The impact of teacher professional development on the effectiveness of financial literacy education

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Introduction

I touch the future. I teach.

- Christa McAuliffe

AP Photo

Teacher quality has been shown to have a significant impact on:

- Student performance
- Later life outcomes

e.g. Goldhaber (2002), Chetty et al., (2014)

Introduction

For school-based financial literacy education to be effective, well-trained teachers are required

e.g. Blue et al., (2004), Totenhagen et al., (2005)

While 75% of the teachers consider themselves financially literate, only 50% feels competent to teach financial topics

Sawatzki & Sullivan (2017)

47% does not perceive themselves 'very competent' to teach topics such as risk management, insurance, saving and investing

Way & Holden (2009)

Only 34% perceives themselves sufficiently capable to teach financial topics

Also a lack of capabilities in terms of teachers' own financial literacy levels

De Beckker et al., (2019)

>> The lack of both perceived and objective capabilities results in a clear need for teacher professional development (TPD)

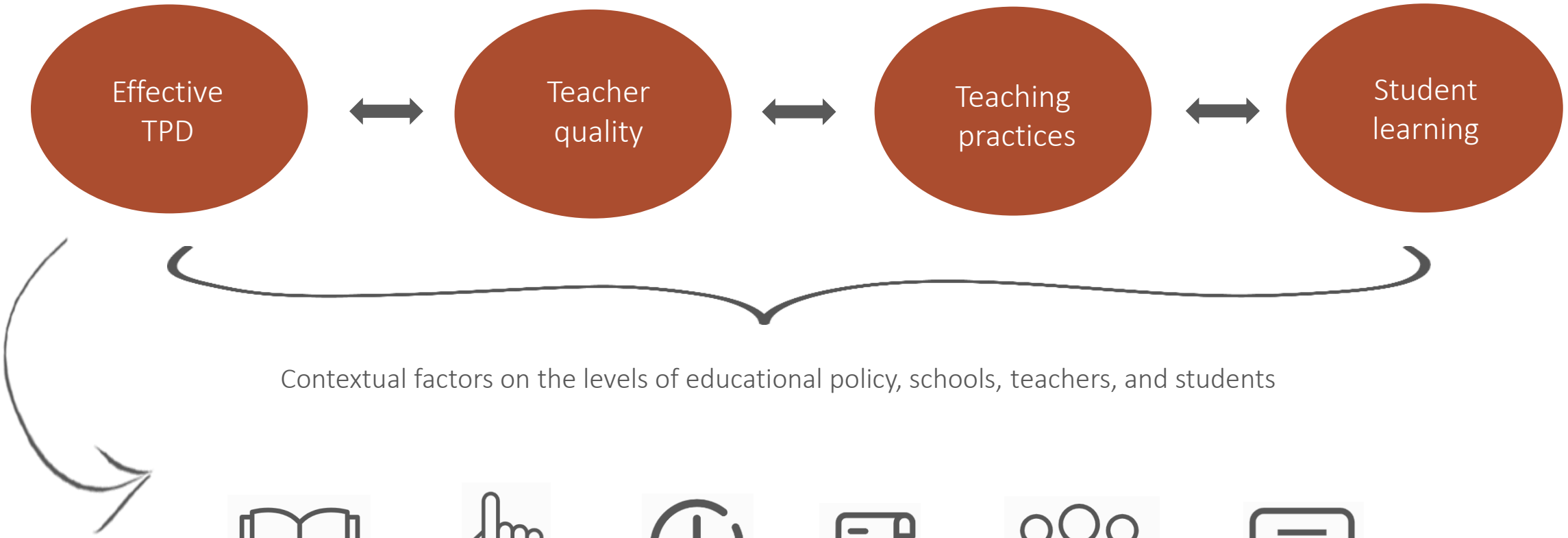
>> The set-up of TPD initiatives may partly explain differences in effect sizes of financial education programmes

Urban et al., (2020)

Which elements are essential to effective TPD in the context of financial literacy education?

Compen, De Witte, & Schelfhout (2018).
The role of teacher professional development in financial literacy education: a systematic literature review
Educational Research Review. 26(9). 16-31

Theoretical framework



Desimone (2009), Merchie et al., (2016)

Methodology & summary of results

Systematic literature review

- Combination of financial literacy/financial education/financial capability & terms from framework
- ERIC, Econlit, Business Source Premier, WoS + specific journals
- 52 studies

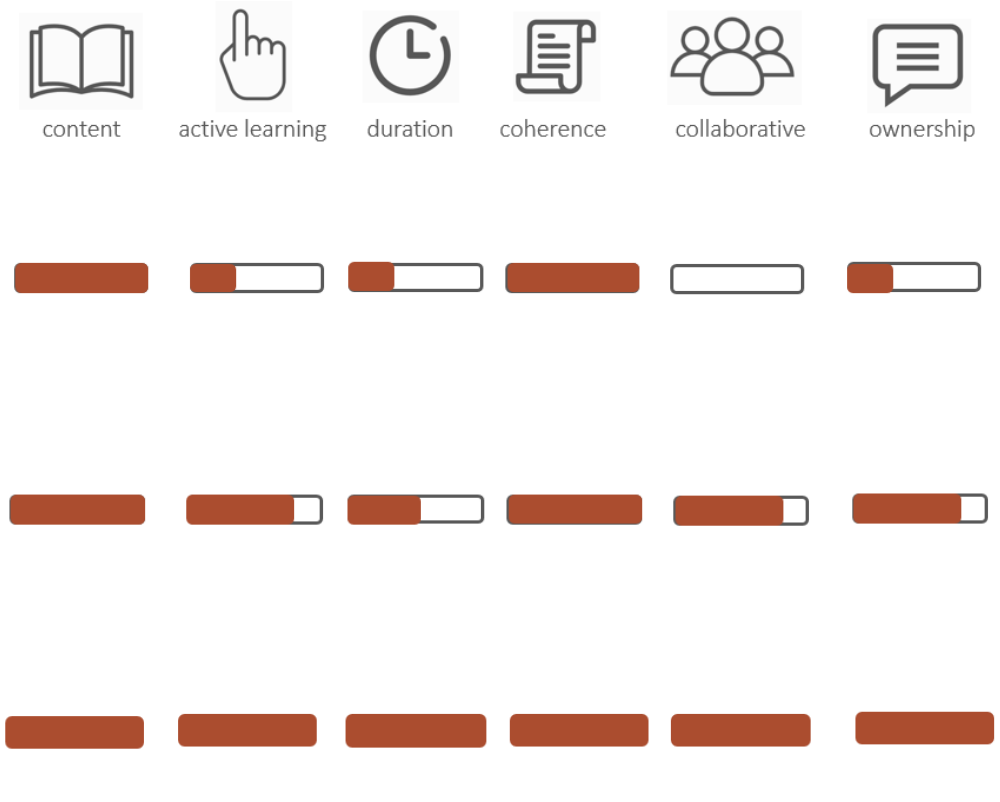
Summary of results

- There is a lack of studies that systematically investigate the impact of TPD initiatives
- Consequently, it remains unclear how the six essential features should be implemented to maximize TPD impact

>> Overall objective of PhD

TPD initiatives

1. Online teacher professional development module
2. Interactive webinar series
3. Teacher design teams



To what extent can an interactive webinar series enhance the effect of a financial education programme on student financial literacy?

Compen, De Witte, & Schelfhout (2020).
The impact of teacher engagement in an interactive webinar series on the effectiveness of financial literacy education.
British Journal of Educational Technology. In press.

Experimental design

Financial education programme

- 8th and 9th grade
- Digital adaptive learning path on saving and investing
- Financial education not yet in curriculum

Design

- Randomised controlled trial
- Pretest, posttest & follow-up test
- Observations
- Four conditions >>

Experimental design

Experimental conditions

- Baseline condition
  Educational materials + online manual for teachers
- Control condition
  Educational material solely received after test completion
- Active teacher condition
  Educational materials + online manual for teachers + additional instructions
- Webinar condition
  Educational materials + online manual for teachers + additional instructions + webinar attendance

>>

Experimental design

Webinar series

- Videoconferencing software establishes the same interactions as established in face-to-face communities of teachers, as teachers communicate in real-time (McConnell et al., 2013; Maher & Prescott, 2017)
- Three webinars of one hour + three hours of preparation time in total
- Enhancing knowledge on saving & investing and stimulating self-regulated learning (motivating, activating and coaching)
- Teachers co-designed a motivating phase of ± 20 minutes and structured feedback moments ± 5 minutes each
- Webinars hosted by a moderator, maximum of 12 teachers per session

Experimental design

Instruments

- Financial knowledge & financial behaviour related to saving & investing
- Relevant background characteristics

Analysis

OLS regression

$$Y_{i,s}^{1} = a + \sum_{k=1}^{4} \beta_k Treatment_{i,k} + \gamma Y_{i,s}^{0} + \delta X_{i,s} + \varepsilon_{i,s}$$

Sample

1102 students (posttest) & 294 (follow-up test)
45 teachers
30 schools

Baseline characteristics

	Baseline	Control	Active teacher	Webinar
Student characteristics				
Gender (female)	0.444	0.571***	0.580	0.548
Age	13.73	13.42***	13.24***	13.30**
SES proxy	1.766	2.048***	1.798**	2.073
Language (non-native)	0.161	0.093***	0.143	0.210***
Grade (9^{th})	2.433	2.362*	2.067***	2.121***
Math performance	3.25	3.689***	3.824	3.319***
Dutch performance	3.650	3.939***	3.807	3.597***
Motivation	4.111	4.218*	3.975**	4.081**
Self-efficacy	3.371	3.417	3.286	3.363
Pretest score	4.121	4.670***	3.992	4.391*
N	423	312	119	248

Note. Significance levels retrieved from t-tests with the baseline condition as the reference group. Solely the characteristics of students that completed both the pre-test and the post-test were included. Standard errors in parentheses. * $p \leq 0.10$ ** $p \leq 0.05$ *** $p \leq 0.01$.

Results

Posttest

Reference category Baseline	Total score		Knowledge score		Behaviour score	
Control	-0.210	-0.294*	-0.363**	-0.426***	0.108	0.023
	(0.154)	(0.152)	(0.144)	(0.126)	(0.120)	(0.140)
Active teacher	-0.298	-0.296	-0.264	-0.203	-0.240	-0.271
	(0.176)	(0.229)	(0.152)	(0.186)	(0.168)	(0.221)
Webinars	0.311*	0.387**	0.256*	0.348***	0.281**	0.304*
	(0.154)	(0.152)	(0.145)	(0.125)	(0.128)	(0.154)
Control variables	No	Yes	No	Yes	No	Yes
R^2	0.193	0.233	0.063	0.217	0.122	0.145
N	1102	1102	1102	1102	1102	1102
Control – Active teacher	0.377	0.887	0.224	0.123	0.008	0.100
Control – Webinars	0.000	0.000	0.000	0.000	0.008	0.002
Active teacher - Webinars	0.000	0.000	0.000	0.000	0.001	0.003

Note. Dependent variables are standardised posttest scores. The standardised pretest score as included as a control in all regressions. Standard errors clustered at school level in parentheses. The bottom rows reflect the p values resulting from F-tests comparing the remaining combinations of conditions.* $p \leq 0.10$ ** $p \leq 0.05$ *** $p \leq 0.01$.

Robustness tests

Results

Follow-up test

Reference category Baseline	Total score		Knowledge score		Behaviour score	
Active teacher	0.084	-0.003	0.038	0.009	0.132	-0.021
	(0.139)	(0.112)	(0.110)	(0.071)	(0.139)	(0.081)
Webinars	0.533***	0.475***	0.530**	0.546***	0.346**	0.180
	(0.144)	(0.110)	(0.118)	(0.115)	(0.141)	(0.101)
Control variables	No	Yes	No	Yes	No	Yes
R^2	0.156	0.199	0.145	0.192	0.079	0.130
N	294	294	294	294	294	294
Active teacher – Webinar	0.000	0.000	0.000	0.000	0.015	0.092

Note. Dependent variables are standardised posttest scores. The standardised pretest score as included as a control in all regressions. Standard errors clustered at school level in parentheses. The bottom rows reflect the p values resulting from F-tests comparing the remaining combinations of conditions.* $p \leq 0.10$ ** $p \leq 0.05$ *** $p \leq 0.01$.

Results

Underlying mechanisms

1. Average self-efficacy scores of teachers

	Baseline	Control	Active teacher	Webinars
Pretest	5.737	5.779	5.338	5.877
	(0.065)	(0.060)	(0.073)	(0.047)
Posttest	5.474	5.714	4.838	5.947
	(0.063)	(0.071)	(0.072)	(0.015)
Difference	-0.236	-0.065***	-0.500**	0.070***
	(0.055)	(0.018)	(0.115)	(0.033)
N	194	199	80	227

Note. The average response to the statement: "I believe that I have a decent knowledge about anything related to financial education" (answered on a Likert scale from 1 = completely disagree to 7 = completely agree). Standard errors in parentheses. Significance levels correspond to differences relative to the baseline condition, derived from *t*-tests.

Results

2. Teachers in the webinar condition were more involved with their students during the programme, and more often offered content-wise help

	Baseline	Webinar
Teacher involvement		
Teacher walks around between the student pairs	2.333	4.286
Teacher is involved with the students (including providing help with the adaptive learning path)	1.667	4.375
Teacher help		
Frequency of content-wise help to students	1.000	1.667
Help provided by hinting towards explanation in material	0.033	0.044
Help provided by providing additional explanation	1.000	0.889
Help provided by clearly helping to solve the exercises	0.000	0.333
N	3	9

Note. Aspects related to the extent of teacher involvement were scored by indicating the share of time per hour in which the behaviour was observed (1 = <20%, 2 = 20–40%, 3 = 40–60%, 4 = 60–80%, 5 = 80–100%). Frequency of content-wise help was scored as follows: 0 = never, 1 = <5 times, 2 = 5–10 times, 3 = >10 times. Aspects related to the type of help were scored as a dummy variable (0 = type of help not provided, 1 = type of help provided).

Discussion

Conclusion

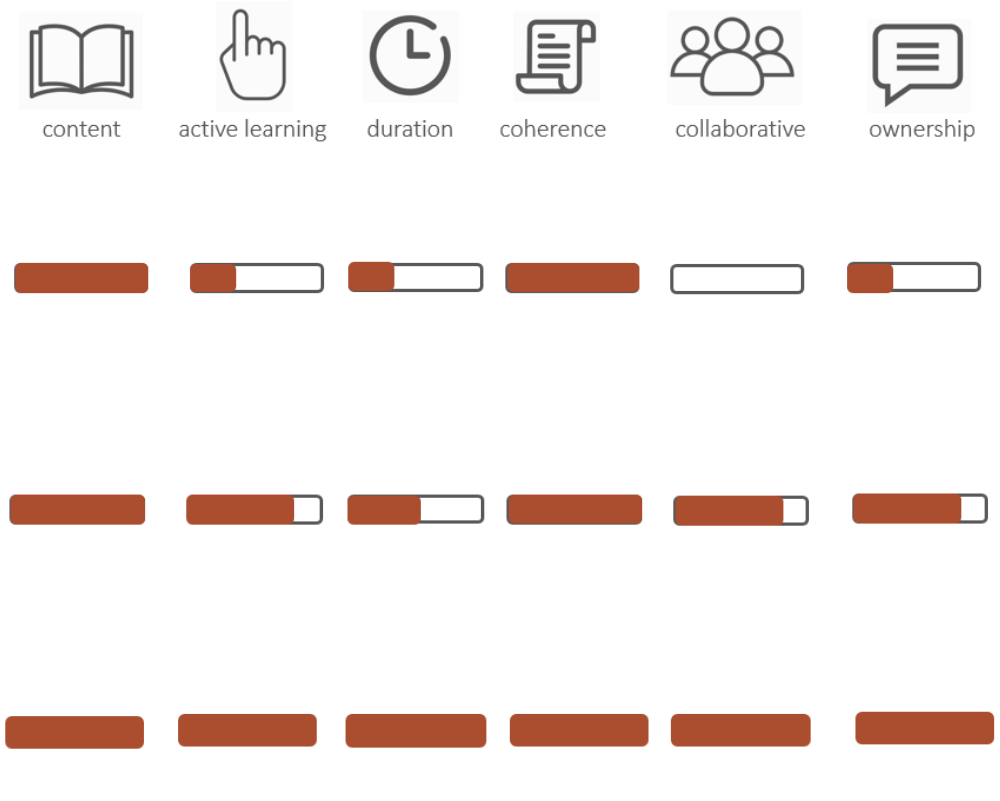
- Solely when teachers engaged in the webinars, enhanced teacher involvement improves student achievement
- The OTPD improved student achievement on both the short- and long-term
- Potential mechanisms at the teacher level are increased self-efficacy, and enhanced teacher involvement

Implications

- An interactive webinar series may be a cost-effective alternative to traditional TPD
- Our findings are particularly relevant considering that the effectiveness of (O)TPD initiatives is often questioned

TPD initiatives

1. Online teacher professional development module
2. Interactive webinar series
3. Teacher design teams



Can students' financial literacy be enhanced by using an online professional development module to train teachers?

Compen, De Witte, Declercq, & Schelfhout (2020).
Improving students' financial literacy by training teachers using an online professional development module.
Working paper.

Experimental design

Financial education programme

- Educational game (‘escape room’)
- Payment methods

Experimental conditions

Random assignment to:

- Control condition
  Educational material solely received after test completion
- No OTPD condition
  Educational materials + online manual for teachers
- OTPD condition
  Educational materials + online manual for teachers + access to OTPD module

Experimental design

OTPD module

- Teachers were free to choose whether, and to that extent, to participate in the initiative
- Focus on enhancing knowledge on payment methods and differentiated instruction
- Videos, quizzes, discussion forum, links to relevant websites
- Approximately three hours needed to cover main content

>> Highly scalable intervention

Analysis

Intent-to-treat

$$Y_i^1 = \alpha_0 + \alpha_1 Treatment_i + \alpha_2 Treatment_i * OTPD_i + \alpha_3 Y_i^0 + \delta X_i + \varepsilon_i$$

Instrumental variables (2SLS)

$$Engagement_i = \beta_0 + \beta_1 OTPD + \beta_2 Y_i^0 + \theta X_i + \varepsilon_i$$

$$Y_i^1 = \gamma_0 + \gamma_1 Treatment_i + \gamma_2 \widehat{Engagement}_i + \gamma_3 Y_i^0 + \lambda X_i + \varepsilon_i$$

Sample

1845 students
53 teachers
45 schools

Summary of results

Financial education programme

The programme increased students' financial knowledge with 0.17 SD, but did not have a significant impact on students' financial behaviour

OTPD module

While the module did not result in a further increase in students' financial knowledge, it benefited the financial behaviour scores with 0.25 SD compared to the no OTPD condition. This estimate increased further when controlling for endogeneity caused by self-selection into the treatment.

Mechanisms at the teacher level

We demonstrated an increased in teacher efficacy, and observed that teachers in the OTPD condition spent more time to introduce the programme to their students

Discussion

Discussion

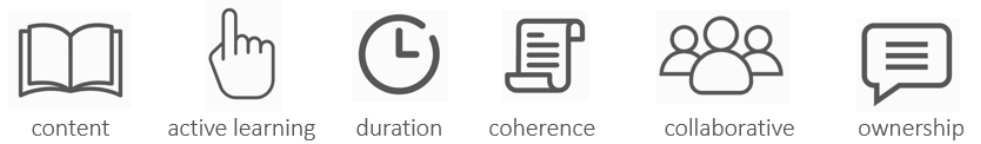
Relatively large effect size for financial behaviour compared to the majority of previous interventions

Kaiser & Menkhoff (2020)

Implications

Despite that the OTPD module required relatively little time investment, it was effective in enhancing student learning. Therefore, policymakers may consider developing similar, highly scalable initiatives.

TPD initiatives



1. Online teacher professional development module

2. Interactive webinar series

3. Teacher design teams

To what extent can participation in a teacher design team contribute to professional learning and teacher efficacy in the context of financial literacy education?

Introduction

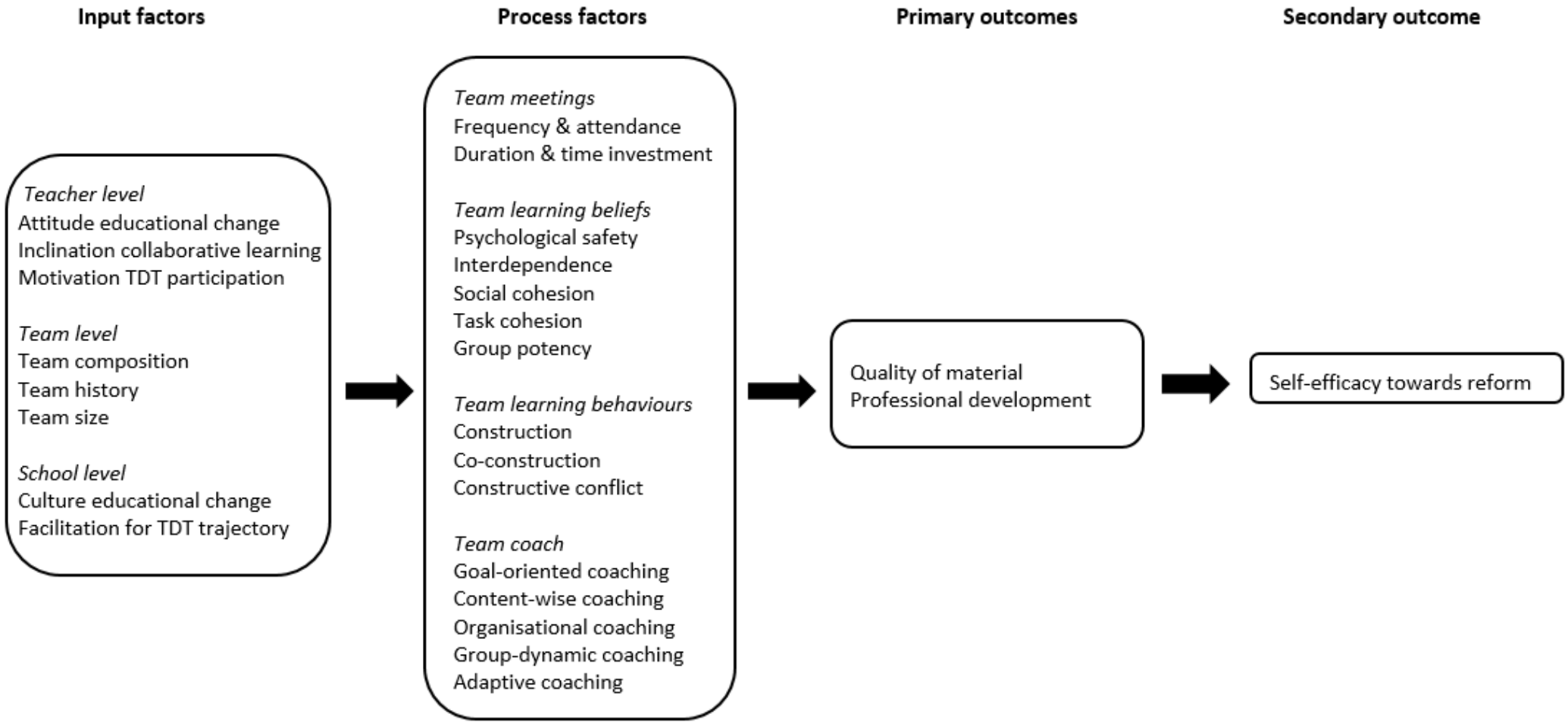
The majority of Flemish teachers do not have the perceived and actual capabilities necessary for financial education. This is not surprising given the context in which financial literacy education is provided:

- The implementation is part of an overall educational reform in Flanders
  >> Educational reforms generally result in teachers experiencing uncertainty and stress
  Geijsel et al., (2001), McCormick et al., (2006)
- Financial topics are often not taught in a separate course, but get integrated in other courses
  >> Teachers with different disciplines and backgrounds are expected to teach these topics

Introduction

- In a teacher design team (TDT) two or more teachers, from the same or related subjects, work together on a regular basis, with the goal to (re)design and enact (a part of) their common curriculum
  Handelzalts (2009)
- TDTs allow for the integration of all six key features for effective TPD
  Binkhorst (2017)
- Existing literature showed that TDT participation may result in professional learning and enhanced teacher efficacy
  Voogt et al., (2016), Compen & Schelfhout (2020)
- Certain conditions need to be met for an effective functioning of TDTs >>
  Schelfhout et al., (2019)

Theoretical framework



Schelfhout et al., (2019), Van den Bossche et al., (2006), Compen & Schelfhout (2020), Binkhorst (2017)

Context

- In preparation for the educational reform, one of the major school networks in Flanders set up a large-scale TDT trajectory in school year 2018 – 2019
- ‘Networked’ TDTs
- 4 sessions of 3 hours
- Support by a team coach

Methodology

Exploratory multiple-case study

Yin (2009)

>> Focus on two TDTs focusing on financial topics

- Interviews with three teachers
- Observations of meetings
- Triangulation
  - Interview- & observation data together provide understanding of the trajectories
  - Member checking and interviews with team coach

Summary of preliminary results

The results of this explorative study confirm that TDT participation benefits professional learning and teacher efficacy.

>> Nevertheless, the results also indicate that TDTs do not fully eliminate teachers' insecurities about the educational reforms. Also, knowledge on content solely improves for teachers with disciplines that are not related to economics.

In addition, we show that ideally, certain conditions need to be met on the input and process level:

- Teachers need to be motivated, and should sufficiently be facilitated by their school leader
- The team composition should be consistent
- TDTs should consist of at least 4 or 5 teachers, and preferably be composed of teachers with different backgrounds
- A competent teach coach who is able to meet the needs of the TDT

Overall discussion

Conclusion

The TDT initiatives that we evaluated are all effective in terms of benefiting student learning outcomes and/or teacher efficacy. We observe this general positive impact despite that the initiatives differed in the extent to which the six key features for effective TPD were integrated.

Implications

Policy makers are encouraged to invest in offering TPD initiatives related to financial literacy education, and can develop initiatives that best suit the professional development needs at hand (e.g. considering costs, scalability, etc.)

Areas for future research:

- Assessing the cost-effectiveness of TPD initiatives in financial literacy education
- Designing studies that compare the impact of multiple initiatives within the same RCT
- Impact on long-term knowledge and behaviours (of both students and teachers)
- …

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