

# DESIGNING AND TESTING A NEW CONCEPT FOR INQUIRY-BASED LITERATURE TEACHING

Design principles, development and adaptation of a large-scale  
intervention study in Denmark

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## Abstract

Departing from a newly developed phenomenological inquiry-based approach to literature, this article examines the process of designing, developing, and refining a large multi-pronged intervention program in Danish lower secondary schools (86 schools, 265 classes, 5531 students), including randomized controlled trials in 72 schools. In order to offer greater insight into the complex causality between design, process, output, and outcome, the intervention process is described by means of an initial program theory, a pre-study with three reviews of available evidence and practice, and a Design Based Research (DBR) process with iterations and interconnected phases: small-scale interventions, a pilot study, and three rounds of large-scale interventions with randomized controlled trials with different samples. This article focuses particularly on the crucial decision points at which participants change their role and redesigns contribute to a deeper insight into the social mechanisms of the complex intervention.

Keywords: phenomenology, inquiry-based, teaching literature, program theory, multi-pronged intervention, Design-Based Research

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## 1. INTRODUCTION

Inquiry-Based Learning (often abbreviated IBL) is a well-known pedagogical approach which is typically associated with science education (Loyens & Rikers, 2011, p. 362). On a more general level, elements of inquiry learning cycles are present in other school subjects. For example, students may wonder, investigate, discover and reflect when learning about literature within Language arts/L1. However, in the theory of teaching literature there is no obvious and coherent method for making learning in literature classes inquiry-based. The degree of elaboration in designs for learning and the amount of research within the domain of Inquiry Based Science Education (IBSE) is far greater than in L1 IBL (Albrechtsen & Qvortrup, 2017). There is a lack of evidence that could document the impact of an inquiry-based approach to subject-specific learning in language and literature teaching (Elf & Hansen, 2017). Therefore, in more than one sense, to develop a fine-grained and coherent approach to inquiries in literature teaching and use this as a core element in a large-scale randomized controlled trial (RCT) is a pioneering endeavor.

In this article we present the process of designing, evaluating and testing a newly-developed concept for inquiry-based literature teaching grounded in a phenomenological framework and applying a multi-pronged intervention. The approach was developed as part of an ongoing large-scale project entitled “Improving the Quality of Danish and Math in Danish lower Secondary education: A multiple intervention research program focusing on an inquiry-based teaching of Danish and Math” (our translation; the project is generally abbreviated (and also here, in the following) as KiDM [Kvalitet i Dansk og Matematik/Quality in Danish and Mathematics]). As the subtitle suggests, KiDM is designed as an intervention. Intervention studies come in many types and variations. We argue that the KiDM intervention is based on what Merton (1967) would label a middle range theory and a variant of Design-Based Research (DBR) methodology (Wang and Hannafin, 2005). This perspective on intervention studies holds implications for how design principles and learning activities (Rijlaarsdam et al., 2018) could and should be described, as we will argue in the following sections.

The backdrop for the intervention was a call announced by the Danish Ministry of Education to start in 2016 and supported by substantial funding (approximately 3 Million Euro, half earmarked for the participating teachers/schools and half for researchers and developers; MBUL, 2015). The call was a result of a political settlement aimed at the improvement of Danish compulsory schooling, which included a focus on two subjects, Danish (L1/Language arts; in the following only referred to as L1) and Mathematics. The project proposal that was submitted, and later accepted, was a complex large-scale project comprising a total of 27 Danish researchers and professional teacher educators from six universities and university colleges, plus 172 co-participating or intervention schools. The time scale was set to three years and later extended to four years, running from 2016 to 2019.

Of course, a policy-driven call as described above frames the project and co-shapes design principles to some extent. Consequently, as an initial framing of the intervention, we will explain what was called for more specifically. In this context, we will focus on Danish as L1. Three key requirements initially framed the project, which will be elaborated on below; later, we will link the framing of the call to a description of the development of design principles, learning activities and realizations of the intervention in the development and pilot phases.

First of all, in the call, the emphasis was not on reading but on literature education. This reflects a remarkable shift in policy interest towards the teaching of literature and other aesthetic texts. After many years of a rather one-sided policy focus on improving students' reading skills, due to disappointing results in PISA tests that focused on non-aesthetic texts, this came as a surprise to L1 educational researchers and practitioners in Denmark.

Secondly, hinting at inquiry-based teaching, the call emphasized that interventions should attempt to change the balance between teacher-centered and student-centered approaches, calling for less teacher transmission and more student participation. Specifically, the call states that:

Experience suggests that literature education is still dominated, to a relatively high degree, by a receiving approach, in which students, facilitated by static models for analysis, look for 'correct' interpretations of texts and, to a lesser degree, engage in a more productive, or creative, approach, in which they are allowed to develop their own systematic inquiries and, through that process, develop their own interpretations which are then subjected to mutual discussion in the classroom. (MBUL, 2015, p. 2, our translation here and in the following).

Further, the call explains what inquiry and productive approaches might involve, as it specifies that "student participation" should include the productive student use of "digital technologies" and "oral participation" (MBUL, 2015, p. 2f).

Thirdly, the project would have to demonstrate, through interventions, a positive effect on student learning as a result of interventions spanning half a year. In other words, this was also a call for an effect study, more specifically the effect of inquiry-based teaching of literature. Furthermore, the call emphasized that the intervention should target and improve the "literary competence performance" of "all students" (MBUL, 2015, p. 2), implying here, and in additional appendices that elaborate on the project goals, that an effect was expected for students who would normally perform at a low level in the national reading test.

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Before we summarize the call's programmatic intentions, we note that it is quite common that educational discourse, like any other policy discourse, represents negotiated, polysemiotic, if not ambiguous meaning-making, which is demanding to handle in meaningful ways for educational and, more specifically, curriculum and *Didaktik* researchers (cf. e.g. Uljens & Ylimaki, 2017). It could be argued that this was precisely the case in this call, as it originated as a political compromise between several institutional actors. Specifically with regard to literature education, on the one hand the call emphasized the development of a process-oriented, inquiry-based and productive pedagogy for teaching literature. On the other hand, it called for an effect study that demonstrates the impact of the intervention in a quantitative sense. Could such seemingly different and contradicting interests be unified? That is, in a sense, the core question of the KiDM intervention in all its phases. Perhaps not surprisingly, we claim that it is both possible and doable, although some fundamental dilemmas remain.

As a first step, we designed a multiple intervention research program, which addresses the project call by establishing an initial "program theory" for creating change (Edwards et al., 2004; Pawson & Tilley, 1997; see also later). The program theory was expected to be revised iteratively throughout the four interconnected phases in the project program:

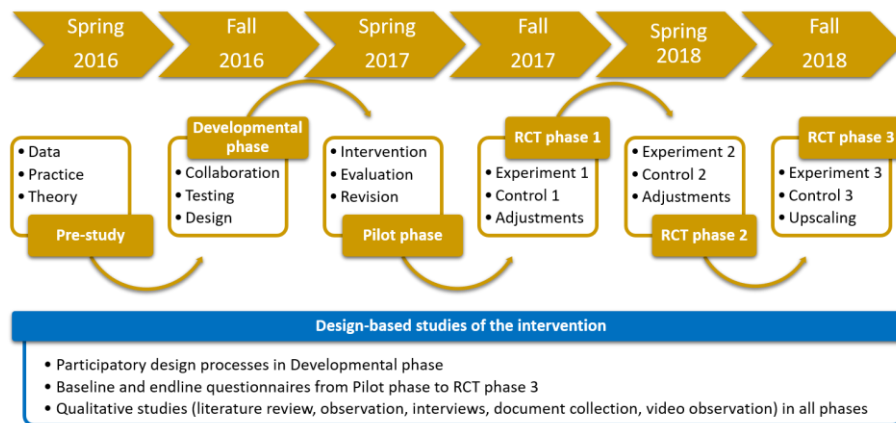
- 1) A pre-study (2016-2017), including a mapping of contemporary relevant practice and a review;
- 2) Small-scale interventions for developing and testing an initial course design in the Developmental phase (Autumn 2016), including four schools;
- 3) A pilot study (Spring 2017), including around 10 schools;
- 4) Three rounds of RCTs with different samples (Autumn 2017- Autumn 2018)

The means through which we learn from the four phases are Design-Based Research (DBR) studies, encompassing a number of research strategies and methods:

- Design-based studies of intervention processes, including participatory design processes in collaboration with a few teachers in the Developmental phase;
- Baseline and endline questionnaires from participating teachers and students in the Pilot phase and in RCT phases 1-3;
- Exploratory qualitative field work in one school participating in the Pilot phase; and
- Systematic fieldwork in four schools participating in RCT phase 3 (Autumn 2017 - Autumn 2018)

The sequential design is visualized in Figure 1. The descriptive bullets with defining actions are listed below the phases to explain and clarify the stepwise change in participant roles and methods.

Figure 1. Sequential design of the KiDM project



With this design, and the financial and human resources supporting it, we had a unique opportunity to iteratively develop the intervention program over time. Changes on the level of design of the intervention, including the material design and description of learning material and learning activities, were significant in the Developmental and Pilot phases, while minor adjustments were made in the last three RCT phases. This is because the core of the design was static in the last three phases, so that we could gather and pool data and treat them with the same statistical model, applying a Rasch analysis.

The basis for the intervention program was a program theory that was developed with input from three important sources. The initial starting point was our interpretation of the three key requirements in the call presented above. They constitute a politically negotiated idea of quality in Danish as a subject, with literature teaching as a core element. The two other inputs derive from the pre-study and consist of a review of 216 studies and a mapping of contemporary relevant literature teaching practice (Elf & Hansen, 2017).

## 2. THE INTERVENTION'S PROGRAM THEORY

The result of our interpretation of the call and the pre-study was a practice-informed and research-based program theory. But what is program theory, and how does it inform intervention studies?

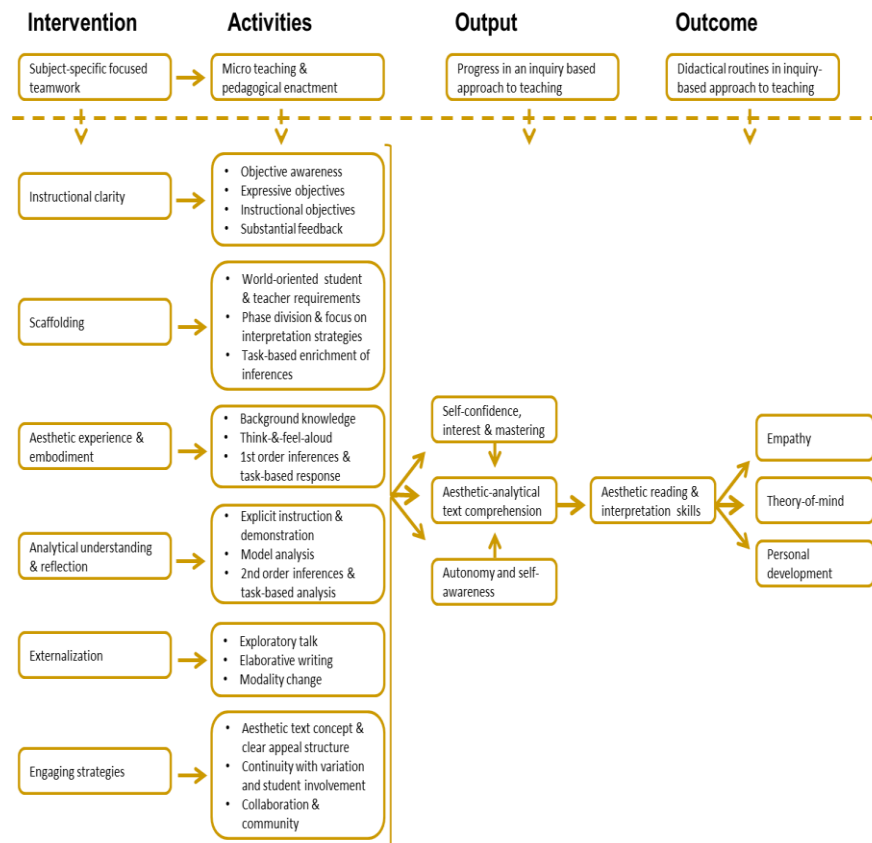
Briefly put, program theory is a theory-based research strategy into the social mechanism of a complex intervention rather than a simple hypothesis-driven test.

Program theory often plays an important role in testing a larger intervention program (Edwards et al., 2004; Pawson & Tilley, 1997). The metatheory of program theory is informed by Merton's (1967) definition of a *middle range theory*. A middle range theory is a limited set of assumptions from which specific hypotheses are logically derived and confirmed by empirical investigation (Merton, 1967: 68). Pawson explains the basic dynamics of middle range theory as follows: "Middle range theory, in other words, deals in generative causal explanation (...) by providing an account of the underlying mechanisms that give rise to demi-regs" (Pawson, 2010: 176; demi-regs is Merton's short term for demi-regularities).

Based on this understanding of program theory, the initial program theory of the KiDM project served as a narrative frame for the pre-study, especially for the review, which included both quantitative and qualitative studies. Our choice of choosing a broad scope when establishing the research base was motivated by several factors. Firstly, different types of studies and research methods are needed to highlight the many types of mechanisms in a complex intervention in literature teaching. Secondly, it is not possible to establish a broad and sophisticated evidence base solely based on RCT studies. There are too few of them in number and those that exist are too general and inadequate. Therefore, we do not use evidence weighting of RCT-studies, but *evidence calibration* of different kinds of studies, in which we explain the connection between context, results and research methods. The kind of causality that applies in an educational practice is not linearly determined. Literature teaching is not, in our view, a matter of simple causality. Rather, it can be better described with the concept of "configurational causation", which extends the concept of "contingent causation", because the output and outcome are not determined by a few prevailing factors but formed by a whole range of pre-existing conditions (Ragins, 1987). Thus, we use program theory to account for generative causal explanations (Bhaskar, 1978) by analyzing implicit mechanisms that manifest themselves as demi-regularities in a particular classroom context.

The overall program theory, based on a phenomenological approach to inquiry-based literature teaching, is presented in Figure 2. It is supposed to be read from left to right with the arrows as probabilistic contexts based on the completed review.

Figure 2. KiDM's overall program theory of inquiry-based literature teaching.



### 3. UNFOLDING THE BASICS OF THE KIDM PROGRAM THEORY

The purpose of this section is to provide an insight into the application of program theory in a design process. Therefore, we aim to explain how the basics of the KiDM program theory are represented in, and could be inferred from, the model.

The primary axis of rotation in the model is the horizontal axis from the aesthetic experience and analytical understanding on the left-hand side, to the development of empathy and Theory-of-Mind on the right-hand side. This composition connects all the way back to our initial interpretation of the ministerial call as a political motivation to improve the phenomenological approach to literature and other aesthetic texts in the classroom. The theoretical inspiration comes from a continental European tradition of literary theory, represented by such names as Roman Ingarden, Georges Poulet, and Maurice Merleau-Ponty, and is closely related to the American

pragmatic tradition as represented by John Dewey, Louise Rosenblatt and Judith Langer. It is important to understand this phenomenological interpretation with reference to a philosophical argumentation for what everyone can experience and acknowledge in a primordial perception of an aesthetic work. Thus, there is a first-person method that provides the basis for further empirical data collection and data processing, and it focuses on an intersubjective dimension in the experience.

A key argument is that the starting point of literature teaching is the student's experience of an aesthetic work, which is transactional because there is an in-depth interwoven relationship between the experiencing subject and the experienced object. The phenomenological tradition offers a thorough description of the otherness, and the experience of another world that is embedded in an aesthetic experience (Poulet, 1968; Ingarden, 1968: §24). In many ways, this tradition anticipates recent empirical studies of cognitive schemas and defamiliarization (Miall & Kuiken, 1994; Fialho, 2007). However, because phenomenology is anti-psychological, it opposes any individualistic reduction to the individual's cognition and mental phenomena (Husserl, 1995; Moran & Parker, 2015). Therefore, we can apply phenomenology as a meta-theory that provides the framework for an integrative interpretation of empirical findings from different traditions, including cognitive, socio-cognitive and sociocultural approaches.

The horizontal axis is based on arguments that are partly critical and partly constructive. The critical part problematizes the fact that literature teaching, according to the initial review in the first part of the project, is often conducted in an analytical and intellectualizing manner. The assertion is that the students' ability to experience aesthetic texts is limited in classrooms, guided by predominantly instructional goals and analytical tasks. The constructive part emphasizes that a task-based teaching approach, which scaffolds a rhythmic transaction and a balance between the aesthetically experiential and the analytically reflective dimensions, leads to a deeper understanding of aesthetic texts and the development in students of literary interpretative competencies. This argument runs as a configurational causation supported by several quite different qualitative and quantitative studies.

Cognitive studies in inferences and defamiliarization are used to argue for (what we in a German-Nordic tradition would term) didactically relevant ways of scaffolding inferencing in the classroom (Elf & Hansen, 2017; Vipond & Hunt, 1984; Graesser, Singer & Trabasso, 1994; Eva-Wood, 2004; McCarthy & Goldman, 2015; Burkett & Goldman, 2016). Classroom studies contribute, in particular, to arguing for and substantiating the didactic use of dialogue and interpretation as strategies in teaching (Applebee, Langer, Nystrand & Gamoran, 2003; Olson & Land, 2007; Kim et al., 2011; Tengberg, Olin-Scheller & Lindholm, 2015). Socio-cultural and social semiotic studies in writing and multimodal production (Littleton & Mercer, 2013; Bezemer & Kress, 2016) are complemented by strategies for externalizing students' comprehension and engaging them by virtue of more performative activities (Applebee & Langer, 2013; Graham & Perin, 2007).



In order to summarize the interpretation of the 216 studies, we have synthesized them in intervention themes (Figure 2, the left column), translated them into prototypical learning activities (in the second column) and linked them with semi-predictable output and outcomes (to the right). The four boxes above the dotted line indicate how we have interpreted the studies underlying the organizational intervention aimed at improving teachers' teamwork. The vertical arrows illustrate that the organizational intervention is expected to moderate the didactical intervention below the dotted line.

The six intervention themes that are presented to the left in Figure 2 show that the phenomenological approach is integrated into a broader didactic framework that includes instructional clarity, scaffolding, externalization, and engaging strategies drawing on more general results from educational research. The six boxes with prototypical activities indicate how we translate the program theory into concrete design principles. Finally, the semi-predictable outputs and outcomes point to how we have developed a quantitative effect study with a test of the students' literary interpretation competencies inspired by Frederking et al. (2012), which would represent the output in quantitative terms. In a qualitative sense, the outcomes are pursued and investigated through case studies of meaning-making and interaction patterns in the literary classroom. In this article, we do not focus on the quantitative effect study. Instead, we focus on the transformative design processes from themes to activities, tested out in developmental and pilot phases. In particular, we are interested in analyzing specific choices made and dilemmas that emerged in the design processes.

#### 4. DEVELOPING A NEW APPROACH TO INQUIRY-BASED LITERATURE TEACHING THROUGH DBR STUDIES

As indicated earlier, the process of identifying intervention themes, as well as designing and evaluating the design principles, the materials and the learning activities in this project, were all rooted in Design-based Research (DBR): a genre of research that aims to develop both practical solutions and new theoretical constructs. In studies using DBR as methodological base, there is a lot of variation with regard to what aspects of the methodology are being emphasized. Wang and Hannafin (2005) characterize DBR as being both a systematic and flexible methodology. However, prototypically, DBR will aim to improve educational practice through "iterative analysis, design, development, and implementation, based on collaboration among researchers and practitioners in real-world settings, and leading to contextually sensitive design principles and theories" (Wang & Hannafin, 2005, p. 2). The potential benefits of using DBR are that solutions can end up being both usable and desirable for practitioners, and that research can claim high ecological validity.

In the following subsections, we will describe how the DBR research strategy has been applied, and to some extent transformed, during the intervention so far. In

particular, we will elaborate on the changing role of theory and theory-informed design principles and learning activities in the Developmental and Pilot phases, as well as on the role of the participating teachers and how they contributed to the intervention through participatory learning processes.

#### *4.1 The role of teachers: When not experiencing a problem becomes a problem*

An initial paradox in using DBR as methodological base in a government-initialized project is that the problem to be solved is to some extent given. Likewise, in this project, the analysis of practical problems by researchers and practitioners in collaboration that is often associated with the DBR approach (Amiel & Reeves, 2008) was not a completely open-ended endeavor. Rather, the problem facing us in this research project was to find out what could characterize an inquiry-based approach to teaching literature and how it could be implemented in classrooms. Consequently, we set out with the aim of creating an inquiry-based approach to teaching literature in collaboration with teachers. We recruited 12 L1 teachers from two public schools and invited them to a two-day seminar to start off their development process and collaborate with them in the process of designing materials for teaching that they could use and evaluate with us. At this point, our framing of the design process was rather scanty: it was limited to general points about the potential for inquiry, inspired by Louise Rosenblatt's basic notion of literature as exploration, Dewey's *Art as Experience* (Rosenblatt, 1938; Dewey, 2005 [1934]), Umberto Eco's notion of open literary works of art (Eco, 1989), the New London Group's multiliteracies principles for designs of learning (New London Group, 2000), and more recent research in a Danish context emphasizing phenomenological and social semiotic approaches (Hansen, 2011a, 2011b; Elf, 2018; Høegh, 2009, among others), which resonated with some of the call's programmatic intentions.

Meanwhile, however, as we were finishing the preliminary pre-study (see Figure 1), we were also getting a clearer picture of what an inquiry-based approach would imply. Eventually, the pre-study of best practice and the systematic review of more than 200 studies worldwide (Elf & Hansen, 2017) would confirm the assumptions made in the call, namely that both the teaching of Danish literature in practice, and learning materials for teaching this subject area are rather formalistic, top down-oriented (for example guided by thematic approaches) and scarcely facilitated any of the requirements concerning teaching literary interpretation asked for in the call. We, the research team, saw this one-sidedness to be a problem, and felt that the originator of the project was right in calling for alternative approaches. However, the teachers involved in the initial developmental design phase of the project did not share our concern. In the initial user-generated outlines of course designs, the teachers adopted an approach very much in line with the approach found to be a problem in the preliminary investigation. There may be many reasons for this: habitual thinking and acting, pressure from tests and exams, a classroom culture focused on visible learning outcomes and insufficient knowledge of literature didactics.

As a result, we adjusted the involvement of teachers in the research design. The research group chose to take responsibility for formulating rigorous design principles and designing the courses, including materials, for the interventions. The teachers, thus positioned differently, were invited to participate by using our prototypes in their classes and giving feedback about their experiences with the materials that provided input for redesigning them. Hence, in accordance with DBR, the design was indeed tested with actual students in real classroom settings and in collaboration with teachers (McKenney & Reeves, 2012), but the design process was neither user-driven, nor based on any actual negotiation with practitioners.

This shift in user involvement was by no means an easy decision. Instead of having user-generated designs, our design process and design experiments could now be characterized as a much more rationalistic linear process striving for completeness and efficiency in the designs. The researchers would be positioned as designer-researchers as they were designing materials, while teachers would be positioned as implementers of the designs and to some extent contributors to redesign (Engeström, 2011). So, this shift in roles reshuffled authority from teachers to designer-researchers, which may be problematic for sustainable change in practice. It also had implications for a shift in the role of *theory* within the intervention process.

#### 4.2 *The changing role of theory from the developmental to the pilot phases*

The more developed the research base for a given intervention, the more likely it is that design choices will be sound, and interventions will work. As with other design-based projects, existing theory and relevant research were applied to inform our design choices. However, the interventions in this project were multi-pronged and therefore complex. This complexity is reflected in our program theory, our design principles and our use of different theories on various levels (see Figure 2).

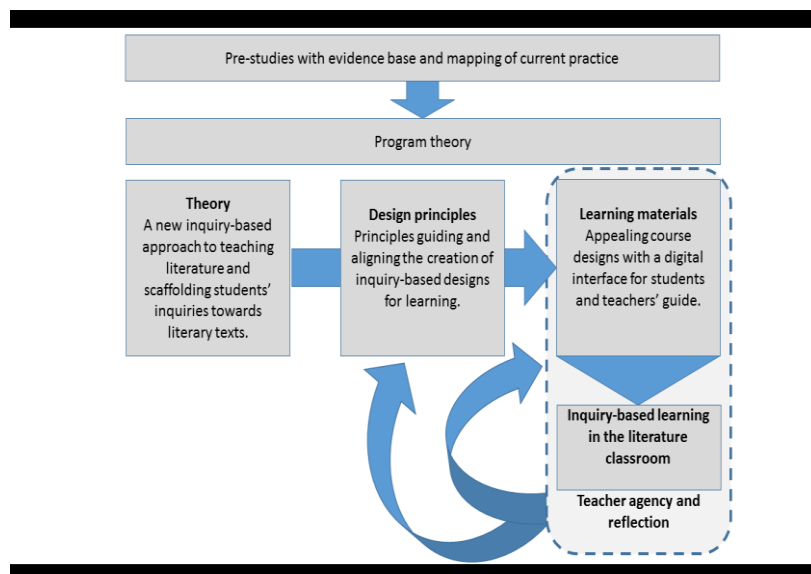
In our attempt to develop a new approach to teaching literary inquiry, existing theory was applied in a *theory-guided bricolage* (Gravemeijer & Cobb, 2006), bringing in and adapting theory and research about different aspects of literature teaching, fictional reading and inferencing, multimodality, oracy, scaffolding, and research on the efficiency of inquiry-based approaches to teaching. Hence, different *types* of theory and research were used, both domain-specific and more general theory, with different aims and degrees of applicability vis-à-vis the designs.

It follows that our theoretical base can be characterized as a *conjecture* (Cobb & Gravemeijer, 2008; MacKellar, 2010), that is, something that must be evaluated, redesigned and elaborated—rather than proven or disproven as a hypothesis. No single theory can be said to be tested or falsified in our study because we are merging multiple theoretical inputs into a new entity (diSessa & Cobb, 2004). The question is, however, how theory would influence, more specifically, the design principles and the design of learning materials, comprising resources and learning activities.

### 4.3 The influence of theory on the development of design principles and learning activities

Figure 3 presents a general overview of the dynamic relations between the development of learning materials for the interventions and the interplay of program theory, findings from the pre-study, our iterative development of a coherent theory of an inquiry-based approach to literature teaching, and our design principles. The initial program theory set the frame for the evolving pre-studies and formed the base of the development of theory focused on the inquiry-based teaching of literature, the formulation of design principles, as well as the creation of course designs and teachers' guides. With each round of evaluation with teachers and students we had to revise program theory, the theory of inquiry-based literature teaching, design principles and learning materials. The 'primary axis' of the program theory has remained the same throughout the span of the project. However, the DBR studies in the intervention process—through the Developmental and Pilot phases—led us from this general program theory, and general design principles, towards increasingly context-specific and outcome-oriented program theory, design principles, and learning activities.

Figure 3. An overview of the dynamic relations in the project.



*Figure 4. Eight general principles for the inquiry-based approach.*

<p><b>1. Commitment</b></p> <p>Texts and courses must engage students by making room for experience, challenge, preoccupation, and initiative, both towards the L1 subject, socially, and personally.</p>
<p><b>2. Dialogic community</b></p> <p>Students should have the opportunity to work with their own experiences of texts as a starting point for analysis and interpretation in a dialogic community, characterized by active listening and exploratory talks.</p>
<p><b>3. Inquiry-oriented courses</b></p> <p>Teaching is organized in inquiry-based courses that do not close in on theme, genre, historical transmission, and narrow goal orientation, but open up for students' own inquiries.</p>
<p><b>4. Guided openness</b></p> <p>Teacher presentation, tasks, and questions are formulated from a deep understanding of the texts and every single text's distinctive traits, so that teaching becomes neither too open nor too closed, but creates a guided openness in the tension field between the texts' structuring elements and blanks.</p>
<p><b>5. Intellectual framing</b></p> <p>Students receive direct instruction in terms and strategies that make them capable of independently examining aesthetic texts and to be reflective towards their work and learning outcome.</p>
<p><b>6. Varied progression</b></p> <p>Courses and tasks are varied and goal-oriented to make teaching dynamically alternate between in-depth analysis, skill training, and perspectivation to the world outside the texts.</p>
<p><b>7. Multimodal production</b></p> <p>Creative production combining different ways of making meaning (multimodality), for example using body, speech, writing, sound, image, and diagrams, make students' work with texts concrete and creative.</p>
<p><b>8. Mastery of interpretation</b></p> <p>Teachers' and instructional materials' examples and model analysis illustrate how to fill out blanks, i.e. have a concrete perception of the implicit parts of the text, how to expand understanding of the text, and master an inquiry-based approach.</p>

The design principles may be said to have been theory-informed, since they were gradually developed and formulated into *eight* general principles for the inquiry-based approach that teachers were introduced to during our preparatory meetings with them. The general principles are found in Table 1 (in our translation).

However, as explained above, such general principles were transformed into gradually more contextualized and outcome-oriented principles related to the specific design of learning resources and the formulation of learning activities within these resources. As an example of the transformation from the program theory to our own theoretical amalgam, and further on to the formulation of design principles and learning activities, we will track the development of a key element of the design: *Progression and phases in the learning process*.

In the program theory (Figure 2), various elements hint at structuring activities with the purpose of creating progression. For example, under Scaffolding, “Phase division” is mentioned. Under “Engaging strategies” we find “Continuity with variation” as a structural principle. Furthermore, the elements under the headings “Intervention” and “Activities” are to some extent organized as a progression in time: The first element, “Instructional clarity”, concerns the objectives of courses, and “Aesthetic experience & embodiment” precedes “Analytical understanding & reflection”—followed by “Externalization”. This progression became, in fact, a key structuring principle in the course designs. However, the main structuring principle in the program theory is conceptual and refers to the themes in the pre-study.

After we decided to develop the intervention materials within the research team, a first version of a set of design principles for developing prototypical courses was formulated to guide the development of prototypes. The design principles explicate a structure in the aesthetic inquiries that the courses must frame in concrete ways. For example, the second of eight design principles stated the following:

Figure 5. An elaborated design principle explicating the progression and structure of Inquiry.

<p><b>Progression and phasing:</b> Organization of courses must reflect an inquiry-based approach to aesthetic texts, where one works one's way into, works within, and finally out of aesthetic texts:</p> <p><b>a) Into aesthetic texts:</b></p> <p>Tasks and questions → Connecting, interest, empathy, expectation, preunderstanding, wondering</p> <p><b>b) Within aesthetic texts:</b></p> <p>Tasks and questions → Wondering, investigating, observation, discovery, reflection, interpretation</p> <p><b>c) Out of aesthetic texts:</b></p> <p>Tasks and questions → Retrospection, reflexive references, actualization, contextualization, perspectivation, transformation</p>
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In this design principle we find a tripartite structure, a reflection of many concepts from the program theory, along with some supplementary concepts vis-a-vis the program theory. When designing courses, applying these general principles to the individual aesthetic texts calls for substantial translation, creativity, and eclecticism. One important aspect is that every aesthetic text will be particular and more or less unique compared to other aesthetic texts (Dewey, 2005 [1934]). Some texts, for example older texts from the 19<sup>th</sup> Century (including a short story by Danish author and Nobel Prize winner, Henrik Pontoppidan, which was included in one of the teaching modules), require students to gain a level of pre-understanding before reading that a more contemporary text will not. Some texts work with overt defamiliarization, while other texts are more subtle. Some texts have a more open-ended structure that requires student inferencing and deeper levels of scaffolding. These considerations, which vary from text to text, will have a direct impact on the student activities and tasks that are designed.






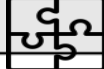

When working with this process of 'application' or 'adaptation' of the design principles, we found that the processes envisioned in the design principles did not make sense as a linear process from students reading the text to their contextualization. Rather, in order to scaffold students' inquiries, a structure in which the text, for example a short story, is cut up into pieces seemed more productive. Some elements recurred every time students read a piece of text, while others did not. Hence, in the operationalizations of the design principle in the courses and their material design, students always have to do some aspects of *a) Moving into aesthetic texts*, *b) Moving*

*within aesthetic texts* when confronted with new text, and *c) Moving out of text*. This general design principle of literature pedagogy is, of course, indebted to the work of Langer and others (as described in the pre-study and above). However, as we experienced in specific design processes, this principle is not as straightforward as one might think. For example, parts of *b) Moving within aesthetic texts* (particularly reflection and interpretation) do not always make sense in relation to excerpts of text. And in some cases, *c) Moving out of aesthetic texts*, had to be postponed to later instances of the inquiry process (what we later termed the Contextualization phase, see Table 3 and Figure 4), to keep students focused on the literary work and not their subjective pre-understanding of the world.

Consequently, to stimulate students' metacognition we reformulated these design principles into *seven strategies* for aesthetic text inquiry (see Table 3 below). We described each of the strategies in a straightforward manner that both teachers and students should be able to understand and supplied each strategy with an icon that would be recurrent in each course when a particular strategy was in play. This also served the purpose of allowing teachers and students to experience a sense of continuity between each course.



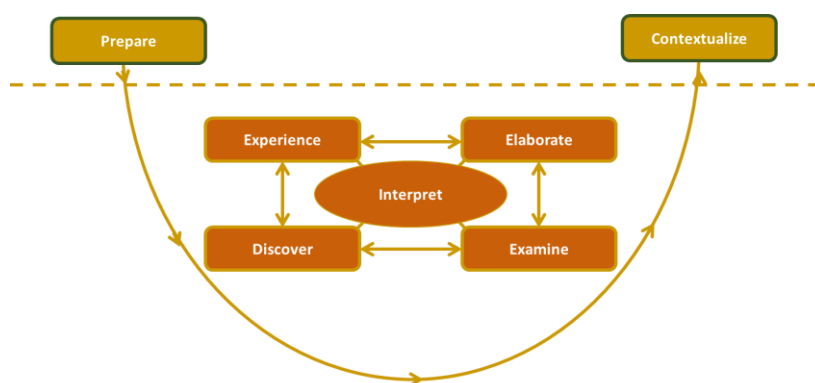
Figure 6. Strategies for inquiries into aesthetic texts, as presented to students and teachers.

Strategy	Icon	Specific actions
<b>Prepare</b> <i>Before you read the text</i>		<ul style="list-style-type: none"> <li>• Keep an open attitude towards the literary text.</li> <li>• Set yourself up to new and alternative ways of seeing sayings things.</li> <li>• Stay tuned to gather knowledge required for imagining the text's world.</li> </ul>
<b>Experience</b> <i>Experience the text's world</i>		<ul style="list-style-type: none"> <li>• Give yourself time to perceive the text's world.</li> <li>• Follow the text, and engage in persons and actions.</li> <li>• Transform your experience into other forms (e.g. writing, drama, video), that enrich the experience.</li> <li>• Note odd things and sensations, but don't jump to conclusions.</li> <li>• Stay open for multiple interpretations.</li> </ul>
<b>Discover</b> <i>Discover the text</i>		<ul style="list-style-type: none"> <li>• Discover the text back and forth.</li> <li>• Consider possible links and connections.</li> <li>• Find key text bits and meanings.</li> <li>• Suggest meanings that the text might want to convey.</li> </ul>
<b>Examine</b> <i>Test your interpretations of the text</i>		<ul style="list-style-type: none"> <li>• Check reasoning and references to the text.</li> <li>• Test suggestions of interpretations in collaboration with peers.</li> <li>• Stay open for dialogue, and other respons to others.</li> <li>• Set up a plan for further investigation.</li> </ul>
<b>Elaborate</b> <i>Dig deeper into the text</i>		<ul style="list-style-type: none"> <li>• Elaborate further on selected text.</li> <li>• Analyse larger connections.</li> <li>• Justify interpretations with reference to the text.</li> </ul>
<b>Interpret</b> <i>Summarize interpretations</i>		<ul style="list-style-type: none"> <li>• Justify most important themes and text foci</li> <li>• Justify what the main point that the text wants to convey.</li> <li>• Make a suggestion for a full interpretation of the text.</li> </ul>
<b>Contextualize</b> <i>Evaluate and contextualize</i>		<ul style="list-style-type: none"> <li>• Try to relate the text to yourself.</li> <li>• Try to understand the text in relation to society.</li> <li>• Evaluate the quality and relevance of the text.</li> <li>• Summarize main disciplinary points which the investigation of the text has led to.</li> </ul>

The activity-oriented description of strategies and use of icons could be thought of as a mediating tool between learning materials and our theory and design principles for teachers and students. The systematic, yet varied and contextualized, application of the strategies in the literary inquiry processes are an essential part of the expected outcome of classroom activities. Furthermore, we hypothesize that the strategies play a vital causal role in the size of the effect produced in the output-oriented RCT study that tests student literary competence. A crucial point is that we were constantly working towards developing formats that would be understandable, appealing to and applicable by students as well as teachers, and that would not only improve student performance but also enhance teacher agency and reflection (cf. Figure 3), attempting as it they do to explain and structure, in plain disciplinary/subject-specific and pedagogical language, what is, in fact, a rather complex endeavor.

In order to facilitate teachers' reflection on their actions when teaching literature, we developed a simplified model of the basic dynamics of an inquiry-based approach, presented in Figure 7.

*Figure 7. A model of inquiry-based teaching of literature shared with teachers.*



We assume, and try to depict using the model, that the seven strategies are interrelated and mutually interacting. Also, the model implies that when specific strategies are applied in relation to working with a specific aesthetic text, this would contribute to the students' development of the particular strategy. Furthermore, by linking the model to the program theory, we assume—and explained to teachers in writing and orally at the preparatory seminars—that teaching and learning with or through the strategies is evidence-based and related to the core design principles and intervention themes that inform the intervention as a whole.

Such iterations on the level of theory, design principles, and material necessitated revisions of the materials to ensure uniformity and coherence. There are pedagogical

reasons for this, but also methodological reasons deeply related to the situated context of the intervention. The complex dialogic interactions and reflexive processes that the study tries to instantiate require teachers to feel both agency and ownership of the designs for learning. We do not believe that teachers can be simply instructed to frame these challenging processes without them reflecting and actively taking part, when, for example, facilitating open dialogues and keeping multiple interpretations on track in the classroom. Nor do we believe, from a more socio-historical perspective, that teachers would accept to act as mere puppets, doing what we tell them to do. In the Nordic-German region there is a century-long *Didaktik* history of acknowledging and drawing on the authority of the individual teacher and his or her professional judgement (Deng, 2015; Gundem, 2000), which also formed part of our considerations of the intervention process. Finally, theory about engaging teachers in reform and developmental work suggests that it is vital that teachers should indeed be positioned as innovators who can and will engage in developing their practice (Randi & Corno, 1997; Nielsen, 2012). This brings us back to the focus on teachers and how we collaborated with them in the intervention process in specific settings.

#### *4.4 Prompting and training teachers for inquiry-based literature teaching in classrooms*

DBR is associated with the use of iterative interventions and formative evaluations to explore teacher activities and student learning using a broader set of research methods than mere experiments that measure effects (Collins, Joseph, & Bielaczyc, 2004). Brown (1992) suggests that the DBR research process is performed in three stages with successively less researcher support and control of the context, and that in the final stage the design is widely adopted with minimal support. As illustrated in Figure 1, we operationalized this idea by establishing Developmental and Pilot testing phases before the RCT study. In these phases, we applied a number of methods for gathering evaluative information, including teacher and student questionnaires, individual and focus group interviews and more or less systematic observation studies.

Focusing on the Pilot phase, to prepare teachers teaching the courses based on our material, we produced what we would refer to in a Nordic-German context as *didacticized* learning materials: learning materials which contain tools, texts, exercises and prescriptions for the use of the materials by teachers and students (Hansen, 2011b; Bundsgaard & Hansen, 2011). The didacticized material should reflect the program theory, including the six intervention themes (cf. figure 2, 'Intervention' column). Specifically, in our interventions, teachers and students were guided by a user-friendly digital interface on the web that served as a learning platform in the teaching and learning processes in the classroom. This platform, which has both student and teacher entries, plus additional resources such as the tools described above

(Table 3 and Figure 4), were introduced at a so-called “kick off seminar” for participating teachers which played a crucial role in the intervention process.

The use of didacticized learning materials for our interventions meant that the support for teachers and students was built into the intervention materials. Therefore, both in the pilot study and the three successive rounds of RCT phases, teachers received support only by attending a kick off seminar, having access to documents that framed a dialogue between teachers at each participating school, and the learning materials. This type of intervention has great upscaling potential, because any teacher or group of teachers will be able to use the materials in their contexts without expenses for teacher training. Ideally and intentionally, the learning materials are artifacts that are usable and understandable for teachers and students and that could have a widespread impact on teaching after the project has ended.

Both in the development phase and, predominantly, in the pilot phase, the learning materials were formatively evaluated using teacher interviews, classroom observations, and surveys. In line with DBR, our interest in these formative evaluations was to obtain an empirical base for understanding *how* our intervention worked (Gravemeijer & Cobb, 2006). We wanted to gain insight into what elements of the intervention that seemed, more or less, to work or not to work—for whom, and why. One specific example of teacher feedback was the following comment from a final evaluation meeting in the Pilot phase:

*We have missed variation. Occasionally, however, there would be something new, like role play, playing that we are talking on the phone, or something like that. Those alternative activities have been accepted enthusiastically.* (Transcription of teacher evaluation, our translation)

This particular comment, which was supported by other data calling for more variety in activities and tasks, reminded us of one of the intervention themes, *Externalisation*, related to *modality change*, which is a core element of KiDM’s program theory (cf. Figure 2). Specifically, for the next intervention phase we developed more tasks in which students were asked to externalize interpretations of texts through a visually creative product, or other kinds of production, such as sound productions integrating voice production and sound effects.

The example illustrates a general evaluative practice in the DBR-approach. The use of different evaluative methods had a *developmental purpose* (Greene, Caracelli, & Graham, 1989) in which data from the formative evaluation of each iteration informed the following process of redesign. Observations and patterns inferred from the developmental phase (we deliberately do not use the notion of findings, as they are based on eclectic methods and tentative pattern analysis), eventually lead to an iterative redesign in a pilot study and yet another iteration in the transition to the three upscaled rounds of RCT studies.

Collaboration with, and the training of, the large number of participating teachers was a crucial focus point from the pilot phase and throughout the subsequent RCT-iterations. After all, no changes in classroom practice are likely to happen in a

project like this without the teachers having both the right kind of involvement and the competencies required to teach literature in an inquiry-based manner. Given the large number of participating schools and teachers in the KiDM-project and the large geographical spread of participants, one major challenge has been how to develop adequate models and methods for teacher training that could meet two central requirements.

Firstly, the teacher training program had to be designed in a way that ensured the implementation of our eight design principles and seven strategies in classroom teaching. This requirement cannot be met without a relatively high degree of uniformity and structure in the design of the training program.

Secondly, we wanted teachers to internalize the philosophy of reading literature through inquiry and spread this approach to fellow teachers at their local schools. We hypothesize that the activity of asking teachers to participate in the study and to reflect on their retrospective experiences with, and prospective considerations of, the next step in the module, contribute to the positive implementation of the intervention, in the sense that teachers would work better towards realizing the intentions of the program theory. This requirement cannot be met without having a fair number of discussion and inquiry-based activities in the teacher training program. Such activities help to engage teachers personally and ensure local relevance.

Due to the large-scale requirements of the study, and the limited time and resources in the project, an action-oriented approach towards teacher training had to be ruled out. Thus, we found ourselves left with the problem of how to instruct teachers how to work in engaged dialogue-based ways in a situation where our possibilities of having a dialogue-based approach to the teachers themselves were limited.

Our solution to these methodological challenges has been to design what could be termed a blended learning format comprising several events and settings: face-to-face kick off meetings with the participating teachers at our institutions; web-based materials to be used in the classrooms; *scripts* for a number of mandatory teacher team meetings to be held at the local schools in the slots between the different teaching modules; and also an organizational structure that would appoint a teacher coordinator amongst the participating teachers at each school. This teacher training program has both some built-in strengths and weaknesses. The main weakness is the limited number of face-to-face learning opportunities for researchers, developers, the participating teachers and the coordinators in the project. However, we would also argue that the program has many strengths and did help in the mobilizing of teachers as active and engaged teachers who realized the intervention with a high degree of fidelity, as explained in the following four sections.

#### *4.5 Organizational structures and assigned roles*

At the schools, we have attempted to establish an organizational structure with two different levels of team collaboration: “the project team”, consisting of teachers participating in the KiDM interventions, and a larger group of L1 teachers teaching literature but not participating directly in the intervention. In order to facilitate both the KiDM-interventions and the formation of local communities of learning (Lave and Wenger 1991) and knowledge transfer, we designed a structure consisting of three roles for teachers at each participating school: 1) the coordinating teacher, 2) teachers participating in KiDM, and 3) fellow teachers not participating in KiDM but teaching literature. Sometimes the schools chose an “ordinary teacher” as coordinator, and sometimes they chose a teacher with special tasks, typically the reading supervisor (a certified position in the Danish school system).

#### *4.6 Preparatory face-to-face meetings with coordinators and teachers*

At the beginning of each intervention phase—both in the pilot and RCT phases—we invited the teachers to two seminars. The first was only intended for the coordinating teachers. At this seminar, we introduced the coordinating teachers to their special tasks, which included, among other things, communication with researchers, coordinating and facilitating local teacher team meetings and planning the test program at the schools.

In order to convey the main principle of the program theory at the preparatory seminar, we wanted to offer the coordinators an instructive incident—an experience of what an inquiry-oriented approach to literature teaching, emphasizing aesthetic experience and embodiment prior to analytical understanding and reflection, would mean in practice. We did so, specifically, by showing them a poem on a PowerPoint slide, reading it aloud, and then asking them specific, but semi-open questions about what they thought about specific aspects of the text, such as “what time was it”, “how many people were present”, “how old were they”, etc. After having discussed their ideas for a while in pairs or groups, we revealed with a click on the slide that they had not seen the complete poem; another few final lines were added. These lines would turn many of the teachers’ interpretative inferences upside down. In this way we tried to offer the teachers an indicative and embodied experience in the practice of basic intervention themes, design principles, learning activities and strategies of literary inquiry. In particular, the exercise demonstrated the distinction between aesthetic experience and analytical understanding and research-informed findings about inferences and defamiliarization that could take place in the classroom. Also, the exercise offers an experience of how such principles could be operationalized into learning activities through the ‘cut up’ appearance of text sequences and deeply scaffolded tasks associated with the texts.

The second seminar was intended for both coordinating teachers and other teachers participating in the pilot or RCT study (not control groups). This seminar,

entitled “the kick-off seminar” had a crucial function in the project. Due to the large number of teachers and the geographical spread of the project, the meeting was conducted simultaneously at three different geographic locations covering Jutland, Funen and Zealand at the beginning of each intervention phase (pilot and the three rounds of RCT).

#### *4.7 Teachers trained by working with the introductory course module*

Besides giving the teachers practical information about the project and a general introduction to inquiry-based teaching, we wanted to model, in a way that was as realistic as possible, a literature teaching situation based on our design principles. In order to do so, the short exercise described above was repeated during the kick off seminar. Moreover, teachers were enrolled into the first sections of the first introductory module for students in the intervention, because we used the same literary text (“Plastichjerte” [“Plastic Heart”] by Ronnie Andersen, a Danish author who writes for young people), read the teacher guidelines and used the student resources available on the website. The “Plastic Heart” module is the introductory module, meant to introduce the essential design principles and learning activities of the intervention to the students in class. We argue that the teachers’ own analyses and evaluation of literary texts are required in order for them to scaffold inquiry-based learning processes in the classroom. The core activities in the introductory module are founded on a task-based approach to aesthetic slow reading that contributes to enriching textual inferences.

What is “Plastic Heart” about, and how is it aesthetically formed? In brief, “Plastic Heart” is a short story about a young misanthropic person who manipulates and horrifies random victims by making so-called troll comments on the internet. The main character is also the often openly unreliable first-person narrator of the story contradicting himself and attempting to manipulate the reader by making devious remarks in the same manner as he manipulates people in the story. At the end of the story, however, the text gives the reader strong hints that the main character is sitting in a wheelchair having broken his neck by jumping into the shallow end of a swimming pool. This short story addresses the current issue of ethical behavior on the internet as well as general moral issues of guilt, bitterness, personal relations and responsibility. Moreover, the text provides a lot of suspense, only revealing the full story about the main character bit by bit, which makes it suitable for cut up-sequencing and the inquiry-based application of strategies: experiencing, investigating, testing, elaborating, etc. By working with selected learning activities from our teaching materials for “Plastic Heart” on the web page, the teachers were introduced to the seven strategies for interpreting aesthetic texts that lie behind our version of inquiry-based literature teaching. As most KiDM texts, “Plastic Heart” is cut into three sections on the web page with a sequence of questions and tasks following each section. The following quote is an example of instructional actions following

reading of the first part of “Plastic Heart”. The instructions are connected to the second strategy “experience”:

*Try to read the section one more time in pairs. One of you reads the text aloud. Make pauses when something strikes you as important and express in your own words what you experience and feel. Make a brief note. Sum up our readings answering the following questions: Is the main character a male or a female? What time of the day is it? How do you experience the actions of the main character? How is the relation between the main character and his mother? How would you describe the main character to others? (Instructions for “Plastic Heart”, KiDM web resource for students on microsite (with login), our translation)*

The aim of this and related KiDM-activities is to facilitate a process of slow and inquiry-based reading. The questions are designed to be specific and open at the same time. Following our phenomenological approach to literature in the classroom, many of the questions and text activities, especially in the opening phases entitled “experience” and “investigation”, target significant blanks in the text (Iser, 1972). For instance, the text does not say explicitly whether the main character is male or female. Our intention in asking this question and having students and teachers discuss it, is to make them aware of the open nature of the text and the dialectic construction of meaning between text and reader. In this case it was also about making their pre-conceptions about male and female behavior visible to themselves.

By prompting for specific reflections while at the same time leaving space for individual interpretations, we try to overcome one of the well-described barriers to students’ engagement in discussing literature in classrooms, namely “the reader/text dichotomy” (Rosenblatt 1993, p. 382). At the kick off seminar one of the researchers would function as the teacher and guide the participating teachers through a reading and learning process on the model of a literature class with lower secondary pupils. In this manner, we attempted to teach the teachers how to guide students to think and work inquiry-based when reading literature, while at the same time maintaining an interpretive direction. In general, we would argue that the teachers appeared very engaged in the literary discussions at the kick off seminars.

#### *4.8 Building local communities of learning using scripts*

As a final focus on prompting and training teachers, we will now highlight how we worked on building local communities of learning using *scripts*. Traditionally, Danish teachers have planned and evaluated their teaching as private professional practitioners. During the past decades, however, schools have focused on developing local cultures for teacher collaboration. Teacher team meetings are expected to help teachers plan their teaching and focus on how to promote student learning, though it would seem from some of the literature that teachers’ team meetings tend to not to focus on the content of teaching and the students’ learning processes (Nielsen, 2012). Our initial talks with teachers at the residential meeting for researchers and teachers in the Developmental phase of the project confirmed our impression of the



varying quantity and quality of teacher team meetings. Thus, a central challenge and goal in the KiDM project has been to facilitate the creation of local teacher communities that can support the development of the teachers' competencies in inquiry-based teaching of literature.

Having a busy working life with limited time for lesson planning, many teachers often request inputs from intervention projects that are immediately applicable in the classroom. In order to meet this request, while at the same time making room for professional reflection on teaching literature with an inquiry-based approach, we have striven to balance local teacher agency and room for reflection with a clear thematic structure and a strong framing of the discussions at team meetings. In order to do that, we designed a concept for scaffolding instructions, so-called scripts, for each meeting. In film-making, a script will describe, verbally, visually and in some detail, what the director has to do in the filmmaking process. The scripts developed for this intervention function in similar ways. For all intervention phases, we designed scripts for four to five team meetings. The scripts are written documents consisting of two sections of instructions. One section, called "Evaluation and reflection", is targeted at reflection on the intervention just completed. The other section is devoted to "Planning and reflection" in connection with the upcoming teaching sequence. In order to scaffold open and inquiry-based discussions at the team meetings, instructions are also given on how to manage turn-taking in the conversation, e.g. "Short statements from all participants, then plenary discussion" (cited from one script, our translation).

The team coordinator has the role of facilitating the discussion, summing up main points and writing a summary of the discussion, which is to be sent to the researchers afterwards (and is thus a method, data source and part of the DBR studies; cf. Figure 1). Examples of specific questions to be discussed in the "Evaluation and reflection" phase are: What worked out well during theme X? Where did you encounter problems and challenges? How did the students respond to the literary texts? Which of the literary texts did you find most suitable to scaffold the students' inquiry-based competencies? Are there special circumstances which need extra attention in the next thematic phase? Which ones? The discussions in the "evaluation and reflection phase" are planned to last 30 minutes. In order to build up routines for reflections, the instructions for discussion in this phase are the same in each "team script".

The second part of the scripts, entitled "Planning and reflection", is devoted to mutual reflection and planning of the upcoming teaching sequence. This phase is given most weight in the script, with a duration of 90 minutes. The instructions in this part of the script are closely related to the teacher's guide on the webpage and the materials the students have to work with in class. The rationale behind this section of the script is that if teachers conduct the inquiry-based exercises themselves, they will get firsthand experience of the learning potentials and barriers the students most probably will encounter. The order of instructions in the scripts typically follow a taxonomic pattern with 1) performance of selected student activities, 2) reflection upon the concrete activity, and 3) more general discussions addressing areas worthy

of special attention when implementing the teaching sequence in the classroom. A concrete example of a sequence of instructions from a script could be this:

*In pairs of two: Read student assignment 3 (re-read and draw) and the text on class dialogue in the teacher's guide. Brainstorm on what you suppose the students could possibly draw. Make a written list and swap your list with another group. Look through the list from the other group and select the idea that seems most surprising to you. Discuss how such a drawing could be integrated into the class dialogue in such a way that you both respect the students' experience and guide them towards a warranted reading of the short story" (Phase 1, script 3, internal project document, our translation).*

#### *4.9 The use of teachers' feedback in the process of re-designing materials*

In order to make decisions on redesign after each experimental phase, continuous feedback from teachers is crucial (Engeström, 2011). During the project, we have experimented with different evaluation methods. In the Pilot phase in the spring of 2017, we used the team coordinators' written feedback from the team meetings, along with three video conference-based interviews with the team coordinators, to formulate a "mid-term" evaluation of the intervention. The written feedback from the team coordinators informed us of the main points in the discussions at the local team meetings, and we therefore continued to use this approach throughout the project. However, we felt a need to complement the written feedback with interviews, making it possible for the participating teachers to express their experiences and attitudes in more detail. At the end of each of the following RCT phases, we therefore invited teachers to participate in plenary talks and group interviews at the closing seminar.

Overall, the feedback from the teachers is mainly positive. In a thematic analysis of evaluation data, including reports from coordinators, teachers' interviews from the closing seminars and the notes from the Adobe Connect meeting, we find that the teachers highlight our choices of literary texts as inspiring and relevant for their teaching. Many of them also find that our approach of cutting up literary texts into smaller sections, as a means to make the students aware of their ongoing construction of meaning through reading, is useful in classroom practice.

Concerning the inquiry-based approach, the teachers express different opinions. Some teachers find the phenomenological approach, which emphasizes aesthetic experience and strategies, more *inclusive* for students with diverse learning needs than more traditional approaches to the teaching of literature. The inclusive potential of our version of the phenomenological approach is related to a shift in teaching focus from a knowledge of genres and analytical concepts to the discussion of and inquiry into the content of the literary work. If this evaluation holds true, it would comply with one of the three main requirements of the call, namely that the intervention should include all students.

On the negative side, however, other teachers consider our materials excessively structured, because there are more questions and activities attached to each literary text than they are used to in traditional teaching materials. These teachers point out

that the large number of questions and exercises challenge the students and may, paradoxically, catalyze more repetitive and monological teaching and learning processes, leading to less exploratory or inquiry-oriented learning processes in the classroom. So here we encountered a real dilemma, which cannot be solved as a simple matter of redesign. It appears that if one design solution is chosen, then the needs of some teachers and students will be met, while the needs of others will not.

Looking onwards in the research process, such paradoxical and dilemma-oriented outcomes and outputs, inferred from the evaluation meetings with teachers, have informed the qualitative studies of four classrooms based on field work in the autumn of 2018 that we report about in future publications. Analyses based on the more or less informal feedback from teachers suggest that the large number of scaffolding activities in the teaching material create opportunities for in-depth work with literature. However, the method of scaffolding imposes a higher degree of intensity in the textual work, and poses heavy, persistent demands on the students' cognitive inferences. From a DBR perspective, these activities create new challenges, and point towards paradoxes and dilemmas, both in the research-oriented design process and the practice-oriented process of teaching and learning in the classroom.

A factor that can very likely have contributed to the experience of some relatively monotonous teaching sequences is the intense focus on *reading literature*, catalyzed by the RCT-study as a sort of backwash effect. In the assessment talks at our final seminars, several teachers called for a closer integration of literature with other dimensions of the L1-subject, especially writing and grammar, but even bodily oriented experiences such as drama, movement and performance.

As a consequence of this and other sources of teacher feedback, our teaching sequences have been subjected to a number of adjustments. For example, we have reduced the number of teaching sequences from four to three and cut down on the number of literary texts, in order to create more flexibility and room for variation, as illustrated above. Another example of a concrete adjustment of the teaching materials based on the teachers' feedback to us, has been the creation of a web-based resource consisting of short encyclopedic texts explaining central literary concepts as for instance "metaphors", "multimodality", "intertextuality" and "the narrator". The encyclopedic resource is mainly intended for students, in order to support their close reading using traditional analytical concepts from literary theory. The background for our development of this resource was teacher feedback pointing to the problem that our phenomenological approach to literary analysis made some students forget to use the conventional literary concepts which they are expected to demonstrate the use of in their final exam in oral Danish. These examples show how a DBR intervention always has to balance the program theory—in our case certain views on how to teach literature—up against demands and existing practices in the local contexts. As Kant pointed out centuries ago, pedagogical reforms often produce 'unexpected results' (Kant, 1878 [1802]). This is the case even in the 21st century, when we as L1 educational scientists attempt to design rational literature education interventions in L1 classrooms.

## 5. CONCLUSION AND DISCUSSION

As a first meta-comment, we conclude that the description of the systematically designed classroom intervention is in itself a study with its own epistemic value. The need for a coherent elaboration of initial program theory, pre-study, revised program theory, design principles, prototyping, rehearsals, iterative design process, and continuous formative evaluation forces us to articulate what is extensive tacit knowledge.

The interpretation of program theory as a middle-range theory with a set of assumptions and specific generative causal explanations supports us by providing an account of the underlying mechanisms which is important for an understanding of the design process. Although this initial program theory contains a high degree of domain-specific knowledge of subjects and schools as the context of our intervention, a significant descriptive finding is that the iterative design process promotes a much more specific unfolding and articulation of the multilateral correlations and causalities between design, effects and contextual factors. Thus, the process of prototyping, iteration and redesign contributes to an explicit articulation of implicit parts of the program theory. In addition, it has also been necessary to expand and revise the complex intervention as new aspects of the context have been taken into account. There is a subtle demarcation line between extension and elaboration that requires a closer reflection upon the relationship between an adjustment to the design and a decisive redesign.

On the one hand there have been a number of crucial design decisions. First of all, the decision to develop didactic learning materials has been of great significance for the design process. The point of departure, involving review and practice mapping combined with iterative prototyping, means that the material is at the same time both research and practice based. In relation to this, it has been crucial to incorporate a reflective dimension into the interaction design. The language we developed about interpretation, process phases and strategies for an inquiry-based approach, offers a metacognitive dimension that addresses the students directly. At the same time, this meta-communication is also addressed to the teacher. In this sense, the central interaction design in the didactic learning material is characterized by an intentionality with a dual address. An important consequence is that the intervention becomes less dependent on the additional teaching guides, which provide a more detailed description of the background for tasks and materials.

On the other hand, we completed a series of adjustments intended to realize the basic didactic design principles. However, we recognize that regardless of the number of adjustments and revisions, a number of dilemma-oriented questions emerge and are unavoidable. For example, how do we create a varied progression? How do we find the right balance between structuring elements and openness? How do we demonstrate mastering of interpretation without closing the text? How do we position a dialogue-based community? And in a broader historical perspective: How do we acknowledge the authority of the teacher's decisions in the classroom, while at

the same time offering teachers access to new evidence-based knowledge and using new materials that would, in a sense, minimize this tradition? To answer these questions, it is not enough to rely on theory and research. Didactically sustainable answers require design development that allows for flexible and context-sensitive designs that are simultaneously scalable.

An important premise has been that the volume and scale of the project made it possible to combine methods in different ways and for different purposes. The sequential mix of methods in time has made it possible to develop an increasingly robust design with a high degree of ecological validity. The complementary mix of methods within the project's individual RCT phases has made it possible to test core elements of the intervention and create, we would claim, a high degree of external validity. However, this is yet to be seen and reviewed when the RCT study has been completed. A similar point could be made with regards to the systematic qualitative research study conducted as we write, which will offer video-based insights into the meso and micro-discursive events and interactions in the classroom that realize the program theory and intended design principles.

In continuation of this, a cautious methodological conclusion could be that we must develop the combination of research methods based on their different functionalities in large-scale projects, if we wish to establish a stronger tradition of researching complex interventions in complex contexts. A main intention of this paper has been to increase transparency and ensure the highest degree of validity and replicability in classroom interventions in the teaching of literature. While writing the paper, we have sometimes wondered whether some aspects would be too detailed or context-specific to account for. However, such detailed accounts, embedded in a theoretical and methodological framework informed by middle range theory and DBR, illuminate the complexity of interventions in demi-regularized settings, such as the L1 classroom, within which the KiDM interventions take place. Hopefully, this descriptive account offers other scholars the opportunity to perform similar interventions in other regional and local contexts, and to do so with a more reflective and informed understanding of the dynamics of intervention processes in the teaching of literature than we had to start off with. Finally, we should note that the descriptive account of the intervention will serve as an important reference for a planned later publication which will report on quantitative and qualitative findings in the project.

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