Educational Research Review 26 (2019) 16–31

Contents lists available at ScienceDirect

Educational Research Review

journal homepage: www.elsevier.com/locate/edurev

Review

The role of teacher professional development in financial literacy education: A systematic literature review

Boukje Compen[a,b,*], Kristof De Witte[b,c], Wouter Schelfhout[d]

[a] Department of Training and Education Sciences, Faculty of Social Sciences, University of Antwerp, Gratiekapelstraat 10, 2000, Antwerp, Belgium
[b] Leuven Economics of Education Research, Faculty of Economics and Business, KU Leuven, Naamsestraat 69, 3000, Leuven, Belgium
[c] Top Institute for Evidence-Based Education Research, Maastricht University, Kapoenstraat 2, 6211, Maastricht, the Netherlands
[d] Antwerp School of Education, Faculty of Social Sciences, University of Antwerp, Venusstraat 35, 2000, Antwerp, Belgium

ARTICLE INFO

Keywords:
Teacher professional development
Financial literacy
Financial education

ABSTRACT

This paper examines the elements essential to effective teacher professional development (TPD) in financial literacy education by means of a systematic literature review. We provide a theoretical underpinning for the literature review by proposing a revised presentation of an existing general TPD model. Our results provide insight into the student learning goals in financial literacy education, the desirable teaching behaviour, the required teacher quality and the contextual factors that play a role. However, our findings also suggest a lack of studies that systematically investigate whether and how TPD initiatives enhance the effect of financial education on students' financial literacy. Furthermore, existing literature fails to provide insight in how the six key features of TPD should be implemented to optimize its effectiveness.

1. Introduction

Teachers have been shown to have a significant impact on school outcomes, as well as on students' outcomes later in life (Chetty, Friedman, & Rockoff, 2014). Teacher professional development (TPD) aims to increase the quality of the teacher, such that this positive impact can be maximised. Traditionally, professional development tended to be associated with the attendance of events such as workshops or conferences (Guskey, 2000; Wei, Darling-Hammond, Andree, Richardson, & Orphanos, 2009). Nowadays, it is increasingly recognised that teacher learning is a more continuous, embedded process, that is influenced by the context in which the professional development takes place (Guskey, 2000; Timperley, 2008). This implies that there is no general TPD approach that is successful in any country, school or classroom. Instead, professional development efforts should be adapted to the specific content, process and context in question (Guskey, 2009). This review answers this call by providing an overview of the elements necessary for effective TPD in the specific context of financial literacy education.

Higher life expectancies, pension and income reforms, and the availability of a more complex range of financial products and services have meant that the ability to make well-informed financial decisions is increasingly considered an important life skill (Aprea et al., 2016). While terms such as financial capability, financial competence and financial insight have been proposed to capture this

* Corresponding author. Department of Training and Education Sciences, Faculty of Social Sciences, University of Antwerp, Gratiekapelstraat 10, 2000, Antwerp, Belgium.
E-mail address: boukje.compen@uantwerpen.be (B. Compen).

https://doi.org/10.1016/j.edurev.2018.12.001
Received 8 June 2018; Received in revised form 25 October 2018; Accepted 2 December 2018
Available online 04 December 2018
1747-938X/

ability (Yoong, Mihaly, Bauhoff, Rabinovich, & Hung, 2013), the term financial literacy will be used throughout this paper.[1]

In a popular and frequently applied definition, 'literacy' has been described as "the ability, confidence and willingness to engage with language to acquire, construct and communicate meaning in all aspects of daily living" (Alberta Educaton, 2015). Clearly, this definition considers literacy as a concept that encompasses more than solely reading and writing. Financial literacy has been 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 & Messy, 2012, p. 14). This definition suggests that financial literacy is a means to enhance and maintain financial well-being, rather than an end goal in itself (Van Campenhout, De Witte, & De Beckker, 2017). Furthermore, it emphasises that, in correspondence with general literacy, financial literacy has two dimensions: understanding (having sufficient financial knowledge) and application (applying this knowledge appropriately) (Huston, 2010). In other words, the definition highlights that financial literacy is broader than the knowledge of financial affairs, but also includes financial attitude (such as the willingness to save money for the long run) and financial behaviour (such as having a household budget). This implies that financial literacy involves deep learning, meaning making and critical thinking, and that an objective understanding of financial content is insufficient (Danes, Rodriguez, & Brewton, 2013). This clearly has consequences for the design and content of TPD initiatives.

In 2008, the average financial literacy score of high school students in the United States reached an all-time low (Mandell, 2008). More recently, a study by the Programme for International Student Assessment (PISA), established by the Organisation for Economic Co-operation and Development (OECD), showed that financial literacy levels among 15-year-old students remain insufficient: 22% of participating students did not achieve the baseline score, which is deemed necessary for participation in contemporary society (OECD, 2017). While these students usually have a basic knowledge of financial concepts, such as what the purpose of an invoice is or how prices per unit can be calculated and compared, they are unable to translate this knowledge into appropriate decision-making in real-life situations (OECD, 2017). Poor performance on financial literacy is problematic as financial literacy enhances desirable financial behaviour in both the short and long term (Van Campenhout et al., 2017). Among others, it has been demonstrated that higher levels of financial literacy correlate with increased wealth accumulation (van Rooij, Lusardi, & Alessie, 2012), better debt management (Lusardi & de Bassa Scheresberg, 2013) and more retirement planning (Lusardi & Mitchell, 2007).

In response to the poor levels of financial literacy among youth, the OECD recommended that national authorities integrate financial education in school curricula. Financial education can play a role in enhancing financial literacy as it "has always been important for consumers in helping them budget and manage their income, save and invest efficiently, and avoid becoming victims of fraud" (OECD, 2005b, p. 2). Decisions of policy makers on the implementation of financial education vary significantly over countries. First, financial education could either be made mandatory through the national curriculum, or could be provided on a voluntary basis. The OECD recommendation led to an increase in regions with a mandatory programme (e.g., the U.K., Spain, Ireland, Denmark, Belgium, the Czech Republic and Estonia). Countries like Italy, the Netherlands, Portugal and the Russian Federation adopt a non-compulsory approach (OECD, 2016a). Second, countries differ in whether financial education is included in the curriculum as a stand-alone subject, as an explicit module, or integrated in related subjects such as mathematics, social sciences, civic education and economics (OECD, 2016a). Although a stand-alone subject would have the advantage that students get sufficient exposure to financial literacy subjects, it is often difficult to implement in view of overloaded curricula and lack of resources and time (OECD, 2014a). The majority of policy makers therefore decide to incorporate the subject matter in a cross-curriculum approach (OECD, 2016a).

Despite an increase in the implementation of financial literacy programmes, the professional development of financial literacy teachers is lagging behind. This is worrisome, since teachers, in addition to parents, have a major impact on the financial socialisation of youth (Cornelis & Storms, 2014; Van Campenhout et al., 2017). As a result, well-trained school teachers are considered as a crucial stakeholder to increase students' financial literacy (Consumer Financial Protection Bureau, 2013; Totenhagen et al., 2015). However, previous literature demonstrated that the majority of teachers are not sufficiently knowledgeable to teach financial topics (e.g., Otter, 2010). While these findings emphasise the need for TPD, most articles describing financial education programmes seem to have focused on student learning, rather than assessing the professional development of teachers (McCormick, 2009; Sasser & Grimes, 2010). This implies that little insight or support has been found in relation to one of the practices suggested by the OECD (2005a, p. 7): "For those programmes which favour use of classrooms, proper education and competence of the educators should be promoted […]".

This review aims to contribute to the literature by providing insight in the professional development process of financial education teachers, by answering the following general research question: *Which elements are essential to effective teacher professional development in a financial literacy education context?* Following Desimone (2009) and Opfer and Pedder (2011) we consider a TPD initiative as *effective* when it results in positive changes in teacher quality, teaching behaviour and student learning. Whenever we mention a particular *effect*, this implies a causal relationship.

As a theoretical underpinning for the systematic literature review, we provide a revised presentation of an existing general TPD model (Merchie, Tuytens, Devos, & Vanderlinde, 2016). Based on the conceptual model, we develop five additional detailed research questions:

1) What are the student learning goals in financial literacy education?

[1] Although previous literature used these terms interchangeably, Taruna and Kumar (2015) reviewed these concepts and argue that financial competence refers to the ability to apply knowledge and understanding, while financial capability "can be viewed in terms of financial behaviour that is what people do and what people should be capable of doing." (Taruna & Kumar, 2015, p. 320).

2) Which types of teaching behaviours are desirable in financial literacy education?
3) What are the requirements with respect to teacher quality in financial literacy education?
4) How should the key features of teacher professional development be implemented in financial literacy education?
5) Which contextual factors play a role in financial literacy education?

To answer the research questions, we combine literature on general characteristics of effective TPD with insights into the professional development needs for financial education. This approach not only sheds light on the characteristics and effects of previous professional development initiatives, but also demonstrates which aspects require further research.

The rest of this paper is organised as follows. Section 2 presents a general TPD model, defining characteristics of effective TPD initiatives. Section 3 outlines the methodology, while Section 4 discusses the findings and their implications in relation to the structure of the general TPD model. More specifically, Section 4.1 describes the student learning goals that should be reached in financial education. This is followed by Section 4.2, which provides recommendations on teaching behaviour in financial education. Section 4.3 describes literature on the extent to which teachers currently possess the required knowledge, beliefs, attitudes and skills to teach financial topics. An overview of previous literature on the key features required for effective TPD in financial education is given in Section 4.4. Finally, Section 4.5 discusses literature related to the contextual factors that influence TPD initiatives in financial education. The discussion and suggestions for further research are provided in Sections 5 and 6, respectively.

2. A general TPD model as a basis for the review study

Desimone (2009) developed a conceptual framework to evaluate the influence of professional development on teacher and student outcomes. Five key features of professional development were included, since these particular characteristics had been shown to explain TPD effectiveness (Desimone, Porter, Garet, Yoon, & Birman, 2002; Garet, Porter, Desimone, Birman, & Yoon, 2001). The framework posits that content focus, active learning, coherence, duration and collective participation are the main requirements for successful professional development (Jeanpierre, Oberhauser, & Freeman, 2005; Johnson, Kahle, & Fargo, 2007; Penuel, Fishman, Yamaguchi, & Gallagher, 2007). The paragraph below explores these concepts in more detail.

Content focus is believed to have the most considerable impact on the effectiveness of professional development and refers to an initiative's aim to increase teachers' subject matter knowledge, as well as their knowledge of how this subject matter should be taught to students (Desimone, 2009; Guskey & Yoon, 2009). *Active learning* methods for teachers entail activities such as giving trial lessons or participating in discussions with colleagues, and are assumed to contribute to teacher learning to a larger extent than, for example, listening passively to an expert presentation (van Veen, Zwart, Meirink, & Verloop, 2010). The *coherence* of an initiative refers to the alignment with the curriculum and academic standards set at different organisational levels (Blank, de las Alas, & Smith, 2008; Desimone & Garet, 2015). The *duration* of professional development, which includes both the time span and the total number of hours spent, needs to be substantial to result in sustained impact on teacher performance (Desimone, 2009; Yoon, Duncan, Lee, Scarloss, & Shapley, 2007). A comparative study on the effects of TPD on student learning showed that programmes that lasted less than fourteen hours were ineffective (Yoon et al., 2007). Furthermore, it is typically recommended that follow-up activities are integrated throughout the year (Blank et al., 2008; Guskey & Yoon, 2009). *Collective participation* refers to the formation of professional learning communities (PLCs) of teachers that engage in activities together (Desimone & Garet, 2015). These communities could result in interaction and discussion, enhancing teacher learning (Desimone, 2009). The influence of the educational context is integrated in the model as an important mediator and moderator. Specifically, the model considers educational policy conditions, influential factors at school level and the individual characteristics of both students and teachers (Desimone, 2009).

There are several mediating factors between the TPD initiative and the eventual goal of improved student learning (Ingvarson, Meiers, & Beavis, 2005). As shown in Fig. 1, Desimone (2009) suggests that the five key TPD features increase teacher knowledge and skills, and affect teachers' attitudes and beliefs positively. This should in turn change classroom instruction and eventually lead to enhanced student learning. The arrows in the model portray that the relationships between the TPD outcomes are interactive, rather than that a linear pathway exists (Desimone, 2009). It could be possible, for example, that a particular event during instruction leads to a change in beliefs or attitudes. In addition, it has been emphasised that if one of the steps in the model is weak or missing, it becomes less likely that student learning will increase (Yoon et al., 2007).

Merchie et al. (2016) refined Desimone's model by means of a systematic narrative synthesis. They extended the model by adding subcomponents to the various steps, such as teacher quality and contextual factors. As Merchie et al. (2016) state: “This study adds to the literature as, to date, no such extended framework was available to more directly guide researchers and practitioners in the evaluation of professional development initiatives” (Merchie et al., 2016, p. 14). Among others, the authors distinguish between the core and structural features of TPD. The former relate to the initiative's content, while the latter are related to its design. Furthermore, they include additional key features, such as ownership of the initiative's content and setup, since teachers consider TPD to be more relevant when it aligns with their individual needs and motivations (Díaz-Maggioli, 2004; Merchie et al., 2016). With regard to the influences of TPD on teacher quality, Merchie et al. (2016) distinguish cognitive goals, affective goals and skills. Cognitive goals include increased content knowledge and pedagogical content knowledge (Shulman, 1986), while affective goals are, for example, teachers' attitudes about teaching styles or beliefs about the quality of one's own teaching, i.e., teacher efficacy. The final refinement discussed here relates to the change in instruction, or teaching behaviour. Merchie et al. (2016) divide this into instruction practices and interaction patterns. This implies that TPD could focus on, for example, the use of technology, as well as on enhancing the ability to integrate class differentiation (Merchie et al., 2016).

Despite adding valuable and evidence-based characteristics, the model proposed by Merchie et al. (2016) is presented in a linear

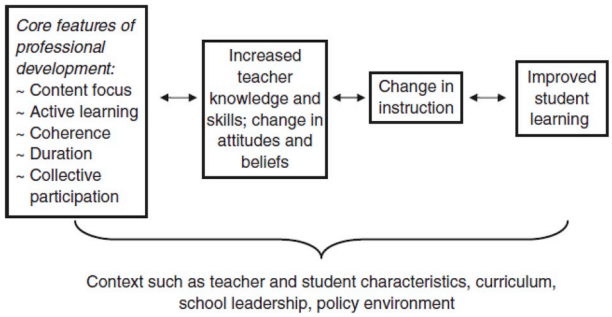

Fig. 1. Conceptual framework for evaluating the influence of TPD initiatives on student learning. Reprinted from: "Improving impact studies of teachers' professional development: Toward better conceptualizations and measures," by L.M. Desimone, 2009, *Educational Researcher,* 38(3), p. 185. Copyright 2009 by AERA.

manner and consequently does not highlight the interactivity of the different components in the model. Therefore, we propose the revised presentation of the conceptual model as demonstrated in Fig. 2. The visualisation in the form of an inner circle diagram emphasises the importance of the interaction between the different components in the model, as each circle has an influence on the other circles. This model is used as a basis for the literature review by examining to what extent each TPD concept in the model has been studied in the context of financial literacy education.

Strong support for the interactive, even circular character of different constituting and influencing aspects of TPD initiatives can be found in the work of Timperley and colleagues. Based on a research synthesis, ten key principles on successful teacher professional learning and development were identified (Timperley, 2008). A number of these key principles clearly situate on the level of TPD goals and the key features of professional development to reach these goals, others situate on the level of school leadership and context variables. The research synthesis from which these principles were deduced started from an extensive, linearly presented

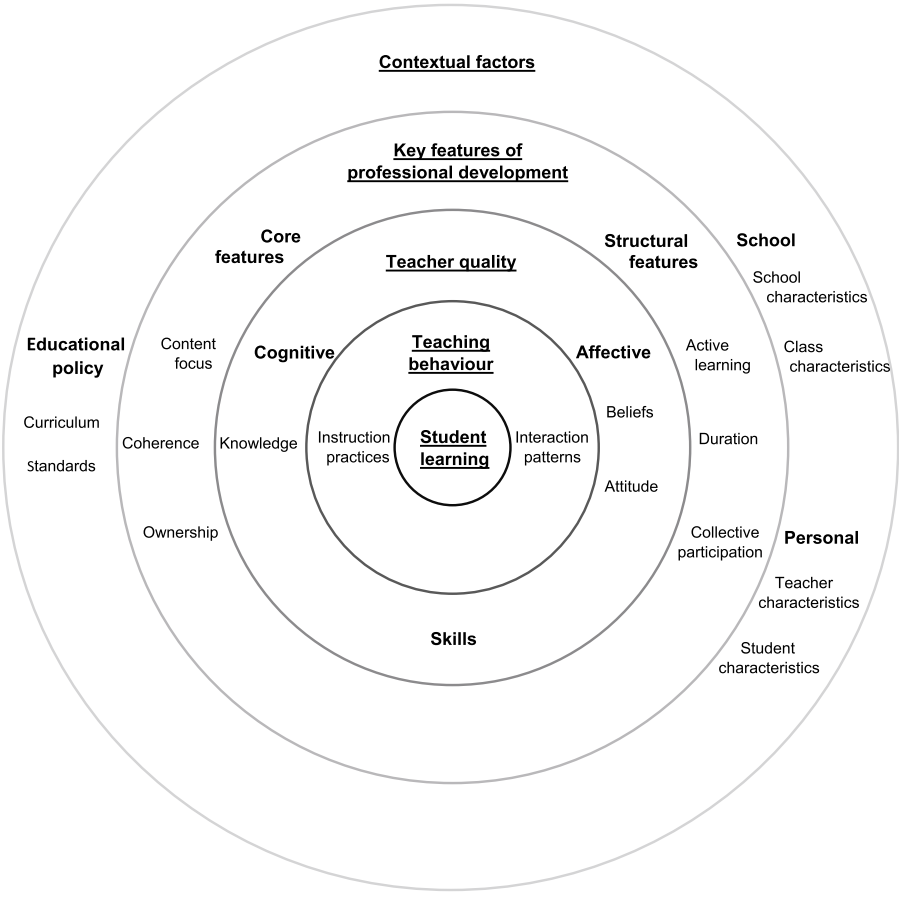

Fig. 2. The general TPD model used as a basis for the review.

'Framework for the Analysis of the Effectiveness of Professional Learning Experiences' (Timperley & Alton-Lee, 2008, p. 342) – which shares aspects with the model of Merchie et al. (2016). However, the authors realised that the different variables influencing TPD effectiveness are interdependent, which resulted in the need for an inquiry-based, cyclical model: "Teachers need to have a problem to solve, to have multiple opportunities to learn relevant pedagogical content and assessment knowledge in ways that integrate theory and practice, and to maintain a constant focus on how teaching affects students. Better outcomes for students are sustained when the organisational conditions support ongoing evidence-informed inquiry into the impact of practice on students. Take any of the ingredients out, and its impact is likely to diminish." (Timperley & Alton-Lee, 2008, pp. 358–359).

The inner circle diagram proposed in the present paper highlights that the ultimate goal of TPD is *student learning*. The second circle represents *teaching behaviour* in the classroom, since this impacts student learning most directly. The third circle describes the required *teacher quality* aspects which should be enhanced by professional development. The fourth circle encompasses the *key features of professional development*. The outer circle consists of *contextual factors* at three different levels, which impact the inner circles of the model. The context in which teachers operate is relevant, as it determines both the leeway that teachers have (such as whether teachers have to teach in stand-alone initiatives, or in a comprehensive curriculum), the didactical approaches that can be adopted (for instance due to school and class characteristics), and the need for differentiated teaching styles (due to heterogeneous class composition). In other words, the environment in which TPD takes place is typically an exogenous factor that influences the teacher, the content taught, and the TPD initiative in itself. The contextual factors also include classroom-level characteristics, since we believe that this enhances the completeness of the model.

3. Methodology

We investigate which elements are essential to effective TPD in the context of financial education by means of a systematic, comprehensive literature review. We followed the guidelines for systematic reviews as proposed by the Cochrane Collaboration (Higgins & Green, 2011).

In order to retrieve studies that gathered empirical, quantitative data on financial literacy (education), the following study types were considered for inclusion in this review: experiments, quasi-experiments, surveys and correlational studies. These identification strategies and empirical designs allow us to deduce causal interpretation of the results (in the case of experiments or quasi-experiments, or provide relatively general insights in the underlying patterns (in the case of surveys and correlational studies). Moreover, besides high internal validity, these empirical techniques typically avoid us from taking conclusions from studies with small samples sizes. Sample sizes ranged from 12 to 647 participating teachers, and from 53 to approximately 25000 participating students. Studies with smaller numbers of participants were included only if the experimental design was convincing (for example combined with qualitative research methods).

Eligible were studies that focused on primary or secondary education. This implies that study participants could be children or adolescents in the corresponding age groups, teachers, students in teacher education programmes, or a combination of these. When the intervention type consisted of a financial education programme that was not school-based, it was excluded. These initiatives are namely more prone to selection bias, and hence, result in endogenous estimates. While the outcome measures did not form part of the inclusion criteria, typical measures of interest were (changes in) the financial literacy of students and teachers.

The electronic search was run in November 2017, and was restricted to articles that were published between 2000 and 2017, and articles that were written in English. Since important and valuable knowledge might be contained in sources other than academic journals, especially in social science research (Grayson & Gomersall, 2003), book chapters, dissertations and working papers were also eligible for selection. Conference papers were excluded. In line with the systematic review on financial education programmes for children and adolescents by Amagir, Groot, Maassen van den Brink, and Wilschut (2018), the following databases were used: ERIC, Econlit, Business Source Premier and Web of Science. The search terms consisted of *'financial literacy'*, *'financial education'* or *'financial capability'* in combination with keywords (and their synonyms) derived from the proposed TPD model outlined above. Table 1 presents an overview of the search strategy and search terms that were used.

In addition to the electronic search outlined above, articles published in journals that focus specifically on financial or economics education were included, provided that the criteria had been met. In particular, we considered articles in the following resources: *Journal of Financial Counseling and Planning, Journal of Financial Education, Advances in Financial Education, Journal of Economic Education* and *International Review of Economics Education*.

To analyse the records that resulted from the search strategy, the first author screened the titles and abstracts. When the initial screening did not suffice, the full texts were retrieved to decide whether the article met the inclusion criteria. In case of doubt, the second and third author were consulted. The final list of included articles was agreed upon by all authors.

The electronic search strategy resulted in 961 unique records, 46 of which met all criteria. The search for articles in specific journals led to six additional relevant articles. Of the 52 resulting records, the majority consisted of peer-reviewed articles; seven other documents were included. Most articles were published in journals that focus on financial and/or economics education, followed by those focusing on (applied) finance, economics, business and/or consumer studies, and (teacher) education. The number of records classified as experimental or quasi-experimental is comparable to the number of records classified as survey or correlational. The majority of included studies were conducted in the United States and Europe, the remainder had investigated financial literacy in Asia, New Zealand, Australia, Africa and South America, or performed international comparisons. As a result, this review is able to give a rather unbiased view on the current state of affairs worldwide.

While the keywords from the TPD model formed the basis for the search and the construction of the underlying database used in this review, the insights of the resulting articles are structured and discussed along the theoretical model developed in Section 2. An

Table 1
Electronic search strategy.

Search terms included in title (TI) and abstract (AB)				
Financial literacy				
Financial education				
Financial capability				
Search terms included in full text (TX All)				
Student learning	*Teaching behaviour*	*Teacher quality*	*Key features PD*	*Contextual factors*
Student learning	Instruction	Teacher	Professional development	Context
Student outcome	Interaction	Educator	Professionalization	Learning environment
Financial knowledge	Differentiation	Teacher knowledge	Teacher training	Student characteristics
Financial attitude		Teacher beliefs	Content	Student differences
Financial behaviour		Teacher attitudes	Coherence	Teacher characteristics
			Ownership	Classroom climate
			Active learning	School climate
			Duration	Curriculum
			Collective participation	
			Cooperation	

Note. Boolean operators were used during the electronic search. The 'OR' operator was used to select one out of the three search terms that should be included in the title or abstract, the 'AND' operator was used to combine one of these search terms with one of the other keywords or synonyms derived from the general TPD model.

overview of the included references that directly emerged from the search, is provided in the appendix.

4. Results

Drawing on the conceptual framework presented in Fig. 2, this section provides an overview of existing literature on TPD in the financial education context, and how this could serve as a starting point for the design of TPD initiatives. Additionally, it reveals whether and where additional research is required. Each subsection starts with a description of the literature, followed by its implications for TPD, or TPD research, in financial literacy education.

4.1. Student learning goals in financial literacy education

The inner circle of the diagram in Fig. 2 is student learning, which is the goal of any TPD initiative (Desimone, 2009; Merchie et al., 2016). Since financial literacy education strives to increase students' financial literacy levels, the latter are considered as the ultimate student learning goal. The conceptualisation of our definition of financial literacy implies that this learning goal covers three major concepts: financial knowledge, financial attitude and financial behaviour (Atkinson & Messy, 2012; Van Campenhout et al., 2017). These are explored in more depth below.

4.1.1. Discussion of literature

Financial knowledge refers to the student's awareness and understanding of financial terms, concepts, products and services (Yoong et al., 2013). In addition, it captures the numeric abilities of students that are required to apply this understanding in a financial context (Arceo-Gómez & Villagómez, 2017). A distinction can be made between knowledge of basic financial concepts, such as inflation and compound interest, and knowledge of more sophisticated ones, such as risk diversification (Erner, Goedde-Menke, & Oberste, 2016).

Financial attitude refers to the extent to which the long term is favoured over the short term (OECD, 2016b). A person's ability to delay gratification has been demonstrated to positively impact retirement planning, credit scores and saving (Migheli & Moscarola, 2017). In addition to intertemporal preferences, a student's attitude towards risk could be considered, as this is relevant in for example stock investments, insurance and retirement savings (Cameron, Calderwood, Cox, Lim, & Yamaoka, 2014).

Financial behaviour has been stated to eventually determine one's level of financial capability (Yoong et al., 2013). In Yoong et al. (2013), the following four types of relevant financial behaviour were distinguished: taking care of everyday finances, finding the correct balance between saving, spending and borrowing taking current and future needs into account, ensuring protection against financial risks, and selecting and using financial products and services appropriately.

4.1.2. Implications for TPD

Our review of previous literature on financial literacy education indicates that programmes rarely provide details on the TPD initiative they offered teachers, so that it remains unclear to what extent, and how, TPD prepared them to help students reach the underlying learning goals. This is unfortunate, since it could be expected that these goals serve as a starting point for TPD. Moreover, it is not clear if and how existing initiatives were paying attention to the interaction between the three aspects of financial literacy.

However, the results demonstrate that multiple programmes that offered teacher training evaluated student performance on a

combination of all three financial literacy components (Batty, Collins, & Odders-White, 2015; Bruhn, de Souza Leão, Legovini, Marchetti, & Zia, 2016). This may imply that the TPD initiatives explicitly strived to develop teachers' skills to influence students' financial knowledge, attitudes and behaviour.

4.2. Teaching behaviour in financial literacy education

The second level of the circle diagram is teaching behaviour in the classroom, which has a direct influence on student learning (Desimone, 2009). As indicated by Merchie et al. (2016), a distinction can be drawn between instruction practices and interaction patterns.

4.2.1. Instruction practices

4.2.1.1. Discussion of literature. The fact that the financial environment is rapidly changing has implications for the instruction practices of teachers that provide financial education. It no longer suffices to increase students' knowledge of current financial matters (Van Campenhout et al., 2017). Instead, teachers should develop students' financial attitudes and behaviour in order to prepare them for financial decision-making in the future (Amagir et al., 2018). After all, the ability to make appropriate financial decisions is not static, but is developed continuously throughout people's lives as they adapt to new experiences and contexts (Ali, McRae, & Ramsey, 2014). Furthermore, multiple studies have demonstrated that increases in financial knowledge only influence financial attitude and behaviour to a limited extent, indicating that a sole focus on knowledge transfer is not sufficient to improve financial decision-making (e.g., Batty et al., 2015; Jang, Hahn, & Park, 2014).

4.2.1.2. Implications for TPD. To ensure positive changes in all three concepts of students' financial literacy, TPD efforts should equip teachers with the required pedagogical knowledge and skills. However, for none of the TPD initiatives part of the studies included in this review, it was explicitly reported that teachers received instructions on how they could develop students' financial attitudes and behaviour, in addition to their financial knowledge. Similarly as described in Section 4.1.2., it could at most be assumed that for those studies who evaluated changes in student performance on all three concepts, the focus on this particular instruction practice was part of the TPD initiative.

4.2.2. Interaction patterns

4.2.2.1. Discussion of literature. With respect to the interaction patterns, as a second aspect of teaching behaviour, existing literature has recommended multiple aspects. The first posits that financial education teachers should create learning environments that stimulate experiential learning. Learning by doing is desirable since it goes beyond knowledge and enhances students' abilities to apply their knowledge and skills in practice (Brancewicz, Pattison, & Fok, 2014). Furthermore, teaching methods that support creativity and initiative are thought to generate enthusiasm about the subject matter (Belás, Nguyen, Smrčka, Kolembus, & Cipovová, 2016; Haynes & Chinadle, 2007). The literature search revealed that previously developed financial education programmes allowed students to gain practical experience by using active, hands-on methods such as simulations (Brancewicz et al., 2014; Carlin & Robinson, 2012a; Gill & Bhattacharya, 2015; St.Pierre, Simpson, Moffat, & Cothren, 2011), case studies (Belás et al., 2016; Bruhn et al., 2016), games (Migheli & Moscarola, 2017; Varcoe, Martin, Devitto, & Go, 2005), saving clubs (Berry, Karlan, & Pradhan, 2015; Sherraden, Johnson, Guo, & Elliott III, 2010), and financial fitness camps (Bhattacharya, Gill, & Stanley, 2016). Carlin and Robinson (2012b) demonstrated that the learning processes of students who attended in-class financial literacy training before visiting Finance Park – an experiential learning centre – were more favourable than those of students who did not receive this training before their visit. This implies that experiential methods might complement, rather than substitute, more traditional teaching methods.

The second recommendation follows from the general insight that using examples from students' daily lives, increases their perceptions of relevance (e.g. OECD, 2014b). Thus, ensuring this alignment in financial literacy education would help to make the financial subject matter contextually meaningful, and to enhance students' motivation (Sawatzki, 2017; Sawatzki & Sullivan, 2017; Sherraden, Johnson, Guo, & Elliott, 2010). Furthermore, studies advise that the content should include explicit links to students' current, as well as future lives (Asarta, Hill, & Meszaros, 2014; Brancewicz et al., 2014).

Third, financial education teachers are encouraged to differentiate their lessons according to the characteristics which might differ between students and which are of particular relevance in financial education (Van Campenhout et al., 2017).[2] Taking these differences into account allows teachers to improve the learning of all students and thus to help them reach their potential (Castelein et al., 2016; Tomlinson, 2008). Despite this recommendation, no studies carried out to date seem to have investigated or integrated this interaction pattern in the financial education context.

4.2.2.2. Implications for TPD. Previous studies demonstrate the feasibility of experiential learning for financial literacy education. In a few studies, the TPD initiative encouraged teachers to apply this strategy and provided them with inspiration on which methods they could employ (Sawatzki, 2017; Sawatzki & Sullivan, 2017). Since external factors such as instruction time and budget may limit the scope of teachers' options, these should be considered.

In correspondence with the literature on the alignment of teacher instruction with students' daily lives, the TPD initiatives described by Sawatzki (2017) and Sawatzki and Sullivan (2017) strongly recommended teachers to help students see the relevance of

[2] These characteristics will be elaborated on in Section 4.5.4.

the financial literacy tasks that they needed to solve. However, previous literature does not provide insight in how TPD could train teachers to transform their content knowledge and skills into targeted classroom instruction. Since existing literature has not yet examined the exact role of differentiated instruction in financial education, we consider this as an area for future research.

4.3. Teacher quality in financial literacy education

Professional development is assumed to primarily affect the quality of the teacher, which is the third level of the general TPD model. The aspects of teacher knowledge, beliefs, attitudes and skills are included (Desimone, 2009; Merchie et al., 2016). Here, results from the systematic review provide insight into the state-of-the-art when it comes to these aspects in the financial education context.

4.3.1. Knowledge

4.3.1.1. Discussion of literature. One of the prerequisites of teachers is that they are sufficiently knowledgeable about 1) the subject matter they teach and 2) how they could develop students' understanding of this particular matter (Shulman, 1986). When knowledge of financial topics is concerned, Otter (2010) demonstrated that teachers in the United States had an average score of only 37.5% on a financial knowledge test. This finding presumably results from a lack of background in these matters: only 8.8% of U.S. teachers followed a personal finance course in college, and fewer than 3% took a course about teaching financial matters (Way & Holden, 2009). Similarly, in Belgium, the financial knowledge scores of students in teacher education programmes suggest that 84% of students have insufficient knowledge to provide financial education (De Moor & Verschetze, 2017).

4.3.1.2. Implications for TPD. Since students in teacher education programmes are not well prepared for teaching financial topics, it has been recommended to invest in financial training as part of teacher education programmes (BenDavid-Hadar, 2015; De Moor & Verschetze, 2017). This would ensure that the teachers of the future have the required knowledge and skills to provide financial education effectively. However, this measure does not solve the issue of current teachers lacking the teacher quality needed. Therefore, there is an urgent need for professional development. Furthermore, since the financial world is constantly evolving, teachers' (and students') financial knowledge, attitudes and behaviours need to be continuously adapted, so that TPD remains relevant over time.

4.3.2. Beliefs

4.3.2.1. Discussion of literature. The article by Merchie et al. (2016) proposes two types of beliefs that could be influenced by TPD initiatives: beliefs about learning and teaching, and beliefs about one's competences as a teacher. There is no existing literature that relates the first type of teacher beliefs to financial literacy education. On the other hand, multiple studies in the financial literacy context examined teachers' beliefs about their competences as a teacher, i.e., teacher efficacy. Teacher efficacy has a considerable influence on teacher performance, and additionally correlates with student motivation and achievement (Tschannen-Moran & Hoy, 2001). However, Way and Holden (2009) reported that less than 20% of teachers feels well prepared to teach financial topics. In addition, Sawatzki and Sullivan (2017) found that while more than 75% of primary school teachers consider themselves financially literate, only 50% are confident about the related teaching skills.

Another type of beliefs considered in existing literature on financial literacy education, relates to the extent to which teachers perceive financial education at school to be relevant. It has been demonstrated that this belief is one of the factors influencing teachers' intentions to provide financial education (Teo, Koh, & Lee, 2011). Previous studies showed that the majority of teachers believe that financial education should be implemented, and that it would help increase the low levels of students' financial literacy (Neill, Berg, & Stevens, 2014; Samkin, Low, & Taylor, 2012).

4.3.2.2. Implications for TPD. Previous studies argued that teacher training is crucial to establish teachers' confidence with the financial content they teach in class (e.g., Haynes & Chinadle, 2007). Especially since teacher efficacy is suggested to be a requirement for changes in teaching behaviour to occur (Merchie et al., 2016), enhancing efficacy should be one of the major aims of TPD initiatives. Still, the study by Hensley, Jurgenson, and Ferris (2017) is one of the few studies in which changes in confidence levels of financial education teachers were evaluated.

Since the literature shows that the vast majority of teachers agree on the importance of financial education at school, it seems that TPD initiatives do not need to convince participating teachers of its relevance. However, it may be required to establish common ground concerning best practices in *how* financial education should be provided, since teachers differ in their beliefs on aspects such as its place in the curriculum (Loibl & Fisher, 2013; Otter, 2010).

While no studies so far have examined the interaction between teachers' general beliefs on learning and teaching and how they design financial education lessons, there is a vast amount of research on the interaction between beliefs and practice in general (e.g., Buehl & Beck, 2015). For example, it has been demonstrated that often, teachers' beliefs are not in favour of shaping activating, experiential lessons (e.g., Richardson, 1996). Since these practices were recommended in the context of financial literacy education (e.g., Brancewicz et al., 2014), TPD initiatives should strive to change these beliefs positively. The potential of TPD initiatives to alter teachers' beliefs on experiential learning, and to eventually change instruction practice, was shown by Girvana, Conneely, and Tangneya (2016).

4.3.3. Attitudes

4.3.3.1. Discussion of literature. While changes in attitudes are usually regarded as an outcome of TPD (Desimone, 2009; Merchie et al., 2016), it is relevant to examine teachers' attitudes towards engaging in professional development in the first place. Previous studies showed that teachers are generally open to improving their own financial literacy (Otter, 2010), and that 85% of teachers would be willing to engage in professional development for teaching financial education (Sawatzki & Sullivan, 2017).

A desirable outcome of TPD in financial education would be that teachers have positive attitudes towards differentiated instruction, since this is one of the recommended interaction patterns (e.g., Van Campenhout et al., 2017). These attitudes have not yet been examined in this particular context. However, context independent studies showed that teachers agree on the benefits of differentiation for their students, but that the additional time and effort that is required while preparing classes, result in concerns about its feasibility (OECD, 2014b; Tomlinson, 2008).

4.3.3.2. Implications for TPD. It is promising that existing literature demonstrated that teachers are motivated to engage in TPD initiatives for financial education. The next step is to ensure that the TPD is designed in such a way that teachers' expectations are met. The six key features of the general TPD model, and the ownership feature in particular, could serve as a relevant starting point.

With regard to teachers' attitudes towards differentiation, the literature seems to indicate that teachers are in need of strategies that help them to implement differentiated instruction in a time-efficient manner. Offering these strategies in a TPD initiative, in addition to developing the knowledge and skills that are needed to integrate differentiation in teaching behaviour, might help teachers' attitudes towards this interaction pattern to become more positive. Indeed, previous literature demonstrated that engaging in TPD initiatives on differentiated instruction, resulted in enhanced self-efficacy and greater levels of applying this practice in the classroom (Dixon, Yssel, McConnell, & Hardin, 2014).

4.3.4. Skills

4.3.4.1. Discussion of literature. Instruction practices and interaction patterns have frequently been described as aspects of teaching behaviour, yet there is a lack of literature on the current state of affairs concerning teachers' skills when it comes to financial education. However, the general lack of teacher efficacy in financial education (e.g., Sawatzki & Sullivan, 2017) could be regarded as indirect evidence of current skills shortage.

4.3.4.2. Implications for TPD. The discussion of literature implies that up to date, little is known about the extent to which teachers have the skills that are required to teach financial topics. Future research would be needed to reveal which skills should be developed during TPD and how this could best be achieved. However, since the current literature provides insight in the instruction practices and interaction patterns that are desirable for financial education, it seems probable that TPD initiatives would minimally cover these aspects.

4.4. Key features of professional development in financial literacy education

This section reviews the literature on financial literacy education for each of the six key features included in the general TPD model, which are shown in the fourth circle of the diagram in Fig. 2. Since the key features are inherent to TPD, Section 4.4.7 combines their implications in one paragraph.

4.4.1. Content focus

Teo et al. (2011) demonstrated that the ease with which financial matters can be learned and taught contributes to teachers' intention to provide financial education. To this end, the authors recommended providing teachers with learning aids and teaching materials as part of TPD (Teo et al., 2011). This review demonstrates that teachers generally are provided with materials aimed at enhancing their (pedagogical) content knowledge. Some of the ways in which this knowledge is transferred include expert presentations (Hensley et al., 2017), teacher guides (e.g., Becchetti, Caiazza, & Coviello, 2011; Varcoe et al., 2005), modelled lessons (e.g., Asarta et al., 2014; Sawatzki, 2017; Sawatzki & Sullivan, 2017), online support (e.g., Bruhn et al., 2016; Hospido, Villanueva, & Zamarro, 2015) and pre-recorded training sessions (e.g., Hagedorn, Schug, & Suiter, 2016). Despite this variety in methods, the current literature provides little insight into exactly which content should be covered by the TPD initiative. First, evaluations usually focus on the content of the entire programme, rather than on the content of the professional development initiative. Thus, while studies might have been able to show the effectiveness of financial education as a whole, it is uncertain what role the initiative – and especially the content covered – played in this success. Second, it is difficult to compare articles in terms of the integration of content focus, since the overall setup and context of the programmes differ widely. Since content focus is an important factor in TPD (Desimone, 2009), future studies of financial education should evaluate different types of knowledge transfer, as well as the content covered, in more depth.

4.4.2. Coherence

Coherence denotes the TPD initiative's alignment with the curriculum, academic standards and policy reforms (Blank et al., 2008; Yoon et al., 2007). In the context of financial education we observe that, for a variety of reasons, many of the TPD initiatives evaluated can be considered coherent. First of all, a number of programmes were explicitly developed in response to national standards (e.g., Hospido et al., 2015). Second, they usually aimed to provide teachers with instructions about a specific programme, rather than more general or unrelated information. This can be regarded as a means of ensuring alignment. Although none of the

articles explicitly mentions having focused on coherence, the importance of implementing standards and designing targeted initiatives for teachers generally seems to have been recognised.

4.4.3. Ownership

Hensley et al. (2017) conducted one of the few studies that expressly strived to evaluate a TPD initiative in the financial literacy education context. In addition, the study was relatively rare in integrating the aspect of ownership. Whereas in Batty et al. (2015), ownership was implemented by allowing teachers to choose which breakout session to attend during the TPD initiative, Hensley et al. (2017) applied the 'teacher-as-learner' approach. The aim was to increase secondary school teachers' own financial literacy, which would enhance their preparedness for providing financial education. The material was developed so that it could be linked to teachers' personal finances and their future plans, thus increasing perceived relevance and meaning. The 'teacher-as-learner' approach was found to enhance self-reported financial literacy and confidence in teaching, as well as more integration of financial content in the classroom. However, the ownership feature was not evaluated in isolation. This implies that the study by Hensley et al. (2017) is unable to provide direct evidence for the beneficial influence of ownership. Furthermore, while these are promising findings, the lack of similar studies makes it impossible to replicate the effectiveness of the approach or to reveal complementary efforts that could enhance its success.

4.4.4. Active learning

In the Family Economics and Financial Education (FEFE) project, teachers were invited to attend a training week in which one of the activities was to write additional material for the programme (Haynes & Chinadle, 2007). This approach does not only give substance to the concept of active learning, but also to ownership. In fact, it allows to stretch the ownership feature from being related exclusively to the content of the TPD initiative (as in Section 4.4.3.), to the approach the teacher prefers to deploy in the classroom. Haynes and Chinadle (2007) reported that expert teachers regularly adapted the curriculum based on their own classroom experiences, and that the project as a whole was found to be effective. However, since no details were provided on the evaluation of the professional development initiative, there is no direct evidence that the features of active learning and ownership contributed to this success. While the benefits for teachers of active and experiential learning during professional development have generally been established, few other financial education initiatives seem to have applied these methods. Exceptions are the studies by Batty et al. (2015) and Hensley et al. (2017), whose TPD initiatives included active learning in the form of discussions about the programme's lessons or money-related issues.

4.4.5. Duration

Of the articles that reported the duration of the professional development initiative, all lasted between a few hours and one week. The majority, however, lasted only one day. Considering that, in general, at least fourteen hours of training is required to have a lasting impact on teacher performance (Yoon et al., 2007), these are discouraging results. Studies have also recommended spreading the activities throughout the year in the form of follow-up activities (Blank et al., 2008; Desimone, 2009; Guskey & Yoon, 2009). In the context of financial education, teachers themselves appear to be in favour of a support network continuing after the initial TPD initiative (Otter, 2010). However, the study by Asarta et al. (2014) is unique in inviting teachers back to keep them up to date on financial affairs. A few other studies reported to have organised a follow-up activity, but this was in the form of an evaluation session of the programme. Since none of the studies varied in duration and compared the effects of this, little can be concluded about the influence of TPD duration. Interestingly, programmes in which teachers received only a few hours of training were still able to improve student performance, and even in the longer run (e.g., Batty et al., 2015). A potential explanation for this finding is that the implementation of financial education at a school could make a significant difference, despite the limited duration of the TPD initiative.

4.4.6. Collective participation

Strong support for the integration of collective participation in financial education TPD initiatives was found by Otter (2010), when teachers reported being in favour of peer interaction during professional development. In Pang (2010), two groups of teachers were formed in which teachers co-designed financial literacy classes. The study examined the effects of these classes on student performance, but did not assess teacher learning. Collective participation was also included in studies by Batty et al. (2015) and Hensley et al. (2017), though to a lesser extent than in Pang (2010), since it took the form of small group discussions. The results of Batty et al. (2015) showed that after the TPD, 85% of the teachers felt either mostly or very prepared to teach the lessons. Furthermore, students gained knowledge of financial topics, which provides support for the effectiveness of the programme as a whole.

4.4.7. Implications for TPD

Reviewing the literature on the key features of TPD revealed some consistent findings. Since few studies on financial education described the details of the TPD initiative, there is little evidence on the integration of the key features. Furthermore, none but one of the studies evaluated the TPD initiative in isolation, which inherently implies that the effects of the separate features were not examined either. Consequently, there is a need for future research that separates the key features and compares the effects on teacher quality, teaching behaviour, and student learning. This would allow to gain insight into how the features should be integrated to optimize the effectiveness of TPD initiatives.

An alternative perspective for future research concerns examining the potential of professional learning communities (PLCs) as a form of TPD in financial literacy education. This is in line with growing evidence on the benefits of bringing teachers together in

learning environments in which they are triggered to learn from and with each other (Muijs et al., 2014; Schelfhout, 2017; Stoll, Bolam, McMahon, Wallace, & Thomas, 2006). Admiraal, Lockhorst, and van der Pol (2012) identified the following main components of PLCs: the development of a group identity, a common teaching domain, shared goals and room for interaction. A major benefit of a PLC is that all key features of the general TPD model can be integrated (Binkhorst, 2017). Besides that collective participation is inherently included, PLCs often aim to translate teachers' knowledge into classroom practice, so that content knowledge and pedagogical knowledge are both part of the TPD (Binkhorst, 2017; van Keulen, Voogt, van Wessum, Cornelissen, & Schelfhout, 2015). PLCs can also integrate active learning methods, for example when teachers co-create educational material (van Keulen et al., 2015). In addition, teachers are likely to experience feelings of ownership and coherence, since they can influence the content and process of the professional development, aligning it with their own goals and with those of their students (Binkhorst, 2017). Since teachers meet on a regular basis and over longer periods of time, PLCs also allow for sustained duration (Binkhorst, 2017; Vangrieken, Meredith, Packer, & Kyndt, 2017). Especially since financial education teachers reported being in favour of interaction with colleagues during professional development (Otter, 2010), future studies are encouraged to set up PLCs and to evaluate their effects on teacher quality, teaching behaviour and student learning.

4.5. Contextual factors in financial literacy education

Finally, teacher professional development always takes place within a certain educational context (Timperley, 2008). These contextual factors play an important role in the development of TPD initiatives as they influence teacher quality, teaching behaviour and the extent to which student learning goals can be reached (Desimone, 2009; Merchie et al., 2016).

4.5.1. Educational policy

4.5.1.1. Discussion of literature. One educational policy with implications for TPD concerns the place of financial education in the curriculum. Farinella, Bland, and Franco (2017) demonstrated that a stand-alone money management subject could not be associated with increased financial literacy levels, while the inclusion of this content in another subject was found to be influential. This partly contrasts Parrish and Servon (2006), who state that at primary school level, financial education could be integrated in different subjects, while at secondary school level, a stand-alone subject would be recommended. Walstad, Rebeck, and Richard (2010) found that programmes for secondary school students can significantly improve financial literacy, regardless of which subject they are integrated in.

Both cross-curricular and stand-alone approaches have advantages. The former approach might be easier to implement in already overcrowded curricula. This is especially relevant since in financial education, lack of time is considered one of the most challenging aspects (Klemme, 2002; Neill et al., 2014). Furthermore, this approach enables the subject matter to be taught in a more structured manner, and over multiple school years (Van Campenhout et al., 2017). From a TPD point of view, however, providing a specific type of education as a stand-alone subject is considered as more efficient. This will be elaborated on in Section 4.5.1.2.

Another aspect on the policy level that plays a role in the development of TPD is the setting of academic standards. In the financial education context, a lack of standards is often reported as a reason for teachers not to engage in teaching financial matters (Godsted & McCormick, 2007). Several suggestions have been made with respect to the development of such standards. For example, Tennyson and Nguyen (2001) found that specifically described standards for financial education programmes increase student learning to a larger extent than standards described in broader terms.

4.5.1.2. Implications for TPD. The eventual decision of policy makers on whether financial education is provided cross-curricularly or as a stand-alone subject, influences the setup of TPD initiatives. In particular, developing initiatives for teachers who teach similar subjects and have similar backgrounds is likely to be less challenging than catering for a wider variety of teachers, which is the case in a cross-curricular setup. With regard to financial education, it has been demonstrated that teachers from different disciplines vary in their beliefs on, for example, the content that should be covered (Loibl & Fisher, 2013). Still, Baron-Donovan, Wiener, Gross, and Block-Lieb (2005) showed the feasibility of training teachers from a variety of backgrounds to provide financial education.

Similar as for the place of financial education in the curriculum, the academic standards ultimately set by national authorities provide an important starting point for the development of TPD initiatives. By prescribing which teachers should eventually provide financial education and which student learning goals should be reached, educational policy strongly impacts the implementation of financial education itself, as well as the related TPD.

4.5.2. School and class characteristics

4.5.2.1. Discussion of literature. A variety of factors at the school and class level influence teachers' access to TPD, as well as its setup, content and effectiveness. At the school level, the general characteristics that could be identified include school leadership, school climate, school size and the socioeconomic status of a school (Goldhaber, 2002; Merchie et al., 2016; OECD, 2014b). In the context of financial education, the difference between private and public schools has been examined in particular (e.g., Bover, Hospido, & Villanueva, 2018). Previous research in financial education emphasised the importance of classroom context, since the classroom is the place where “values, beliefs, attitudes, expectations and motivations about money are stimulated […], or further verified or challenged” (Danes et al., 2013, p. 23).

4.5.2.2. Implications for TPD. None of the studies derived from the literature review mentioned whether TPD initiatives paid attention to school and class characteristics. While part of the characteristics are external factors for teachers, on which they have

little influence, it could be advantageous to train teachers on how these could best be dealt with. For example, TPD initiatives could focus on dealing with variations in class sizes, facilitating a safe classroom climate, or dealing with the heterogeneity of students in terms of socioeconomic status, prior knowledge, or interests (Castelein et al., 2016). These initiatives could be inspired by TPD initiatives on differentiated instruction (see Section 4.5.4).

4.5.3. Teacher characteristics

4.5.3.1. Discussion of literature. Teachers' individual characteristics play a role in their responses to professional development (Desimone & Garet, 2015). Examples of general characteristics are age, gender, educational level, subject(s) taught, income and years of teaching experience (Hensley et al., 2017). In the context of financial literacy, other relevant aspects include a background in financial affairs acquired during the study, and experience of providing financial education (Sasser & Grimes, 2010; Way & Holden, 2009).

4.5.3.2. Implications for TPD. Since the characteristics described above result in different teacher responses to TPD, previous literature recommended to organise differentiated TPD initiatives (Desimone & Garet, 2015). This would be an effective strategy to ensure that all participating teachers, despite differences in background, eventually develop the knowledge, beliefs, attitudes and skills necessary to provide financial education.

4.5.4. Student characteristics

4.5.4.1. Discussion of literature. The increasing diversity in student populations implies that students bring different realities to school, so that teachers need to be able to respond to a variety of different learning contexts (Danes et al., 2013; Tomlinson & Strickland, 2005). General factors that may vary between students include prior knowledge, interests, motivation, cognitive skills and the learning profile (Castelein et al., 2016; Mandell & Klein, 2007). There are a number of characteristics that are specifically relevant in financial education.

Financial inclusion could be defined as the access to and use of a range of appropriate financial products and services (OECD, 2016b). In a broader sense, it can be regarded as the extent to which a student has experience with money and financial products. This experience may exist in the form of having a bank account, receiving money gifts, or earning a salary from a student job (da Silva, Dal Magro, Gorla, & Nakamura, 2017; OECD, 2014a, 2017; Sohn, Joo, Grable, Lee, & Kim, 2012; Valentine & Khayum, 2005). Since financial inclusion makes students more confident with regard to using financial products, and provides an incentive to learn more about financial matters, positive correlations exist between financial literacy and financial inclusion (OECD, 2017).

Socioeconomic status (SES) is typically considered as a combination of parents' education and profession, wealth in the sense of having certain properties, and access to educational resources such as books (OECD, 2014a, 2017). Another aspect regularly considered, is whether there is a discrepancy between the language spoken at home and the one spoken at school (OECD, 2014a, 2017; Riitsalu & Põder, 2016). In all countries participating in PISA, students with a higher SES scored higher on financial literacy than those with a lower SES (Lusardi, 2015). This relation between SES and financial literacy was shown to be less strong among elementary school children (Sari, Fatimah, & Suyanto, 2017).

Two other influential factors are self-efficacy and self-confidence. Self-efficacy can be described as a person's confidence that his or her actions will eventually result in positive outcomes (Van Campenhout et al., 2017). It is assumed that higher levels of self-efficacy result in increased levels of desirable financial behaviour, especially when unexpected events occur (Van Campenhout et al., 2017). Arellano, Cámara, and Tuesta (2014) demonstrated that self-confidence in seemingly rather unrelated areas (such as study results and the student's place at school), can still correlate positively with financial literacy scores.

One of the characteristics most often examined in relation to financial literacy is gender. Evidence for the impact of gender on financial literacy scores is mixed. Agnew and Cameron-Agnew (2015) found support for PISA results, demonstrating that gender does not seem to have a significant influence on the financial literacy test scores of 15 year-old students (OECD, 2017). In contrast, Arellano, Cámara, and Tuesta (2015) showed that girls score worse than boys in the same age category. This in turn supports earlier studies (e.g., Lusardi, Mitchell, & Curto, 2010) indicating that women perform less well than men.

4.5.4.2. Implications for TPD. The existing literature on financial literacy provides a clear overview of specific characteristics that may differ between students. The differences between students might be considered as a threat or as a strength, depending on whether teachers are able to use these differences to improve the learning process. To prevent teachers from following a one-size-fits-all approach (Totenhagen et al., 2015), it is important that TPD initiatives make teachers aware of the variety of factors that influence students' financial literacy levels, and that they develop teachers' skills so that they will integrate differentiated instruction in their teaching behaviour.

5. Discussion

Given the importance of financial literacy for people's well-being, and given the considerable room for improvement in financial literacy levels among youth, national authorities are increasingly integrating financial education in schools (OECD, 2014b; 2016a, 2017). Although teachers play a major role in the transfer of financial knowledge, attitudes and behaviour, too little attention has been paid to teacher professional development. This systematic literature review contributes to existing literature by examining which elements are essential to effective teacher professional development in a financial literacy education context. A revised presentation of the general TPD model by Merchie et al. (2016), which emphasises the interactivity of the model's components, served as

a basis for the review.

Based on previous studies, this review suggested a few teaching behaviours to indicate how teachers can design financial literacy education. To prepare students for future financial decision-making, teachers should aim at developing students' financial attitudes and behaviours, rather than focusing too narrowly on increasing their knowledge. However, existing literature did not elaborate on how TPD initiatives could develop the required pedagogical knowledge and skills to apply this instruction practice. Another suggestion concerns introducing experiential learning both inside and outside the classroom. The results of the review indicate that many financial education programmes tested previously included forms of experiential learning. Studies also recommend aligning financial subject matter with students' everyday lives, and emphasise the importance of differentiated instruction. However, similar as for the previous suggestion, existing literature does not provide insight in how teachers should be trained to integrate these aspects in their teaching.

The review has resulted in a coherent picture of the quality required of teachers. Earlier research finds almost unanimously that the financial knowledge of teachers, and students in teacher education programmes, is insufficient to teach financial matters. TPD efforts and financial training are required to increase teachers' (pedagogical) content knowledge and to additionally improve teacher efficacy. Multiple studies revealed teachers to be in favour of engaging in professional development. However, there is a lack of literature examining teachers' attitudes towards the integration of differentiated instruction in financial education. In addition, teachers' current skills regarding financial education have not been directly assessed yet. The extent to which TPD initiatives should focus on developing teachers' skills, in addition to enhancing knowledge and changing their attitudes and beliefs where necessary, remains unclear.

This review further revealed that few studies described the TPD initiative in detail, such that it is unknown whether and how the general TPD model's key features were integrated. Additionally, the majority of studies evaluated the programme as a whole, rather than the TPD initiative or isolated features. This implies that to date, there is little insight in how the key features should be integrated to optimize the effect of TPD on teaching quality, teaching behaviour and student learning. While the 'teacher-as-learner' approach, combining the key features active learning and ownership, seemed promising, a lack of similar studies makes it impossible to replicate the effectiveness of the investigated approach, or to reveal complementary efforts that could enhance its success. An alternative suggestion for future research is the setup and evaluation of PLCs as a form of TPD, since all key features can be integrated.

Finally, this review provided an overview of the educational context of financial literacy education and its implications for TPD. The results demonstrate that the place of financial education in the curriculum and in academic standards serves as a starting point for the development of TPD initiatives. In addition, it was shown that the influence of school and class characteristics on teachers' access to TPD, as well as TPD effectiveness, has not yet been investigated in the context of financial education. In contrast, factors at the personal level were shown to have received extensive attention. Since differences in teacher characteristics could result in different responses to TPD in terms of teaching quality, teaching behaviour and student learning, previous literature suggested to design differentiated TPD initiatives. Furthermore, we observe that a large part of the literature assessed the factors that influence students' financial literacy, which might create a knowledge base for further TPD initiatives. In particular, to be able to handle student differences in aspects such as financial inclusion and socioeconomic background, it is important that TPD initiatives train teachers to integrate differentiated instruction in their teaching behaviour.

6. Future research

The results of this review indicate that clear evidence exists with regard to student learning goals in financial education, desirable teaching practices, required teacher quality and the contextual factors that play a role. However, they also reveal that existing literature tends to be scarce in describing TPD initiatives in financial education, and rarely evaluates the impact of TPD. As a result, there is a lack of studies systematically investigating the effectiveness of TPD initiatives – especially when it comes to the key features of the general TPD model. This implies that, despite the clear need for TPD in financial literacy education, there is currently little insight into how initiatives should be designed. In terms of future research, this review provides two broad avenues.

First, the review demonstrated the need for future studies that investigate the effectiveness of various types of TPD initiatives, which differ in how the key features are implemented. Harter and Harter (2012) is unique in comparing two different types of TPD initiatives in financial education, and demonstrated that both a teacher workshop and a graduate course in personal finance resulted in enhanced student scores compared to students whose teachers did not engage in TPD. While this research design allowed them to make a highly relevant contribution to the literature, it would be insightful if future studies would additionally investigate the influence of more subtle differences between initiatives, by slightly varying the implementation of the TPD key features (Desimone & Garet, 2015).

Second, as few studies provide details on the TPD initiatives in financial education programmes, future studies are encouraged to elaborately report on the design and content of the initiative. The importance of this aspect is demonstrated using the study by Swinton, DeBerry, Scafidi, and Woodard (2007) as an example. Their findings demonstrated that students whose teachers had attended a personal finance instruction workshop outperformed students whose teachers had not attended this workshop. This is one of the few studies that used empirical data to confirm the relevance of TPD in financial literacy education, but few details were provided on the setup of the TPD. As a result, the initiative's design could not be replicated or improved upon by other studies, which prevents benefiting from progressive insight.

Funding

This work was supported by the Research Foundation Flanders (FWO) through the programme 'Financial Literacy @ School' (grant number S000617N).

Acknowledgements

We are grateful to three anonymous referees and seminar participants at KU Leuven and IMT Lucca.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.edurev.2018.12.001.

References

Admiraal, W., Lockhorst, D., & van der Pol, J. (2012). An expert study of a descriptive model of teacher communities. *Learning Environments Research, 15*(3), 345–361. https://doi.org/10.1007/s10984-012-9117-3.

Agnew, S., & Cameron-Agnew, T. (2015). The influence of consumer socialisation in the home on gender differences in financial literacy. *International Journal of Consumer Studies, 39*, 630–638. https://doi.org/10.1111/ijcs.12179.

Alberta Educaton (2015). Literacy - definition, components and elements of the progressions. Retrieved from https://education.alberta.ca/literacy-and-numeracy/literacy/everyone/what-is-literacy/.

Ali, P., McRae, C., & Ramsey, I. (2014). Financial literacy and financial decision making of Australian secondary school students. *Australian Business Law Review, 42*(3), 228–233.

Amagir, A., Groot, W., Maassen van den Brink, H., & Wilschut, A. (2018). A review of financial-literacy education programs for children and adolescents. *Citizenship, Social and Economics Education, 17*(1), 56–80. https://doi.org/10.1177/2047173417719555.

Aprea, C., Wuttke, E., Breuer, K., Koh, N. K., Davies, P., Greimel-Fuhrmann, B., et al. (2016). *International handbook of financial literacy.* Singapore: Springer.

Arceo-Gómez, E. O., & Villagómez, F. A. (2017). Financial literacy among Mexican high school teenagers. *International Review of Economics Education, 24*, 1–17. https://doi.org/10.1016/j.iree.2016.10.001.

Arellano, A., Cámara, N., & Tuesta, D. (2014). *The effect of self-confidence on financial literacy. Working paper.* BBVA Research.

Arellano, A., Cámara, N., & Tuesta, D. (2015). Explaining the gender gap in financial Literacy: The role of non-cognitive skills. *Economic Notes, 47*(2–3), 495–517. https://doi.org/10.1111/ecno.12113.

Asarta, C. J., Hill, A. T., & Meszaros, B. T. (2014). The features and effectiveness of the Keys to Financial Success curriculum. *International Review of Economics Education, 16*, 39–50. https://doi.org/10.1016/j.iree.2014.07.002.

Atkinson, A., & Messy, F. (2012). *Measuring financial literacy: Results of the OECD/International Network on Financial Education (INFE) pilot study.* Paris: OECD Publishing.

Baron-Donovan, C., Wiener, R. L., Gross, K., & Block-Lieb, S. (2005). Financial literacy teacher training: A multiple-measure evaluation. *Journal of Financial Counseling and Planning, 16*(2), 63–75.

Batty, M., Collins, J. M., & Odders-White, E. (2015). Experimental evidence on the effects of financial education on elementary school students' knowledge, behavior, and attitudes. *Journal of Consumer Affairs, 49*(1), 69–96. https://doi.org/10.1111/joca.12058.

Becchetti, L., Caiazza, S., & Coviello, D. (2011). Financial education and investment attitudes in high schools: Evidence from a randomized experiment. Working paper. *Centre for Economic and International Studies*.

Belás, J., Nguyen, A., Smrčka, L., Kolembus, J., & Cipovová, E. (2016). Financial literacy of secondary school students: Case study from the Czech Republic and Slovakia. *Recent Issues in Sociological Research, 9*(4), 191–206. https://doi.org/10.14254/2071-789X.2016/9-4/12.

BenDavid-Hadar, I. (2015). An analysis of personal financial literacy among educators. *Journal of Financial Education, 41*(1), 50–89.

Berry, J., Karlan, D., & Pradhan, M. (2015). *The impact of financial education for youth in Ghana. Working paper.* National Bureau of Economic Research.

Bhattacharya, R., Gill, A., & Stanley, D. (2016). The effectiveness of financial literacy instruction: The role of individual development accounts participation and the intensity of instruction. *Journal of Financial Counseling and Planning, 27*(1), 20–35. https://doi.org/10.1891/1052-3073.27.1.20.

Binkhorst, F. (2017). *Connecting the dots: Supporting the implementation of teacher design teams.* Dissertation. University of Twente.

Blank, R. K., de las Alas, N., & Smith, C. (2008). *Does teacher professional development have effects on teaching and learning? Evaluation findings from programs in 14 states.* Washington: Council of Chief State School Officers.

Bover, O., Hospido, L., & Villanueva, E. (2018). The impact of high school financial education on financial knowledge and choices. *Evidence from a randomized trial in Spain. Discussion paper. IZA*.

Brancewicz, J. G., Pattison, J., & Fok, L. Y. (2014). Impacts of JA Biztown on improving financial literacy among middle-school students. *Journal of Economics and Economic Education Research, 15*(2), 1–12.

Bruhn, M., de Souza Leão, L., Legovini, A., Marchetti, R., & Zia, B. (2016). The impact of high school financial education: Evidence from a large-scale evaluation in Brazil. *American Economic Journal: Applied Economics, 8*(4), 256–295. https://doi.org/10.1257/app.20150149.

Buehl, M. M., & Beck, J. S. (2015). The relationship between teachers' beliefs and teachers' practices. In H. Fives, & M. G. Gill (Eds.). *International handbook of research on teachers' beliefs*(1st ed.). New York: Routledge.

Cameron, M. P., Calderwood, R., Cox, A., Lim, S., & Yamaoka, M. (2014). Factors associated with financial literacy among high school students in New Zealand. *International Review of Economics Education, 16*, 12–21. https://doi.org/10.1016/j.iree.2014.07.006.

Carlin, B. I., & Robinson, D. T. (2012a). Financial education and timely decision support: Lessons from Junior Achievement. *The American Economic Review, 102*(3), 305–308. https://doi.org/10.1257/aer.102.3.305.

Carlin, B. I., & Robinson, D. T. (2012b). What does financial literacy training teach us? *The Journal of Economic Education, 43*(3), 235–247. https://doi.org/10.1080/00220485.2012.686385.

Castelein, E., Coens, J., De Witte, K., Houben, A., Lauwers, W., Segers, J., et al. (2016). *Binnenklasdifferentiatie, een beroepshouding, geen recept.* Leuven/Den Haag: Acco.

Chetty, R., Friedman, J. N., & Rockoff, J. E. (2014). Measuring the impacts of teachers II: Teacher value-added and student outcomes in adulthood. *The American Economic Review, 104*(9), 2633–2679. https://doi.org/10.3386/w19424.

Consumer Financial Protection Bureau (2013). Transforming the financial lives of a generation of young americans. *Policy recommendations for advancing K-12 financial edcuation. White paper*.

Cornelis, I., & Storms, B. (2014). *Financieel risicogedrag bij jongeren.* CEBUD.

Danes, S. M., Rodriguez, M. C., & Brewton, K. E. (2013). Learning context when studying financial planning in high schools: Nesting of student, teacher, and classroom characteristics. *Journal of Financial Counseling and Planning, 24*(2), 20–36.

De Moor, L., & Verschetze, L. (2017). Student teachers' capacity and willingness to teach financial literacy in Flanders. *Journal of Financial Counseling and Planning, 28*(2), 313–321. https://doi.org/10.1891/1052-3073.28.2.313.

Desimone, L. M. (2009). Improving impact studies of teachers' professional development: Toward better conceptualizations and measures. *Educational Researcher, 38*(3), 181–199. https://doi.org/10.3102/0013189X08331140.

Desimone, L. M., & Garet, M. S. (2015). Best practices in teachers' professional development in the United States. *Psychology, Society, & Education, 7*(3), 252–263. https://doi.org/10.25115/psye.v7i3.515.
Desimone, L. M., Porter, A. C., Garet, M. S., Yoon, K. S., & Birman, B. F. (2002). Effects of professional development on teachers' instruction: Results from a three-year longitudinal study. *Educational Evaluation and Policy Analysis, 24*(2), 81–112. https://doi.org/10.3102/01623737024002081.
Díaz-Maggioli, G. (2004). *Teacher-centered professional development.* Alexandria: Assocation for Supervision and Curriculum Development.
Dixon, F. A., Yssel, N., McConnell, J. M., & Hardin, T. (2014). Differentiated instruction, professional development, and teacher efficacy. *Journal for the Education of the Gifted, 37*(2), 111–127. https://doi.org/10.1177/0162353214529042.
Erner, C., Goedde-Menke, M., & Oberste, M. (2016). Financial literacy of high school students: Evidence from Germany. *The Journal of Economic Education, 47*(2), 95–105. https://doi.org/10.1080/00220485.2016.1146102.
Farinella, J., Bland, J., & Franco, J. (2017). The impact of financial education on financial literacy and spending habits. *International Journal of Business, Accounting, and Finance, 11*(1), 1–12.
Garet, M. S., Porter, A. C., Desimone, L. M., Birman, B. F., & Yoon, K. S. (2001). What makes professional development effective? Results from a national sample of teachers. *American Educational Research Journal, 38*(4), 915–945. https://doi.org/10.3102/00028312038004915.
Gill, A., & Bhattacharya, R. (2015). Integration of a financial literacy curriculum in a high school economics class: Implications of varying the input mix from an experiment. *Journal of Consumer Affairs, 49*(2), 472–487. https://doi.org/10.1111/joca.12048.
Girvana, C., Conneely, C., & Tangneya, B. (2016). Extending experiential learning in teacher professional development. *Teaching and Teacher Education, 58*, 129–139. https://doi.org/10.1016/j.tate.2016.04.009.
Godsted, D., & McCormick, M. H. (2007). *National K-12 financial literacy research overview.* Indiana State University: Networks Financial Institute.
Goldhaber, D. (2002). The mistery of good teaching. *Education Next, 2*(1), 1–8.
Grayson, L., & Gomersall, A. (2003). *A difficult business: Finding the evidence for social science reviews. Working paper. ESRC UK centre for evidence based policy and practice.* University of London.
Guskey, T. R. (2000). *Evaluating professional development.* Thousand Oaks: Corwin Press.
Guskey, T. R. (2009). Closing the knowledge gap on effective professional development. *Educational Horizons, 87*(4), 224–233.
Guskey, T. R., & Yoon, K. S. (2009). What works in professional development? *Phi Delta Kappan, 90*(7), 495–500. https://doi.org/10.1177/003172170909000709.
Hagedorn, E. A., Schug, M. C., & Suiter, M. (2016). A collaborative approach to financial literacy in the Chicago public schools. *Journal of Private Enterprise, 31*(1), 79–90.
Harter, C. L., & Harter, J. F. R. (2012). Does a graduate course in personal finance for teachers lead to higher student financial literacy than a teacher workshop? *Journal of Consumer Education, 29*, 35–46.
Haynes, D. C., & Chinadle, N. (2007). Private sector/educator collaboration: Project improves economic literacy. *Journal of Family and Consumer Sciences, 99*(1), 8–10.
Hensley, B. J., Jurgenson, J. B., & Ferris, L.-A. (2017). Combining adult education and professional development best practice to improve financial education teacher training. *Journal of Financial Counseling and Planning, 28*(1), 33–48. https://doi.org/10.2139/ssrn.2655682.
Higgins, J. P., & Green, S. (2011). *Cochrane handbook for systematic reviews of interventions.* The Cochrane Collaboration.
Hospido, L., Villanueva, E., & Zamarro, G. (2015). Finance for all: The impact of financial literacy training in compulsory secondary education in Spain. *IZA. Discussion paper*.
Huston, S. J. (2010). Measuring financial literacy. *Journal of Consumer Affairs, 44*(2), 296–316. https://doi.org/10.1111/j.1745-6606.2010.01170.x.
Ingvarson, L., Meiers, M., & Beavis, A. (2005). Factors affecting the impact of professional development programs on teachers' knowledge, practice, student outcomes & efficacy. *Education Policy Analysis Archives, 13*(10), https://doi.org/10.14507/epaa.v13n10.2005.
Jang, K., Hahn, J., & Park, H. J. (2014). Comparison of financial literacy between Korean and U.S. high school students. *International Review of Economics Education, 16*, 22–38. https://doi.org/10.1016/j.iree.2014.07.003.
Jeanpierre, B., Oberhauser, K., & Freeman, C. (2005). Characteristics of professional development that effect change in secondary science teachers' classroom practices. *Journal of Research in Science Teaching, 42*(6), 668–690. https://doi.org/10.1002/tea.20069.
Johnson, C. C., Kahle, J. B., & Fargo, J. D. (2007). A study of the effect of sustained, whole-school professional development on student achievement in science. *Journal of Research in Science Teaching, 44*(6), 775–786. https://doi.org/10.3102/0002831207308221.
van Keulen, H., Voogt, J., van Wessum, L., Cornelissen, F., & Schelfhout, W. (2015). Professionele leergemeenschappen in onderwijs en lerarenopleiding. *Tijdschrift voor Lerarenopleiders, 36*(4), 143–160.
Klemme, D. (2002). National Jump$tart coalation for financial literacy benchmarks: Curriculum inclusion and pedagogical practice in Wisconsin. *Journal of Family & Consumer Sciences Education, 20*(2), 12–19.
Loibl, C., & Fisher, P. J. (2013). Academic discipline and personal finance instruction in high school. *Journal of Financial Counseling and Planning, 24*(1), 15–33.
Lusardi, A. (2015). Financial literacy skills for the 21st century: Evidence from PISA. *Journal of Consumer Affairs, 49*(3), 639–659. https://doi.org/10.1111/joca.12099.
Lusardi, A., & de Bassa Scheresberg, C. (2013). *Financial literacy and high-cost borrowing in the United States. Working paper.* National Bureau of Economics Research.
Lusardi, A., & Mitchell, O. S. (2007). Financial literacy and retirement preparedness: Evidence and implications for financial education. *Business Economics, 42*(1), 35–44. https://doi.org/10.2145/20070104.
Lusardi, A., Mitchell, O. S., & Curto, V. (2010). Financial literacy among the young. *Journal of Consumer Affairs, 44*(2), 358–380. https://doi.org/10.1111/j.1745-6606.2010.01173.x.
Mandell, L. (2008). *The financial literacy of young american adults.* Washington: Jump$tart Coalition for Personal Financial Literacy.
Mandell, L., & Klein, L. S. (2007). Motivation and financial literacy. *Financial Services Review, 16*(2), 105–116.
McCormick, M. H. (2009). The effectiveness of youth financial education: A review of the literature. *Journal of Financial Counseling and Planning, 20*(1), 70–83.
Merchie, E., Tuytens, M., Devos, G., & Vanderlinde, R. (2016). Evaluating teachers' professional development initiatives: Towards an extended evaluative framework. *Research Papers in Education*. https://doi.org/10.1080/02671522.2016.1271003.
Migheli, M., & Moscarola, F. C. (2017). Gender differences in financial education: Evidence from primary school. *De Economist, 165*(3), 321–347. https://doi.org/10.1007/s10645-017-9300-0.
Muijs, D., Kyriakides, L., van der Werf, G., Creemers, B., Timperley, H., & Earl, L. (2014). State of the art – teacher effectiveness and professional learning. *International Journal of Research, Policy and Practice, 25*(2), 231–256. https://doi.org/10.1080/09243453.2014.885451.
Neill, A., Berg, M., & Stevens, L. (2014). *Financial literacy of secondary students, and its place within secondary schools.* New Zealand Council for Educational Research.
OECD (2005a). *Improving financial literacy: Analysis of issues and policies.* Paris: OECD Publishing.
OECD (2005b). *Recommendation on principles and good practices for financial education and awareness*.
OECD (2014a). *PISA 2012 results: Students and money financial literacy skills for the 21st century (volume VI).* Paris: OECD Publishing.
OECD (2014b). *TALIS 2013 results: An international perspective on teaching and learning.* Paris: OECD Publishing.
OECD (2016a). *Financial education in Europe: Trends and recent developments.* Paris: OECD Publishing.
OECD (2016b). *OECD/INFE international survey of adult financial literacy competencies.* Paris: OECD Publishing.
OECD (2017). *PISA 2015 results (volume IV): Students' financial literacy.* Paris: OECD Publishing.
Opfer, V. D., & Pedder, D. (2011). The lost promise of teacher professional development in England. *European Journal of Teacher Education, 34*(1), 3–24. https://doi.org/10.1080/02619768.2010.534131.
Otter, D. (2010). *Teaching financial literacy in K-12 schools: A survey of teacher beliefs and knowledge.* Dissertation: The University of New Mexico.
Pang, M. F. (2010). Boosting financial literacy: Benefits from learning study. *Instructional Science, 38*(6), 659–677. https://doi.org/10.1007/s11251-009-9094-9.
Parrish, L., & Servon, L. (2006). *Policy options to improve financial education: Equipping families for their financial futures.* Washington, DC: Asset Building Program, New America Foundation.
Penuel, W. R., Fishman, B. J., Yamaguchi, R., & Gallagher, L. P. (2007). What makes professional development effective? Strategies that foster curriculum implementation. *American Educational Research Journal, 44*(4), 921–958. https://doi.org/10.3102/0002831207308221.

Richardson, V. (1996). The role of attitudes and beliefs in learning to teach. In J. Sikula (Ed.). *Handbook of research on teacher education* (pp. 102–119). (2 ed.). New York: Macmillan Library Reference.
Riitsalu, L., & Põder, K. (2016). A glimpse of the complexity of factors that influence financial literacy. *International Journal of Consumer Studies, 40*, 722–731. https://doi.org/10.1111/ijcs.12291.
van Rooij, M., Lusardi, A., & Alessie, R. (2012). Financial literacy, retirement planning and household wealth. *The Economic Journal, 122*, 449–478. https://doi.org/10.1111/j.1468-0297.2012.02501.x.
Samkin, G., Low, M., & Taylor, J. (2012). Incorporating financial literacy into the secondary school accounting curriculum: A New Zealand perspective. *Australasian Accounting Business and Finance Journal, 6*(4), 5–30.
Sari, R. C., Fatimah, P. L. R., & Suyanto (2017). Bringing voluntary financial education in emerging economy: Role of financial socialization during elementary years. *The Asia-Pacific Education Researcher, 26*(3–4), 183–192. https://doi.org/10.1007/s40299-017-0339-0.
Sasser, S. L., & Grimes, P. W. (2010). Personal financial literacy: A baseline analysis of teacher knowledge in Oklahoma. *Franklin Business and Law Journal,* (3), 68–82.
Sawatzki, C. M. (2017). Lessons in financial literacy task design: Authentic, imaginable, useful. *Mathematics Education Research Journal, 29*(1), 25–43. https://doi.org/10.1007/s13394-016-0184-0.
Sawatzki, C. M., & Sullivan, P. A. (2017). Teachers' perceptions of financial literacy and the implications for professional learning. *Australian Journal of Teacher Education, 42*(5), 51–65. https://doi.org/10.14221/ajte.2017v42n5.4.
Schelfhout, W. (2017). Toward data for development: A model on learning communities as a platform for growing data use. In J. Vanthienen, & K. De Witte (Eds.). *Data analytics applications in education.* CRC Press.
Sherraden, M. S., Johnson, L., Guo, B., & Elliott, W., III (2010). Financial capability in children: Effects of participation in a school-based financial education and savings p rogram. *Journal of Family and Economic Issues, 32*(3), 385–399. https://doi.org/10.1007/s10834-010-9220-5.
Shulman, L. S. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher, 15*(2), 4–14. https://doi.org/10.2307/1175860.
da Silva, T. P., Dal Magro, C. B., Gorla, M. C., & Nakamura, W. T. (2017). Financial education level of high school students and its economic reflections. *Revista de Administracao, 52*, 285–303. https://doi.org/10.1016/j.rausp.2016.12.010.
Sohn, S., Joo, S., Grable, J. E., Lee, S., & Kim, M. (2012). Adolescents' financial literacy: The role of financial socialization agents, financial experiences, and money attitudes in shaping financial literacy among South Korean youth. *Journal of Adolescence, 35*, 969–980. https://doi.org/10.1016/j.adolescence.2012.02.002.
St.Pierre, E., Simpson, M., Moffat, S., & Cothren, P. (2011). Reality check: OK extension helps teachers meet financial education requirements. *Journal of Family and Consumer Sciences, 103*(2), 52–56.
Stoll, L., Bolam, R., McMahon, A., Wallace, M., & Thomas, S. (2006). Professional learning communities: A review of the literature. *Journal of Educational Change, 7*(4), 221–258. https://doi.org/10.1007/s10833-006-0001-8.
Swinton, J., DeBerry, T., Scafidi, B., & Woodard, H. (2007). The impact of financial education workshops for teachers on students' economic achievement. *The Journal of Consumer Education, 24*, 63–77.
Taruna, & Kumar, M. (2015). Contrasting levels of financial capability in India – an exploratory study. *International Journal of Innovative Research and Development, 4*(9), 320–323.
Tennyson, S., & Nguyen, C. (2001). State curriculum mandates and student knowledge of personal finance. *Journal of Consumer Affairs, 35*(2), 241–262. https://doi.org/10.1111/j.1745-6606.2001.tb00112.x.
Teo, T., Koh, N. K., & Lee, C. B. (2011). Teachers' intention to teach financial literacy in Singapore: A path analysis of an extended theory of planned behaviour (TPB). *The Asia-Pacific Education Researcher, 20*(2), 410–419.
Timperley, H. (2008). *Teacher professional learning and development.* Brussels/Geneva: International Academy of Education.
Timperley, H., & Alton-Lee, A. (2008). Reframing teacher professional learning: An alternative policy approach to strengthening valued outcomes for diverse learners. *Review of Research in Education, 31*(1), 328–369. https://doi.org/10.3102/0091732X07308968.
Tomlinson, C. A. (2008). The goals of differentiation. *Educational Leadership,* 26–30.
Tomlinson, C. A., & Strickland, C. A. (2005). *Differentiation in practice: A resource guide for differentiating curriculum.* Alexandria, Virginia: Association for Supervision and Curriculum Development.
Totenhagen, C. J., Casper, D. M., Faber, K. M., Bosch, L. A., Wiggs, C. B., & Borden, L. M. (2015). Youth financial literacy: A review of key considerations and promising delivery methods. *Journal of Family and Economic Issues, 36*(2), 167–191. https://doi.org/10.1007/s10834-014-9397-0.
Tschannen-Moran, M., & Hoy, A. W. (2001). Teacher efficacy: Capturing an elusive construct. *Teaching and Teacher Education, 17*(7), 783–805. https://doi.org/10.1016/S0742-051X(01)00036-1.
Valentine, G. P., & Khayum, M. (2005). Financial literacy skills of students in urban and rural high schools. *Delta Pi Epsilon Journal, 47*, 1–10.
Van Campenhout, G., De Witte, K., & De Beckker, K. (2017). *Financiele vorming op school.* De geslaagde school153–181.
Vangrieken, K., Meredith, C., Packer, T., & Kyndt, E. (2017). Teacher communities as a context for professional development: A systematic review. *Teaching and Teacher Education, 61*, 47–59. https://doi.org/10.1016/j.tate.2016.10.001.
Varcoe, K. P., Martin, A., Devitto, Z., & Go, C. (2005). Using a financial education curriculum for teens. *Journal of Financial Counseling and Planning, 16*(1), 63–71.
van Veen, K., Zwart, R. C., Meirink, J. A., & Verloop, N. (2010). *Professionele ontwikkeling van leraren: Een reviewstudie naar effectieve kenmerken van professionaliseringsinterventies van leraren.* ICLON/Expertisecentrum Leren van Docenten.
Walstad, W. B., Rebeck, K. M., & Richard, A. (2010). The effects of financial education on the financial knowledge of high school students. *Journal of Consumer Affairs, 44*(2), 336–357. https://doi.org/10.1111/j.1745-6606.2010.01172.x.
Way, W. L., & Holden, K. (2009). 2009 Outstanding AFCPE conference paper: Teachers' background and capacity to teach personal finance: Results of a national study. *Journal of Financial Counseling and Planning, 20*(2), 64–78.
Wei, R. C., Darling-Hammond, L., Andree, A., Richardson, N., & Orphanos, S. (2009). *Professional learning in the learning profession: A status report on teacher development in the United States and abroad*Dallas: National Staff Development Council.
Yoon, K. S., Duncan, T., Lee, S. W., Scarloss, B., & Shapley, K. L. (2007). *Reviewing the evidence on how teacher professional development affects student achievement.* Washington DC: Institute of Education Sciences (IES).
Yoong, J., Mihaly, K., Bauhoff, S., Rabinovich, L., & Hung, A. (2013). *A toolkit for the evaluation of financial capability programs in low- and middle-income countries.* Washington: International Bank for Reconstruction and Development/The World Bank.