

METHOD INTEGRATION AS A LEARNING PROCESS

Göran Goldkuhl 1) 2) **Mikael Lind** 3) 1) **Ulf Seigerroth** 2) 1)
Email: ggo@ida.liu.se Email: Mikael.Lind@hb.se Email:
Ulf.Seigerroth@ihh.hj.se

1) Linköpings University, S-581 83 Linköping, Sweden

2) Jönköping International Business School, P.O 1026, S-551 11 Jönköping, Sweden

3) University of Borås, S-501 90 Borås, Sweden

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Abstract

In many situations there is a need to integrate different methods. In such a method integration process learning aspects should be addressed explicitly. The paper presents procedure and experiences from a R&D project concerning integration of two change methods. Communication problems obstructed the integrative method redesign initially. These communication problems were resolved through the use of an explicit method theory for classification and reconstruction of the method candidates. During application of the integrated method further reconstruction of tacit method knowledge was performed. The method integration process also included meta learning: Formulation of the method integration as a learning process and modification of the applied method theory. Use of an explicit method theory/notion is important for learning methods. It should thus be included in methods training.

1 Introduction

There is an unanswered quest for a universal method in information systems development. Many methods are developed with the aim of making them generally applicable. However, the differences in development circumstances seem to be extensive and also growing due to the general technological and organisational evolution. A general information systems development (ISD) method can be used in many situations but there will also be situations where its coverage and appropriateness will be challenged. We do not question the ambition to design a method to be as general as possible. A good feature of an ISD method is that it can be used in a broad variety of development situations. We do not think however that it is possible to have THE METHOD that supports people in solving all kind of ISD problems and tasks. There is not a final answer to the ISD method quest, and there will be no final answer. This is also due to differences in knowledge, competence, experiences and expectations of the method users.

The diversity of development and change situations gives rise to a need to combine and integrate different methods (Kronlöf, 1993). This can be done both 1) temporarily in a specific development situation (Kumar & Welke, 1992; Brinkkemper, 1995) and 2) more permanently as a new integrated method to be used in several situations. In this paper we are interested in the second situation of method integration. We think this kind of method integration will be more common in the future due to the manifold

of both methods and development situations and circumstances.

For over a year we have participating in a method integration process (a Research & Development project). Two different change methods are to be integrated into a new method. These two methods are Change Analysis/SIMM (CA/SIMM) (Goldkuhl & Röstlinger, 1988, 1993) and Protek (TräteK, undated). CA/SIMM is developed by the research group VITS (deVelopment of Information systems and Work ContextS, a research group at several Swedish universities). SIMM stands for Situation adaptable work and Information systems Modelling Method. CA/SIMM is a structured method for early phases of business and IT-development. The purpose of a change analysis is to generate well grounded measures for developing business processes and information systems. CA/SIMM includes method components (with different modelling techniques) for analysis of business processes and activities, problems, strengths and goals. It has an emphasis on problem solving, critical evaluation, communicative interaction and creative thinking. The other change method, Protek, has been developed by the Swedish Institute of Wood Technology Research (TräteK). Protek is a change method with its major focus on work environment and quality issues. The method is focusing on changes regarding profitability and competitiveness as well as the work conditions for the employees. Protek is building on the social field theory of Kurt Lewin (1951) emphasizing organizational change to be performed in three steps; unfreezing - change - freezing. Protek should through different methods for data collection and documentation give a multilateral picture of the enterprise. It has been developed in order to be used within the Swedish wood industries of small and medium sizes. Both methods represent a Scandinavian perspective which harmonises with the socio-technical perspective and emphasizing user participation (Nurminen, 1988). The purpose of this method integration project is to create a structured change method for wood industries, with special emphasis on development of planning procedures and information systems. The authors of this paper participated in the method integration work and are active in the research group VITS.

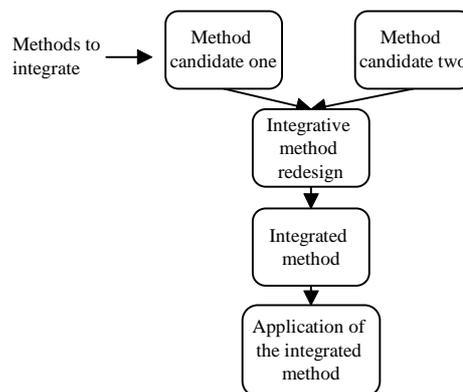


Figure 1: The different phases of method integration

At the beginning of this R&D project we outlined a procedure for integration and test of the integrated method in several change projects (figure 1). However we seem initially to have underestimated the problems of integrating the two method candidates. There was an initial presentation (in purpose of education) of each method candidate but this was not enough. One main experience of the method integration process so far is that it should be seen as learning process as a whole.

The purpose of this paper is to describe our method integration process in a learning perspective and from our experiences argue that a learning dimension should be dealt with consciously in such a process. We use our R&D project as a case study here but our purpose is to go beyond this single case and present theoretical and practical implications which we claim are transferable to other method integration situations.

2 From communication breakdown to discourse: Need for a method theory

2.1 Communication breakdowns in the method integration process

The R&D project group discussed in which situations different method parts were possible to use. In this discussion there were a lot of confusion about what it meant to perform one part of a method. Trätekt with the Protek method puts much emphasis on how to collect data. This is mainly done with interviews and questionnaires. In CA/SIMM there is a main emphasis on different modelling techniques for business analysis (Goldkuhl, 1992; Lind & Goldkuhl, 1997) and problem analysis (Goldkuhl & Röstlinger, 1993), but also on other aspects. Here there is an emphasis on what things to describe and how to do it. The different stances did not match.

In CA/SIMM we try to distinguish between what to do (e.g. business analysis) and different ways to co-operate (e.g. work seminars or interviewing) when performing this. Several tasks within Protek were tightly connected to certain ways of gathering data. E.g. an attitude investigation should be performed through questionnaires. Before we could understand this tight coupling there were a lot of discussion and confusion.

How to perform data collection is important within the Protek method. Interviewing should e.g. be performed direct at the work place. When interviewing a lathe operator the interview should be held at the lathe. After this interview the answers should be analysed by the external investigator. It is important that the informant feels comfortable. No complicated modelling tools should be used.

The CA/SIMM method, on the contrary, builds on heavy usage of modelling techniques. And these are often used directly together with the informants/users. CA/SIMM has an emphasis on describing business processes within an organisation. The Protek method has a more individual orientation. Protek tries to capture different opinions held by different actors, rather than describing activities within a business process.

There were differences in views on how much resources should be put on an initial diagnosis phase. CA/SIMM argues for a transparent and well-grounded basis for decision on alternative change measures. This implies that a good understanding on the current situations must be reached among participating actors. Protek puts emphasis on making a quick investigation in order to get a brief overview of the business.

Another important problem was that the Protek method was not well documented. It was very much an informal method held by its designers and not described in external method documentation. There were a lot of tacit knowledge, which were only seen and understood partially in the discussions. The contents of Protek seemed sometimes to be rather fluent.

There were differences in the underlying perspectives and also in the character of the method parts of each method. How should we proceed in this conceptual and methodological quagmire? Should we be able to perform a method integration where

we could use the best parts of each method and not introducing too much inherent conflict within the new method?

2.2 Shifting to discourse

When there is misunderstanding, confusion and lack of common categories one has to shift focus in communication. The intersubjective basis for communication in the method integration was not enough. There was a need to shift to a discussion concerning the foundations of this method integration communication. This means shifting to a meta level or as Habermas (1984) puts it: Change to *discourse*. In a discourse one investigates the grounds for a specific communication (ibid). There will be a reconstruction, elicitation and evaluation of grounds for different utterances (made in the method integration communication) which are questioned or not understood. We identified that there were differences and confusions in the conceptions of what a method is. What kind of phenomena is a change method? What does it consist of? The intersubjective understanding of the method concept was not enough and this was considered to be a main cause for the communication breakdowns and problems to arrive to an integrated method.

We had to establish a common understanding of what a method is and its different parts and aspects. We had in a discourse to arrive at a joint understanding of the method notion as this seem to be a main foundation for successful communication in method integration.

We did not develop a new method conception or theory. We presented and discussed the method theory which is used in the research group VITS. There are of course many similar conceptual frameworks for ISD methods (as e.g Avison & Fitzgerald, 1995; Brinkkemper, 1995; Jayaratna, 1994; Kronlöf, 1993; Kumar & Welke, 1992; Tolvanen & Lyytinen, 1992). In this discourse there was no reason to go further and discuss alternatives to the proposed method theory. This method theory was satisfactory as a catalyst in the method integration work as will be shown in section 3 and 4 below. The method theory was however slightly modified as a result of the method integration process as will be discussed in section 5.

2.3 Method theory

A method is guidelines for work. Its character is prescriptive. A method tells what to do in different situations in order to arrive at certain goals. In information systems development there is usually a need to document different aspects. Many ISD methods therefore include representational guidelines; what often is called modelling techniques or notations. Such methods also involves procedural guidelines; i.e. how to work and what questions to ask. The notation prescribes how answers to these questions should be documented. Many times the procedure and notation are tightly coupled to each other. The procedure involves some meta concepts as e.g. process, activity, information, object. Such general concepts are used when asking the questions; i.e. they are parts of the prescribed procedure. They are also parts of the semantics of the notation. The concepts are the cement between procedure and notation; the overlapping parts of procedure and notation.

When there is a close link between *procedure*, *notation* and *concepts* we call this a *method component* (Röstlinger & Goldkuhl, 1994); cf the notion of method fragment by Brinkkemper (1995). A method is often compound of several method components

to what is many times called a methodology (Avison & Fitzgerald, 1995). These different method components form together a structure. We call this a *framework*. This includes the phase structure of the method.

All methods build on some implicit or explicit *perspective*. A perspective includes values, principles and categories (with definitions), which are more fully expressed in the method and its method components. Observe that the perspective can be expressed in the method without being explicitly articulated. Parts of the perspective can be inherent in the method in a rather tacit way. A perspective is the conceptual and value basis of the method.

In this method theory a procedure includes questions. But who puts the question and who is answering? This aspect is labelled *co-operation form*; i.e. how different persons interacts and co-operates when performing the method guided work. Co-operation forms have to do with roles and division of work in the development process. We think it is conceptually important to distinguish between a procedure ("what question to ask") and the co-operation form ("who is asking the question"). A method component (with procedures) can be used within several different co-operation forms, as e.g. brain storm sessions vs interviews.

The important parts of this method theory (Goldkuhl & Cronholm, 1993; Röstlinger & Goldkuhl, 1994) is illustrated in figure 2. In the box of co-operation forms there is also in parenthesis a mentioning of 'collection forms'. Initially when using the method theory we only talked about co-operation forms. Later on we explicitly introduced the concept of collection form. See section 5 below.

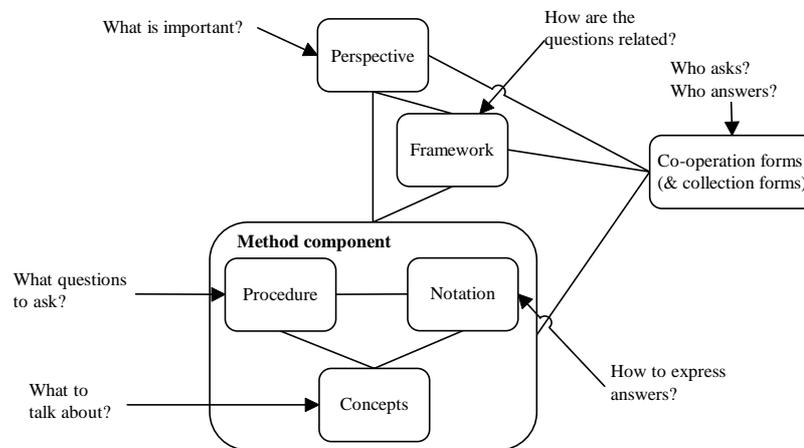


Figure 2: The method notion: Relationships between perspective - framework - method component - co-operation forms (Röstlinger & Goldkuhl, 1994)

3 The method theory as a learning aid in method design

3.1 Reconstruction and classification of the method candidates

The purpose of this kind of method integration is to create a new method, which goes beyond the original methods, but where each of these original method has valuable contributions to the new integrated method. To be able to find different highlights in each method we have used the method theory described above (sec 2.3). The approach was to go through each method candidate and classify different method parts in accordance with the method theory. Different aspects and parts were classified as

perspective, framework, method component and co-operation/collection form. An overview of this classification is presented in figure 3.

When we talk about a method part it is not a synonym to method component. A method part is some constituent of the method and can be a method component or a part of a method component or a collection form or a combination of these or some other constellation or part. It is simply a meaningful unit within a method to talk about.

In this method classification there was also a need for reconstruction. CA/SIMM was well described in books and research papers. Protek was not well described and there was an obvious need for articulating and reconstructing it in the method integration process. The method theory was an important aid in this reconstruction. Protek was built on a lot of tacit knowledge (Polanyi, 1958). This means knowledge which is underlying and taken for granted for the explicit parts of the method. It is the background knowledge which is not focal. However it is in certain situations possible to bring this tacit knowledge to focal awareness and to give it a verbal articulation. This is the process of reconstruction (ibid and Habermas, 1984). The method theory was an instrument to bring this background knowledge to the front and discuss it and thus make it possible to use in the integrative redesign. If it had still been tacit it would not have been possible to use in a conscious way in the method integration process.

There has been a lot of research around CA/SIMM. It has been developed and used since 1981 and there has been much written about it (e.g. Goldkuhl, 1992; Goldkuhl & Röstlinger, 1993; Lind & Goldkuhl, 1997). The theoretical underpinning are rather well documented during the years. But not all background knowledge is of course explicated. The comparative analysis of CA/SIMM and Protek gave rise to needs for articulating still more aspects of CA/SIMM background knowledge. This was especially made for collection and co-operation forms.

When we classified and reconstructed the two methods we identified similarities and differences. Each method had important contributions to the "new" method. The table below, figure 3, shows the classifications of each method on the different levels according to used method theory. These classifications are used to identify contributions from each method candidate in order to form the "new" method. The table is not complete concerning detailed aspects of each method; cf Lind & Seigerroth (1997) for more details. There are also similar aspects within each level of each method that we have not given prominence to in the table below.

In the method classification we had sometimes to break apart a method part within a method. Several of the Protek method parts were mixtures of procedure and collection form. For our understanding and the rational method design it was important to distinguish between these aspects. The method theory was an important aid to accomplish a more complete thematizing of different aspects and parts of the two methods.

When using the method theory as an aid in method classification and reconstruction we could arrive at consensus about most issues which earlier were controversial or confused. There were however still some controversy about some issues. Two method parts of Protek (profile analysis and attitude description) were hard to get well integrated into the new method. We had to learn more about their practical usage before they could be given clear places within the new method (cf sec 4 below).

Our experiences in this project show that the method theory can be a good basis for

argumentation about and classification of each method. There was argumentation made for each method based on the different aspects of the method theory. Each method is classified on the basis of perspective, framework, method component and co-operation (and collection) form.

<i>Method Level</i>	<i>Change Analysis/SIMM</i>	<i>Protek</i>
Perspective	<p>Based on communicative action theories.</p> <p>The method has its origin in the information systems school.</p> <p>Emphasises that information systems should be developed together with developing other aspects of the business.</p> <p>Accentuates situational use of the method, contextual thinking, actors within the business, participation, commitment and user influence.</p> <p>Measures for developing a business need to be well founded.</p>	<p>Focus on human attitudes.</p> <p>The method points out that some measures need to be implemented immediately in the business in order to keep the development work "living".</p> <p>Motivation through participation</p> <p>Develop the capacity of the people within an organisation to be able to see their role in the whole situation in order to participate when planning his/her future.</p> <p>The method is based on Lewin's social-psychological model (Lewin, 1951)</p>
Framework	A phase oriented framework, where a deep analysis of the business is emphasised before measures are generated.	Short preceding analysis of the business in order to establish continued development work and generate focusing needs.
Method component	<ul style="list-style-type: none"> • Business modelling • Problem analysis • Strength analysis • Goal analysis 	<ul style="list-style-type: none"> • Attitude description • Economic Analysis • Profile Analysis
Co-operation and collection form	A difference has been made between co-operation form and method component, i.e. a method component can be used with several co-operation forms.	The co-operation and collection forms are tightly connected to each method component. An example of a co-operation and collection form is the interview.

Figure 3: Classification of the two method candidates

3.2 Formulated method hypothesis

The method that should be generated from the two method candidates (Protek & CA/SIMM) should meet some explicitly formulated demands. This was according to the goals of the R&D project. The method should:

- be based on a business process oriented perspective

- support the method users in generating well grounded change measures
- support the formulation of demands on future information and planning systems
- support the preparation for continued change work in the enterprise
- support a high degree of participation among the actors within the enterprise through increased knowledge about and competence in development work.

In order to achieve the goal of generating a coherent and congruent method we first formulated a "method hypothesis". We call it a method hypothesis in order to emphasize that it is a proposal and something to be put to test. The framework of the hypothesis is shown in figure 4 below. As can be seen in the figure the framework has a sequence through a number of steps: determine prerequisites, initial business diagnosis, initial report, focused business diagnosis, summary valuation, measure study and determine measures. These steps should be regarded as phases where a preceding phase or step is a prerequisite for the next phase and so on. A detailed description of the integrated method is not made here, since it goes beyond the purpose of this paper. For more details confer Lind & Seigerroth (1997).

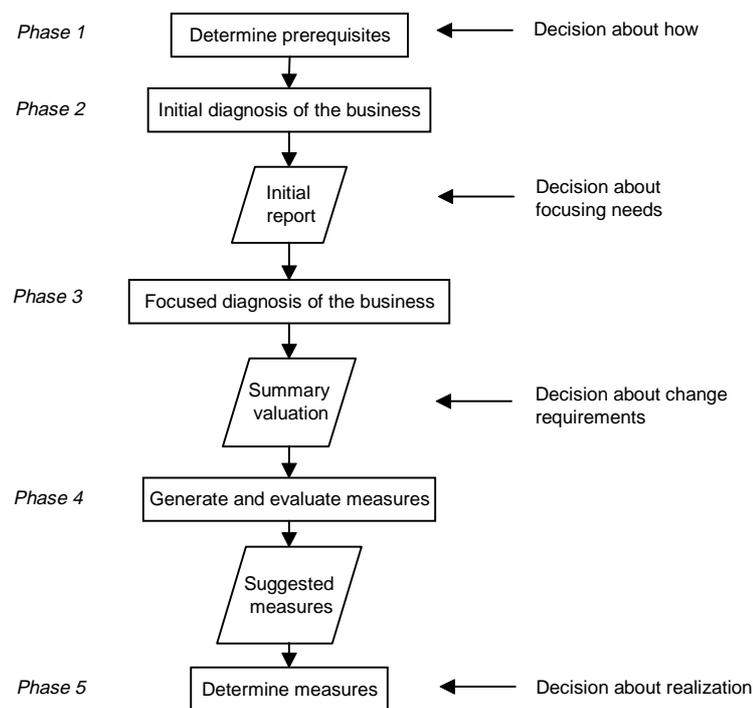


Figure 4: The framework of the new method TRÄFA

Within each phase there are a number of method components that are to be used to satisfy the purpose of each phase. During the integrative method redesign the purposes for each phase were not distinctly expressed. For example the purpose of the second phase was to get a quick overview of the business in order to determine focusing needs for the following phases. As we will show later on in section 4, these purposes were formulated more precisely after we had performed empirical tests on the method. For every phase there are also a number of co-operation and collection forms that can be used together with different method components. Since we believe that situation

adaptability is important, we have made it possible in the framework to choose from these method components depending on the situation. Within the diagnosing phases (phase 2 and 3) business modelling, problem analysis, strength analysis, goal analysis are possible method components to use. Other method components possible to use within the second phase (initial diagnosis of the business) are attitude description, profile analysis and economic analysis. These three method components are however not to be performed in the focused diagnosis of the business (phase 3). The reason for this is that they do not contribute with any new data after having been used once. The method components used in the phases are contributions from both Protek and CA/SIMM.

It should be possible to use the method components in different inquiry situations, where the framework gives possible method components to choose from. In one inquiry situation one might not need to use all method components that are specified in each phase.

4 Continued learning through joint practical experiences

In this section we will present some experiences from putting the method hypothesis to test in practical application. The new method has so far been used in two diagnosis projects in two small wood industries. One main reason for using the method in these real life projects was to gain experiences concerning its applicability. We were interested in what ways the method was useful. It was important for the different method redesigners from VITS and Trätekt to achieve joint practical experiences. These experiences should be a basis for continued development of the method. The method applications were performed on an action research basis. The method researchers from VITS and Trätekt participated as analysts and method experts in two change projects.

Argyris & Schön (1996) make an important distinction between ‘espoused theory’ and ‘theory-in-use’. We prefer here to use the corresponding terms between ‘espoused knowledge’ and ‘knowledge-in-use’. Argyris & Schön state that in many situations there are differences in knowledge between what is espoused (articulated) and what is used. It is thus important, through reflection on action, to try to reconstruct the knowledge-in-use, which deviates from the espoused knowledge taken for granted.

Through practical usage of the method it was important to gain experiences about positive and negative effects of its usage. However this was also a way of arriving at a further reconstruction of the tacit knowledge of each method candidate; i.e. a reconstruction of the knowledge-in-use which goes beyond the earlier espoused method knowledge. To know more about the two methods encapsulated in the new integrated method the different method designers had together to apply this new method in two joint case studies.

Underlying values and knowledge became more explicit when the method was put to practice. The method designers were confronted with what was done - with facts. They saw different ways of applying the method and if these ways deviated from what was expected they started to reflect upon these differences. The knowledge-in-use were in this way stepwise reconstructed. We also believe that some communication breakdowns cannot be solved until the “new” method has been put to practice. Below we present experiences showing that we gained a deeper understanding of underlying values.

Earlier we mentioned that there were method parts of Protek which did not fit in well according to the method theory. During the application of the integrated method we now found arguments to position these parts in a better way. E.g. the attitude description (from Protek) were more clearly classified as a method component and it was also more clearly related to other method components of the new method.

During the application projects we also identified different analyst roles when using different method components and acting in different situations. There was one role of a "project driver", i.e. a person actively driving the project ahead. This was done in order to ensure that the change work got started and also in order to train some of the personnel within the enterprise in the method. However, this role has gradually changed during the project to be more like a catalyst and less like driver of the project. During this process of being more like catalysts we gradually transferred the responsibility of the project to the internal project group within the enterprises. The importance of this way of shifting analyst roles was something that we did not realise until we had put the method to practice. Issues of role division and co-operation forms became more visible during the practical application.

During the application of the "new" method we conducted a number activities supported by method components. The purposes of these activities became more explicit and precise now. E.g. the activities within the initial diagnosis of the business (phase 2) can be grouped into two different classes: One group of process based analysis and one more general group. We have also more accurately formulated different purposes of this phase. The initial business diagnosis should support:

- initiation and establishment of the change work.
- preparation of the enterprise and its actors for the change process.
- generation of focusing needs for the following change work.
- generation of different measures that could immediately be implemented in the business.
- creation of soundly based grounds for change work.

5 Conclusions

Often learning is associated with action and gained experiences. This is true in our case: *Joint practical experiences* have been important for learning. But it is equal important to consider learning through *abstraction and discourse*. There were breakdowns in the communication process during method design, which could only be resolved through abstracting to a meta level; i.e. to a discourse investigating on what grounds the integrated method should be built on. Habermas (1984) has in his theory of communicative action explicated the concepts of discourse and argumentation. He states that "the concept of *grounding* is interwoven with that of *learning*" (ibid p 18). Without reconstructing the grounds (in terms of a method theory in this case), there could be neither a common method understanding nor a mutual learning of respective method. This lack of understanding would have been obstructive for arriving at an integrated method.

The method theory has been actively used to reconstruct the method candidates. This holds especially for the Protek method, which was not well documented and thus involved much tacit knowledge. The method theory also played an important role in

positioning and valuating different parts of the method candidates.

The method integration process has not only included learning in relation to the primary purpose of arriving at a good integrated method. It has also included meta learning - or "deutero learning" as Argyris & Schön (1996) call "learning about how to learn". We would now describe the method integration process in the following way emphasising its learning aspects (figure 5; which should be compared with figure 1). The role of using an explicit method theory as a basis for method integration has been extensively recognised.

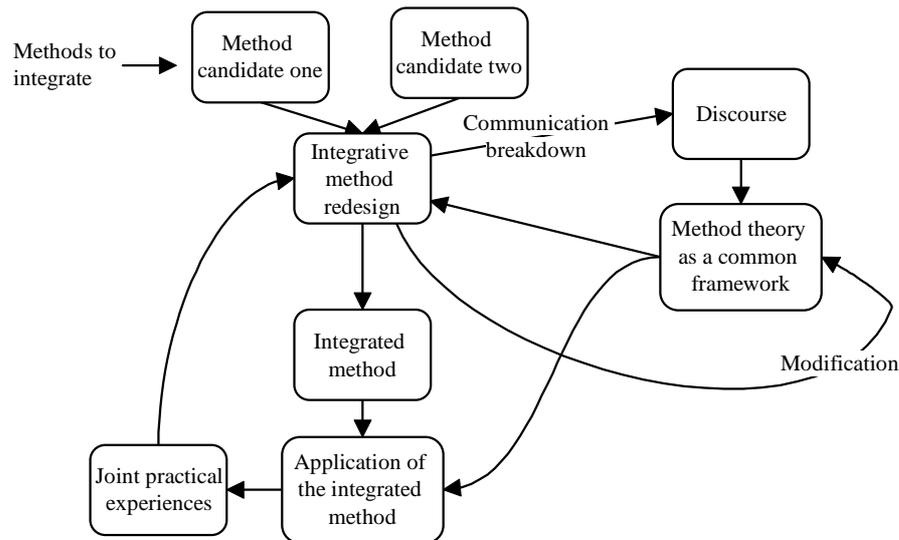


Figure 5: Method integration as a learning process

We have learnt how to perform method integration as a learning process; i.e. how to perform a theory and practice driven method integration. Our method theory, which has been a catalyst in the method integration process has been partly modified. It is important to talk about both co-operation and collection forms, rather than only co-operation forms (figure 2).

We think that the role of an explicit method theory goes far beyond integrative method redesign. It is important in many situations. When learning a method one should understand the method notion (and not only the method itself) in order to understand how to use the method in a proper way. Method training should, thus, not only be training of a specific method. It should include method theory and a reflection on the method notion.

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