



Article

# Collaborative Curriculum Design in the Context of Financial Literacy Education

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**Abstract:** Financial literacy education is being integrated into school curricula at an increasing frequency. However, the majority of teachers lack the required competencies and teacher self-efficacy to effectively teach financial topics. In this study, we evaluated whether participation in teacher design teams (TDTs) results in high-quality educational materials, encouragement of professional learning, and ultimately, enhanced teacher self-efficacy in the face of pending curriculum reform. We conducted an exploratory multiple-case study in Flanders, Belgium. Data were collected from two TDTs that developed materials aligning with the financial literacy learning standards. We observed the team meetings and conducted interviews with the participating teachers and the team coach. Our results suggest that participation in TDTs supports the three outcome variables that we examined. However, they also revealed that each outcome shows room for improvement. Furthermore, the data provided additional evidence for the importance of meeting several input and process factors that had been previously shown to be essential for effective TDT function.

**Keywords:** collaborative curriculum design; financial literacy education; teacher design team



**Citation:** Compen, Boukje, and Wouter Schelfhout. 2021.

Collaborative Curriculum Design in the Context of Financial Literacy Education. *Journal of Risk and Financial Management* 14: 234. <https://doi.org/10.3390/jrfm14060234>

Academic Editors: Nirosha Hewa Wellage and Krishna Reddy

Received: 13 May 2021  
Accepted: 20 May 2021  
Published: 23 May 2021

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## 1. Introduction

The integration of financial literacy assessment in the Programme for International Student Assessment (PISA) raised interest among journalists and researchers alike (Schuhen and Schürkmann 2014). Financial literacy is defined as ‘a combination of awareness, knowledge, skill, attitude and behaviour necessary to make sound financial decisions and ultimately achieve individual financial well-being’ (Atkinson and Messy 2012, p. 14). Given that a lack of financial literacy correlates with, for example, poor mortgage choices and debt accumulation (Lusardi and Tufano 2015; Moore 2003), it is worrisome that more than one-fifth of 15-year-old students worldwide lack basic financial competence, including the ability to interpret financial documents and distinguish gross and net pay (OECD 2017). Governments worldwide have begun to recognise the importance of enhancing financial literacy, and many have started to implement school-based financial literacy education. Offering financial literacy education programmes through the school system enables schools to reach all of the students in a particular cohort (Lührmann et al. 2015) and target them at an age at which they tend to be open to attitudinal and behavioural changes (Van Campenhout et al. 2017).

For these initiatives to be effective, it is essential that the teachers who provide financial literacy education not only be sufficiently knowledgeable, but they must also feel confident in their teaching capabilities (Totenhagen et al. 2015). However, it has been shown that teachers often lack both perceived and actual competencies in the context of financial literacy education (De Beckker et al. 2019; Otter 2010; Way and Holden 2010). This indicates that teachers must be properly educated and supported through teacher professional development (TPD) (Blue et al. 2014), and it is promising that a share of financial literacy

education programmes provides TPD in various forms, including workshops, modelled lessons and online materials (e.g., [Asarta et al. 2014](#); [Bruhn et al. 2016](#); [Frisancho 2018](#)). However, in earlier work, where we reviewed the role of TPD in financial literacy education, we showed that only a few studies have evaluated the impact of these initiatives on teacher quality ([Compen et al. 2018](#); [Harter and Harter 2012](#); [Hensley et al. 2017](#)). Since the publication of this review, the effectiveness of multiple TPD initiatives has been evaluated (e.g., [Compen et al. 2020](#); [Lopus et al. 2019](#)). The present study contributes to this literature by evaluating the impact of teacher participation in a teacher design team (TDT), which is a particular type of professional learning community (PLC) wherein the collaborative design of learning materials is central.

TPD initiatives have been used by policymakers to increase teacher quality for decades. The effectiveness of this approach used to be a subject of debate since the obtained insights in traditional TPD initiatives often did not translate into changes in teachers' instructional practices ([Guskey 2002](#)). Consequently, the need for initiatives that support teachers to translate theory into practice by enhancing their understanding of pedagogical content knowledge has become obvious ([Timperley et al. 2007](#)). TDTs, defined as 'groups of at least two teachers, from the same or related subjects, working together on a regular basis, with the goal to (re)design and enact (a part of) their common curriculum' ([Handelzalts 2009](#), p. 7), provide an answer to this call.

General models of the effectiveness of TPD posit that TPD initiatives must include multiple key features to be effective: content focus, active learning, coherence, sustained duration, collective participation and ownership ([Desimone 2009](#); [Merchie et al. 2016](#)). TDTs are an increasingly popular form of TPD, as they allow for the integration of all these features ([Binkhorst 2017](#)). Since TDTs ask teachers to collaboratively design materials that are coherent with the content covered in the curriculum, the teachers will naturally be inclined to engage in the active learning and sustained time investment that is required. Furthermore, ownership is directly integrated into TDTs, as teachers 'are not only exposed to the practice but actively shape their own practice' ([Voogt et al. 2016](#)).

Studies have confirmed the positive effects of collaborative curriculum design on teachers' content knowledge and design expertise, which supports the validity of the TPD models that state that integration of the key features results in effective TPD. Furthermore, it has been shown that this enhanced knowledge is effectively translated to the classroom, given observed changes in instructional practices ([Voogt et al. 2016](#)). In previous work, we confirmed that TDT participation could also increase teachers' self-efficacy, which, in this case, refers to their judgement of their capability to implement required educational changes ([Bliss and Wanless 2018](#); [Compen and Schelfhout 2020](#); [Mintzes et al. 2010](#); [Velthuis et al. 2015](#)). This finding is highly relevant, as reforms are often associated with feelings of resistance, uncertainty and stress ([Geijssel et al. 2001](#); [McCormick et al. 2006](#); [Zembylas and Barker 2007](#)). Teacher self-efficacy has also been shown to influence implementation efforts and eventual implementation quality ([Bliss and Wanless 2018](#)).

The majority of TDTs that have been evaluated in terms of professional learning and enhanced teacher self-efficacy were asked to re-design existing materials to ensure their alignment with revised learning standards in 'classic' subjects such as biology, chemistry, science and foreign languages ([Coenders et al. 2010](#); [Huizinga et al. 2015](#); [Mintzes et al. 2010](#); [Simmie 2007](#); [Velthuis et al. 2015](#)). One distinction of financial literacy education is that it is often introduced as an entirely new subject or topic. Furthermore, teachers from various backgrounds become responsible for teaching financial topics, as they tend to be integrated into existing subjects such as economics, mathematics and civic education. Therefore, the extent to which the teachers have access to existing materials and practices that can serve as an inspiration for designing the new material largely depends on the individual teachers' disciplines and backgrounds. Where economics teachers, for example, may only need to focus on redesigning existing material, other teachers may be required to design new educational materials from scratch. This could influence the extent of professional

development that is necessary, but it may also affect teachers' self-efficacy levels. Therefore, the first two research questions of this study were:

1. To what extent can TDT participation result in professional learning of teachers who will provide financial literacy education?
2. To what extent can TDT participation enhance teacher self-efficacy of teachers who will provide financial literacy education?

Given that the design of educational materials is the core goal of TDTs, it is surprising that earlier studies have only rarely evaluated the quality of this concrete TDT outcome (Voogt et al. 2016). While the use of materials by TDT participants and the distribution of materials to other colleagues may both be indicators of satisfaction with the developed materials, it appears that the quality of the materials was rarely assessed objectively. This is especially pertinent when one considers that for financial literacy education, handbooks aligning with the new learning standards did not yet exist at the time of this study. Consequently, the TDTs did not solely serve as a platform for TPD; rather, the materials were intended to actually be used in the classroom. Therefore, we researched the quality of materials further with the following research question:

3. To what extent can TDTs produce high-quality learning materials focused on financial topics?

Earlier research has emphasised that TDT trajectories should meet particular conditions on the input level (e.g., in terms of teachers' motivation to participate and team composition) and on the process level (e.g., in terms of group dynamics and support provided by a team coach) to be able to function effectively and to ultimately reach the desired outcomes (Becuwe et al. 2017; Compen and Schelfhout 2020; Handelzalts 2009). To provide insight into how the ultimate TDT outcomes have come about, this study discusses the extent to which input and process factors were met in the monitored TDTs. Specifically, the following research question was answered:

4. How do input and process factors influence the trajectory and outcomes of TDTs focusing on financial topics?

We used a multiple-case study design to answer our research questions. The two TDTs included in the study were part of a larger TDT trajectory that was organised by a Flemish school network. Data were collected by systematically observing the TDTs' team meetings and by conducting interviews with participating teachers and the team coach.

## 2. Theoretical Framework

Similar to Binkhorst (2017), the theoretical framework of this study was based upon distinguishing three main stages: the input stage, the process stage, and the outcome stage. For the input stage, we evaluated the extent to which the teacher, team and school level conditions were met. These conditions are largely based on the model of Schelfhout et al. (2019). For the process stage, we evaluated the organisation of the team meetings, the team learning beliefs and behaviours (Van den Bossche et al. 2006), and the role of the team coach (Compen and Schelfhout 2020). Since we expected that the two primary outcomes of the trajectory (i.e., quality of material and professional learning) would influence the secondary outcome (i.e., teacher self-efficacy), we divided the outcome stage into two parts. The framework is visualised in Figure 1.

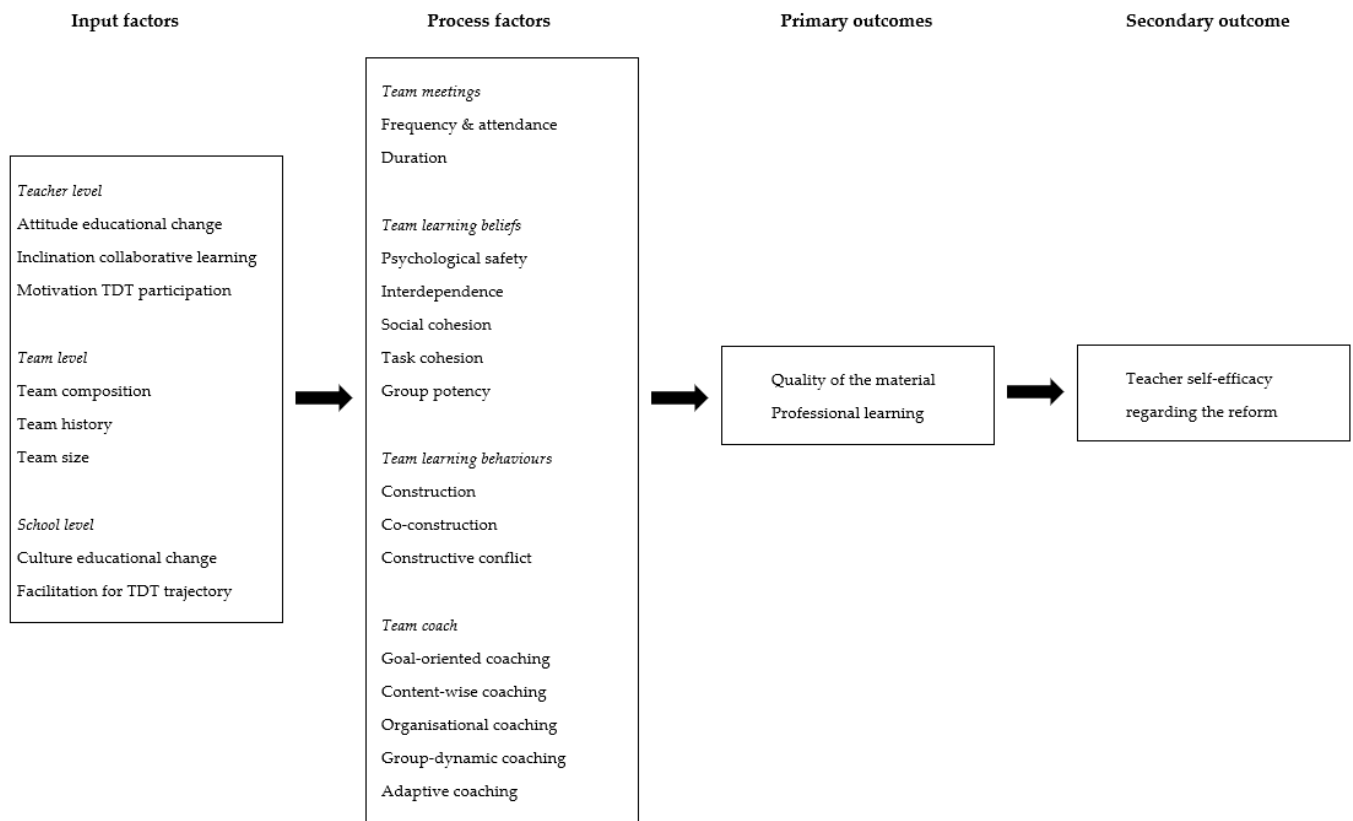


Figure 1. Theoretical framework.

## 2.1. Input Factors

### 2.1.1. Teacher Level

A first condition for the effective functioning of TDTs is that teachers have positive attitudes towards educational change (Becuwe et al. 2017; Stoll et al. 2006). How teachers attach meaning to an innovation influences the effectiveness of the innovation, and positive attitudes benefit the eventual TDT outcomes (Geijsel et al. 2001). For the present study, we considered attitudes towards educational innovation in general, as well as the participants' attitudes towards upcoming reform.

The second factor involves the teachers' inclination towards collaborative learning. Since collaboration forms the basis for TDT trajectories, team members should be open to engaging in activities like sharing teaching experiences and working with colleagues to design educational materials (de Vries et al. 2013).

The final factor is the teachers' motivation for TDT participation. Gorozidis and Papaioannou (2014) showed that teachers who had autonomous motivation were more likely to participate in TPD for teaching innovative academic subjects and were ultimately more eager to implement innovations. Despite the fact that voluntary participation is preferable, reforms require the participation of teachers across the board. This has resulted in a debate as to whether teachers should be obliged to participate (Handelzalts 2009). In this study, we examined whether teacher participation was voluntary and how actively the team members contributed to the design process.

### 2.1.2. Team Level

It has been suggested that diversity among team members is an important consideration for TDTs. A TDT that is composed of members from different schools (i.e., 'networked' TDTs) who have taught a variety of subjects, have varying degrees of teaching experience, and have different visions on teaching will encourage members to share new ideas knowl-

edge and expertise (Handelzalts 2009). Nevertheless, team members must also be able to unite these ideas and find common ground for the team's goals (Hargreaves 2003).

Team history refers to whether team members have worked together before. Shared experiences may result in trust among the team members, which could benefit the process. However, for teams in which previous collaborations may have been negative, it may be recommended to alter the team composition (Grossman et al. 2001).

In terms of team size, Thousand and Villa (1993) posited that the ideal team should be large enough to have sufficient variation in ideas and expertise while remaining small enough for team members to bond and interact with one another and to allow all members to actively contribute to the process. Typically, TDTs consist of four to eight members (Schelfhout et al. 2019).

### 2.1.3. School Level

At the school level, school culture with regard to educational change plays an important role in a TDT's trajectory (Hipp et al. 2008). For the TDT process to be effective, team members should feel supported by their school principal and colleagues. Therefore, principals should be open to TDTs as a form of professional development and should ideally show interest in the progress of the trajectory (Becuwe et al. 2017).

Teachers must also have sufficient facilitation from their principal for their participation (Bliss and Wanless 2018). Practical support, in addition to emotional support, is a condition for an effective TDT trajectory (Binkhorst 2017). The former form refers to efforts and accommodations that may include adapting teachers' schedules so they can attend team meetings.

## 2.2. Process Factors

### 2.2.1. Team Meetings

While the literature suggests that meetings should be organised regularly to ensure that the process keeps progressing (Thousand and Villa 1993), there should also be sufficient time between meetings for teachers to work on their individual tasks (Schelfhout et al. 2019). Team members' attendance at the meetings must also remain consistent, and attention should be paid to the duration of the meetings. For learning communities that aim to develop educational materials, the length of the meetings should be sufficient to not only share experiences and brainstorm potential ideas but to also get to the actual design phase (Schelfhout et al. 2019).

### 2.2.2. Team Learning Beliefs

Existing research on team functioning has emphasised that to ensure that the team works productively, it is not sufficient to merely put knowledgeable people together. In educational as well as other organisational contexts, interpersonal factors are also important (Stoll et al. 2006). For example, while perceptions of competitiveness hinder team functioning, feelings of friendship enhance productivity (Barron 2003). Indeed, to establish a functioning team, it is essential that team members feel both loyalty to and identification with the team. Differences between team members should be respected, but the team should still be united in reaching its goals (Stoll et al. 2006).

The team learning beliefs and behaviours (TLBB) model of Van den Bossche et al. (2006) specifies five types of team beliefs that facilitate the team learning process. In other words, these beliefs tend to be present among members of highly functioning teams:

- Psychological safety exists when team members can express their ideas and dare to experiment with new approaches (Newman et al. 2017);
- Interdependence exists when team members feel that it is only when other members reach their goals that they will also reach theirs (Boon et al. 2013);
- Social cohesion exists when team members experience feelings of friendship (i.e., liking, caring and closeness) for each other (Van den Bossche et al. 2006);

- Task cohesion exists when team members perceive a shared commitment to achieving a goal that requires team effort (Van den Bossche et al. 2006);
- Group potency exists when team members believe that the team will achieve its goals (i.e., it is the team's collective belief) (Shelton et al. 2010).

### 2.2.3. Team Learning Behaviours

Barron (2003) highlighted that perceptions of the interpersonal context are expressed in conversations between team members, and the quality of collaborative conversations was shown to impact team learning. The TLBB model distinguishes three forms of team learning behaviours that are reflected by interactions within the team. Team members engage in the construction of meaning when one member describes the task and provides suggestions on its execution while the others actively listen and ask questions to understand this initial view and potential handling of the task. Co-construction of meaning occurs when team members build the meaning of the task together by collaboratively refining, elaborating, and adapting the initial proposal. Finally, constructive conflict, reflected through discussions on different interpretations among the team members, is necessary to ensure that shared understanding transfers to a shared agreement on the handling of the task (Van den Bossche et al. 2006).

### 2.2.4. Team Coach

It has been posited that without adequate support, the effectiveness of TDTs is questionable. After all, the majority of teachers are not experts in designing educational materials (Huizinga et al. 2014). Therefore, TDTs are usually supervised by a team coach. In line with previous work (Compen and Schelfhout 2020), for our current study, we distinguished four specific categories of activities for TDT team coaches: goal-oriented coaching (e.g., helping the team set its goals), content-wise coaching (e.g., safeguarding the quality of the material that is developed), organisational coaching (e.g., taking care of meeting logistics), and group-dynamic coaching (e.g., managing the overall atmosphere). We also evaluate the extent to which the coach of the TDTs engaged in adaptive coaching, which we perceive as switching between different roles based on the current needs of the team members (Petrone and Ortquist-Ahrens 2004). After all, research has shown that support should be provided 'just in time' (Becuwe et al. 2016).

## 2.3. Outcomes

For the present study, we evaluated two direct outcome variables; namely, the quality of the material developed in the TDT trajectory and the teachers' professional learning. We expected that these two outcomes would, in turn, influence the teachers' self-efficacy with regard to the curriculum reform.

Given that the direct aim of TDTs is to develop materials, we examined the quality of the material developed by each of the teams. In addition to a general evaluation by the teachers and whether they planned to use the materials in their teaching practices (Becuwe et al. 2017), there are other aspects that are particularly relevant in the context of curriculum reform. Specifically, it is important in this context to evaluate whether the material developed by the team covers the new learning standards. This holds for the content knowledge as well as for the integration of didactical innovation. Some of the innovative practices that are encouraged in the Flemish school system are the alignment of content with students' daily lives, stimulation of active learning, differentiated instruction and formative evaluation (Onderwijsinspectie 2019). In addition, the materials need to cover the content at the appropriate level of cognitive learning (Bloom 1956), as prescribed in the learning standards.

Next, we evaluated whether teachers feel that their content knowledge and pedagogical content knowledge were enhanced through their participation in the TDT. Given that teachers from various backgrounds are expected to teach financial topics, the in-depth content discussions during the development process could lead to differences in

the extent to which TDT participation induced professional learning. Additionally, we considered it relevant to examine whether the teachers' understanding of the curriculum reform increased.

Finally, we evaluated whether teachers experienced an increase in teacher self-efficacy regarding the curriculum reform due to their participation in the TDT trajectory. It is highly relevant to examine whether teacher self-efficacy with regard to the implementation of these particular learning competencies saw an increase, particularly given the trend of financial literacy education being newly integrated into school curricula and the low levels of teacher self-efficacy towards providing this education that has been demonstrated in previous work (e.g., [De Beckker et al. 2019](#)).

### 3. Methodology

To gain insight into the trajectories and outcomes of TDTs that develop educational materials in alignment with learning standards on financial literacy, we employed an exploratory multiple-case study design ([Yin 2009](#)). Herewith, we aimed to uncover additional support for the findings obtained in previous studies, which ground the research questions—specifically focusing on the context of financial literacy education—for this study. We performed in-depth monitoring of two TDTs, which enabled us to explore the impact of potential differences in input and process factors on the trajectory's eventual outcomes. We systematically observed the TDT team meetings for both groups throughout the trajectory. These observations allowed us to understand the team learning behaviours, as observing verbal interactions in real-time is more informative than retrospectively asking the members about their perceptions of the team learning behaviours ([Raes et al. 2015](#)). Furthermore, this observation data enabled us to provide a chronological description of the team learning process, which provided insight into the context through which the results were obtained. At the end of the trajectory, we conducted interviews with the participating teachers. Employing multiple qualitative methods served to enrich our results and allowed us to compensate for the limitations of each method; it also enhanced the validity and reliability of our results ([Noor 2008](#)). Whereas the interviews increased our understanding of the trajectory from the perspective of the teachers, the observations provided a more objective description. To further triangulate the results, we interviewed the team coach who supervised both TDTs to obtain insights into the trajectories and outcomes from a different perspective.

#### 3.1. Research Context

##### 3.1.1. TDT Trajectory

The two TDTs that were monitored were part of a larger TDT trajectory that was set up by Onderwijsvereniging van Steden en Gemeenten (OVSG), a school network in Flanders, Belgium. The TDT trajectory was developed to prepare secondary school teachers for curriculum reform that would affect all schools and teaching subjects. The entire trajectory consisted of approximately 20 TDTs that focused on a variety of teaching subjects. The trajectory ran from January to May 2019. The materials were developed over four three-hour sessions that were scheduled approximately every four weeks. The TDTs we examined were supported by the same team coach, a pedagogical expert employed at OVSG. This coach had experience in supporting PLCs and had a background in teaching economics-related subjects.

##### 3.1.2. Financial Literacy Education in Flanders

In the existing Flemish curriculum, only students who chose a specific study track related to economics would learn about financial topics. However, the curriculum reform will require all students in the seventh and eighth grades to have a minimum level of financial knowledge to pass the school year. For example, students must be able to understand a household budget and demonstrate insight into the factors that influence buying behaviour.

### 3.2. Data Collection and Data Analysis

#### 3.2.1. Team Meeting Observations

To get a detailed view of the team learning behaviours in the TDTs, the first author observed their team meetings. Since systematic observations allow quantifying behaviours (Hardman and Hardman 2017), we developed an observation scheme to capture information on the team learning behaviours (Van den Bossche et al. 2006) and the team coach's activities (Compen and Schelfhout 2020). Each session was divided into blocks of ten minutes, and for each block, the author took notes on what had taken place; the observation scheme was completed based on these narratives. Whenever the observer noted a particular behaviour during a block, this behaviour was checked off. The observation scheme is presented in Supplementary File A. The meetings were audiotaped with the permission of all those present, and all teachers agreed with participating in the study.

To compare the observation data between the sessions and between the two TDTs, we summed the number of checkmarks for each type of behaviour that was observed per session. We then calculated the share of 10 min blocks in which each behaviour occurred. For example, if a session consisted of 16 blocks, and in 7 of those blocks, the author observed that 'team members constructively elaborated on each other's information and ideas', then this behaviour occurred in 44% of the blocks. We used 'charting' to enhance the interpretability of the data (e.g., Pope et al. 2000). Specifically, we present the percentage ranges rather than the exact percentages to indicate the frequency of each of the behaviours (0%, 1%–19%, 20%–39%, 40%–59%, 60%–79% and 80%–100%).

#### 3.2.2. Interviews with Teachers

We conducted semi-structured interviews with a selection of teachers from each of the TDTs. To be selected, teachers had to have attended at least three sessions. Three teachers who met this criterion were interviewed: one from TDT A and two from TDT B. The aim of the interviews was to gain insight into the input and process factors and the participants' perceptions of the trajectory's outcomes. The interview guide was, therefore, largely based on the theoretical framework. We used open-ended questions to encourage the respondents to elaborate on their answers and allowed them to discuss aspects that were not part of the initial guide. All interviews were audiotaped with the permission of the teachers and then transcribed.

The NVivo 12 software was used to analyse the interview data. More specifically, two steps were performed. For the first step, we used a deductive approach that involved applying an initial coding scheme based on the theoretical framework to the transcriptions. Concretely, in correspondence with Binkhorst (2017), text sections were coded when they referred to the elements of the theoretical framework. Since these elements formed the basis of the interview guide, the majority of codes were present in each interview. Following the categorisation in Braun and Clarke (2013), this method implied that the codes were semantic (i.e., based on explicit content in the data) rather than latent (i.e., based on implicit meanings in the data). The second step of the analysis used an inductive approach through which we extended the initial coding scheme by adding newly obtained insights. Similar to peer debriefing (e.g., Spall 1998), we deliberated extensively on both approaches until we reached an agreement. The final coding scheme, including elaborate explanations and representative citations of each code, is provided in Supplementary File B. Since the number of interviews was limited, similarities and differences in the teachers' responses will be discussed in Section 4.

#### 3.2.3. Interviews with Team Coach

The team coach could provide information on the trajectories and outcomes of each of the TDTs from a different perspective, and therefore served as an important source to further validate and triangulate our results. First, as a form of member checking, the first author's perceptions on the progress of the TDTs that was obtained through the team meeting observations were discussed with the coach. This check took place after the teams'



second working sessions, halfway through the process. This allowed the coach to correct any misinterpretations in the observations. This meeting clarified that the researcher and coach had similar perceptions of the team learning behaviours. Second, to triangulate the teacher interview data, we also conducted semi-structured interviews with the team coach. We asked the team coach the same types of questions we had asked the teachers, which provided insight into the results from different perspectives. Third, the team coach was in the right position to more objectively evaluate the quality of the material that had been developed; she is a pedagogical expert with a background in teaching economics and very well informed on the new learning standards and innovative practices encouraged in the Flemish school system. The coach explained the quality indicators for the materials in the first meetings of the TDTs, kept track of whether the TDTs paid sufficient attention to these elements throughout the trajectory, and critically evaluated the final versions of the materials based on these indicators. This evaluation focused on whether the content of the material—and its cognitive level—aligned with the new learning standards. It was also assessed whether elements such as differentiated instruction and formative evaluation were sufficiently integrated. The final coding scheme is provided in Supplementary File C.

#### 4. Results

The structure of this section follows the outline of the theoretical framework. In Section 4.1, we discuss the extent to which the input factors were met in the TDTs. These results are primarily based on the interview data. We continue with a discussion of the process factors, including a chronological discussion of the team learning processes, in Section 4.2. Here, we combine insights derived from the observation data and the interviews. We end by describing perceptions of the trajectory's outcomes, derived from the interviews, in Section 4.3. For each stage, we discuss the results for the TDTs separately, followed by a comparison of the TDTs in which the main similarities and differences are highlighted. After all, potential differences between the TDTs in the outcome variables may at least partly be due to differences in the input and process factors. When discussing our interview data, we discuss the results from the teachers' perspectives first and then complement these with the team coach's viewpoints whenever applicable. To increase readability, we offer a general summary of the interview results in continuous text. Quotes are included when they provide support or emphasis for specific points.

##### 4.1. Input Factors

###### 4.1.1. TDT A

###### Teacher Level

We interviewed one female teacher from TDT A (i.e., Teacher A1). This teacher mainly taught economics-related subjects in the higher grades. When asked about her attitude to educational change, she admitted to feeling rather sceptical towards the upcoming curriculum reform, as she had experienced many reforms in her career. She also reported some objections to the new format of the learning standards. With regard to collaborative learning, the teacher stated that she generally preferred to collaborate with others rather than to work alone. Her direct motivation to sign up for the TDT trajectory was that it had been requested by the school principal. Initially, she had not been enthusiastic, given that she only planned to teach for two more years (until her retirement). However, her positive experiences with previous PLCs eventually convinced her to participate in this TDT trajectory.

Teacher A1 also mentioned that as soon as she decides to engage in something, she contributes to the process. Furthermore, she elaborated on the motivation of the other team members—while she was very positive about Teacher A2's input, she also reported that Teacher A5 contributed very little to the process. Teacher A5 had often complained that she had been obliged by her principal to participate even though she would not be teaching financial topics in the next school year. The team coach also noted that not all of the teachers were equally motivated and that Teacher A5, in particular, was not eager to

actively engage in the process, which eventually resulted in her dropping out altogether. In contrast, Teacher A4 was enthusiastic but was not facilitated by his school principal; this also resulted in his dropping out. The coach emphasised that the remaining three teachers were definitely motivated, as they fulfilled their commitments and continued working on the materials between meetings.

#### Team Level

TDT A was originally composed of five teachers with heterogeneous backgrounds. One of the differences among them was their experience in teaching economics-related topics. The team coach mentioned that a team that includes teachers with experience in teaching financial topics could be a comfort to teachers who lacked this experience. Furthermore, the group had a great variety in terms of years of teaching experience. A few of the teachers had also participated in PLCs before, while it was a new experience to others. With regard to team history, Teacher A1 and A3 were colleagues from the same school, but the remainder of the teachers did not know each other. Finally, regarding team size, Teacher A1 mentioned that to be able to achieve something worthy and to ensure a balanced workload, the team should have ideally consisted of at least five team members.

#### School Level

Teacher A1's school principal requested that several teachers participate in the TDT trajectory, which implies a school culture in which educational change is supported. However, colleagues' attitudes towards the reform varied. While a few of the teachers actively discussed how the reform should be integrated, Teacher A1 believed that the majority of her colleagues were still unaware of the changes they would soon face. Her principal ensured that the schedules of the participating teachers were rearranged, which facilitated its trajectory. However, in practice, it was not always possible to find a replacement teacher, and as a result, these teachers were regularly required to prepare meaningful tasks for the students, which increased their overall workloads.

#### 4.1.2. TDT B

##### Teacher Level

We interviewed two teachers from TDT B. Teacher B1 was a female who teaches economics-related subjects in the higher grades. Teacher B2 was a male geography teacher who would likely teach financial literacy education in the next school year.

Regarding attitudes to educational change, Teacher B1 believed that reforms could be perceived as 'a challenge or as something scary'. With regard, specifically, to the upcoming reform, Teacher B1 stated that as she had never taught students in the seventh grade, she could create the materials from scratch. She mentioned that she would have been more reluctant towards the reform if the existing materials and teaching practices for higher grades had required adaptation. Teacher B2 admitted that as he was a relatively new teacher, he had been relatively ignorant about the curriculum reform before the TDT trajectory. After having attended the trajectory, he had come to believe that the reform would offer many opportunities, as it would encourage a more cross-curricular integration of subjects.

Neither of the teachers explicitly reported their views on collaborative learning. Regarding the motivation to participate, however, Teacher B1 had participated in PLCs for six years and mentioned that there had always been positive experiences that resulted in usable materials. Therefore, she considered the present trajectory to be a valuable opportunity. The initial request for Teacher B1 to attend the trajectory had come from the school principal. Since she would be responsible for teaching the financial topics to first-year students in the next year, she considered this a logical step. Teacher B2 mentioned that his school principal had encouraged him to participate, as this could enhance his chances to obtain job security. Regarding the motivation of the other team members, Teacher B1 said that all of the team members were prepared to work, and they 'did their jobs'. Teacher B2 agreed that all team members were involved, and they were sufficiently prepared for each

meeting. The team coach also reported that the team members all seemed enthusiastic to collaborate. She praised the efforts of the team, which also continued working between meetings. The majority of the extra work was done by Teacher B1, who had been given additional hours by her school principal to work on materials for the next year.

#### Team Level

TDT B consisted of three teachers. While Teachers B1 and B3 were familiar with teaching economics-related topics, Teacher B2 had no background in teaching topics related to financial literacy. There was less variety in teaching experience than there was in TDT A. The team's composition did not change during the trajectory, and the teachers had not collaborated yet. Teacher B1 perceived that it was beneficial to have teachers with experience teaching financial topics on the team, but Teacher B2 suggested that it may also be advantageous for the design process to include team members with different backgrounds:

'I think it fitted me the most to use the helicopter perspective. To think about those learning standards in a more abstract manner, as I could look at those open-mindedly. I think that the other two spoke a lot from the material they had developed before, and from their own experience. So, it was more my role to somewhat counterbalance.'

With regard to team size, Teacher B1 mentioned that even though three members was adequate, there is a danger that two members would be absent at the same time. Teacher B2 agreed; he reported that even though it may be more difficult in practice, it would be interesting if the team consisted of between four to six teachers, as this would provide a wider range of perspectives. With only two or three different views, their perspectives were limited.

#### School Level

The principal of Teacher B1's school was strongly involved in the curriculum reform. She was well informed about the setup of the new learning standards, and she encouraged teachers to participate in the TDT trajectory, which suggests a positive school culture in terms of educational innovation. The colleagues' responses to the upcoming reform differed, however, with some reporting that they were motivated to get involved and others reporting feeling anxious. Teachers from higher grades were less concerned, given that the reform for their grade levels would only be implemented in a few years. Teacher B2 reported that the principal had sent teachers to the TDTs to ensure that they would be informed and could share their enhanced knowledge on the upcoming changes with the principal and with colleagues at the school. The participants' colleagues were generally positive about the reform, though some of them also reported feeling anxious. In terms of facilitation, Teacher B1's principal arranged for a colleague to fill in for some of her teaching hours so she could use two additional hours each week to develop educational materials. The principal of Teacher B2, meanwhile, ensured that the teacher would not need to teach when the meetings were scheduled.

#### 4.1.3. Comparison of TDTs

The previous sections have provided insight into the extent to which the various input factors on the teacher, team and school levels were met in the two TDTs. We summarise the similarities and differences between the TDTs for each level.

For the teacher level, we noted that Teacher A1 was rather critical towards the upcoming reform, whereas TDT B's teachers did not have strong opinions on the reform. Teachers A1 and B1 reported positive experiences with collaborative learning, which partially explained why they chose to participate in the current TDT trajectory. However, there were strong differences in regards to the motivation of team members in TDT A. It was shown that teachers should be intrinsically motivated, as lack of motivation may result in teacher

dropout. In TDT B, all of the teachers in TDT B were actively involved and prepared for each meeting.

Regarding the factors on the team level, both TDTs consisted of teachers with and without previous experience in financial literacy education. This was perceived as beneficial, as it was comforting for teachers new to this topic to know that more experienced teachers were also participating, while the teachers who did not have experience were able to provide new perspectives. In TDT A, two teachers were colleagues from the same school. The other teachers had not worked together before. Teachers from both TDTs mentioned that a larger team size would have been advantageous, as this would ensure that the work can be divided and guarantees insights from multiple perspectives.

With regard to school support, it was shown that all of the principals, except for that of Teacher A4, had encouraged the teachers to attend the TDT trajectory. This suggests that the principals were in favour of the teachers being involved with developing educational materials and acquiring insights related to the upcoming educational change. Meanwhile, in terms of facilitation, Teacher A1 and Teacher B2's principals only ensured that they could attend the meetings, while Teacher B1 received additional hours to continue developing material in preparation for the next school year. It appears that school support is essential, as lack of facilitation for Teacher A4 resulted in their dropping out from the trajectory.

#### 4.2. Process Factors

Following the theoretical framework, we elaborated on the four main process factors: the organisational aspects of the team meetings, the team learning beliefs, the team learning behaviours and the activities of the team coach. We used the interview data to discuss perceptions of the team meetings and the team learning beliefs. The overview of the observation data describing the team learning behaviours and the coaching activities are shown in Table 1, and we used it as a basis for a chronological description of the team learning process. The observation data on the role of the team coach is complemented with data derived from the interviews.

##### 4.2.1. TDT A

###### Team Meetings

The TDT met four times for three hours to work on the educational materials, but the teachers' attendance varied largely over the sessions. While Teacher A1 was consistently present in the first three sessions, the other teachers were only present at a maximum of two of the sessions. In the final session, only Teacher A2 was present. In the interview, Teacher A1 mentioned the practical issues related to this varying composition, such as when the teacher with the most recent document on his laptop was absent. The team coach also mentioned that this hindered the team's progress and emphasised that it was a challenge to ensure that the material would eventually be coherent, as the separate elements were developed by different teachers who had rarely had the chance to work together. She considered it to be essential that the TDTs that are formed at the beginning of the trajectory go through the entire process together.

Table 1. Summary of observation data.

Date	TDT A				TDT B			
	07-02 A1 A3 A4 A5	26-02 A1 A2 A4	20-03 A1 A3 A5	25-04 A2	11-02 B1 B2 B3	28-02 B1 B3	18-03 B1 B2 B3	26-4 B1 B2
<b>Teachers present</b>								
<b>Team learning behaviours</b>								
<i>Construction</i>								
Team members share relevant information and ideas	●●●○	●●●●	●●●●	N.A.	●●●●	●●●●	●●●●	●●●●
Team members are listening carefully to each other	●○○○	●●●●	●●●●	N.A.	●●●●	●●●●	●●●●	●●●●
Team members ask each other questions if something is unclear	●○○○	●○○○	●●●○	N.A.	●○○○	●○○○	●●○○	●○○○
<i>Co-construction</i>								
Information from team members is complemented with information from others	●●○○	●●○○	●●○○	N.A.	●●○○	●○○○	●●○○	●○○○
Team members elaborate on each other's information and ideas	●○○○	●●○○	●●○○	N.A.	●●○○	●●●●	●●●●	●○○○
Team members draw shared conclusions from the ideas discussed	●○○○	●○○○	●○○○	N.A.	●○○○	○○○○	●●○○	○○○○
<i>Constructive conflict</i>								
Opinions and ideas of team members are verified by asking each other critical questions	●○○○	●○○○	●○○○	N.A.	●○○○	●○○○	●○○○	○○○○
Comments on ideas are acted upon	●○○○	○○○○	○○○○	N.A.	○○○○	●○○○	●○○○	○○○○
Differences of opinions tend to be handled by addressing them directly	○○○○	○○○○	○○○○	N.A.	○○○○	○○○○	○○○○	○○○○
<b>Coaching activities</b>								
<i>Goal-oriented coaching</i>								
Keeping the team's focus on the goal	●●○○	●○○○	●○○○	○○○○	○○○○	○○○○	○○○○	○○○○
Encouraging in-depth discussions and provision of feedback	●○○○	●○○○	●○○○	○○○○	○○○○	○○○○	●○○○	○○○○
Sharing plan of action for current and/or future meetings	●○○○	●○○○	○○○○	●○○○	○○○○	●○○○	●○○○	○○○○
Summarising ideas, opinions and decisions	●○○○	○○○○	○○○○	○○○○	●○○○	○○○○	○○○○	○○○○
<i>Content-wise coaching</i>								
Transferring content knowledge	●○○○	●○○○	○○○○	○○○○	○○○○	●○○○	●○○○	●○○○
Transferring knowledge on the new curriculum/learning standards or quality indicators	●●○○	●●○○	●●○○	●○○○	●○○○	●○○○	●●○○	●●○○
Providing feedback or criticising the team's ideas or work	●○○○	●○○○	○○○○	●○○○	●○○○	●○○○	●○○○	●○○○
Suggesting alternative solutions methods, ideas or materials	●○○○	●●○○	●○○○	●○○○	●○○○	●○○○	●●○○	●●○○
<i>Organisational coaching</i>								
Dividing tasks or asking the team members to do so	●○○○	●○○○	●○○○	●○○○	●○○○	●○○○	●○○○	○○○○
Monitoring the time	●○○○	●○○○	○○○○	○○○○	○○○○	●○○○	○○○○	○○○○
<i>Group-dynamic coaching</i>								
Motivating and inspiring the team	○○○○	●○○○	●○○○	●○○○	○○○○	●○○○	○○○○	●○○○
Letting the team share their concerns and problems	○○○○	●○○○	○○○○	○○○○	○○○○	○○○○	○○○○	○○○○
Reflecting on the team's experiences and the role of the coach	●○○○	○○○○	○○○○	○○○○	○○○○	○○○○	○○○○	●○○○
Ensuring that all team members feel heard and can have input	●●○○	●○○○	○○○○	○○○○	●○○○	○○○○	○○○○	○○○○
Managing the general atmosphere within the team	○○○○	○○○○	○○○○	○○○○	○○○○	○○○○	○○○○	●○○○

Note. Share of 10-minute time slots per meeting in which a team learning behaviour or coaching activity was observed. ○○○○ = 0%, ●○○○ = 1–20%, ●●○○ = 21–40%, ●●○○ = 41–60%, ●●●○ = 61–80%, ●●●● = 81–100%.

### Team Learning Beliefs

Neither Teacher A1 nor the team coach talked about psychological safety within the team. Regarding interdependence, Teacher A1 described how the team had collaboratively generated the format of the material they would like to develop. She was comforted by the fact that A2, in particular, fulfilled his responsibilities, but she also mentioned that Teacher A5 did not provide any input. Elaborating on the impact the varying group composition had on interdependence within the TDT, the team coach reported that:

‘This was something that impacted the...the teachers didn’t like this, let’s state it like that. You’re dependent on each other. But the ‘together’ aspect was hindered. Elements that need to be brought together, need to become a coherent product...and this is not straightforward when you are unable to check with your team members what they had in mind.’

Teacher A1 was scarce in sharing her perceptions of social and task cohesion within her group. This may have been due to the consistently varying team composition, as the team members did not have a chance to become a coherent team in the first place. Neither did the team coach reflect on how she perceived the interpersonal relationships within the team. Regarding task cohesion, Teacher A1 only mentioned that all members had collaboratively decided on the focus of the material they would develop, while the team coach also referred to these decisions as being outcomes of a shared process based on a discussion of the content of the new learning standards. Neither the teacher nor the team coach discussed their beliefs with regard to group potency.

### Team Learning Behaviours

Table 1 presents an overview of the observation data. This overview serves as a basis for a narrative description of team learning behaviours at each meeting, which provides the reader with a more detailed idea of the process in each TDT. Additionally, it provides a first indication of the activities performed by the team coach.

To clarify the expectations regarding the educational material, the first session began with the coach discussing the quality indicators that the material should ideally meet (i.e., content-wise coaching). More specifically, teachers were informed about which content needed to be covered at which level of Bloom’s taxonomy and the didactical practices that needed to be taken into consideration. Afterwards, the teachers engaged in the construction of meaning through a discussion of the type of material they would develop; they used existing materials as inspiration and shared current teaching practices. Overall, the TDT had difficulty remaining goal-focused and struggled to concretely start working; they encountered ICT issues, side-talks emerged, and the teachers, at times, simply read existing materials by themselves rather than interacting as a group. These challenges resulted in time blocks during which team members did not carefully listen to each other. This prevented continuous co-construction, as the teachers did not always elaborate on each other’s ideas. Furthermore, constructive conflict occasionally occurred when team members asked each other critical questions. While the coach was responsible for supervising two teams simultaneously, she did strive to steer the team throughout the meeting and to answer questions on the new curriculum (i.e., goal-oriented and content-wise coaching).

In the second session, the team composition was different; this had an effect on the team learning behaviours. Teacher A5, whose behaviour had been somewhat distracting in the previous meeting, was absent for this session. At the beginning of the session, a significant amount of time was spent on deep reflection on particular definitions. Teacher A2 boosted the construction of meaning by sharing many ideas on how the material could be developed; as a result, the time spent on co-construction was enhanced, as this new input led the team members to concretely build upon the proposed ideas. Therefore, the TDT was more goal-focused compared to the first session. The TDT rarely demonstrated constructive conflict during the session. Given the decreased need for goal-oriented coaching during this session, the coach was able to be more involved in co-creating the material, suggesting new ideas, and safeguarding the material’s quality (i.e., content-wise coaching).

Only one of the teachers who had been present in the second meeting—Teacher A1—was also present in the third meeting. In Table 1, we show that in a relatively large share of time blocks, the team members asked questions (i.e., construction of meaning), which reflects that the coach was often asked to clarify the new learning standards (i.e., content-wise coaching). In terms of co-construction, the TDT made slight adaptations to the material that had been developed at the previous meeting. In addition to answering questions, the coach emphasised the importance of integrating didactical innovation into the material and provided suggestions (i.e., content-wise coaching). Engagement in constructive conflict was again negligible.

In the final session, only Teacher A2 was present, which means that we cannot present the team learning behaviours for this session in Table 1. As the coach had to share her time between two TDTs, the available time could not be used optimally. However, the teacher and the coach did critically evaluate the latest version of the material, and they made final adaptations. The coach was, therefore, mainly engaged in content-wise coaching during this session.

#### Team Coach

When asked about the role of the team coach, Teacher A1 mainly noted that the coach safeguarded the quality of the material. By reminding the TDT that the material should align with the new curriculum, the coach ensured that the material was not purely focused on increasing students' knowledge but that it must also help to change their financial behaviours. Additionally, the teacher emphasised that while they could develop materials based on their own ideas, the team coach encouraged them to also think in-depth about whether quality indicators such as formative evaluation were sufficiently integrated. This could be perceived as adaptive coaching, as the coach intervened only when this seemed necessary.

Given that the interviews with the team coach were specifically focused on her role in the process, her perspective provides a broader range of information regarding her coaching activities. The coach mentioned that the TDT needed support in maintaining focus on its goals—she regularly had to remind the team members to keep their goals in mind and to ensure that conversations on their teaching experiences would not distract them from their work (i.e., goal-oriented coaching). Nevertheless, she also recognised the importance of allowing some time to share issues or concerns (i.e., group-dynamic coaching). Furthermore, given that the team composition constantly differed, the coach had to ensure that tasks were divided and that the team members followed through on the tasks they had committed to, as the TDT could not progress without them (i.e., organisational coaching). The team coach also played an important role in the completion of the team's material, as only Teacher A2 was present in the final session (i.e., content-wise coaching). Confirming the statements of Teacher A1, the coach mentioned regularly encouraging the TDT to evaluate whether the material aligned with the learning standards and contained particular didactical quality indicators. Finally, the team coach strived to generate a positive dynamic within the group (i.e., group-dynamic coaching), as she considered this to be a basis for a functioning team.

#### 4.2.2. TDT B

##### Team Meetings

TDT B also met four times, for three hours each time, to develop materials. Teacher attendance was more consistent than it was for TDT A. Teacher B1 was present at all of the meetings, and Teachers B2 and B3 were both absent at one meeting. Teacher B1 mentioned that it would have been easier if they would all have been present for each meeting, but both teachers mentioned that the absences were due to external private issues rather than lack of motivation. The team coach did not have the impression that the change in composition affected the team learning process or its outcomes.

### Team Learning Beliefs

In reference to psychological safety, Teacher B2 mentioned that while the team members were somewhat reserved at the beginning, the level of trust grew throughout the trajectory. This change in the level of trust and openness was also observed by the team coach. With regard to interdependence, Teacher B1 mentioned that all of the team members were motivated to actively collaborate, which was also reflected by the fact that they all followed through on the tasks they had agreed to do. Similarly, Teacher B2 reported that they were all generally well-prepared for the meetings, which indicates that all team members were involved and engaged. The team coach supported these perspectives, stating that the team succeeded in bringing all materials together, that they all met their commitments and that they worked hard between the meetings. The participants made very few references to social cohesion and task cohesion. The only comment on social cohesion came from Teacher B2, who mentioned that the overall atmosphere was positive but remained professional. With regard to task cohesion, Teacher B1 reported that the team members first came to a general agreement on what they wanted to cover in the material and then divided tasks among the group members. Teacher B2 further mentioned that they came to these decisions through a discussion that included the team members and the team coach. Whereas the teachers did not elaborate on their experience of group potency, the team coach did mention that Teacher B1 had played an important role in establishing confidence within the group that they would reach their goals and that this was one of the reasons the team members felt comfortable opening up with each other.

### Team Learning Behaviours

Similar to the trajectory of TDT A, the team coach started the first session by explaining the desired quality indicators of the material (i.e., content-wise coaching). Teachers B1 and B3 soon engaged in the construction of meaning by discussing existing materials that could serve as a starting point to develop new material. The teachers complemented each other's ideas and came up with suggestions to 'upgrade' the material by integrating elements of didactical innovation. As Table 1 demonstrates, this implies that in the first session, TDT B spent more time on co-construction than TDT A. Teacher B2 mainly ensured that the proposed ideas aligned with learning standards and provided complementary ideas. This contributed to co-construction rather than initialising constructive conflict. In this session, the team coach mainly focused on supervising another TDT.

Teacher B2 was absent from the second session. Given that Teacher B1 had been given additional hours by her school principal to prepare for the reform, she continued to work on the material between meetings. Together with the team coach, the teachers went through the material that had been developed so far, immediately integrating new ideas and suggestions. This reflects co-construction as well as content-wise coaching. The teachers rarely disagreed and seemed to have a shared understanding of their goals. The team coach's critical comments were also acted upon, which could be perceived as a mild form of constructive conflict. The coach was involved in the co-creation of the material, ensured that the material aligned with the learning standards and encouraged the teachers to keep didactical innovation in mind (i.e., content-wise coaching).

All three teachers were present for the third session. This session was characterised by the presence of an OVSG staff member who temporarily took over the role of the team coach. This temporary coach encouraged deeper reflection on the possibilities for integrating didactical innovation (i.e., content-wise coaching). The teachers engaged in co-construction by collaboratively surveying the material to refine it while considering the coach's suggestions. While Teachers B1 and B3 were somewhat distracted at times as they shared teaching experiences, Teacher B2 remained goal-focused and shared new ideas, suggestions and potential exercises to include in the materials. Again, these behaviours seemed to reflect the construction and co-construction of meaning rather than constructive conflict.



In the final session, Teacher B3 was absent. Teacher B1 took the lead, and Teacher B2 actively participated in evaluating the material that had been developed and providing a few final suggestions. The coach informed the team members that the material was too extensive, as it covered content that was not required to meet the learning standards (i.e., content-wise coaching). Therefore, this session mainly consisted of a step-by-step evaluation of which aspects should be maintained and which could be perceived as additional material. Thus, rather than engaging in construction and co-construction, in this session, the teachers were required to critically evaluate the material they had developed so far. Given that it was the coach who steered this process (i.e., content-wise coaching), we observed no constructive conflict among the team members themselves, as is shown in Table 1.

#### Team Coach

Reflecting on the role of the team coach, Teacher B1 confirmed that she had mainly engaged in content-wise coaching with this TDT, as we have shown in the previous section. The coach helped the teachers recognise that the material covered too many elements that were not included in the new learning standards. The coach approached this in a way that made it comfortable for the teacher to accept and handle this criticism, which reflects the coach's ability to maintain a positive group dynamic. In addition to confirming that the coach intervened to ensure that the material remained on-topic (i.e., content-wise coaching), Teacher B2 also noted that the coach had engaged in goal-oriented coaching activities by providing suggestions on the focus of the material. The teacher also noted that at times in which the TDT was not progressing or had difficulties making decisions, the coach provided direction. Referring to adaptive coaching, Teacher B2 mentioned that the coach remained in the background whenever possible but that she would intervene or make decisions whenever necessary.

The team coach herself also mentioned that she told the TDT to re-evaluate the material they had developed (i.e., content-wise coaching) and that she had phrased this criticism carefully to respect the time and effort that had been spent by the team members in developing the materials (i.e., group-dynamic coaching). The coach also engaged in group-dynamic coaching by presenting an enthusiastic attitude in order to maintain the existing motivation and drive within the team. Another element of content-wise coaching was that the coach functioned as an expert on the new curriculum and its learning standards. Regarding organisational coaching, the coach also noted that she ensured that commitments were made and kept, particularly in relation to what the team members would work on between the meetings.

#### 4.2.3. Comparison of TDTs

The previous sections provided insight into the overall process each of the TDTs went through and elaborated on meeting attendance, team learning beliefs, team learning behaviours and the role of the team coach. Below, we provide a summary of the main similarities and differences for each of these factors.

In both TDTs, the teachers met four times for three hours. For TDT A, the team learning process was characterised by the varying team composition from meeting to meeting. This was perceived as a factor that hindered the team's progress and made it difficult to create a coherent end product. Despite the fact that attendance in TDT B was not completely consistent either, it did not seem to affect the design process as strongly as it did for TDT A as the team members were still sufficiently able to build on each other's work.

Generally, relatively few references were made to team learning beliefs. For TDT A, this may be a consequence of the fact that the members did not end up forming a cohesive team. For TDT B, a sense of trust between the team members did develop, and one of the teachers encouraged group potency beliefs within the group. Whereas the team members in this group got along well, they remained on a professional level.

With regard to team learning behaviours, the findings for TDT A indicate that it took some time before the TDT began to engage in co-construction and that the progress was strongly influenced by which teachers were present for the meeting. For TDT B, one of the members was able to continue working on the material between meetings, which likely contributed to the team's ability to spend a larger share of the sessions on co-construction compared to TDT A since the team members were mainly involved with adapting, refining and improving this teacher's work. Constructive conflict occurred very rarely in both TDIs.

The team coach played an important role in keeping TDT A goal-focused and contributed significantly to the eventual end product, while for TDT B, the coach primarily safeguarded the quality of the material by ensuring that the team members were aware that the material should only cover the essence of the new learning standards.

### 4.3. Outcomes

#### 4.3.1. TDT A

##### Quality of the Materials

Teacher A1 reported that she was satisfied with the quality of the material that was developed by the TDT and considered it usable in practice. Nevertheless, she mentioned that the material only covered one of the five learning standards that students would be required to meet, which left questions remaining for the other standards. She also mentioned that they did not decide how to evaluate whether students met the standards. The team coach was also relatively satisfied with the quality of the material that was developed, but she did mention several aspects that could be improved. In particular, she noted four sessions was an insufficient amount of time to integrate particular didactical elements in the material:

'I'm fairly satisfied with the material considering the limited time that we had, and the fact that the group was inconsistent. It's a limited product, but the quality is definitely okay regarding the content . . . I think that there's still the opportunity to give an extra dimension to the material that has been developed now. In terms of formative evaluation, to elaborate on how teachers can provide students with good feedback. And definitely for the basic literacy learning standards, to decide how we can monitor whether students have actually reached those . . . Differentiated instruction . . . Those extra layers.'

##### Professional Learning

Teacher A1 indicated that after she participated in the TDT she had more insight into how the new learning standards should be understood and how, as a teacher, she could help students to reach them. Specifically, she had learned about the extent to which students needed to understand or apply particular concepts. She did not feel that she had gained new knowledge about financial topics or that particular skills had improved.

##### Teacher Self-Efficacy towards Reform

The teacher indicated her main goal for participating in the trajectory was to better understand the setup of the new learning standards and how these could be integrated into educational materials. She had been particularly insecure about this as the learning standards were relatively abstract and did not provide concrete targets for the actual knowledge and competencies students were expected to develop. Furthermore, she mentioned that she had been uncertain about how the learning standards should be implemented for the seventh and eighth grade. The teacher noted that she gained enough new knowledge through her participation in the TDT to reduce her insecurities. Nevertheless, she did state that it remains unclear how new learning should be evaluated:

'Reaching the learning standards, those that are focused on content, I think that that will succeed . . . But what I still have problems with . . . How should we eventually prove whether these are met, or not? That is still a grey area.'

#### 4.3.2. TDT B

##### Quality of the Material

Teacher B1 reported that she was very satisfied with the material that the team developed. However, she would have liked to also have developed materials for the other learning standards. She additionally mentions that it would be interesting to share experiences over the next year regarding how the developed materials were used and perceived in practice so they could be improved. Teacher B2 was also satisfied with the material and expressed that he intended to use it as a basis for his teaching in the next year. He also stated, however, that the material could generally have been somewhat more challenging, both in terms of cognitive level and links to other subjects.

The team coach also reported that she was highly satisfied with the material. It was apparent that there was curriculum expertise within the team, as quality indicators such as formative evaluation, differentiated instruction and ICT had been integrated to at least some extent. Nevertheless, she believed that evaluation and differentiated instruction could be embedded more strongly and that in the future, the material could be adapted to make it more project-based. The coach further mentioned that during the design process, the teachers had included too much content that was not essential for reaching the learning standard, and she had stepped in to guide them to reduce the material to its core.

##### Professional Learning

With regard to professional learning, Teacher B1 mentioned that as a higher grades teacher, she had specifically learned more about what needs to be considered when teaching first-year students. While the financial content itself did not contain elements that were new to her, she gained more insight into its application and certain connections she had been unaware of. She also reported that her understanding of the learning standards had increased during the design phase but that she would need more time to become fully accustomed to using the new terms. Teacher B2, meanwhile, stated that by the end of the trajectory, he was much more informed about the reform and its consequences. Regarding the extent to which he experienced an increase in his capability to teach financial topics, he said:

‘Everyone has of course, purely content-wise, some sort of knowledge on the economic-financial competences. Me too, but my view on this has broadened a bit. This is, of course, important when you need to tell teenagers about it within six months from now. So that is definitely not unimportant.’

##### Teacher Self-Efficacy towards Reform

Despite the fact that Teacher B1 indicated that she had gained knowledge on the reform and insight into how financial topics could be taught to first-year students, she was still uncertain whether the preparation was sufficient:

‘I still have, to a certain extent, a wait-and-see attitude. Because I don’t know yet how it will eventually turn out. Because it is not the case that because we have material now, it will all be alright . . . We are all developing material, so that is a start. But then now, translating it to the classroom. We will only know in September whether this will work out or not. We are trying our best, but if that will be sufficient, we do not know yet.’

Teacher B2 did not discuss any personal insecurities with regard to the reform, but he did report that most of his colleagues were rather anxious—especially the teachers who had many years of experience. He had the impression that having access to appropriate educational materials reduced insecurities among the teachers who participated in the TDT trajectory. The team coach shared this perception, stating that because teachers knew they had access to materials that could be used in the next year, they felt reassured—especially those who would become responsible for teaching financial topics:

'I think that because the learning standards are new, new to everyone, there was an enormous need for educational material. And that is why they chose to develop bundles that could readily be used in the next school year. And I think that that has given them comfort, knowing that they had material to use.'

#### 4.3.3. Comparison of TDTs

The previous sections provided insight into the teachers' and coach's perceptions of the outcome variables. In the following, we summarise the main similarities and differences between the TDTs for each outcome.

Regarding the quality of the material that was developed, we observed that teachers in both TDTs were fairly satisfied. They considered the newly-developed materials usable in practice, though both Teachers A1 and B1 would have preferred if they also had materials prepared for the remaining learning standards. Teacher B2 would have preferred it if the material were somewhat more challenging for students. Meanwhile, the team coach was pleased with the newly-developed materials, but she believed that particular elements related to didactical innovation, such as formative evaluation and differentiated instruction, could have been integrated to a larger extent. Whereas the material in TDT B already contained a few of these elements, there remained significant room for improvement in the material developed by TDT A.

In terms of professional learning, we relied on self-reported changes in the participants' capabilities. The teachers who had experience teaching financial topics did not believe that their content knowledge had increased, but they did report that they had gained more insight into how the new learning standards should be understood and how they could specifically be applied in the context of seventh and eighth grade students. Teacher B2, who had no background in economics, experienced increases in both content knowledge and pedagogical content knowledge.

Regarding the changes in teacher self-efficacy towards the curriculum reform, our findings indicated that despite the teachers' increased understanding of the new learning standards and the teachers having materials they could use in their own practice, they still experienced insecurities. Teacher A1, for example, had become more confident about teaching the content but remained unsure about how the new learning standards should eventually be evaluated. Meanwhile, Teacher B2 had the impression that overall, the teachers' insecurities had been reduced due to their participation in the TDTs, as they now had materials that were ready to be used. This was nuanced by Teacher B1, who mentioned that the materials were a good start but that she was still slightly anxious about the actual implementation of the new curriculum.

## 5. Discussion and Conclusions

Despite the essential role of teachers in financial literacy education, there remains a lack in their perceived and actual competencies. We employed an exploratory multiple-case study design to evaluate the extent to which TDT participation results in high-quality educational materials, professional learning, and increased teacher self-efficacy among teachers who were expected to start teaching financial topics as a part of curriculum reform. Data were collected from two TDTs through both team meeting observations and interviews.

The first three research questions focused on exploring the impact of TDT participation on the three outcome variables. With regard to the influence of TDT participation on professional learning, addressed in the first research question, our results indicated that the teachers' understanding of the new learning standards had increased. However, whereas earlier studies generally showed a positive impact on teachers' content knowledge (e.g., [Bakah et al. 2012](#); [Binkhorst 2017](#)), our results indicated that this knowledge increase was only experienced by the teacher who lacked experience in teaching financial topics. A potential explanation for this finding may be that the material was developed for seventh and eighth grade students, which means that for experienced teachers, the content may already

have been familiar. We also showed that teachers generally felt more secure about the upcoming reform after participating in a TDT, which answers our second research question and is in line with previous findings (Compen and Schelfhout 2020; Mintzes et al. 2010; Velthuis et al. 2015). Nevertheless, teachers indicated that they still had concerns about how the new learning standards should be evaluated, and more generally, how the reform would ultimately turn out in practice. Regarding the third research question, the results suggested that both the teachers and the team coach were satisfied with the materials developed in the TDTs, primarily as they were considered usable in practice. However, the material required more integration of elements related to didactical innovation, according to the team coach. Regarding the latter, it appears that a total of four meetings is insufficient, at least for beginning TDTs, to establish optimal results. This is not surprising, as the team members need to get to know each other and need to determine the shared team goal before they can begin their work on the new materials (Binkhorst et al. 2015). Given that the materials developed in TDTs are rarely objectively evaluated (Voogt et al. 2016), this finding is a relevant contribution to the existing literature.

By comparing the trajectories of two TDTs, this study also provided further insight into how differences in the extent to which input and process factors are met may play a role in differences in the trajectories' outcomes. In terms of the fourth research question, our results show, for example, that teachers should be motivated to engage in the team and that they should be sufficiently facilitated by the school principal. A lack of these factors may result in teacher absence or dropout, which, in the case of one of our TDTs, led to a different team composition for each of the four sessions. This was perceived to obstruct the progress of the team, as the teachers could not simply continue where they had left off in the previous meeting. In contrast, the TDT with a more consistent team composition—in which all of the teachers were motivated to reach the team goals, and one teacher could use additional hours to develop material—spent more time on the co-construction of meaning, which may explain why the material developed by this TDT was evaluated more positively by the team coach.

Additionally, our results confirmed the importance of a team coach who is able to sense the type of support required by the TDT (Becuwe et al. 2016; Compen and Schelfhout 2020; Petrone and Ortquist-Ahrens 2004). Whereas in one of the TDTs, the coach played a major role in keeping the TDT goal-focused, this need was less prevalent in the other TDT. Overall, we observed that the coach in the current study engaged particularly in content-wise coaching activities, which is most likely due to the focus on financial literacy education, which was to be newly integrated into the curriculum. Given that materials aligning with the new standards were not yet available, the teachers relied on the expertise of the coach for information on the content that should be covered and the related pedagogical content knowledge that would be required (Bausmith and Barry 2011; Beyer et al. 2009). Consequently, in terms of the debate on whether top-down leadership or shared leadership in teams is preferred (Compen and Schelfhout 2020), it appears that—in the specific context of this study—the expertise of an expert external to the team was vital to the outcomes of the TDT trajectory.

This study also had a few limitations. First, given that we only monitored two TDTs, the obtained results may largely be specific to this study. Among other factors that may have influenced the TDT trajectories, the study country may have played a role. Although we recognised that teachers' inclinations towards collaborative learning might impact the TDT process and its outcomes, Gächter et al. (2010) showed that between-culture variation in cooperation tends to be larger than within-culture variation. Thus, similar TDT trajectories may lead to different outcomes in other regions due to cultural differences in the willingness or ability to engage in collaborative learning. Furthermore, the teachers who participated in this trajectory may not have been representative of the entire teacher population in Flanders. Those who completed the trajectory may have been more motivated than the average Flemish teacher to engage in TPD for financial literacy education; they may also have received more support than the average from their school principals. All in

all, the small scale of the study implies that the generalisability of our results is limited. Second, given that we did not conduct an experiment, we are unable to claim causal relationships between TDT participation and the outcome variables. Nevertheless, by collecting data from multiple sources and triangulating our data, we were able to provide in-depth insight into the processes of the observed TDTs and the different outcomes. Third, in line with previous studies evaluating TDT (Bakah et al. 2012; Binkhorst 2017), we relied on self-reported outcomes on professional learning. Future research should consider also administering financial literacy tests before and after participation in the TPD initiative. Fourth, we were unable to measure changes in the participating teachers' instructional practices due to TDT participation or to assess the impact of the teachers' professional learning on student achievement. Future studies are encouraged to evaluate the effectiveness of TDTs in these regards. Studies such as these would be in line with, for example, the work of Nihuka (2011).

In conclusion, our findings suggested that TDT participation resulted in an improved understanding of the new learning standards related to financial literacy education, but not necessarily in increases in content knowledge. Furthermore, although the participating teachers were relatively satisfied with the educational materials that had been developed through the TDTs, primarily the team coach noted that there was room for improvement. Whereas these outcomes nevertheless led to more confidence in implementing the new learning standards, the teachers reported some remaining uncertainties regarding the upcoming reform. Our results confirmed previous studies by showing that several factors on the input and process level appear essential to the effective functioning of TDTs; therefore, we recommend that policymakers ensure that these factors are met as they put the use of TDTs into further practice. These recommendations will increase the likelihood that TDTs will result in desirable outcomes, and hence, they are likely to provide an effective form of TPD in the context of financial literacy education.

**Supplementary Materials:** The following are available online at <https://www.mdpi.com/article/10.3390/jrfm14060234/s1>: Supplementary File A: Observation Scheme; Supplementary File B: Coding scheme teachers, Supplementary File C: Coding scheme team coach.

**Author Contributions:** B.C. was responsible for the conceptualisation, investigation, formal analysis and writing of the original draft. W.S. supervised the study, contributed to the conceptualisation, validated the analyses and reviewed the article. Both authors have read and agreed to the published version of the manuscript.

**Funding:** This research was funded by the Research Foundation Flanders (FWO), grant number S000617N.

**Data Availability Statement:** Data will be shared upon request.

**Acknowledgments:** We are thankful to OVSG, and particularly An Buckinx, for their collaboration.

**Conflicts of Interest:** The authors declare no conflict of interest.

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