Negotiating teacher educators' beliefs about blended learning: Using stimulated recall to explore design choices

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Teachers' beliefs about education influence practice and vice versa. Teacher educators should be particularly attuned to the association between educational beliefs and practice. Teachers' beliefs about education have been widely studied, but investigating how a team of teacher educators put a shared vision on blended learning into practice is less researched. Blended learning practices are subject to the four design aspects of incorporating flexibility, stimulating interaction, facilitating the learning process, and creating an affective learning climate. This qualitative study investigates a team of experienced blended learning teacher educators from two perspectives: their beliefs about blended learning, and how these beliefs are realised in practice. Seventeen screencast stimulated recall interviews revealed: (1) teacher educators express evaluative beliefs about deep and meaningful blended learning and descriptive beliefs about online flexibility and face-to-face interaction, and (2) how these beliefs are realised in practice by flexible online facilitation of learning processes, profound face-to-face interaction, and providing authentic learning experiences. Furthermore, as a result of the association between beliefs about blended learning and practice, the areas of refining student feedback, improving online structure and increasing interaction in online learning materials emerged for professional growth. Finally, recommendations are made for blended learning practitioners and teacher educators.

Implications for practice or policy:
- Teacher educators hold evaluative beliefs about deep and meaningful blended learning and descriptive beliefs about online flexibility and face-to-face interaction.
- Deep and meaningful blended learning is promoted by flexible online facilitation of learning processes, profound face-to-face interaction, and providing authentic learning experiences.
- Areas for professional growth are refining student feedback, improving online structure and increasing interaction in online learning materials.

Keywords: blended learning, professional growth, screencast stimulated recall, teacher beliefs, university teacher education

Introduction

> It is necessary to understand the potential relationship between beliefs [about education] and practice as well as the possible internal and external factors that may support or hinder this connection. (Buehl & Beck, 2015, p. 66)

Although blended learning has been widely adopted across higher education (Dziuban et al., 2018), many challenges remain to effectively implementing or applying the pedagogical concept in higher education. For example, Rasheed et al. (2020) identified challenges in the online component of blended learning from the student's perspective (e.g., self-regulation or online help-seeking), from the teacher's perspective (e.g., teachers' negative beliefs about the effectiveness of online instruction), and from the institutional perspective (e.g., determining the level of technological innovation or providing effective training to

teachers and students). Focusing on the design of blended learning, Boelens et al. (2017) identified four key design aspects of blended learning: incorporating flexibility, stimulating interaction, facilitating the learning process, and creating an affective learning climate. Much is known about teachers' beliefs, specifically in the context of technology integration, while less is known on what teacher educators believe about blended learning and how it associates with practice. Moreover, there is relatively little qualitative research that examines values, beliefs, and experiences in relation to blended learning (Smith & Hill, 2019). This qualitative study, therefore, unifies two perspectives: (1) what teacher educators believe about blended learning, and (2) how those beliefs are realised in practice, based on a shared team vision. Furthermore, areas for professional growth are formulated based on those beliefs about blended learning. This study used a stimulated recall interview method while recording computer screens of participants' blended learning practices in the online learning environment. In this way, the participants in this study were stimulated to become aware of their assumptions and decision-making (Calderhead, 1981; Consuegra et al., 2016) about blended learning in a university teacher education that has experience of blended learning.

Conceptual background

Teachers' beliefs about education

Clark and Peterson (1986) categorised teachers' thought processes into three fundamental types: (1) teacher planning, (2) teachers' interactive thoughts and decisions, and (3) teachers' theories and beliefs. Every teacher has conscious or unconscious beliefs about education, teaching and learning that shape and inform their teaching practice (Buehl & Beck, 2015; Kagan, 1992; Pajares, 1992). Teachers' beliefs are often consistent among those who share the same circumstances, and beliefs are organised into belief systems that guide the actions of those who hold them (Eisenhart et al., 1988). The beliefs of teachers are not easily defined (e.g., Pajares, 1992), but there is sufficient consensus among researchers on four key aspects of teachers' beliefs (Skott, 2015).

First, beliefs are considered to be highly personal mental constructs which are felt to be true by the person in question (Richardson, 2003; Skott, 2015). From a contemporary philosophical perspective, beliefs refer to mental attitudes that certain statements, ideas, or facts are true for the people who hold them (Watt & Richardson, 2015). Rokeach (1968) validates this by defining beliefs as "any simple proposition, conscious or unconscious, inferred from what a person says or does, capable of being preceded by the phrase 'I believe that …'" (p. 113). According to Rokeach (1968), a belief can be descriptive (e.g., I believe that blended learning should include online interaction); or evaluative (e.g., I believe that blended learning improves student learning outcomes), or a belief can be prescriptive (e.g., I believe teachers should implement blended learning to better meet the needs of international students).

Second, although considered to be different, beliefs and affects are inextricably linked (Gill & Hardin, 2014; Pajares, 1992; Skott, 2015). In the words of Cross and Hong (2009), "the intensity and quality of the emotional responses of teachers in the context of reform are results of how individual teachers view the reform policies and objectives in relation to their beliefs, goals, and identities" (p.288). Third, beliefs are relatively stable, enduring mental constructs that are likely to change only after a considerable and deliberate investigation of one's teaching practices (Kagan, 1992; Richardson, 2003; Rokeach, 1968). Fourth, there is enough evidence to suggest that beliefs guide teaching behaviour and influence teachers' decision-making, whether about teaching in general or about technology integration in education in particular (Fives & Gill, 2015; Pajares, 1992; Skott, 2015; Tondeur et al., 2017).

Teachers hold beliefs, but about what? In general, the review of Eisenhart et al. (1988) revealed three domains in teachers' beliefs, varying in levels of teacher (1) responsibility, (2) expertise, and (3) control. In domain one, teachers are positively orientated towards instructional classroom activities and believe themselves to have great responsibility, expertise, and control (Eisenhart et al., 1988). In domain two, teachers rely less on intuition with regard to students' learning and believe they need more cooperation with others to assess students' learning (Eisenhart et al., 1988). According to domain three, the areas in which teachers believe themselves to have the least responsibility and expertise include beliefs about the curriculum and non-instructional duties (Eisenhart et al., 1988).

According to Fischer and Hänze (2020), university teachers hold transmissive beliefs – transmission of knowledge and theory – and constructivist beliefs that affect their teaching. Whereas transmissive beliefs

impact the quality of instruction, constructivist beliefs are positively related to the clarity of instruction, active student involvement and rapport (Fischer & Hänze, 2020). In the context of educational technology, and blended learning specifically, teachers' beliefs also play an important role (Brown, 2016; Ertmer et al., 2012). According to Deng et al. (2014), teachers' beliefs about technology integration can be classified into two categories: teacher-centered beliefs that tend to emphasise subject matter and the teacher who acts as an authority; and secondly, student-centered teacher beliefs associated with social-constructivist views on learning, where students actively participate in authentic problems (Deng et al., 2014). Moreover, Tondeur et al. (2017) suggest that "technology use can lead to creation of new, reconstructed or reaffirmed beliefs" (p. 561).

Teacher educators are important role models for new ways of learning (Lunenberg et al., 2014) and how they cope with blended learning is affected by their beliefs about teaching, learning and instruction (Boelens et al., 2018; Jonker et al., 2018). Consequently, there is a need for a better understanding of how beliefs about blended learning are aligned with the enacted practice from the perspective of teacher educators. The relationship between teacher beliefs and the actual practice is paramount to generating real change (Owens, 2012). Yet, the dimension most difficult to change is people's beliefs, for example, the assumptions that underlie particular teachers' practices (Burner, 2018).

Teacher educators' blended learning practice

Buehl and Beck (2015) define teachers' practice as "any action that is part of the teaching process (e.g. planning, decision making, instructional strategies or approaches, assessment, reflection, work with families, and relationship building)" (p. 67). Although teacher education programs differ from other programs in higher education, the methods or approaches applied by teacher educators are similar to others in higher education (Keengwe & Kang, 2013). Yet, the practice of teacher educators is diverse. Teacher educators work in different settings and have various roles, such as teacher of teachers, curriculum developer, researcher, or coach (Dengerink et al., 2015; Lunenberg et al., 2014). Moreover, by acting as role models, teacher educators have the potential to discuss risks and opportunities when experimenting with new ways of learning (Lunenberg et al., 2007). Teacher educators' tasks are particularly complex since they are supposed to teach congruently, which implies constant awareness of how their teaching is visible to student teachers (Swennen et al., 2008).

Over the past 10 years, blended learning has received a great deal of attention from researchers. For example, Smith and Hill (2019) reviewed 97 articles on blended learning between 2012 and mid-2017. They suggested that blended learning in higher education was a relatively well understood research area, particularly in the context of higher education for the themes instructional design, learner outcomes, and the impact of specific technologies such as learning management systems or video creating technologies. Blended learning practice is influenced by both external factors, such as academic workload or institutional characteristics, and internal influences, such as attitudes and beliefs about teaching (Brown, 2016). According to Hrastinski (2019), the most commonly used definitions of blended learning in research are those of Graham (2006) and Garrison and Kanuka (2004). Graham (2006) defines blended learning as "blended learning systems that combine face-to-face instruction with computer-mediated instruction" (p. 5). Although Graham (2006) acknowledges the broad definition that virtually encompasses all learning systems, this definition clearly lacks focus on learning (Cronje, 2020). On the other hand, Garrison and Kanuka (2004) refine the definition by including a quality dimension. Blended learning is in their view "the thoughtful integration of classroom face-to-face learning experiences with online learning experiences" (p.96).

Generally, the design of blended learning is subject to four key design aspects (Boelens et al., 2017). First is flexibility in the sequence of online and face-to-face activities, the balance between online and face-to-face instruction, and flexibility in learner control - whether to complete learning activities online or face-to-face - are important challenges. Second, encouraging (social) interaction, whether it be online or in face-to-face moments, is crucial when designing blended learning. Since blended learning increases the distance between teachers and learners by including distance learning moments, extra attention must be paid to the two-way communication between instructors and learners. Third, facilitating students' learning processes through blended learning is an important challenge by facilitating the orientation and planning of the learning process, monitoring and adjusting students' progress, and/or evaluating students' learning. Finally, fourth, blended learning can foster an affective learning climate by motivating students, providing authentic

or situational learning activities that require effort or stimulate reflection, and by appraising and dealing with emotions. The framework of Boelens et al. (2017) can assist researchers and practitioners when evaluating existing blended learning practices from a design perspective. Moreover, Jonker et al. (2018) researched a transition of teacher educators to a blended learning curriculum and found that acceptance of blended learning was influenced by teacher educators' beliefs about blended education. Moreover, teacher educators must be able to identify the pedagogical added value of blended learning for their own teaching (Amhag et al., 2019). While blended learning has been a feature in higher education for the past two decades, the field of blended learning practice is still developing and more qualitative, holistic research into the beliefs and attitudes of practitioners can enhance the research base on blended learning (Smith & Hill, 2019).

Purpose of the study

The overall purpose of this qualitative case study was twofold, to investigate what teacher educators' believe about blended learning and to explore how these beliefs are associated with the design aspects of their practice, based on a shared vision. The following research questions were formulated:

1. What are teacher educators' beliefs about blended learning?
2. How are teacher educators' beliefs about blended learning associated with their blended learning practice?

Method

This study aimed to be interpretative in nature and involved in-depth investigation of teacher educators' beliefs and blended learning practices. Qualitative research in general, and the case study method in particular, provides rich sources of knowledge to investigate issues of practice (Gall et al., 2010). Moreover, an understanding of teachers' beliefs can be promoted by allowing teachers to tell their stories (Olafson et al., 2015). This research sought to answer the above research questions by presenting a case study situated in a teacher training department that had experience with blended learning. Data was obtained by means of screencasting and stimulated recall interviews with participants' on their blended learning practices.

Participants

A team of 17 university teacher educators who had experience with blended learning were selected for this case study. They all had active teaching roles in teacher training in a Flemish university and experience with blended learning. They represented various educational roles and fields of expertise, and diversity in age and gender. According to Becuwe et al. (2017), a long-term perspective is a necessary condition for successful teacher educator design teams. Since the teacher educator team had engaged in a transition project towards a blended curriculum prior to this study, all participants shared mutual understanding of the concept of blended learning. To validate their common understanding of blended learning, a random sample of participants ($n = 5$) were asked about their perception of blended learning at the beginning of the interview. Interpretation of these perceived definitions showed that all the participants had sufficient understanding of blended learning as defined in the conceptual background section. Details about the privacy settings of the recordings and guaranteed anonymity were communicated in the informed consent. The names in this study have been anonymised to ensure privacy by using teacher educator 1 (TE1), TE2, and so on. Table 1 presents an overview of participants' backgrounds.

Table 1
Overview of the participants

Teacher educator	Gender	Age group	Educational role	Field of expertise
TE01	F	45-54	Assistant professor, supervisor	Teaching English as a foreign language
TE02	M	35-44	Professor, principal lecturer	Teacher education in urban settings
TE03	F	45-54	Instructor, supervisor	Community Service Learning
TE04	F	55-64	Professor, principal lecturer	Teacher professional development, teacher professional identity, well-being of teachers and students
TE05	F	35-44	Assistant professor, coach	Movement and Sport Sciences, coaching
TE06	M	45-54	Assistant professor	Teacher educator Sport sciences
TE07	F	35-44	Assistant professor, supervisor	Teacher adult education, blended learning
TE08	M	45-54	Assistant professor, supervisor	Business and economics teacher education, Urban education
TE09	F	25-34	Professor, principal lecturer	Education inequality in compulsory and higher education
TE10	M	45-54	Professor, principal lecturer	ICT & educational innovation, blended learning, Design-oriented educational research
TE11	M	35-44	Professor, principal lecturer	Teacher educator Sport sciences
TE12	M	35-44	Assistant professor	Teacher adult education, ICT and learning
TE13	F	45-54	Professor, principal lecturer	Vocational secondary education, Social sciences, Professionalisation of teacher educators
TE14	M	45-54	Assistant professor	Educational Technology, and Instructional Design, blended learning
TE15	F	25-34	Assistant professor, supervisor	Teacher adult education, ICT and learning
TE16	F	25-34	Professor, principal lecturer	Teacher educator language teaching, classroom diversity
TE17	F	45-54	Assistant professor	Teacher educator Physical education

Data collection: screencast stimulated recall

A screencast is a digitally captured video that records computer screen output, including audio narration, and in this way visually demonstrates information to students (Sugar et al., 2010). Screencasts have the power to capture both verbalised thinking and on-screen activity, which enhances the articulation of authentic practical narratives (Cox et al., 2018). Calderhead (1981, p. 212) defines stimulated recall as the "use of audiotapes or videotapes of skilled behavior, which are used to aid a participant's recall of his thought processes at the time of that behavior". According to Consuegra et al. (2016), stimulated recall can assist teachers in paying attention to specific strategies for raising awareness about their practice, such as seeing their practice through a different perspective.

The interviews each started by launching a screencast recording tool, and inviting the participants to open one or more blended courses in the online learning environment. The respondents described different design aspects of one or more blended learning courses, which was recorded through webcam video and audio in Panopto – a video platform for universities to create and share professional videos securely (Figure 1). Then the interview shifted towards participants' beliefs about blended learning. During the respondent's description of their blended learning practice, the interviewer asked questions to clarify the design of their practice or to get a better insight into the participants' reasoning behind their blended learning choices. Then, the interviewer encouraged participants to reflect on their teacher beliefs by asking open-ended questions, such as, "Why is [approach] so important to you?" All the quotes in this study have been translated from the Dutch.

Role of the researcher

The researcher played a considerable role in the methodological approach in this study. First, the researcher was already engaged in the process of transition to a blended curriculum prior to the study. Hence, the researcher and participants knew each other personally and the interviews were conducted in an atmosphere of mutual trust. Second, the researcher's professional experience as a teacher educator and blended learning expert contributed to the quality and open nature of the interviews and supported the garnering of authentic data. The researcher's familiarity with the subject under investigation helped with the interpreting of the results in the context of this case study. To ensure the validity of responses (Miles et al., 1994), the position of the researcher during the stimulated recall interviews was made clear at the beginning of every interview. In order to avoid turning the interview into a professional development session, the first author had to make this clear to some participants during the interviews. Furthermore, since competency, personal, and social values influence the research process, the research method is never value-free (Greenbank, 2003). While the researcher accepts that value-neutrality is hard to realise, this issue was addressed by the researcher's self-awareness during the interviews ensuring that personal values did not interfere with participants' reactions.

Data analysis and trustworthiness

The video data was analysed iteratively to ensure its trustworthiness and reduce bias (Guba & Lincoln, 1985). Observation and analysis can present challenges in all empirical research, but can be particularly difficult when analysing video data (Erickson, 2006). Researchers risk avoiding microanalysis of labour-intensive non-verbal transcripts, while only focusing on the analysis of verbal transcripts can result in fragmented instances that lack the coherence of the entire video (Erickson, 2006). Either extreme of analysis inadequately represents significant insights into the phenomenon being reported (Erickson, 2006). Thus, a whole-to-part approach was chosen that combines integral video data analysis and targeted transcriptions (Erickson, 2006). After a first round of analysis, the first and second author discussed a draft of the coding scheme, leading to a final coding scheme. Next, the videos and targeted transcripts were imported into NVivo 12 and coded by the first author. To ensure trustworthiness (Morse et al., 2002), the second author coded five randomly chosen videos parallel to the first author, based on the final coding scheme. Inter-rater reliability (Cohen et al., 2002) was calculated in NVivo 12 and showed 92% agreement. No video-editing was performed on the videos in order to ensure the reliable analysis of continuous footage (Erickson, 2006).
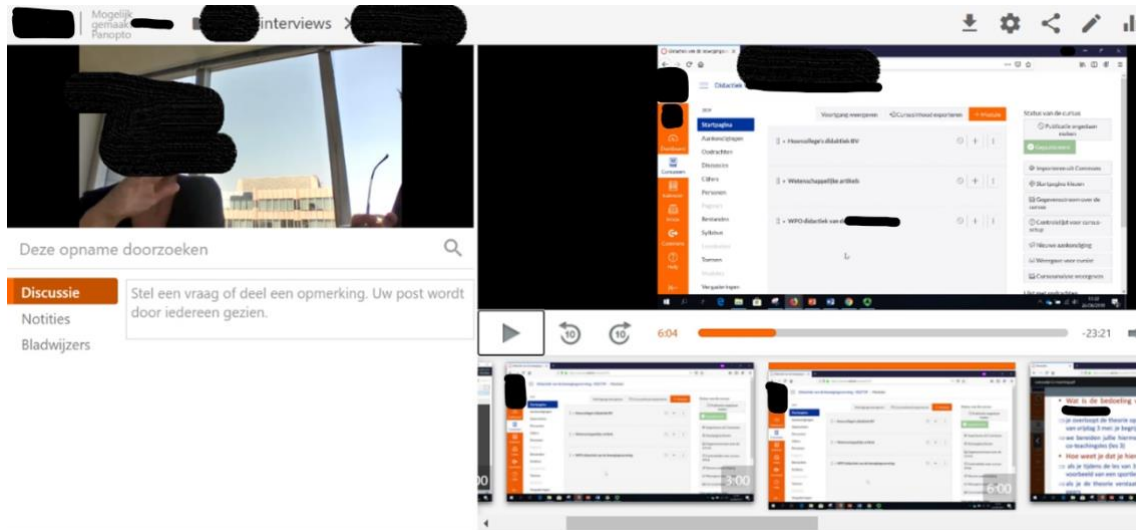
Figure 1. Screenshot of Panopto recording software

Results

During the stimulated recall interviews, participants expressed what they believed about blended learning in terms of "I believe that …", or "I think it is very important that …", and described how they organised their blended learning practice. Furthermore, based on the association between expressed beliefs and practice, participants expressed areas for professional growth based on what they believed about blended learning. Table 2 presents a detailed overview of participants' reactions.

Table 2

Overview of participants' reactions

Teacher educator	Deep and meaningful blended learning	Blended learning belief in flexibility	Blended learning belief in face-to-face interaction	Practice: online facilitation of learning	Practice: Face-to-face interaction	Practice: online flexibility	Authentic and practical learning tasks
TE01	x		x	x	x	x	
TE02	x		x	x	x	x	x
TE03	x			x	x	x	x
TE04	x		x	x	x	x	x
TE05	x			x	x	x	
TE06	x	x		x	x	x	x
TE07	x			x	x	x	
TE08				x	x	x	
TE09	x			x		x	x
TE10	x			x	x	x	x
TE11	x		x	x	x	x	x
TE12	x		x	x	x	x	x
TE13	x	x	x	x	x	x	
TE14		x		x	x	x	
TE15	x	x	x	x	x	x	
TE16	x	x	x	x			x
TE17	x		x	x	x	x	x

Evaluative beliefs: Deep and meaningful blended learning

All but one of the teacher educators described teacher beliefs about realising deep and meaningful blended learning experiences for the students. In general, teacher educators described the aim of developing a deeper understanding of the theory. According to most of the participants, deep learning concerns a constructivist view of learning that stimulates students to go beyond mere acquisition of theoretical knowledge. As TE4 stated: "We attach great importance to deeper levels of cognitive processing. We have a knowledge base per discipline, and that must be used, applied and internalized by students." The participants in this study found it important that students go beyond assimilation of knowledge, that students "don't just blindly copy what the teacher says, but they actually work with the theory themselves" (TE7). As TE2 stated: "I hope that I can broaden students' horizons, stimulate the students to dig deeper. I think that stimulating to dig deeper is an important role of a teacher". By meaningful, participants intended that students comprehended the meaning of theory by applying it to practical cases, situated in the real world of urban settings and diverse school contexts. According to most of the participants, students construct personal meaning by applying the theory to practical situations. For example, TE10 and TE6 added the importance of a connection to the real world:

> I think it's important to link theory to practice. That you don't stay on your island, don't stay on your campus, and that the students experience what educational innovation and technology mean in real life. That they experience what the frameworks I offer mean for them in practice. I do find it important, yes, the interaction between theory and practice. (TE10)

Generally, most of the participants held evaluative beliefs about blended learning which implied an added value to students' learning processes. As TE7 described: "I think blended learning is a good way to achieve deeper learning. You can create a kind of knowledge backpack and then let them actively work with that knowledge." In the words of TE9:

> We apply blended learning so that in our contact moments we can focus on integration as much as possible, in order to really work on integration of theory and practice, on deepening knowledge. To really dig deeper during the contact moments.

As TE16 summarised: "I think what we want to achieve with blended learning is that the students can apply theory. We want to deliver competent teachers, and for that they need certain knowledge, but above all, be able to apply that knowledge."

Descriptive beliefs about blended learning: Face-to face interaction and online flexibility

About half of the participants explicitly mention descriptive teacher beliefs in relation to interaction and flexibility. This was less referenced than beliefs about deep and meaningful learning. For example, TE13 stated:

> Some theoretical lessons could of course also be done in a typical lecture, but I think it is more important to focus on interaction during my face-to-face lessons, and letting students acquire basic knowledge and insights online.

Or in the words of TE17: "I think interaction is important because they get very practical basic exercises, e.g. about making lesson plans. Face-to-face interaction is important to really get the hang of it."

On the other hand, TE6, TE13, and TE14 expressed how important they found flexibility through the online learning environment. TE14 described: "The most important reason why I work with generic, reusable online lesson packages is because it offers flexibility, it is possible to easily address students with different prior knowledge." TE16 stated, "I want the students to really know what they are doing and why you they are doing it, and especially that they process it in depth. But "how" they get there, that is open." TE6 also mentioned the flexibility in space, that students can (re)watch online video materials whenever they want:

> I find it enriching that students – even only those who are occasionally absent – can still look at the recorded footage. Because in the limited contact time I have, it is impossible to demonstrate or repeat everything. In this way, I can refer back to the online footage.

How are beliefs about blended learning organised in practice?

Matrix coding queries and cluster analysis in NVivo 12 revealed how the beliefs expressed in the previous section were organised in practice. Overall, the beliefs in the previous section were mirrored in practice, with the exception of online facilitation of the learning process. Remarkably, all participants described the importance of online facilitation of the learning process in their practice, yet only a few participants deliberately expressed beliefs about how they value online facilitation of the learning process. Generally, the four key design aspects of Boelens et al. (2017) were strongly present in the blended learning practices of all the teacher educators, with a strong focus on orientation and planning of the learning process, face-to-face interaction, and authentic learning tasks. The results in this case study suggested a particular combination of how the design aspects of blended learning practices were related and/or overlapped.

Online facilitation of the learning process
All teacher educators described a large component of online facilitation of the learning process, with a focus on the orientation, planning, and evaluation of learning experiences during the course. Although some teacher educators mentioned a first introductory face-to-face moment to initiate the learning process, all participants strongly emphasised the importance of how they facilitate the learning process in the online learning environment: orientation of the course, elucidating goals in the course, providing planning, distribution of theory, and practical knowledge. Online facilitation of the learning process was especially valued for cutting large amounts of learning materials into manageable pieces of information through targeted use of hyperlinks. For example, TE12, TE5, TE9, and TE6 described how they use the learning environment to give structure to large amounts of course information:

> I try to avoid too much text. If I distribute a mainly text in the online learning environment, I fear that the students will not read it. So they receive a hyperlinked guideline. That only seems like a simple page, but if they click through to the different subpages, they end up on many files and pages, containing instructional videos and such.

TE15 agreed, but in addition provided a clickable image to structure course content:

> To avoid too much text, I developed a clickable image, so that the students can click through to theoretical concepts and receive extra explanation. When there is too much text, they scroll through it and they do nothing with it.

During the blended courses, the learning process was evaluated both in online settings and in face-to-face moments. For example, TE14 and TE5 described the use of formative and summative evaluation: "Portfolio assignments are summative in nature, and are submitted online, but formative evaluation - both through online feedback as in face-to-face moments - is being used" (TE14). TE13 and TE16 described the use of authentic assignments with practical cases:

> The students first apply the theory to an authentic case, which is not evaluated. And then, they can adjust or improve, based on an online rubric. The students must indicate any adjustments in color. In this way, I can see how they process feedback.

Face-to-face interaction is crucial
The majority of the participants expressed beliefs about the necessity of face-to-face interaction to realise deep and meaningful learning. In practice, face-to-face interaction was organised in order to make connections between theory and practice, to adjust misconceptions, or to apply theory to different contexts. Although online interaction was facilitated through discussion forums by some participants, a typical statement was: "face-to-face moments are needed to realize a powerful learning environment. A limitation of the online learning environment is that it lacks this in-depth dimension" (TE11). TE9 described the added value of the face-to-face moments as follows:

> What happens in the contact moments is correcting misconceptions, making connections between theory and practice. The students ask themselves, "I apply something in a classroom, but why is that a good choice? Can I see the theoretical principles behind a practical case?"

Online flexibility in time and space

More than half of the participants deliberately addressed flexibility in time and space in their blended practice, which associates with expressed beliefs about flexibility for about half of the participants. The online learning environment played an important role in allowing students to go through online learning objects (e.g., learning packages containing text, images, videos, and interactive quizzes) and theory (e.g., online readers with scientific papers) at their own pace and in their own time. "Thanks to blended learning, the students can choose whenever they engage with the learning materials. Blended learning helps to process large amounts of material at their own pace" (TE6). TE15 summarised how more than half of the participants addressed flexibility:

> Blended learning offers flexibility for students to process the theory at their own pace, whenever they choose. Master students can process some theory perfectly at their own pace. But focusing then on working in-depth in face-to-face moments is really necessary, e.g. by forming own opinions or stimulating discussion.

Authentic, practical learning tasks

The majority of participants deliberately aimed at in-depth processing of theory by designing authentic, practical learning tasks to reflect to diversity. These authentic learning tasks were distributed through the online learning environment and, through face-to-face interaction, for discussion of practical cases. For example, TE2 and TE10 emphasised active student engagement in the surrounding community, and the interplay between theory and practice:

> I work deliberately with authentic practical challenges in which the students actively engage with the community around us, there is a creative interchange between theory and practice, a dynamic develops between theory and practice.

TE13 stated: "Yes, it is a conscious choice to work with real-life, authentic tasks. I really hope that my students will also work with real-life contexts."

Expressions of professional growth

Finally, as a result of the beliefs and practice association, participants expressed areas for professional development and improvement. Coding comparison queries between what participants expressed as belief and what they described in practice revealed three areas of professional growth. All teacher educators expressed (to some extent) beliefs they considered important, but do not realise in practice. These perceived areas of blended learning improvement were formulated in terms of: "I would like to …", "I strongly believe that …, but this is not the case at the moment.", or "I think … is important, but would like even more …". Interestingly, these expressed areas for professional growth mainly concerned facilitating the learning process (improving online structure), increasing interaction in online learning content, and refining their feedback to students. None of the participants mentioned areas for improvement at the level of deep and meaningful blended learning or face-to-face interaction.

For example, TE8 stated that they would like to improve the structure in their courses: "I would like to structure my course better, I think it would help myself and my students to be more structured, to increase the transparency". TE9 said: "I would like to offer even more scaffolds in the online section, because of the diversity of my young students. Blended learning is quite a challenge for young people with few self-regulating skills."

TE7 and TE15 emphasised the desire for more online interaction: "I would really like to include more online interaction, such as an interactive video with questions. Now it is all rather static" (TE7). In TE15's words: "I think that our online learning content is sometimes insufficient because it contains too much static text, to me that is 'putting theory online'. I would like to make it much more interactive." TE5 and TE15 described how they would like to provide more online feedback: "I would also like to make videos to give feedback, instead of written feedback. I think the students would benefit from that, that they understand better what you mean" (TE15). In the words of TE5: "Actually, it would be very nice if I could address my

students individually according to their specific needs and give differentiated feedback more easily online."
Lastly, TE13 and TE10 planned to increase flexibility by creating flexible learning paths:

> I am concerned that I won't be able to supervise students from different campuses. I'm going
> to create learning paths for that. I am still struggling with flexible learning paths, I would like
> to make them more flexible, give the students even more options to learn. (TE13)

Discussion and implications

This study set out with the aim of investigating teacher educators' blended learning practice. Since teacher educators are role models for new ways of learning (Lunenberg et al., 2007), this study investigated teacher educators' beliefs about blended learning and the association with their blended learning practice. Most of the participants believed that blended learning could contribute to deep and meaningful learning experiences for the students, meaning that through blended learning they intended meaningful internalisation of theory into practice by students and that theory must be applied to practical situations. According to Rokeach (1968), beliefs can be evaluative, descriptive or prescriptive. The results in this study showed that the participants expressed evaluative beliefs about education in relation to blended learning. However, two descriptive beliefs about blended learning emerged. Firstly, the importance of online flexibility and face-to-face interaction. Remarkably, none of the participants expressed a prescriptive belief about blended learning, such as: "I believe that blended learning should be applied because the university told me so". Moreover, the expressed beliefs in this study are both transmissive and constructivist in nature (Fischer & Hänze, 2020). According to the participants in this study, transmission of knowledge and theory is mainly facilitated through the online learning environment, while constructivist beliefs are realised through the online distribution of authentic learning tasks and face-to-face interaction. This combination of transmissive and constructivist beliefs is in line with Cronje (2020), who argued that research has long focused on the mix between online and face-to-face instruction, but that it lacks a learning dimension that combines cognitivist and constructivist approaches to learning outcomes.

According to the findings in the present study, deep and meaningful learning requires both online facilitation of learning processes and face-to-face interaction. This constructive relationship between online facilitation and face-to-face interaction is in line with Mestan (2019), who found that students are particularly satisfied with procedural efficiencies in blended practices, but less satisfied with the socially interactive aspects of learning. Participants in this study avoided the risk of a widening division between faculty and students (Howard, 2020) by including meaningful interaction in the face-to-face moments. It is noteworthy that most teacher educators in the current study paid specific attention to online orientation and the planning of learning processes, which is consistent with Gedik et al. (2013) who highlighted the importance of course organisation when designing blended learning.

While Boelens et al. (2017) deepen the four key design aspects, the results in this study suggest particular overlap between the design aspects of participants' blended learning practice. For example, online facilitation of the learning process and the distribution of authentic assignments, which stimulate an affective learning climate, seemed related to each other. This finding was confirmed by Vermunt and Verloop (1999), who emphasised that teaching and learning activities often show considerable overlap.

The analysis of the association between beliefs about blended learning and practice showed alignment for most of the participants. Analysis revealed a close association between espoused beliefs on deep and meaningful blended learning and the construction of blended learning practices, yet the road to realisation was different between some teacher educators. For example, there was agreement on beliefs about deep and meaningful blended learning, but some teacher educators attached more importance to online learning paths than others. Overall, substantially more instances were coded on practice, compared to what were coded on beliefs. So, it seems that participants described practice more easily than they expressed beliefs. Without overjudging this result, it is interesting to note that participants talked more about how, than about why.

The insights from this study prompt a number of recommendations for practice. The beliefs expressed about blended learning are both evaluative and descriptive. Therefore, it is recommended for blended learning practitioners to deliberately reflect on how overarching evaluative beliefs about education relate to descriptive beliefs about blended learning (e.g., online facilitation of the learning process and face-to-face

interaction contribute to internalisation of theory). Secondly, since face-to-face interaction is crucial for deep internalisation of theory into practice, an important area of concern for blended learning practitioners is how the online facilitation of learning processes is linked to the face-to-face sessions. This could be done by structured hyperlinking in the online learning environment or the use of an online formative assessment portfolio. The results in this study support the principle of belief congruence, whereby people tend to value suggested beliefs in proportion to the degree of congruence with their own belief system (Rokeach, 1968). Therefore, it is suggested that practitioners of blended learning pay explicit attention to how their beliefs about education and blended learning inform their practice and professional growth.

Finally, although the method of screencast stimulated recall used was not specifically addressed in the research questions, it was evaluated positively both by the research team and by the participants. The fact that the actual practice was used as a starting point renders the interviews authentic. The stimulated recall interviews often led to a professional dialogue, making the method a possible innovative approach for professional development. However, this is a time-consuming effort, and it is preferable that the interviewer also be a skilled instructional designer. It might be an idea to organise these types of interviews between experienced blended learning colleagues and less experienced colleagues. Screencast stimulated recall interviews could even be organised through online videoconferencing tools in small teacher groups.

Limitations and future research

Several limitations to this case study need to be acknowledged. First, the association between beliefs and practice has to be approached with caution. The results show an indication of the level of alignment, but do not intend to judge participants' practice. Moreover, teacher education is a group effort, so individual results should not be over-emphasised. Secondly, a limitation concerns the transition project of participants prior to the study. The development of a shared vision is consistent with Becuwe et al. (2017), who emphasised long-term perspective as a necessary condition for successful teacher educator design teams. Yet, this study investigated what happens beyond the shared vision. Many pieces of research have addressed the importance of a shared vision (e.g., Becuwe et al., 2017), but what happens after the vision has been developed, is less well researched. Thirdly, given the context of teacher educators in this study, caution must be exercised when generalizing the results to other teacher educator contexts and teachers overall in higher education. Further research could investigate the beliefs and blended practices of teachers in other fields of higher education, or cross-case studies might look into the similarities and differences between university teaching contexts. Finally, when it comes to methodology, the participants took a particular course design as a starting point in the interview. Although participants were systematically asked to elaborate on other courses, this might have affected their descriptions of practice and the beliefs they expressed. A longitudinal investigation into different blended courses, for example, through observation of, and self-reflection on, blended learning practices, could reveal more insights into how beliefs evolve in time, and are associated with practice and professional growth.

Conclusion

This qualitative case study set out to investigate the association between teacher educators' beliefs about blended learning and how these beliefs are realised in practice, based on a shared vision of blended learning. Teacher educators in particular should be attuned to the role of reflection on this association and are important role models for new ways of learning. Through screencast stimulated recall, starting from the design of their blended learning practice, participants brought to the surface what they believed about blended learning, and how it was associated with the design of their practice. Furthermore, based on the association between beliefs and practice, participants described areas for professional growth. The results in this study show that most teacher educators expressed beliefs about deep and meaningful blended learning, which means that they intend deep internalisation of theory into practical, situated cases. About half of the participants expressed descriptive beliefs about blended learning at the level of online flexibility in time and space, and profound face-to-face interaction. Analysis revealed how these beliefs were realised in practice: (a) structured online facilitation of learning processes, (b) profound face-to-face interaction, (c) online flexibility in time and space, and (d) providing authentic learning experiences. Further analysis revealed perceived areas for professional growth as improving student feedback, providing better online structure, and increased interaction in online learning content. Reflection on the complex relationship between teachers' beliefs about blended learning and the construction of practice is a powerful skill, relevant for the deliberate application of blended learning in higher (teacher) education.

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