickly, compared to the production and analysis of empirical data in data based research. And compared to literature search its results may be very actual and new, as knowledge often takes a long way before it is published in books and articles, and it has found its way to practitioners. Thirdly, many practical problems ask for intuitive understanding, tacit knowledge, and normative considerations**.** This can not or only very scarcely be delivered by means of a mainstream data based research. Fourthly and finally, knowledge based research seems to offer excellent opportunities for multidisciplinary research. This is achieved by selecting participating experts from all kinds of relevant disciplines, and by making them interact intensively. Most practical problems ask for several kinds of expertise. However, within the domain of mainstream data based research the idea of interdisciplinary research

never had an adequate methodological development.

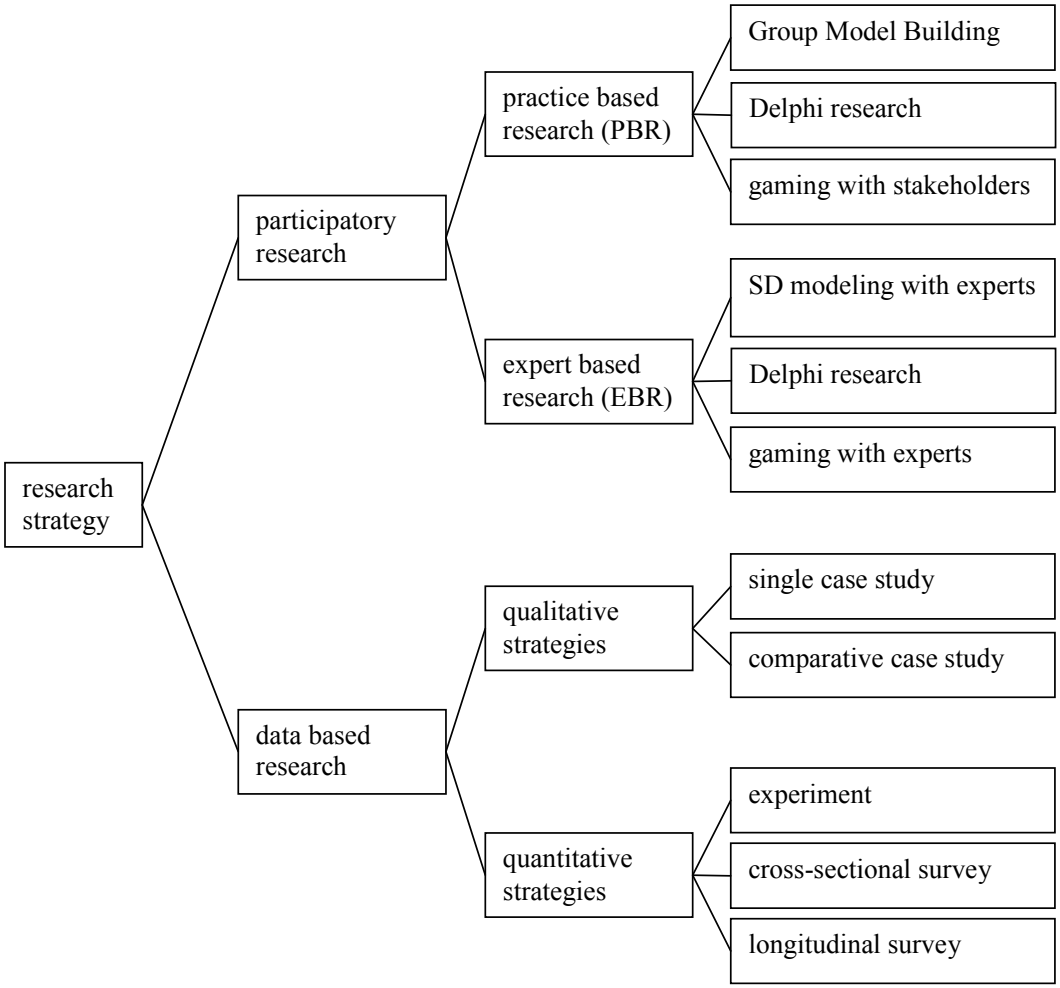

Figure 1
A rudimentary taxonomy of strategies for practice oriented research.

Data Based Research

In the above description of EBR we confronted it with Data Based Research (DBR). There are two main categories of DBR that may significantly differ as to the validity and utility of their results for solving practical problems: (a) quantitative research and (b) qualitative research. There exist several variants of both categories that move along the two extremes of the following three dimensions. The first is a low number of research units in qualitative research, as compared to quantitative research strategies, with a rough demarcation of 60 to 80 units. This enables the use of labor intensive methods in qualitative research, needed for in depth knowledge in combination with a high *internal* validity. In contrast, quantitative research primarily aims at large samples and high *external* validity. Secondly, in a qualitative research strategy the methods for data gathering are relatively open and unstructured, whereas in quantitative research there is a prevalence of stimulus-response methods with a closed and

pre-structured character. This issue is closely related to labor intensiveness, and is needed in order to cover large samples. Thirdly, in a quantitative research the data are figures or codes, whereas in qualitative research the data is text. This text may be either reactions of respondents to questions or propositions offered by the researcher (interview), or reports of systematic observations, or the contents of media and documents (content analysis). In the first case the data are *statistically* analyzed by means of counting and calculations, whereas in the second case the data are *conceptually* analyzed by means of interpretation and comparison. Examples of quantitative data based research strategies that may support practice oriented research are the large-scale survey (Dillman, 2000), panel and trend research and the laboratory and field experiment (Cook & Campbell, 1979). Examples of qualitative data-based research strategies with the same aim are the (comparative) case study (Yin, 2003), the qualitative survey and the grounded theory approach (Corbin & Strauss, 2008).

3. Product criteria

Before proceeding with an evaluation of strategies by means of a Delphi study, we propose in accordance with our first research question a number of methodologically criteria that may be relevant for evaluating the validity and utility of practice oriented research. These criteria were developed on the basis of a small pilot study, involving interviews with practitioners working in the field, combined with our own research experience. The criteria can be characterized as *product* criteria, as they concern the outcomes of a practice oriented research, not the process of the research. Before using them in our evaluation, we propose and discuss seven criteria at face value below.

A well known criterion in mainstream data based research is the external validity of the research results. This criterion is not included because of its weak importance for practice oriented research.

1 *Internal validity.* Internal validity mostly is used for the validity of causal reasoning or causal conclusions and for the validity of the measurement procedure. In this study we use it more broadly as whether a proposition is true for the target population or sample that has been studied (and not for a broader population).

2 *Controllability.* Controllability refers to the possibility for others than the researcher and the participants to check how the research was done and how the results were achieved.

3 *Comprehensiveness of the results.* In a practice oriented research often the target population has to adapt its behavior corresponding to the research recommendations or the resulting decision making. This means that the members of this population should at least understand these results and the way they were produced. A necessary (but not sufficient) condition for this is that the results of the research must be translated in common sense language.

4 *Acceptance of the results.* A similar argument on the comprehensiveness can be made about the acceptance of the results. Comprehensiveness is a necessary but not a sufficient condition for acceptance. People should also recognize themselves in these results and be committed to implement them. This means that they also emotionally support them and consider them legitimate. A necessary (but most often not sufficient) condition for this is that the users or the target population agree with the selection of the participants and experts in the research.

5 *Holism.* Problem solving mostly asks for knowledge of the *whole* problematic phenomenon, instead of understanding parts or aspects of it. A practical problem can be regarded as a system that has subsystems and aspects. The criterion of holism says that we should know the subsystems and the aspects from which they are built and the way these are interrelated, and how they are related to the whole. We also should know the interrelationships with the context in terms of time and space.

6 *Interdisciplinarity.* This criterion comes close to that of holism. However, interdisciplinarity is a necessary but not a sufficient condition for holism. That is, each subsystem and aspects thereof may be the object of a scientific discipline or expertise. So we have to bring together these specializations. Interdisciplinarity is one of the main advantages of the use of participative research strategies as compared to mainstream data based research. Participatory strategies need to support the exchange, integration or reconciliation of knowledge coming from different fields and disciplines.

7 *Manipulability of variables.* The truth of a proposition is not a guarantee for its utility (for decision making or for knowledge building). Valid propositions are therefore not necessarily useful propositions. In order to be useful, practice oriented research needs to identify variables that can be manipulated or influenced. For instance, many studies proved the validity of the hypothesis that children with low socioeconomic status in primary schools usually have weaker results than children with high socioeconomic status. Yet, socioeconomic status is very difficult to manipulate and it is therefore not effective to improve the school results of low socioeconomic status children. Here, research needs to identify variables that can be manipulated more easily in order to improve school results, for example, providing preschool language education.

4. Method

For answering our second research question we needed specialized knowledge that could be quickly obtained and that is multidisciplinary in nature. As argued above, a Delphi study fits these requirements very well. For this study we involved ten experts on various areas of research methodology working at the Institute for Management Research, Radboud University Nijmegen, the Netherlands. They received (in Dutch) a description of the goal of the assessment and a short description of the four research strategies and the seven product

criteria. In the instruction we stressed the importance of independent assessment. Next, they were asked to fill in a scheme in which the different research strategies were confronted with the criteria developed above. Moreover, the experts were given the opportunity to give additional comments on the choice of the criteria, the classification of the research strategies, the assignment of scores, or whether they had any general remarks. Herewith we collected both quantitative as well as qualitative data. For the quantitative data we established interrater agreement and for the qualitative data we performed content analysis.

Interrater agreement for the evaluation of the product criteria on the research strategies was determined by having the ten[1] independent experts assigning scores. They were asked to assign scores of the product criteria to the four different research strategies we defined in the taxonomy developed above on a 4-point ordinal scale: **-** = not/weak; +- = moderate; + = good; ++ = very good (when experts were not able to assign a score they had to indicate that by means of **x** = not applicable).

As the evaluations were of an ordinal level, interrater agreement was assessed by calculating Kendall's coefficient of concordance, Kendall's W, using SPSS Version 15. The values of Kendall's W range from 0, indicating complete disagreement, to 1, meaning complete agreement[2]. We tested the null-hypothesis that the raters 'have no community of reference' (Kendall, 1970, p. 98). In addition, we calculated mean ranks and rank orders of the evaluations given.

Content analysis was performed by open coding of the experts' comments and then ordering them in themes. Themes involved the different criteria, and also concepts such as the taxonomy and the gap between theory and practice. We used this analysis for interpreting the results of the quantitative analysis.

5. Results and interpretation of Delphi study

In Table 1 the results of the interrater agreement of product criteria for research strategies are shown.

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[1] The mean of the independent ratings of the three authors was considered as one of the ten ratings. As comparison of results with and without our rating revealed no substantially different results, we decided to leave it in.

[2] The rank order correlation of Spearman, with coefficients ranging from -1 to 1, was not used. This is because when more than two observers are involved, agreement and disagreement are not symmetrical opposites. Observers may all agree but they cannot all disagree completely (derived from Kendall, 1970, p. 95).

Table1

Results assessment interrater agreement of ten independent experts using Kendall's W.

Internal validity	Control-lability	Comprehen-siveness of the results	Acceptance of the results	Holism	Interdisci-plinarity	Manipu-lability of variables
.16	.70**	.67**	.65**	.37*	.17	.13

* $p < .05$ ** $p < .01$

From Table 1 it appears that the ten experts had statistically significant agreement on the product criteria controllability, comprehensiveness of the results, acceptance of the results, and holism. Experts disagreed in their evaluations of the product criteria internal validity, interdisciplinarity, and manipulability of variables. For the shared rating of all raters (below) these results mean that the evaluations of the research strategies on the criteria controllability, comprehensiveness and acceptance of the results (based on the height of Kendall's W), and to a lesser extent for holism are considerably reliable. Below, we will discuss the rank orderings of the research strategies on the criteria and consider the experts' comments in our interpretation. A short interpretation of the criteria on which the experts agreed is as follows. Controllability refers to the possibility for others than the researcher and the participants to check how the research was done and how the results were achieved. Experts' additional comments put the relationship with reliability into question, but nevertheless agreement exists on the application of this criterion on the different research strategies. Comprehensiveness of the results means that the members of this population should understand the results of practice oriented research. The experts commented that the use of clear language is essential to achieve this. Indeed, we have to presuppose that all four categories of research strategies are carried out equally well at this point in order to know their differences as to our methodological criteria.

Acceptance of the results refers to the target population's need for recognizing, emotionally supporting research results and considering them as legitimate. Some experts indicated that this criterion is especially important for supporting decision making. Holism refers to knowledge of the *whole* phenomenon of study, instead of understanding some parts or aspects of it. The experts stated that holism depends on the diversity of the participants involved in a research. In our view the possibility of selecting various expertises is one of the unique advantages of this approach with regard to holism and interdisciplinarity.

Evaluations of interdisciplinarity, internal validity, and manipulability of variables can not be considered reliable. For the interpretation of this lack of agreement we also use the comments of the experts in our Delphi study. With regard to internal validity, the experts' comments

showed that different interpretations of the concept internal validity caused the disagreement. Experts seem to disagree about the amount in which participatory research can produce internally valid results. More specific, some argue that the social interaction between the researcher and the participants may cause a bias of the knowledge produced. On the contrary, others argue that participatory research produces internally valid knowledge because it is the result of consent between the people involved.
Some experts also disagreed on the criterion of interdisciplinarity. Their comments suggested that this criterion can not be applied in general, as it depends on the design of a particular research. However, whether such a comment is applicable is a matter of dispute, as this can be said for any criterion. The criterion of interdisciplinarity refers to the *possibility* of integrating knowledge from different disciplines. Nevertheless, the lack of agreement between the experts induces us to cancel interdisciplinarity as a criterion. In addition, the criterion of holism also covers the aspect of bringing together knowledge from different domains and may include the use interdisciplinary knowledge.
With regard to the application of the criterion of manipulability of variables on the research strategies, the experts also disagreed. They consider manipulability of variables to be applicable to both causal models and to social reality. When applied to causal models, some experts argue that data based strategies are equipped for producing manipulable variables. When applied to social reality, other experts reason that participatory strategies may be more suited for indicating which variables are appropriate for manipulation. As a result this criterion obviously does not discriminate enough between the various strategies.

To summarize the results so far, there was agreement among experts about controllability, comprehensiveness and acceptance of the results, and holism. Experts disagreed about internal validity, interdisciplinarity, and manipulability of variables. We propose to reject the use of the criteria interdisciplinarity and manipulability of variables and encourage developing a more unanimous definition of internal validity in relation to participatory research.

In order to study the application of the four reliable criteria on the various research strategies we used the experts' ordinal scores. Mean ranks per research strategy for the criteria were calculated. In addition, we determined rank orders. Rank orders range from 1, the research strategy does not or weakly fit the criterion, to 4, the research strategy fits very good on the criterion (see Table 2).

Table 2

Mean ranks per research strategy on four product criteria.

Research strategies		Controllability	Comprehensiveness of the results	Acceptance of the results	Holism
Partici-	PBR	1.70 (1)	3.67 (4)	3.86 (4)	2.80 (3)
patory	EBR	2.05 (2)	2.28 (2)	2.21 (3)	2.75 (2)
Data	DBR qualitative	2.45 (3)	2.67 (3)	1.93 (1)	3.00 (4)
based	DBR quantitative	3.80 (4)	1.39 (1)	2.00 (2)	1.45 (1)

Note. Between brackets the rank orders ranging from 1, not/weak, to 4, very good.

Table 2 shows that Practice Based Research (PBR) is considered very good on the criteria comprehensiveness and acceptance of the results, as well as holism, but was weak on controllability. Expert based research (EBR) is evaluated as good with regard to acceptance of the results, while moderate as to the other three criteria. Qualitative data based research (DBR qualitative) is considered very good on holism, and good on comprehensivenessof the results and controllability. But it is evaluated as weak on acceptance of the results. Quantitative Data Based Research (DBR quantitative) is considered to be very good on controllability, moderate on acceptance and weak on both comprehensiveness and holism. The differences in mean ranks in Table 2 show that, in general, the experts were quite well able to discriminate the research strategies on the product criteria. As a result the criteria appeared to be appropriate to order the various research strategies. For the interpretation of these findings we use the comments of the experts.

With regard to controllability participatory research strategies have the lowest ranks. Comments of the experts indicate that the close collaboration between the researcher and participants make the knowledge produced difficult to control for outsiders. On the basis of both our face value and Delphi, the data based strategies appear to be better equipped to fulfill this criterion.

The experts agreed that practice based research is very good in achieving comprehensiveness of the results. This may be a result of the intense interaction between the researcher and the stakeholders. Obviously the role of using comprehensive language use is a necessary condition here. This may explain why qualitative data based research, with its emphasis on using the natural language of respondents, is second in line here.

With reference to the criterion of the acceptance of the results, the experts state that the two participatory research strategies are best equipped. This may be explained by the active involvement of participants (stakeholders and/or experts) leading to a greater tendency of accepting research results.

Of all four categories, experts consider qualitative data based research as the best research strategy to meet the criterion of holism. However, in terms of mean ranks the two participative research strategies come very close to qualitative research. Some experts argue that participatory research is best in understanding the whole phenomenon at stake while most experts say that qualitative research is best for achieving holism. From the mean ranks of these research strategies, except for quantitative research, it can be derived that holism is a less discriminative criterion than the other criteria discussed so far.

6. Conclusions

The Delphi study combined with our own independent observations, show controllability, comprehensiveness and acceptance of the results and holism to be adequate criteria for evaluating the quality of practice oriented research strategies. However, criteria that at face value appeared to be adequate, i.e. internal validity, interdisciplinarity and manipulability, turned out to be not. With regard to internal validity disagreement concerned the interpretation of this important concept. In the Delphi study, we defined internal validity as whether a proposition is true for the target population or sample that has been studied (the postmodernist interpretation). We considered such an interpretation more appropriate in the context of practice oriented research. After all, answering a research question for the target population is the primary aim of practice oriented research. However, some experts seem to have used more classical and neo-positivist interpretations of internal validity, namely the striving for neutral knowledge that is not biased by the personality of the researcher and participants. Apparently, internal validity, in general terms, measuring what you intend to measure, is too ambiguous to apply it univocally in the field of practice based research. In further research we recommend to differentiate internal validity into various dimensions. By means of more specifically defined dimensions of internal validity practice oriented researched are better able to indicate whether a specific research strategy fits the requirements.

With regard to the criteria interdisciplinarity and manipulability of variables the lack of agreement between the experts as well as their comments showed that these criteria are not suitable for evaluating practice oriented research. As stated above, interdisciplinarity comes too close to the criterion of holism, since it is a condition for the achievement of integrated knowledge. Manipulability of variables was obviously too vague to use it as criterion since it can be understood in terms of causal models and social reality. We would still like to plea for a criterion that takes into consideration the support of decision-making and solutions for practical problems.

With regard to the criteria on which the experts agreed the following observations can be made. Controllability refers to the possibility for others than the researcher and the participants to check how the research was done and how the results were achieved. This criterion differs from the classical criterion of reliability; since controllability emphasizes the openness and transparency of the knowledge production in practice oriented research.
As we argued comprehensiveness of the results calls for common sense and clear language. It also includes summarization and visual representations of complex and abundant amounts of newly acquired knowledge. Although beyond the purpose of our paper, we advocate further research as to what ways of transferring knowledge support this criterion the best.
Acceptance of the results means that people should recognize the results, emotionally support them and consider the results as legitimate. In our opinion, the course of the research *process* is essential for achieving acceptance of the results (cf. Van Dijk, 1986). To do justice to the importance of this aspect of practice oriented research, we propose to further develop process criteria for assessing practice oriented research on the basis of a Delphi study with experts in the field. In the paper we focused on criteria for evaluating the *product* of practice oriented research.
Holism calls for knowledge about both the phenomenon and the context of it. Moreover, it often calls for integration of knowledge that is acquired in different areas of science or by different functional specializations.

Pertaining to the research strategies for practice oriented research we conclude that no single research strategy appears to be best on all criteria but each strategy has it own strengths. Practice based research, where stakeholders are involved in the research process and knowledge production is found to be the best in comprehensiveness and acceptance of the results. So this research strategy can especially be chosen when the research results need to be conveyed adequately. In addition, this strategy is suitable when the acceptance of the research results is important. Expert based research was never considered as the best research strategy on a specific criterion but was considered good on acceptance of the results. Moreover, this strategy was never evaluated as weak on a single criterion. So, expert based research seems appropriate when all criteria discussed have to be met to a considerable degree. The experts in our Delphi study judged qualitative data based research as very good on holism and on comprehensiveness of the results and controllability. Finally, quantitative data based research was seen as very good on controllability. However, on the other criteria for practice oriented research it received the lowest ranks.

The practice based research strategy is very favorable on the criteria of comprehensiveness and acceptance of the results. Moreover, qualitative data based research strategies appear to fit better the criteria for practice oriented research than quantitative data based research. It turns

out that qualitative data based research very well fulfills the three criteria that primarily favor the utility of research results, better than quantitative research does. Given the observation that up till now in practice oriented research data based strategies are much more used than participatory research strategies, we may conclude that the latter are underemployed. The same is valid for qualitative data based strategies compared to the quantitative variants.

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