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Teachers' Experiences of Facilitators and Barriers to Implement Theme-Based Cooperative Learning in a Swedish Context

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Implementing Evidence-Based Practice (EBP) in school settings can be challenging. This case study presents barriers and facilitators expressed by kindergarten teachers (N = 6) during the implementation of a theme-based cooperative learning project over the course of a semester. During three group interviews, at the start, mid-point, and end, the teachers expressed their thoughts and experiences about the project. The Theoretical Domains Framework (TDF) was used to identify and analyze barriers and facilitators throughout the project. The importance of organizational investment, collegial connection and collaboration, the pedagogical fit of the EBP, and plans for long-term change were highlighted as beneficial factors for successful implementation in this case study.

Keywords: early childhood education, in-service teacher training, implementation, cooperative learning, Theoretical Domains Framework (TDF)

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INTRODUCTION

All children have the right to attend a school that ensures academic and social growth. In a multi-tiered system of support, universal interventions that improve the quality of educational provisions for all students can be considered the first level of special educational needs support, in which improvement of quality is assumed to contribute to promoting positive outcomes and preventing difficulties (Carta et al., 2016; Darling-Hammond et al., 2020). The aim of the educational research field is to provide schools with relevant methods for improving pedagogical practice. However, educators need to adopt and implement the methods into everyday practice. The implementation process begins when educators choose an innovative practice for adoption. This case study aims to investigate the barriers and facilitators expressed when implementing an evidence-based practice in an authentic school environment. This targeted implementation project act as an example, and is used to explore the contents of a theoretical model of implementation in a school setting. Subsequently, the aim is not to examine the efficacy of the practice adopted, nor the effects of this particular innovation.

Implementation

Implementation has been defined as "a specific set of activities designed to put into practice an activity or program" (Fixsen et al., 2005, 5). Implementation aims to bridge the knowledge-to-action gap that often occurs between research and practical application by transforming the theoretical contents into a practical program that can be used in practice (Graham et al., 2006).

Implementation aims at performing a lasting change in a practice. In fact, if the change was only temporary, the time, effort, and money spent would not fully benefit the practice. The facilitation of sustainable change is the core focus of implementation research (Rogers, 1983; Fixsen et al., 2005; Proctor et al., 2011; Powell et al., 2012; Fixsen et al., 2013).

A research-based model that shows scientific evidence in authentic settings can be defined as an Evidence-Based Practice (EBP). EBPs can bridge educational research and practice, promoting improved outcomes for students by providing both students and teachers with evidence-based educational tools (Odom et al., 2020). Education policies require teachers to use EBP internationally (Cook and Odom, 2013). Teachers need to be knowledgeable about the different programs available to determine the most appropriate EBP to use in a particular setting, as well as to use their practical expertise in both choosing an EBP and adapting it to the educational context (Scheeler et al., 2016).

For effective change, both the EBP and the implementation process need to be effective (Durlak and DuPre, 2008; Fixsen et al., 2013; Lengnick-Hall et al., 2020; Lewis et al., 2020; Massey et al., 2021). The program needs to fit the target environment without unacceptable program drift. Program drift may occur when an adaptation to the environment is too large. Some adaptation may be necessary, but if the adaptation changes the core values of the program, the implementation will no longer result in an EBP (Chambers et al., 2013; Aarons et al., 2019). Therefore, implementation needs to maintain model fidelity, retain the core values of the program, and achieve a good environmental fit. The complexity of these processes has been the focus of implementation researchers for decades (Ogden and Fixsen, 2014). When performing cultural adaptions between countries or practice settings, a systematic approach needs to be adopted to ensure fidelity and guide future adaptions (Ferrer-Wreder et al., 2012).

Implementation in School Settings

Previous research has highlighted the difficulties of EBP implementation in Swedish school settings (Ingemarson et al., 2014, 2016). In the implementation of an EBP, a school-wide program aiming at preventing negative behavior and supporting positive school climate for students aged 11–16 years, Ingemarson et al. (2014, 2016) found factors for implementation success or failure at multiple levels. Individual-level factors involved professional identity, teachers' understanding of the program, willingness to change and to perform the program, previous teaching experience, and perceived lack of time. Organizational factors concerned support as hands-on support from the internal team and external consultants, visible support from the headmaster in the form of expressed support along with active participation in training and implementation, and managerial support, which included providing time and opportunity for the teachers to meet in collaborative exchanges to support and ground their abilities and willingness to adopt the program (Ingemarson et al., 2014). In this study, the implementation barriers led to the lack of measurable effects of the intervention, although it was a successful EBP in other contexts.

The complexity of implementation is due to pressure from outside as well as inside the implementation context; societal pressure, organizational goals, and teachers' perception of the role of the school influence teachers' educational practices (The Swedish Committee of Education, 2013). An innovative educational practice should have good environmental fit, be perceived as essential to the setting, and be proven favorable to the old practice for it to be implemented (Greenhalgh et al., 2004; The Swedish Committee of Education, 2013). The Swedish School Act (SFS, 2010:800) states that school practices should be scientifically based. However, although the process of implementing scientific educational knowledge into school practice is not comprehensively formulated in the national policies, initiatives in this direction are ongoing at the local level in the decentralized educational system (Ghaderi et al., 2018).

The Swedish Kindergarten Context

Kindergarten is the first stage of mandatory schooling for Swedish children. A majority of Swedish children do attend preschool at ages 1−3 (77%) and 4−5 (94%) (Swedish National Agency of Education, 2018a). Of the Swedish 6-year-olds, 97.7% attend kindergarten (Swedish National Agency of Education, 2018b). There are a number of factors inherent to the Swedish school system, kindergarten in particular, that may influence implementation of educational innovations. The Swedish kindergarten is a distinct type of school, with a separate curriculum and organizationally and pedagogically separate from both preschool and elementary school. However, most kindergartens are placed in elementary school premises and are led by the school headmaster. Kindergartens have a catchment area that includes children from multiple preschools. For many children, kindergarten represents the first classroom in which they are educated in an age-homogeneous group, unlike the age-mixed groups in preschool. Kindergarten teachers can be certified both through pre-school teacher and through elementary school teacher programs, creating potential differences in the perception of kindergartens (Swedish National Agency of Education, 2014).

Organizational Aspects

The organizational characteristics of kindergarten may influence implementation, and therefore, they should be considered. Besides the internal organizational aspects, other general organizational issues should be considered in the analysis of implementation. Kindergarten, with its own teachers, is a one-year bridge between preschool and elementary school (Swedish National Agency of Education, 2014). Implementing educational innovations and EBPs can require long-term efforts, which can be hindered by the one-year rotation of students. Turnover is considered one of the most detrimental factors for implementation success (Swales et al., 2012). Qin (2020) compared the TALIS 2013 results from OECD countries and found that among the OECD countries reported, Swedish teachers expressed the highest intention to quit their job (41%); moreover, their social status was relatively low and their salary was mediocre in comparison to other academic groups in society. It is argued that when these circumstances are coupled with

stress and perceived bad working conditions, teachers are likely to quit their job to seek better opportunity. Qin (2020) concludes that a majority of Swedish teachers wanted to relocate to other schools, rather than choosing a different profession. This may be connected to teacher shortage and the possibility of increasing salaries through school relocation (European Union, 2019).

Theoretical Domains Framework

The Theoretical Domains Framework (TDF) is a framework for implementation evaluation stemming from psychological theories on motivation for future change (14 theories), action for present change (11 theories), and demands on the organization for change (8 theories) (Atkins et al., 2017). It has been revised and validated (Cane et al., 2012; Sarmast et al., 2014). TDF is a more detailed version of the COM-B framework (Michie et al., 2011). COM-B focuses on the three main parts of behavior change (B) in which the TDF domains can be structured: capability (C), opportunity (O), and motivation (M), as can be seen in **Figure 1**.

Atkins et al. (2017) developed a guide to use the TDF in research and practice. The TDF is a so-called determinant framework (Nilsen, 2020), that aims to identify facilitators and barriers in implementation processes in various contexts. To ensure successful, long-lasting implementation, the barriers need to be overcome, and the facilitators will support the behavior change and function as encouragement in order to overcome possible barriers (Ogden and Fixsen, 2014). The TDF was initially constructed to guide health research and practice, but has since been used and found useful in other settings. In the school context, the use of the TDF is still in its early stages (Weatherson et al., 2017). In Sweden, it has been applied in the area of social work (Bäck et al., 2020) and education (Nylén et al., 2021).

In school settings, the TDF has been applied to investigate teachers' responses to the implementation of educational EBPs. Baker-Henningham (2018) used the TDF to identify barriers and to guide facilitating workshops. Weatherson et al. (2017) used the TDF to identify barriers and facilitators in the implementation of a physical activity policy in elementary school. Barriers

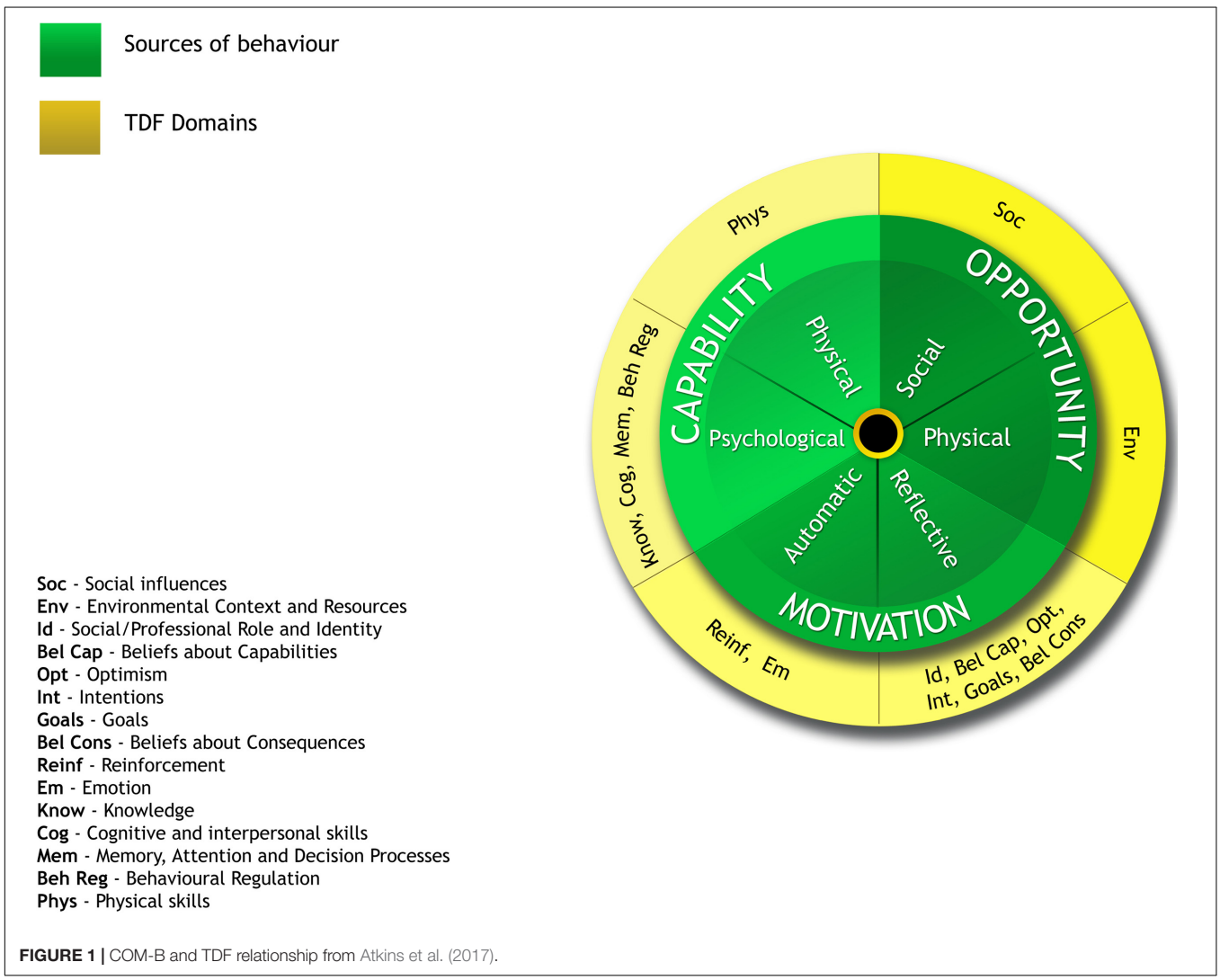

FIGURE 1 | COM-B and TDF relationship from Atkins et al. (2017).

were related to lack of knowledge, confidence, attitudes, and motivation at the teacher level as well as lack of collegial support and time to plan at the school level. Facilitators were related to interest and enjoyment, self-confidence, and previous experience of similar activities. Program adaptability and accordance to established methods acted as facilitators, as did support from school management, increased teacher autonomy, and collegial learning.

McCarthy (2017) found that schools might lack implementation frameworks that could support their implementation process and proposed the TDF as an appropriate framework. After following a New York school district that implemented a project to improve the digital education of the students, the author concluded that the most prominent domains were environmental context and resources, social/professional role and identity, and social influence. These domains could act as both barriers and facilitators, highlighting the importance of organizational and collegial support.

These studies indicate that the TDF can be applied in educational organizations and that it may provide valuable information about teachers' opinions about the implementation processes and identify adaptations needed in school settings. As teachers are in charge of the educational practices in the classrooms, their experiences, opinions, and expressions concerning the implementation process are important (Smul et al., 2019). This study aims to use the TDF and to examine its usability in order to guide the identification of facilitators and barriers expressed by teachers involved in a project adopting an innovation, the Theme-based Cooperative learning approach (Bertucci et al., 2010; Slavin, 2015; Symeonidis and Schwarz, 2016), when the practice was implemented in a Swedish kindergarten work team.

Cooperative Learning and Theme-Based Education

This case study follows a kindergarten work team involved in a school professional development project, which was separately funded by the Swedish National Agency of Education and independent from the present investigation. The project aimed to implement the project "Hälsofrämjande skolutveckling" [School development promoting health and well-being], that will hereafter be termed SDPHW. Specifically, the content of the school professional development project was based around the evidence-based practices of Theme-based education and Cooperative learning. Cooperative learning is a pedagogical practice in which learning is organized and managed as group work, wherein pupils work together in small groups to achieve academic as well as social goals, building on the Social Interdependence Theory (Johnson and Johnson, 2002, 2009; Slavin, 2015). Cooperative learning involves structured activities in which students learn by interacting and collaborating with both their teachers and their peers. Cooperative learning in education is assumed to promote pupils' development and learning (Bertucci et al., 2010; Kyndt et al., 2013; Slavin, 2015). Cooperative learning practices can be combined with other teaching strategies, such as Theme-based learning. Theme-based learning consists of a phenomenon-based approach to teaching. Instead of separating the subjects into segments, e.g., language and mathematics, the subjects are combined by investigations into a common theme that is present in the students' daily surroundings, such as the change of seasons or other natural or cultural phenomenon, adopting a holistic approach to education (Silander, 2015). This approach aims at involving the students in their learning by exploring an object or a phenomenon with the teacher. Theme-based learning has been extensively described in Reggio Emilia approaches (Hewett, 2001) and has been included in the Finnish curriculum since 2016 (Symeonidis and Schwarz, 2016). Studies show that this approach improves student motivation and interest in school subjects (Valanne et al., 2017). The combination of Theme-based, or Thematic approach, and Cooperative learning has been adopted in early childhood education, with the aim of supporting both academic and social development. When new approaches, methods, or programs are introduced in an educational practice, i.e., a teacher team, there are multiple factors that may affect the quality of program; some may be beneficial and some may hinder the adequate implementation of the innovation in particular school settings (Domitrovich et al., 2008).

AIM AND RESEARCH QUESTIONS

The aim is to use the TDF to identify facilitators and barriers expressed by kindergarten teachers in a Swedish school setting, at the start, middle, and end of the implementation of SDPHW. The aim is to identify the overall expressed facilitators and barriers during the course of the six-month project, as well as the potential change in barriers throughout the project. The study aims to answer the following questions:

- Which barriers and facilitators can be identified in the expressions of the teachers during group interviews?
- How does the experience of the identified barriers change over time?

METHOD

This is a case study of kindergarten teachers' perceptions and experiences expressed during an implementation project. The targeted implementation project acts as an example of how implementation might progress in a structured school development project in a Swedish school. This section will cover the methodological choices of the study and will outline some of the practical parts of the targeted implementation project.

Participants and Recruitment

The participants consisted of a teacher team of six (N = 6) certified female kindergarten teachers from two kindergarten classrooms at the same school, located in a small municipality in the middle of Sweden. The teacher team received project funding from the Swedish National Agency of Education to implement

the theme-based cooperative learning project SDPHW during the spring term of 2019. This study was conducted independently from the ongoing educational implementation at the school. The authors did not influence the project, or was part of the project in any other way than the first author being the interviewer for this study.

The first author contacted the researchers involved in the ongoing implementation of the educational innovations and was informed about one suitable location. The first author contacted the project leader at this location and requested the teacher team to participate in the present study. The project leader provided the contact information of the teachers, who received written information via e-mail and met the first author. The teachers were informed verbally and in written form about the study. Their participation was voluntary and they had the option to decline participation and withdraw later.

Description of the Targeted School Development Project

This part aims to outline the contents of the SDPHW project. The project aimed to increase the general well-being of the students and create a more democratic environment in the classrooms. The project consisted of three major parts: (1) cooperative learning to engage learning and discussion among students, (2) theme-based learning to create small groups of students learning together, and (3) joint reflection for the teachers. The theme-based learning approach entailed the six teachers forming three groups of two teachers each that were responsible for one theme. The three student groups with 16 students in each group covered one theme at a time, twice a week, for five sessions. In the larger student groups, student teams of four were formed in order to collaborate in the theme-based work, with the focus being on cooperation and joint learning. The reflection activity was performed in the student teams with the teachers to improve team learning and cooperation. The teachers received training in cooperative learning and feedback from pedagogical developers in six sessions delivered over 6 months.

Data Collection

The first author conducted semi-structured group interviews during the spring term of 2019 in three waves: at the start (January), mid-point (March), and end of the project (June). All six members of the teacher team were present at all three interviews. The interviews lasted approximately 60 minutes and they were conducted on days allocated for the project. The interviews were conducted in rooms used for meetings at the school. The open questions were aimed at getting the teacher to describe their educational practice and express their thoughts, experiences, and hopes for the project. The questions focused on the past, "How has it been?" the present, "How is it now?" the future, "What are your thoughts and plans for the future?" and the project, "What do you know/think/feel about theme-based cooperative learning education?" Follow-up questions were used to expand statements and enable participants to reflect on each other's statements. The approach enabled the teachers to reflect on how they experienced their educational practice before, during, and after the project. The participants did not receive reimbursements for participating in the study. Data concerning implementation fidelity or effects of the implementation was not collected, as that was not the scope of this study.

Data Extraction and Analysis

The interviews were audio-recorded and transcribed verbatim for analysis by the first author. A code key was produced to anonymize the participants into T1-T6. The analysis was performed in three stages. Using Nvivo 12 (QSR, 2018), the data were deductively coded into domains from the TDF according to Atkins et al. (2017) using thematic analysis (Braun et al., 2019). The domains were coded by the first author, and subsequently, by co-authors MWA and MS. The coding was compared and discussed to reach a consensus. The domain constructs were discussed to define the domain borders in the actual pedagogical setting. After reaching consensus on the coding procedure, a final coding was conducted by the first author. The domain contents were re-read by the first author to find patterns that could be worded into sub-themes in each domain. These themes were discussed and agreed upon by all three authors. The themes were analyzed for barriers (preventers of implementation) and facilitators (enablers of implementations) throughout the implementation process. Progression and patterns of change were identified for each theme by the first author.

Ethical and Methodological Considerations

General ethical guidelines (Swedish Research Council, 2017; All European Academies., 2020) were followed and the participants were assured that their participation was voluntary and separate from project participation. Semi-structured open questions were used to encourage and enable the participants to describe the experience in their own words and construct their own experiences, focusing on what they considered important at the different time points; thus, the participants' thoughts about the experience were presented along with insights about why they might have thought as they did (Kitzinger, 1994). All participants were encouraged to express their views, and the group interview setting enabled the teachers to answer only the questions they wanted to answer or the questions on which they had opinions. However, the interview format may have discouraged participants from expressing contradictory opinions. The interviews were conducted away from disturbance, ensuring a quiet space for the teachers to express themselves.

The first author conducted the interviews. Having worked as a preschool teacher, the first author was familiar with the social and educational context, and also had experience of the contents of theme-based and cooperative learning. By performing joint analysis of the data, the authors used their combined knowledge to interpret the data fairly. MWA has previous working experience as teacher as well as researcher in the field of early childhood education and early interventions. She has performed research with children and teachers, and taught students in teacher training programs. MS has professional experiences of teacher training, and intervention research in early

childhood education settings. MWA & MS were not directly involved in the data collection and could study the material with less risk of letting pre-existing knowledge bias the analytical process. Through analysis, discussion, and revision, the domain content was agreed upon and the TDF could be used to identify expressions in the data. In order to check the quality of the analysis and contents the authors followed the COREQ checklist (Tong et al., 2007).

RESULTS

Barriers and Facilitators in the Domains

The thematic analysis of the data found barriers and facilitators for the implementation of theme-based cooperative learning. The findings are presented with the three overarching COM-B categories Capability, Opportunity, and Motivation, in order to provide a comprehensive structure for the TDF domains, since the TDF domains are grouped in a suitable way within the COM-B model. The relevant TDF domains in each category, with sub-themes and illustrative sample quotes, are presented in detail in **Tables 1-3**.

Capability

Capability concerns the capacity of the active change agents, in this study, the teachers, to conduct the project in focus. There was a perception of growth of knowledge (theoretical knowledge) and skills (practical knowledge) expressed by the teachers. Both knowledge and skills were lacking at the start of the project, posing barriers, as expressed in **Table 1**. As the project progressed, knowledge and skills developed as the teachers were willing to test and apply the project didactics, collaborate, and learn together with colleagues. The domain of behavior regulation identified the perception that the teachers believe in their ability to change and gain new knowledge both for themselves and for their students.

Opportunity

Opportunity concerns the physical, social, and practical surroundings of the teachers, which enabled or hindered their ability to conduct the project content. The project funding provided pedagogical material and extra planning time, ensuring that the teachers could conduct the project content. The teachers received the opportunity to use additional spaces, named in **Table 2** as "Premises", which enabled them to work in smaller groups. Practical barriers arose as the teachers expressed a constant lack of time because of the pressure of ordinary teaching, along with additional obligations, such as work duties at the after-school care. This may pose a barrier to the additional task of implementing the project content. The teachers reasoned that the extra time they received for the project might have been crucial to ensure that they could conduct it. Another practical barrier was the high turnover rate, as four of the six teachers left the school at the end of the project. Social barriers arose because the kindergarten was not included in the pedagogical collegium of the school, perhaps because of the absent leadership. The teachers did express a sense of support from the agents involved in the project, such as the external project leader and the interviewer who conducted the follow-up. The teachers expressed mainly facilitators in terms of social influence. They expressed that the project had resulted in increased support among colleagues as well as the creation of a joint vision for the kindergarten and perhaps the school as a whole, which was something they had previously lacked. This is exemplified by the quote in **Table 2** under the sub-theme named "No shared didactical approach".

Motivation

Motivation to change is influenced by intrinsic and extrinsic factors. The teachers' motivation was supported by their beliefs that the project aligned with kindergarten directives and their perception of the teacher role. The project was perceived to increase factors of interest for the teachers, such as collaboration in the teaching team, by positively influencing the collective teacher norms. Motivation was supported by the project being perceived as something that the teachers were capable of conducting. The goals of the project were perceived to be in line with curricular norms, enabling the teachers to incorporate the project content in their ordinary

TABLE 1 | Capability.

Domain	Sub-theme	Sample Quote
Knowledge	Lack of knowledge at start point (B)	We hadn't read about it beforehand, but it was, "well, now it is [like this]", and then we would read [. . .] We are so docile so to speak. "This is how you should do it", "Well... then that is how it is", before we have gained knowledge about it. (T6, W3)
	Basic knowledge (F)	Now we know what is required of us [to conduct the project content]. (T1, W3)
	Knowledge developed over time (F)	We could have done it in a different way, but we have gained experience from it. (T6, W3)
Skills	Difficulty adapting project content to setting (B)	It has to do with [choosing] the groups. It is a challenge to build the groups. (T6, W3)
	Difficulty adapting new practice to include all children (B)	[The project] builds new group constellations that [the students] are not really comfortable with. It has created some anxiety, and the feeling remains the whole day with some students. (T1, W2)
	Test and develop skills (F)	We have tested the different exercises and we have received material. (T4, W2)
	Collaboration and learning together (F)	And the fact that we as teachers get to work between classrooms. That we get to work with different [colleagues]. Get to learn from each other. (T1, W1)
Behavior regulation	Belief in ability to generate growth for self and students (F)	It's my reflection on myself; how can I evaluate myself in this? (T3, W2)

TDF domains, sub-themes and sample quotes for capability to change. F = Facilitators B = Barriers, T1-6 = Teachers 1-6, W1-3 = Interview waves 1-3.

TABLE 2 | Opportunity.

Domain	Sub-theme	Sample Quote
Environmental support and resources	Funding (F)	We said that we would not have been able to carry it out if we would not have had this project, we would not have had the finances for it. (T6, W3)
	New educational material (F)	We have had a shortage of materials [. . .] but now we have bought new materials. (T3, W2)
	Premises (F)	We will use the new art room [. . .] And we will have music in the music hall, the new one that belongs to the school. (T4, W1)
	Lack of time (B)	We need more time. We are not satisfied with the time [we have received]. (T4, W2)
	Time (F)	We have had time [. . .] we think it would have been very difficult to succeed with [the project] if we had not had this time. (T6, W3)
	Lack of leadership (B)	We have not had any staff at a leadership level [responsible for us]. (T6, W1)
	Kindergarten not included in school development (B)	We are not really included. It is a school with the grades: kindergarten to year 6. [. . .] We do not cooperate [with the rest of the school]. We are not included during the educational development days. (T6, W1)
	Outside support (F)	You [as an interviewer] will be with us. [. . .] we feel that we have [the special educator] as a leader, even though we do not have a deputy headmaster, who is our support, if we need support. (T4, W2)
	After-school care and other obligations (B)	We [do not] only work in preschool class, we also work at after-school care, so we must work with many people and [. . .] schedule for the after-school care activities; there is a lot we have to do. (T4, W1)
	Teacher turn-over (B)	Two out of six [teachers] remains [at the school next semester]. That is a great challenge in my opinion. (T6, W3)
Social influence	No shared didactical approach (B)	We are very free [to choose a didactical approach in the classrooms]. We work very differently, even though we conduct the same educational practice. And we are allowed to do that. (T3, W1)
	Joint vision (F)	It becomes a collective starting point and [we] get a joint vision from the start when we plan and implement, and later evaluate. (T3, W3)
	Support each other (F)	We need to help each other [. . .] support each other. (T1, W1)
	Sustainability of implementation (F)	A wish is that, as it is still a project [. . .] that we can continue to work [according to the project], [. . .] so it does not peter out. (T1, W1)

TDF domains, sub-themes and sample quotes for opportunity to change. F = Facilitators B = Barriers, T1-6 = Teachers 1-6, W1-3 = Interview waves 1-3.

educational practice. They perceived the goal of the project to be a pedagogical change for the whole school, which motivated them to work according to the project and put in the work to create an educational practice that would follow the students as they progressed to the next grade. This can be seen in **Table 3**, under the sub-themes "New educational practice for the whole school" and "Build from the ground up". The teachers expressed intentions to continue with the project and make changes that would improve the educational fit as well as increase their professional development. The teachers expressed that they received external positive reinforcement in the form of positive remarks and attitudes from students during lessons, as well as from parents during parent-teacher meetings. There was external positive reinforcement in the form of organizational support for continuation of the project when a Lead teacher was engaged to continue the project work. The teachers expressed internal reinforcement by stating that they enjoyed working according to the project content, and that the continuous documentation throughout the project improved their mandatory pedagogical evaluations. Negative experiences consisted of added pressure from the school management to perform other tasks. This reduced both time and energy being spent on the project. Negative emotions such as worry, stress, and dislike were expressed in relation to the project. However, positive emotions such as inspiration and stress relief were also expressed throughout the project. The teachers expressed a general optimism concerning the project. A fear of the project consuming too much time and energy led to hesitance and pessimism at the start of the project.

Development Throughout the Implementation Process

This section will focus on the progression of the expressed barriers and facilitators throughout the implementation process. The process presented reflects changes that occurred between the different interview points (January, March, and June). Some barriers remained throughout the process, potentially hindering the long-term implementation of the project content.

Knowledge

The teachers expressed that they lacked knowledge when they started working with the project. This is reflected in the June interview with Teacher 6.

> *We had not read about it beforehand, but it was, "Well, now it is [like this]", and then we would read [. . .]. We are so docile, so to speak. "This is how you should do it." "Well... Then it is so", before we have gained knowledge about it. (T6, Wave 3)*

TABLE 3 | Motivation.

Domain	Sub-theme	Sample Quote
Beliefs in capabilities	Overcoming pedagogical and logistical challenges (F)	We have been flexible and quick-thinking. (T4, W2)
	Slow and steady (F)	We must limit ourselves. Start somewhere and take it slow [. . .] we must not have too many things [at once]. (T3, W1)
Beliefs in consequences	New educational practice for the whole school (F)	If this were to be [the educational practice of the school] that we start in kindergarten to make it a way of working for the students. (T4, W1)
	Consequences in accordance with project aim and curriculum aims (F)	I think that the children have learned much more [. . .] both language and maths (T4, W2)
	Increased teacher collaboration (F)	It will be a greater collaboration [between the classrooms]. (T6, W1)
	Teacher pride and enjoyment (F)	I have felt joy and had a lot of exchange and learned a lot both from my colleagues and from the children. (T4, W3)
Social/professional role and identity	Project content in line with teacher role and identity (F)	It supports us as educators. (T4, W3)
	Increased collaborative norms (F)	I, who work in [classroom] A, get to work with you, who work in [classroom] B, with creative and aesthetic forms of expression. [. . .] Two and two. One [teacher] from each classroom. (T2, W1)
Goals	Goal in line with curriculum (F)	The social part is very important. It is our main goal for kindergarten. (T4, W3)
	Build from the ground up (F)	If we start in the kindergarten [. . .] it will continue to the 1st grade and so on. That is the idea. (T2, W3)
Intention	Adapt project to improve environmental fit (F)	[This semester] we have had our fixed roles [in the project groups] [. . .] if we rotate [the project group responsibilities] somehow [next semester]. So that we get to experience everything the other [teachers] have done. (T1, W2)
	Continue to use project didactics (F)	Some things feel natural that you take with you wherever you end up in life, so to speak, as you have learned the basics. [. . .] It is a great project, that is it. So we will probably not stop using [the project content]. (T4, W2)
Reinforcement	Negative reinforcement (B)	[The teaching] will be extended by one hour [a week for the students]. It is not clear what that means for [our planning time]. (T6, W3)
	Perceived feeling of enjoyment from teachers and students (F)	It shows us that [the students] like it [. . .] so [we know that] it is not only we [the teachers] who like [the project content]. (T4, W2)
	Organizational reinforcement (F)	A lead teacher will probably be hired [. . .] in cooperative learning. [. . .] So they should be able to ensure that [the project content] continues and spreads throughout the school, in all grades. (T3, W3)
	From parents (F)	[The presentation of the project] was [received] very nicely and appreciated by [the parents]. (T6, W3)
	Facilitates evaluation (F)	It is always hard to evaluate [by the end of the semester], but if we do it this regularly [as in the project] [. . .] now [that] we have already done it [throughout the semester], it is much easier to produce [a final evaluation]. (T1, W3)
Emotion	Worry (B)	We have felt concern about this. (T6, W1)
	Stress (B)	It is stressful. (T5, W1)
	Dislike (B)	I have been afraid of the [robots]. No, I don't like them at this point. (T5, W2)
	Inspiration (F)	It was very exciting. (T2, W2)
	General positive remarks (F)	It feels very positive. (T3, W1)
	Stress relief (F)	The stress, it has been lowered [. . .] It has been calmer in a way. (T3, W3)
Optimism	Hesitance and pessimism (B)	It has been my fear all along that [the project] will be put on top [of all the other things teachers should do]; that is why I have been more opposed than the rest of you. (T5, W1)
	Optimism	It is only positive. [. . .] We were doing the evaluation now[. . .] [we discussed] if there have been any obstacles, we have not written anything; we do not even know if it has [any] (T2, W3)

TDF domains, sub-themes and sample quotes for motivation to change. F = Facilitators B = Barriers, T1-6 = Teachers 1-6, W1-3 = Interview waves 1-3.

Due to a general willingness and trust in the project, the teachers began teaching accordingly, despite lacking extensi ve knowledge about the content. However, the practice enabled them to increase their knowledge eventually, enabling them to grasp the concept of the project content completely. Had they known at the beginning what they knew at the end, they might have worked differently. This indicates that it could have been beneficial to spend more time before the implementation phase to familiarize themselves with the project content. In that way, the teachers could have obtained a complete picture of what was expected of them, as well as an overarching understanding of the project content. The lack of knowledge might have hindered

method compliance, but the teachers were still able to try the tools of the project. Implementation is considered a learning process, and this process might be essential to the continued use of the project tools.

[. . .] we can see now that, yes, we might have done it in a different way, but we have gained experience from it. [. . .] but it is also a learning process. [. . .] We now see that, "Yes. . . it does not have to be that way", but I think we might have needed this to gain the knowledge. (T6, Wave 3)

Skills

Some of the students had an initial feeling of unease. The teachers expressed that they lacked the skills to help the students through these feelings. This resulted in students expressing unease and unwillingness to be placed in the newly formed groups. As the teachers' skills progressed and they continued to teach in line with the project, they gained procedural knowledge and they could create situations that were comfortable for both students and teachers.

The way of thinking is there. And [the students] have embraced it, so it is nothing strange when you say, "Now we will work like this". Then, that is how it is. It feels safe. So it's good to have... It is there now in the [pedagogical toolbox]. The material feels safe. (T4, Wave 3)

Resources

Time for planning was an important issue discussed by the teachers. The project funding ensured increased planning time for the team. The experiences of time took two directions. One was the constant perceived lack of time that remained consistent throughout the project. The other was the additional time due to additional project funding, which the teachers agreed had provided them more time to meet, plan, and reflect.

[We have met] once a month [. . .]. It is due to the project funding that we have [been able to afford] substitute teachers [during the planning time]. We have had a decent amount of time. (T6, Wave 2)

The fact that the teacher team had time to meet, plan, and prepare the lessons is expressed as a factor facilitating success. The structure of the theme-based cooperative learning project enabled the teachers take the time to listen to the students' suggestions for the progression of the educational content.

[. . .] time-wise, we talked about it; the students get more time to finish what they are doing, express their thoughts and questions [...] students' influence, that we have the time to enable them to express their opinions. (T3, Wave 3)

Emotion

Stress is a factor mentioned throughout the project, often coupled with lack of time. At the first interview, this is expressed by Teacher 3: "We have very little time. [...] we need to work as planned and structured with a teacher focus", and Teacher 5: "[It is] stressful. Because we [. . .] [are] very short on time". The project seemed to provide a way to reduce the feeling of stress for the teachers. The teachers expressed lower levels of stress and a sense of calm while working with the project: "If we were to do [the project] every day, we would perhaps reduce stress even more." (T4, Wave 2).

Another emotion that changed through the process was the sense of dislike. One of the teachers expressed direct dislike toward the Blue bot, a small programming robot (see "Dislike" in **Table 3**). However, as the project progressed, the newness of the item subsided, and in June, the teacher expressed positive remarks regarding using the robot. She expressed a sense of pride and joy as she demonstrated the use of the robot for the parents.

I brought [the robot] when we had the parents' council, so I showed the [programming] mats that we had and showed the parents [...] what we worked with in mathematics [...] I thought it was great fun; it was probably the most fun. (T1, Wave 3)

Social Influence

The lack of a didactic approach was expressed throughout the school and in the municipality. Although this was not commented on further during the process, this project became a starting point for a joint project in the kindergarten, with the hope that it would spread throughout the school. One agent who would promote the project content seemed to be the project leader at the school, the special needs educator. In June, it was suggested that the after-school care would start using the project content, and that this could be a way to reach all the students.

However [the special needs educator] is the deputy headmaster [in charge of] mainly kindergarten and after-school care. They have been interested; the after-school care will now start using the project content. So, they want material to start up. And they have children from all grades. (T4, Wave 3)

Reinforcement

Support for the use of the project content grew throughout the implementation process. The teachers expressed a sense of negative reinforcement, as there would be a potential reduction of their planning time when the extra funding would end. However, it was mentioned that the school would appoint a lead teacher in cooperative learning. For both negative and positive reinforcement quotes, see **Table 3**. A lead teacher develops a particular area of the school and aims to develop this competence in the collegium. This indicates that the school will put additional funds and energy into implementing cooperative learning in at least parts of the school.

Optimism

The attitudes of the teachers were generally optimistic. Misgivings were expressed earlier regarding time to plan and perform as well as the outcome of the project. In March, these misgivings were dispelled, while a general optimistic attitude was observed. This is exemplified by Teacher 2: "We were doing the evaluation now [...] if there have been any barriers, we have not written anything yet; we do not even know if it has [any]." (T2, Wave 3).

DISCUSSION

The aim of this study was to identify barriers and facilitators expressed throughout the implementation process using the TDF. Barriers and facilitators were identified in 13 of the 14 TDF domains, with the domain *Memory, attention, and decision processes* not used in the coding. The content could be related to the three categories of the COM-B. Both barriers and facilitators were identified in the domains *knowledge*, *skills*, *environmental context and resources*, *social influence*, *reinforcement*, *emotion, and optimism*. The variety of content can be considered an indicator of the complexity of processes of change in school settings. The results of this study echo results from previous implementation studies using the TDF in school settings (McCarthy, 2017; Weatherson et al., 2017; Baker-Henningham, 2018). The perceived barriers and facilitators changed over time, with many of the barriers reducing and facilitators increasing.

This study included a small group of teachers performing implementation in a larger context not involved in the change, which presented many initial barriers. The results of this study can provide insights into potential barriers and facilitators when implementing EBP in the Swedish school context in the future.

Pedagogical Fit of the EBP

The project provided the teachers with an increased pedagogical skillset, which may enable them to select and adopt different pedagogical and didactical approaches in the future. The EBP provided the teachers a sturdy framework to use in their teaching practice, and the fact that it was evidence-based provided the teachers with the trust needed in the project to continue this time-consuming task of implementation. An overall good environmental fit of the project content was expressed, enabling the teachers to find motivation and arguments for why the project should be implemented. The project provided the teachers with an EBP that they perceived as having a good fit both in the setting and in the goals of the kindergarten curriculum. These factors, which have been stated as important by previous research (Greenhalgh et al., 2004; The Swedish Committee of Education, 2013; Ogden and Fixsen, 2014), may increase the likelihood of long-term implementation.

The Importance of Teacher Collaboration

Many of the domains highlight the need for increased collaboration and a sense of pedagogical community. Previous studies have shown that the experience of increased collegial community and support facilitates implementation (Weatherson et al., 2017; McCarthy, 2017; Baker-Henningham, 2018). Active participation by the school managers is perceived as a facilitator, as it indicates long-term investment. This is in line with previous research (Ingemarson et al., 2014). Some collaborative barriers presented are due to the Swedish kindergarten being a one-year school context separated from elementary school. This may prevent the kindergarten teachers' inclusion in the elementary school teacher collegium. A big part of sustainable implementation is acceptance by the larger organization (Fixsen et al., 2009). In this project, only the kindergarten implemented the EBP innovation, which prevented them from receiving support, inspiration, and motivation from the other grades.

The issue of school staff turnover is highlighted in the results. The reported relatively high turnover rate of Swedish teachers in elementary school (Qin, 2020) indicates that this could also be the case in Swedish kindergarten. A majority of the teachers in the study reported that they would relocate to other schools at the start of the next semester. Turnover rate poses a grave barrier for implementation (Swales et al., 2012), as skills, knowledge, and experience would be lost, and the remaining teachers would have to work harder to ensure successful long-term change with colleagues who have not experienced the implementation project.

Planning for the Future

A pivotal aspect expressed by the teachers was the funding. It enabled the allocation of time and material resources and support from other teachers. The teachers expressed a constant need for extra time to carry out high-quality education. The teachers expressed that although the format of the theme-based cooperative learning project provided a calmer and more structured learning environment for staff and students, they still needed more time to plan and prepare. For the project to continue without this extra time, it is important that organizational structures be set in place to teach according to the project. Collegial reflection time might have been a part of the project. If this is the case, it needs to be structured to continue in a suitable way for the organization as a whole. A decrease in time to plan, prepare, and reflect on the educational practice will likely result in the experience of a lower qualitative educational practice. To avoid this, the initial phase of the implementation should provide structure and knowledge to the participants to ensure that long-term change can proceed without needing constant extra funding.

Strengths and Limitations

The theoretical framework of the TDF provided strength to the study, as it supported the identification of factors that have been proven important in previous studies. Complexity with the multiple domains of the TDF may reside in the fact that they are closely related to each other, creating a potential overlap in interpretation. For example, the domains *Optimism* and *Emotions* both cover attitudes and feelings expressed by the respondents. When using the framework in the analysis, specific definitions and boundaries are important. Comparison between studies could be impaired if they adopt different definitions of the domains.

This case study focused on the expressions of a group of kindergarten teachers during group interviews and provided the researchers the opportunity to capture their expressions concerning a particular implementation. The repeated design over time can be considered a strength as it may facilitate follow-up and validation of the teachers' experiences. A limitation in the study design is the lack of triangulation, as observations in the classrooms were not included.

The results of the case study provide an example of perceived barriers and facilitators during an implementation in a Swedish kindergarten. It is a small sample of teachers conducting an

implementation process independently from an overall process at the school. The results provide information about factors that may arise in school implementation processes.

CONCLUSION

Implementing projects in school settings may be a complex task. This study provides information about some of the many barriers and facilitators that could occur and clarifies how the Theoretical Domains Framework could be applied to describe future implementation in educational contexts. For further understanding of the barriers and facilitators related to implementation of innovations in school settings, larger scale quantitative studies could be beneficial.

The TDF illuminated the importance of organizational investment, support in the collegial environment, the importance of a pedagogical fit between the implemented project and the present educational environment, and the importance of a long-term plan for the project content, in order for it to survive turnover, managerial decisions, and to keep being prioritized in the educational practice. For sustainable change in educational implementation projects, the capability, opportunity and motivation for each teacher should be considered. This knowledge is important for everyone aiming to perform changes in educational practices, from policymakers, school leaders, pedagogical leaders to in-service teachers at all levels.

DATA AVAILABILITY STATEMENT

The datasets presented in this article are not readily available because the permission obtained only included use of the data for this study as well as related studies by LF. Requests to access the datasets should be directed to LF, lisa.fohlin@specped.su.se.

ETHICS STATEMENT

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

LF, MWA, and MS contributed to the study design. LF conducted data collection, performed preliminary data analysis, and drafted the manuscript. MWA and MS contributed to data analysis and revised the manuscript. All authors approved the final version of the manuscript for submission.

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SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/feduc.2021.663846/full#supplementary-material

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Conflict of Interest: The study was conducted independently from the school project analyzed in the paper. LF has published a book on Cooperative Learning and is part of a national non-profit Cooperative Learning organization (Cooperative Learning in Sweden, KOLIS).

The remaining authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.