PROFESSIONAL DEVELOPMENT TRAINING: WILL IT BLEND?
HOW TO OFFER BLENDED LEARNING

Abstract: Technological innovation in education give rise to new and more efficient possibilities for developing employees through professional development training. Because of increasing technological possibilities, researchers keep referring to the subject of blended learning. Despite elaborate coverage in literature, little literature exists on how blended learning can be applied in a business setting. This study analyses how an organisation, who markets professional development training, can offer blended learning. Blended learning, a thoughtful combination of educational experiences delivered through face-to-face and online activities, is a challenge for organisations who wish to professionally develop their employees through this type of training. In this comparative case study, it is analysed how professional development training can be offered through the use of blended learning. The data is based on interviews with six blended learning experts and theoretically grounded in a conceptual model with theoretical propositions. The central result of this study is that the learner is the most important element of the learning experience. As such, the central recommendations focus on the learner—individual learning styles and learner control have to be facilitated in creating a blended learning environment. Only then a blend will be successful. Furthermore, the case study showed that collaboration is important in blended learning. Collaboration is straightforward to accommodate in face-to-face learning, however, in online learning social cohesion has to be formed face-to-face so that the threshold to collaborating online is lowered. Finally, no optimal blend is possible in practice, because of the fact that every learning situation is different. The recommendations given in this study on how blended learning can be offered in a professional development training setting, contributes to the literature of blended learning by providing empirical evidence on how blended learning is used in a business setting.

Keywords: blended learning, professional development training, face-to-face learning, e-learning, flipped learning, blended learning experts.

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1 INTRODUCTION

This introduction first identifies the problem in this study, explaining *why* this study matters. After the problem identification, the main research question is presented along with the strategy to answer the main research question, explaining *how* this study is designed. The subject of the study, ExplainiT, is described next. Finally, the scientific and practical relevance of this study is presented, highlighting *what* the impact is of this study.

1.1 THE NEED FOR EMPIRICAL RESEARCH ON BLENDED LEARNING

The need for research on blended learning (hereafter abbreviated as: BL) is twofold: 1. There is little consensus in literature on what it exactly is (Arbaugh, 2014), 2. Not a lot of research has been performed on how BL can foster professional development in business environments (Halverson, Graham, Spring, Drysdale, & Henrie, 2014). What is clear, is that BL is an educational method that combines face-to-face learning and online learning. The ever-increasing technological possibilities stimulates the research into BL. When new technological possibilities are added to the possible mix of BL, it is encountered as a new concept in literature (Halverson et al., 2014). Meanwhile, BL has been analysed for over thirty years now (Sharpe, Benfield, Roberts, & Francis, 2006). In this timespan, it has been named many different things, such as distance learning and mixed mode learning (Picciano, 2014). Due to the confusion to what BL exactly is, no uniform definition exists.

This study joins the discussion on professional development training in business environments. Competing definitions on BL are discussed and a fitting encompassing definition is presented in this study. From the definition, different conceptual dimensions of BL emerge, each with different theoretical perspectives. Arbaugh (2014) mentions there are perspectives in literature on flipped learning use in professional development training, but it could be said literature does not sufficiently link this method to BL. Graham (2006) puts BL forwards as a provider of flexibility to organising learning and as a result lowering the time employees are away from their workplace. This result can be effected through the use of flipped learning, however, it can be argued that this link is not made in literature. Moreover, Driscoll (2002) puts forward that workplace learning (learning in the workplace) is perceived in literature as a cost reducing method, allowing employees to continue their professional development while also continuing their work. Workplace learning can be considered part of the face-to-face environment in BL, however, it can be argued that there is no clear connection made between workplace learning and BL in literature.

This study combines all these different theoretical perspectives and provides advice to any company who would want to use BL for professional development training. Through this comparative case study new knowledge on this topic is be added to the field. Since BL can increase the learning outcomes compared to traditional face-to-face learning or online learning, this study creates valuable insight for organisations wishing to use blended learning.

1.2 RESEARCH GOAL

The goal of the research is to produce information relating to BL in professional development training with the ultimate goal of understanding how BL can be offered in this sense. The central research question with accommodating sub-questions for this study:

How can an organisation who markets professional development training offer blended learning?

Table 1, sub-questions to the central research question

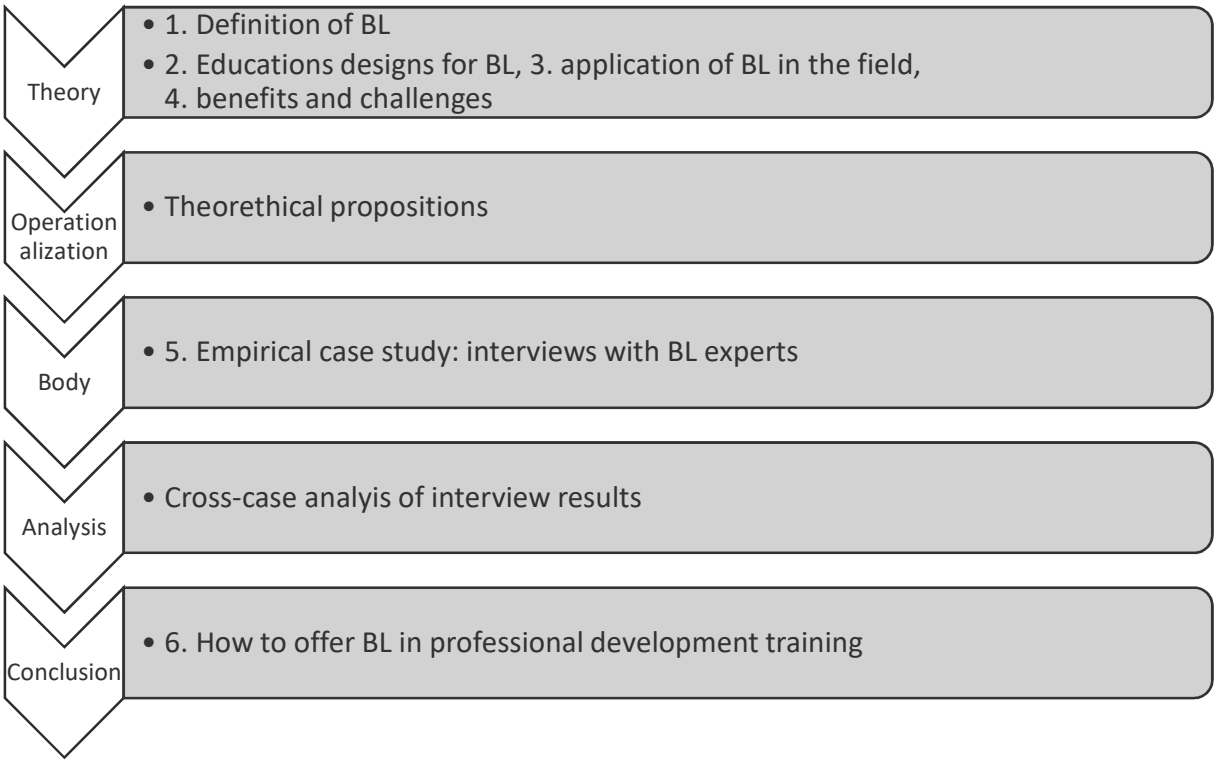
Sub-question	Chapter (#)
1. What is blended learning?	Theory (2.1)
2. What educational designs are possible in blended learning?	Theory (2.2)
3. How is blended learning applied in professional development training?	Theory (2.3)
4. What are the benefits and challenges of blended learning?	Theory (2.4)
5. How do *Blended Learning Experts* offer professional development training in the field?	Empirical case study (5)
6. How can blended learning be offered in professional development training?	Conclusion (7.2)

1.3 RESEARCH STRATEGY

Now that the objective of the study is clear, choices are made regarding the collection of data so that the sub-questions can be answered accordingly. In his book, Yin (2009) distinguishes three conditions assisting in selecting one of the five major research methods discussed: experiment, survey, archival analysis, history, and case study. The first condition pertains to the form of research question. In this study, the central research question starts with a ‘how’, which means it is of an explanatory nature. Explanatory questions look for explanations for the nature of certain relationships (Harvard University, 2017). Explanatory questions are answerable by the use of case studies, histories, or experiments. The second condition asks if a control of behavioural events is required. In this study, no situation can be created wherein behaviour can be directly, precisely, and systematically manipulated. This means that an experiment is not possible in this research setting. Lastly the focus on contemporary events is addressed. The central research question asks for an answer on the current state of perceived knowledge on BL. Thus, contemporary information is needed, which means historical research is not possible. Case study research is generalizable to theoretical propositions. The method is used to understand a real-life phenomenon in depth. The case study inquiry relies on multiple sources of evidence, as a result benefits from the prior development of theoretical propositions to guide data collection and analysis (Yin, 2009, p. 14). In summary, case study research needs a well-grounded theoretical scope to build the case on. Seeing as several sub-questions in this study are linked to the theory, case study research seems to be the best fit for this study.

Figure 1 shows the chosen strategy in writing this research paper. The arrows show the flow of subjects throughout this research paper. The block *Theory* comprises of the first four sub questions. Concepts from the theory are then *operationalized* by means of theoretical propositions and incorporated into interview questions. The body of this research paper presents the results of the *empirical case study*, in which the BL experts were interviewed. The BL Experts are professional development experts who apply BL at their company. The results from the empirical research study are then *analysed* by means of a cross-case analysis. This analysis, combined with the outcome of the empirical case study were then used to *conclude* upon the central research question.

Figure 1, research strategy



1.4 EXPLAINIT

This thesis was written in cooperation with Explainit. Explainit sees itself as a partner for organisations who want to train their employees in their professional development. Throughout the Netherlands there are eighteen locations where the training can be organized, the trainings can be organized in-house too. There are several ways in which trainings can be delivered. Examples are group trainings, one-on-one coaching sessions, and e-learning. Explainit employs account managers who connect training needs of organisations with applicable trainings and accommodating trainers. Every account manager is responsible for approximately one hundred accounts. Next to the sales function of Explainit, there is operations. The function of operations entails marketing, business development, CRM, and other tasks to keep processes running efficiently. The operations function is managed by the director of operations. This study is

performed for the operations side of Explainit, since they want to investigate the premise of BL in professional development training.

The assortment of trainings by Explainit are in the fields of management, communication, and IT. The trainings can be placed under nine themes. Some training themes have grown so specialized, which called for specialized account teams. For this goal, different brands were set up called 'Academy4-xyz', herein the 'xyz' is the name of the theme. Some brands have been launched already, wherein one brand is backed up by a full account team. This brand is Academy4-OR, and can be considered a subsidiary to Explainit. This academy is specialized in trainings for increasing skills of corporate councils and employee participation group members. The other brands focus on the topics of dealing with aggression, Microsoft Sharepoint, and migrating through versions of Microsoft Office/Windows.

1.5 SCIENTIFIC AND PRACTICAL RELEVANCE

Going through literature the notion formed there has not been a lot of peer reviewed research on BL in a professional development setting. Literature reviews on BL confirm this notion (Arbaugh, 2014; Halverson, Graham, Spring, Drysdale, & Henrie, 2014; Drysdale, Graham, Spring, & Halverson, 2013). Researchers seem to be in agreement that a lack of reports from the business world stems from the lack of interest to share knowledge; creating knowledge takes time, creating reports even more. This study takes the theoretical background of BL into account and tests its propositions in a field study, thereby creating insight in how BL is viewed upon in a professional development setting, and therefore in a business setting.

Through a combination of different concepts proposed in this study, and a cross-case analysis, this study provides conclusions as to how BL can be tailored to professional development training. Theoretical and empirical evidence suggests blended learning can increase the learning outcome compared to traditional face-to-face learning or online learning, thus creating valuable insight for organisations wishing to use blended learning.

2 THEORY

This literature review is conducted according to the grounded theory method. The method provides a five-stage process (define, search, select, analyse, and present) which aid in structuring the process of writing a literature review. (Wolfswinkel, Furtmueller, & Wilderom, 2013). Articles were queried using Google Scholar for initial search, and Web of Science for more detailed follow up research. The first step in gathering theory was looking for literature reviews using the keyword 'blended learning'. The best fit for this study was the field encompassing literature study by Arbaugh (2014). This particular article was used to find further articles. The most heavily consulted articles can be found in table 2, all follow up research was based on these articles.

Table 2, theory development process: heavily consulted sources

Source	Type of article, and title
(Arbaugh, 2014)	Review: What might online delivery teach us about blended management education? Prior perspectives and future directions.
(Halverson, et al., 2014)	Overview: A thematic analysis of the most highly cited scholarship in the first decade of blended learning research.
(Bishop & Verleger, 2013)	Survey: The flipped classroom: A survey of the research.
(Zainuddin & Halili, 2016)	Review: Flipped Classroom Research and Trends from Different Fields of Study.
(Nederveld & Berge, 2015)	Summary: Flipped learning in the workplace

The handbook of blended learning: Global perspectives, local designs by Graham (2006) put forward the dimensions for BL used in this study. Additionally, the article by Arbaugh (2014) was analysed and provides the rough outline for the topics in this literature review. The synthesized topics can be found in table 3.

Table 3: theory development process: uncovered topics

Chapter	Topic(s)	Sources
2.1	History of BL	7, see bibliography
2.1	Dimensions of BL	(Williams, 2002) (Singh H. , 2003) (Driscoll, 2002) (Graham C. , 2006)
2.2	Introduction to Design	(Graham C. R., 2014) (Osguthorpe & Graham, 2003) (Richardson & Swan, 2003) (Ross & Rosenbloom, 2011) (Sautter, 2007)
2.2.1	BL models	(Horn & Staker, 2015) (District Administration, 2017)
2.2.2	Flipped learning	(Bishop & Verleger, 2013) (Bloom, 1969) (Lage, Platt, & Treglia, 2000) (Zainuddin & Halili, 2016) (Zhang, Zhou, Briggs, & Nunamaker, 2006)
2.3	BL in business environments / workplace learning	(Garrison & Kanuka, 2004) (Inversini, Botturi, & Triacca, 2006) (Nederveld & Berge, 2015) (Singh H. , 2006)
2.4	Benefits of BL	8, see bibliography
2.4	Challenges of BL	6, see bibliography

2.1 WHAT IS BLENDED LEARNING?

Blended leaning (BL) is a concept that has been around since a long time. The term has its roots in the organisational training and development literature (Oliver & Trigwell, 2005). In traditional education, BL was considered a 'buzz' word (Sharpe, Benfield, Roberts, & Francis, 2006). Some researchers maintain that research in BL is a rather new topic (Halverson, Graham, Spring, Drysdale, & Henrie, 2014), however, research in the field of management education literature has been going on for a long time (Arbaugh, 2014). At the time Sharpe et al. (2006) discussed BL, they stated that the term has been in use for almost twenty years, which means the term has been in use for thirty years now. During this time the definition of BL, and even its name, has been constantly changing. The problem of a changing definition is that there is no consensus in the scientific field. This led professionals to using different definitions like 'hybrid learning' or 'mixed-mode learning' (Picciano, 2014). At the moment of writing this study, there is still no consensus on the definition of BL, leading to difficulties in finding appropriate definitions, models, and frameworks on BL.

Defining what exactly constitutes a BL environment has been a challenge. There are criticisms that dominant definitions focus more on instruction than on learning (Oliver & Trigwell, 2005). The major research in BL was performed during the start of the last decade, in that timeframe three definitions of BL competed with each other, each definition pertaining to a different dimension inherent to BL:

Place: Combining online and face-to-face instruction (Williams, 2002);
Technology: Combining instructional delivery media (Singh H. , 2003);
Design: Combining instructional methods (Driscoll, 2002).

These different definitions exist, since BL is not just implementing technology into a training, and be done with it. There is a need of rethinking the educational design and/or teaching (Bleed, 2001;Vaughan, 2007). The technology point of view is mainly used in the world of business. The third definition is used rarely in research (Graham, 2014). However, in his literature review, Arbaugh (2014) has constructed a more encompassing definition on BL: *educational experiences delivered through the **thoughtful** combination of **face-to-face** and **online** activities*. This is the leading definition of BL in this study as it combines all three dimensions of BL: the concepts *face-to-face* and *online activities* cover the dimensions of **Technology** and **Place**, where the concept *thoughful* covers the dimension of **Design**.

2.2 BLENDED LEARNING EDUCATIONAL MODELS

There is a conception that BL can be fitted in different models, so that the right blend can be created. The combination of face-to-face and online activities that best promotes learning is defined as an '*optimal blend*' (Osguthorpe & Graham, 2003). However, there are no conclusive comparative studies that prescribe an optimal blend. (Arbaugh, 2014), this leaves educators only with the option to deploy trial and error in implementing BL. In short, there are no proven educational model present in the field of education.

BL aims to create the right blend in educational experiences, therefore a careful consideration must be taken in the **Design** phase of a BL training. Sautter (2007) provided some guidelines for determining whether particular educational activities should be conducted online or in a classroom. She argues that activities that require *learner control* should be conducted online, whereas activities that require skills in active listening, oral communication, and/or out of the box thinking were better served by a classroom setting. Learner control is the extent to which the learner has influence over the way he/she can go about the learning. This research was reflected upon by a study of Ross & Rosenbloom (2011), wherein they strived to redesign an undergraduate management strategy course for blended delivery. They discovered that creating a sense of *social presence* early in the course was particularly important for holding the two learning environments together. Social presence is defined as *the extent to which participants are socially and emotionally connected to each other* (Richardson & Swan, 2003). This stress on connection between learners suggests that activities not directly related to educational content are important at the beginning of the training.

2.2.1 BLENDED LEARNING MODELS

As the term says, BL is about creating a blend in education. In their book, Horn & Staker (2015) build on several educational theories and BL research. They developed a model with different blends in educational techniques and delivery:

1. *Rotation models*, a course or subject wherein learners rotate on a fixed schedule between different learning stations (physical location where learning takes place), one of which is online learning.
2. *Flex model*, learners are moving flexibly through different learning stations, based on what they need when they need it. There are no time constraints because learners are not forced to spend a given amount of time in a learning station.
3. *Self-blending model*, learners take some courses online (off-site) and others face-to-face in a classroom.
4. *Enriched virtual model*, a course or subject in which learners have required face-to-face learning sessions with their teacher and then are free to complete their remaining coursework remote from the face-to-face teacher. Many Enriched Virtual programs began as e-learning platforms and then developed blended programs to provide learners with face-to-face experiences.

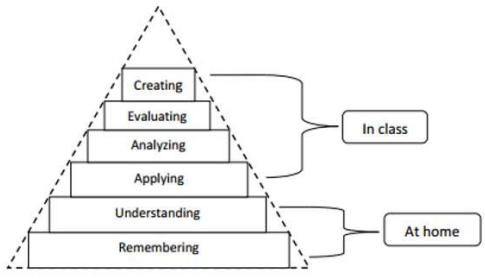
Since the introduction of these models, Californian schools have started working with them and got promising results. The teachers at these schools have more time to effectively administers personal attention to leaners who needed it, improving the effectiveness of teachers (District Administration, 2017). Although these models are based on traditional schools, they are also applicable to professional development, because of the fact that professional development training is administered in classrooms too.

2.2.2 IMPROVING THE EFFECTIVENESS OF CLASSROOMS

The focus of research in BL is mainly on the virtual side of the blend. Influental researchers in BL such as Garrisson, Bonk, Dziuban and Graham (2006) have, as a majority, an educational technology and/or an online teaching background (Halverson, Graham, Spring, Drysdale, & Henrie, 2014). These researchers tend to focus more on the e-learning side of the blend. Since BL focuses on mixing online with face-to-face learning, research in face-to-face learning needs to be addressed as well. Arbaugh (2014) points out that classroom-based researchers may actually be studying the theme of BL under the term of '*flipped classrooms'* or *'flipped learning'*. Flipped learning builds on the notion that *video lectures are as effective as in-person lectures at conveying basic information* (Zhang, Zhou, Briggs, & Nunamaker, 2006). In this sense, using learner and instructor time for lectures is inefficient. Consequently, pre-recorded lectures can be assigned to the learner as homework, leaving class time open for *interactive learning activities* that cannot be automated or computerized (Bishop & Verleger, 2013). Recent studies show that flipped learning is changing the way educators look at learning. There has been a shift going on from 'lecturer-centered' to 'learner-centered' teaching (Zainuddin & Halili, 2016). BL has the opportunity to improve in-classroom learning. Basically, flipped learning means that events that traditionally took place inside the classroom now take place outside the classroom, and vice versa (Lage, Platt, & Treglia, 2000). This definition supports the name 'flipped', although it is considered incomplete, as this description only implies a new combination of the dimension of **Place**; a rearranging of face-to-face and online. Zainuddin & Halili (2016) define flipped learning as a form of BL, wherein both face-to-face learning through group dicussion and online distance learning outside of the class, by watching video lessons and online collaboration, are integrated. To this extent, this definition is almost exactly the same one of the definitions for BL, the only difference being a clear description of activities that should take place.

The basis for the flipped learning model is the idea that individuals have *individual learning styles*. Taking into account that learners have individual learning styles make a thoughtful **Design** of BL possible. The underlying theory to flipped learning is Bloom's 'revised taxonomy of cognitive domain'. In his taxonomy (or categorization) Bloom (1969) established six levels of learning (from lowest to highest level): Remembering, Understanding, Applying, Analysing, Evaluating, and Creating. In the last stage, Creating, learners are able to design, construct and produce something new from what they have learned (Bloom, 1969). Zainuddin and Halili (2016) combined this taxonomy with flipped learning and proposed that the levels of understanding and remembering can best be performed at home (online) and the other stages face-to-face, as displayed in figure 2. In this way, face-to-face time is invested in higher level learning stages instead of listening to lectures and other lower-level learning tasks. Consequently, Zainuddin and Halili (2016) propose tools in which to administer flipped learning per learning level. Furthermore, they compare the tools in flipped learning with traditional classroom tools. The tools are presented in table 4.

Figure 2, Bloom's taxonomy for learning, added with the flipped learning concept



Bloom (1969)

Table 4: Administering flipped learning

Level of learning	Traditional classroom tools	Flipped learning tools
Remembering	Face-to-face lecture	Pre-recorded lecture, reading material, and watching video lectures independently
Understanding	Question and Answer	Reflection, peer-to-peer discussion and collaboration
Analysing	Homework	Classroom activities such as a group discussion
Applying, Evaluating, Creating	Homework or nothing	Classrooms activities such as learner projects, presentations, peer-evaluation and instructor evaluation

Zainuddin and Halili (2016)

In order to reach higher learning levels, it is critical to have face-to-face activities in educational experiences. *Only administering theory and practices through online platforms (e-learning) is simply not enough* (Bishop & Verleger, 2013). Consequently, using a mix of face-to-face and online learning **Technologies**, improves learner experience. In flipped learning, activities such as practice exercises, group-based meetings, and Q&A sessions occur during face-to-face learning activities. Video lectures, individual quizzes, and practice exercises take place outside of class, usually accessed via some type of online platform (Bishop & Verleger, 2013). The justification for using flipped learning is *not using classroom time to deliver lectures,* but to introduce a different kind of teaching. Flipped learning relates to the **Place** and **Design** elements of the definition of BL. In short, interactive group learning is performed in the classroom, whereas learning theory and practice are performed outside the classroom. See table 5 below for an overview of the activities.

Table 5: Activities in flipped classrooms

Inside Class	Outside Class
Questions & Answers	Video Lectures
Group-Based/Open-Ended Problem Solving	Closed-Ended Quizzes & Practice Exercises

Bishop & Verleger (2013)

2.3 BLENDED LEARNING IN BUSINESS ENVIRONMENTS

BL was coined as a promising idea in organisational professional development training since it can reduce costs while still delivering high educational quality. Driscoll (2002) states that in the corporate world BL was first used to refer to educational experiences which allowed for workers to both continue in their workplace and study. BL was initially adopted in business environments as a *cost saving measure*. In addition, Garrison & Kanuka (2004) propose that the delivery of BL experiences involves a move of a significant portion of the learning activities online. A blend of traditional methods (i.e. face-to-face classroom teaching), with technology-based instruction, including online communication, activities and delivery, entails significant changes in **Place** and **Technology** to the educational delivery; for example, leading to shorter '*seat-time*'. This lowered seat time is the reason why BL is so attractive to commercial organisations, as their employees are removed from their workplaces for a reduced amount of time from what they previously were.

Professional development training is also termed as *workplace learning* in literature. Recent workplace learning trends show a favour for flipped learning, which is a flavour of BL (Arbaugh, 2014). Benefits of using flipped learning in a business setting are reduced travel costs, reduced

opportunity costs and increased practice time. Additionally, both employees and managers may see a return on investment during the trainings if they solve a real company problem during the training (Nederveld & Berge, 2015). Since the inception of e-learning, there has been a notion that it could rid organisational need for additional face-to-face trainings. According to Singh (2006), a mistake organisation made was to deliver too much e-learning to their employees. In the past organisations dumped hundreds or even thousands of trainings into a LMS (learning management system), and rely on it too much. A LMS is a software system that delivers courseware plus e-tutoring over the internet (Inversini, Botturi, & Triacca, 2006). Managers expected learners to investigate and find the relevant trainings suited to their work. In many cases, just completing a training through e-learning is not enough to learn task specific requirements. This is where BL proves resourceful, as it involves face-to-face learning. In face-to-face activities learners can put theory into practice by having discussions or performing job specific tasks.

2.4 BENEFITS AND CHALLENGES OF BLENDED LEARNING

The literature outlines different benefits and challenges to BL. First theoretical benefits are outlined. It has been coined that *BL combines the best of the teacher with the best of the technology*. In this way BL delivers improved learning outcomes (Graham, 2006). On the other hand, when there is no thought-through pedagogical relation between parts of the blend, the educational experience will lack coherence (Sharma, 2010). In other words, just because the option of BL is available, does not immediately mean it is wise to use it, a thoughtful **Design** must lay at BL its foundation. Examples of benefits from blended education in management studies include: *increased confidence* when working in virtual project teams, increased *learner control* of the educational experience, and enhanced *dialogue skill development* (Arbaugh, 2014). Furthermore, BL allows for instructors to change how class time is used to *better tailor opportunities for learning* and provide learners with increased *control over their learning experience* by allowing them to decide *what* material they will study and *how* they will study it (Osguthorpe & Graham, 2003). Given the different types of learning activities possible in BL, it accommodates *individual learning styles* learners have, due the fact that learners can choose how they want to learn (Zainuddin & Halili, 2016). In their comparative analysis between traditional and fully online graduate courses, Rovai & Jordan (2004) found evidence which suggest that blended educational experiences produce a *stronger sense of community* among learners than either traditional or fully online educational experiences. Benson, Anderson, & Ooms (2011) add to this by suggesting that BL produced a *stronger sense of community* among learners than traditional face-to-face or online learning combined. A stronger sense of community aides in increasing *learner satisfaction*. Furthermore, BL introduces *more effective use of face-to-face time*, since theory is covered through e-learning (Bishop & Verleger, 2013). In summary, it can combine the best of online and face-to-face teaching, it introduces more effective use of face-to-face time, it allows for learners to learn according to their individual learning styles, learners have increased control over their learning experience, and given the flexible nature of BL is can reduce seat time.

Next to the above-mentioned benefits, there are potential challenges outlined in literature. A challenge that can be denoted is the fact that BL potentially introduces different uses of **Technology**. Derntl & Motschnig-Pitrik (2005), address the challenge of *adoption of technology*

by teachers. The teachers have to, in the end, use the technology to offer their educational experiences in an blended environment. The whole process can be thwarted by teacher not wanting to adopt the technology. Furthermore, incorporating BL as a learning method requires the *roles of the teacher to change*. Bergmann & Sam (2012) highlight that the role of the teacher in flipped learning should shift from being an *instructor to a facilitator*, wherein the instructor should motivate, guide, and give feedback on learners' performance. In other words, educational experiences changes from *lecturer-centred to learner-centred*. Another challenge in introducing BL to teachers is that, in BL the trainers place less emphasis on lectures, but they place emphasis on *flexibility* in the classroom (Nederveld & Berge, 2015). This requires different skills of trainers from what was previously required. A challenge rising up from the flipped learning model is that face-to-face time should not be used to give lectures (Zhang, Zhou, Briggs, & Nunamaker, 2006), face-to-face time should be used for more higher levels of learning than conveying theory. Furthermore, given the lack of comparative studies in BL, Arbaugh (2014) outlined there might not be an optimal blend possible. This is due to the fact that every learning situation is different. The benefit of accommodating different *individual learning styles* can too be interpreted as a challenge. In the past, face-to-face educational experiences were offered in a straight forward manner, what you see is what you get. However, with the introduction of the online environment learners must find their own way in which they learn best, accommodating the individual learning styles requires additional requirements to the **Design** of BL trainings. In addition, the online environment requires *social presence* to be created early in any training (Ross & Rosenbloom, 2011), since it hold the online and face-to-face learning environment together. In summary, there are challenges in adopting new technology by trainers, the role of the trainer is subject to change, Face-to-face teaching should <u>not</u> be used for conveying theory, there is (possibly) no optimal blend possible, different individual learning styles have to be addressed, and it is important for the learning environments to be connected by creating social presence.

3 OPERATIONALIZATION OF CONCEPTS

The aim of this chapter is to operationalize the concepts uncovered in the literature review. First the conceptual frameworks are constructed, after which the inherent concepts are discussed in depth. From the concepts, theoretical propositions are coined which are used for structuring the interviews with the BL Experts.

3.1 CONCEPTUAL FRAMEWORK

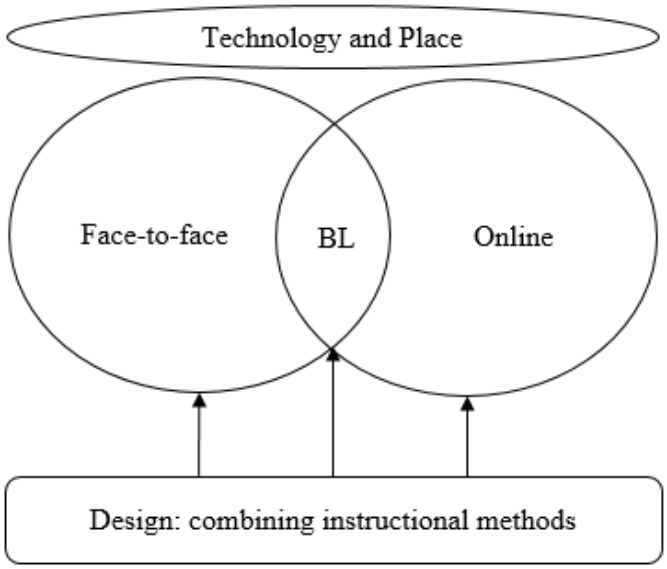
Figure 3 displays the different concepts of the BL models introduced in chapter 2.2.1, it serves as an aide to gauge which models the BL Experts use in practise. The upper side of the matrix relates to the dimension of **Place** and **Technology.** The left side of the matrix relates to the **Design** of the training. Fixed and flexible delivery of instruction is the matter in which timeframe the instructional methods are provided, thus this dimension can also be explained as Time in this figure. In the flexible approach learners can follow the instructions at their own pace, whereas the learning timeframe is prescribed in the fixed delivery type. With the proposed framework, organisations who want to introduce BL into their trainings can choose for a blend in their instruction. The prerequisite needs for the training must first be analysed, after which the model can be used to select the right blend. The literature speaks of the possibility of an 'optimal blend', but does not conclude on it actually existing. This study tries to answer, through interviews, if the BL Experts think it exists.

Figure 3, Blends in blended learning

Delivery of instruction	**Majority of instruction through** Face-to-face	**Majority of instruction through** Online
Fixed	Rotation models	Enriched virtual model
Flexible	Flex model	Self-blending model

Next to trying to find whether an optimal blend exists, the interviews in this case studies are structured according to the dimensions of BL found in this chapter. As an aid, a conceptual framework is drawn up, depicted in figure 4. In the model **Technology** and **Place** are placed above the learning environments, since they both cover the distinction of *face-to-face* and *online* learning; **Technology** covers the instructional delivery media and **Place** covers the instructional location. The two dimensions overlap in learning environment, but their inherent concepts do not. **Design** is placed below the learning environments, since it introduces the supporting elements influencing both learning environments. The concepts in each dimension are enumerated upon in the next three subchapters. *Face-to-face* relates to learning activities which happen in the physical world. Examples of such activities are classroom and workplace learning. Either of these **Places** allow for professional development training. The *online* environment relates to learning activities which can be performed *online*, examples of such activities are e-learning, practice exercises/quizzes, and online collaboration. Where the two environments overlap, BL is taking place. The **Design** dimension influences in which environment the learning takes places. Additionally, **Design** provides the methodological backbone to the blend in that it binds the two learning environments together.

Figure 4, conceptual framework of dimensions in blended learning



3.1.1 **TECHNOLOGY**

Technology is the combination of instructional delivery media (Singh H. , 2003). In BL, there are two types of delivery media: Face-to-face and online. Online media are platforms through which instructions and information are provided. Through online delivery different instructional media can be used: pre-recorded lectures, reading material, and video lectures. Additionally, learners can communicate with other learners in the online environment so that they can reflect, discuss with their peers, and collaborate with them. Face-to-face activities make use of traditional instructional media such as classroom activities and workplace learning. The activities in the face-to-face environment support interactive activities such as: group discussion, presentations, peer-evaluation, and instructor evaluation (Zainuddin & Halili, 2016). BL builds on the fact that face-to-face activities are needed in educational experiences, online activities in itself are useful, but are on its own not enough to get a good learning result. Bishop & Verleger (2013) propose that administiring theory and practices only through online platforms is not enough, face-to-face learning is needed. In this way the two environments are bound together as shown in the above conceptual framework.

3.1.2 **PLACE**

Place is the combination of online and face-to-face instruction (Williams, 2002). In the model, interactive learning is performed in the face-to-face environment, where theory is performed online, this is line with the flipped learning model. The general belief in literature is to optimize classroom time of learners and teachers. The stages in the taxonomy of Bloom of Understanding and Remembering should be performed online, whereas Applying, Analysing, Evaluating, and Creating is best performed face-to-face (Zainuddin & Halili, 2016). This is in part because collaboration comes into play in these learning stages, which is best done in face-to-face since physical contact is then possible. Furthermore, it can be argued that BL can, in the end, reduce costs for organisations. This is due to the fact that employees are less time away from their working stations, leading to a so called reduced ‘seat time’ (Graham C. , 2006).

3.1.3 DESIGN

Design is the combination of instructional methods (Driscoll, 2002). Design decisions influence the outcome of the blend. The Design can be seen as the foundation of BL and is therefore placed beneath the two learning environments in the conceptual framework. Design underlines the use of accommodating individual learning styles (Zainuddin & Halili, 2016), providing learner control (Sautter, 2007), and creating flexibility (Nederveld & Berge, 2015), which all contribute to the effectiveness and results of BL. Initial face-to-face activities are useful for creating social presence. Social presence is useful in fusing the two learning environments together (Ross & Rosenbloom, 2011). Designing educational experiences in a thoughtful way can help learners to use according to their own learning style. Individual learning styles require learners to have control over their learning experience, moving a part of the educational experiences online helps learners in doing so.

3.2 THEORETHICAL PROPOSITIONS

The interviews in this study provide more information on how BL Experts apply BL in the field. By means of the conceptual framework, different concepts are defined. These concepts are operationalized into variables by means of theoretical propositions (TP's), see table 6. In the table, the concepts are displayed in **bold**. The TP's are a guideline to gauge whether the theory is in line with the real world, in this way empirical evidence for the theory can be gathered. For each TP specific questions are formulated, these can be found in Appendix A: Interview questions. There is one TP which is not grounded by theory: Technology 2: instructional media should be compatible with the LMS of customers. The questions behind the TP deal with requirements of a LMS, since Explainit wants to learn from these questions the proposition is introduced here.

Table 6: Interview topics and theoretical propositions

Topic	Theoretical proposition
Blended learning in **general**	Blended learning is the future in learning.
Technology: combining instructional media	1. Administering theory and practices only through online platforms is not enough, **face-to-face learning is needed**. 2. Instructional media should be **compatible** with the LMS of customers.
Place: combining face-to-face and online learning	1. Understanding and remembering of theory should be performed **online**, whereas applying, analysing, evaluating, and creating theory is best performed **face-to-face**. 2. Shifting a part of the training from face-to-face to online helps **reduce costs** for companies, in part due to a **lowered seat time**.
Design: combining instructional methods	1. Creating **social presence** early in the training is essential to the success of blended learning. 2. Learners have **individual learning styles**, therefore learning activities that require **learner control** should be performed online, whereas interactive learning activities should be performed face-to-face.
Getting the right **blend**	There is **no optimal blend** in blended learning.

4 METHODS

This chapter describes the methodology with which the research is performed. First, case selection is described after which the data collection methodology is presented. The final part of the methodology clarifies how the collected data is analysed.

4.1 CASE SELECTION

Different types of case study designs exist. There are single-case and multiple-case designs on the one hand, and holistic or embedded designs on the other (Yin, 2009, p. 46). Mixing these two designs up makes for a possible of four types of case study designs. In order to be able to select cases, different decisions have to be taken. In this study, Explainit indicated it wants to know the opinion of organisations on the topic of BL. This automatically leads to the introduction of multiple cases—analysis of one case (in this case: one organisation) is not what Explainit desires. Scientifically, multiple-case studies are more convincing, than single-case studies, as their evidence is regarded as more robust (Herriot & Firestone, 1983). The application of a holistic design is called single method, whereas studies with an embedded design are called mixed method: more than one method of research is used (Yin, 2009, p. 62). This study applies a single method approach, through the use of interviews. The interview method needs a case to build itself on, in this way it is important to specify which cases are to be studied. Figure 5 aids in selecting a data collection source.

Figure 5, Design versus Data Collection: Different Units of Analysis

Design	Data Collection Source: From an individual	Data Collection Source: From an organization	Study Conclusions
About an individual	Individual behaviour Individual attitudes Individual perceptions	Individual employee records Interview with individual' s supervisor; other employees	If case is an individual
About an organization	How organizations works Why organization works	Personnel policies Organization outcomes	If case is an organization

Yin (2009, p. 89)

Information is needed on how an organisation works with BL, and why it works this way. As figure 5 shows, the data should then be collected from an individual in an organisation. As a result, the case study design is complete: Cases are about an organisation, with data extracted from an individual in that organisation.

4.2 DATA COLLECTION

In case study research, there are six possible sources of information: documents, archival records, interviews, direct observation, participant-observation, and physical artefacts. Each type of

information calls for a different type of data collection procedures. However, in every data collection method some principles are important: to use multiple sources of information, to keep a case study database, and constructing a chain of evidence in the data (Yin, 2009, pp. 98-125). This study makes use of qualitative interviews to extract information from the *BL Experts*.

The qualitative interview is based on a set of topics to be discussed in depth rather than based on the use of standardized questions (Babbie, 2014, p. 318). Since patterns need to be drawn from the questions, some sort of standardization has to take place in order to have some kind of control in this study. RAND distinguishes three types of interviews (from low to high control): unstructured, semi-structured, and structured (RAND Corporation, 2009). In this study, the interviews are used for delving information on what BL Experts think of BL. For this purpose, semi-structured interviews are the best fit. In semi-structured interviews a guide is used, which outlines which topics have to be covered. The questions herein are standardized, wherein standard follow up questions are inventoried before the interview, to apply structure. The follow up questions allows for the interviewee to give the needed information, if the information is not retrieved through the original question. For the semi-structured interviews, a protocol was constructed, which led the conversation in the interviews. The interview protocol can be found in Appendix A.

A total of six BL Experts were interviewed, which are shown in table 8 below. Guest, Bunce & Johnson outlined considerations on deciding how many interviews a researcher needs. The first consideration is interview structure. The more structured the interview is, less interview are needed than with an unstructured interview. The second consideration is the heterogeneity of a group, the more heterogeneous a group is, the more interviews are needed (Guest, Bunce, & Johnson, 2006). The interviews in this research are semi-structured with interviewees being a homogenous group. The BL experts are all employing BL in practise with the goal of professionally developing employees. The only heterogeneity between the BL experts is the type of organization they work for. Additionally, after four interviews, patterns from the interviews emerged to a point the researcher could guess in the following interviews how the interviewees would respond. This phenomenon is called ‘theoretical saturation’ (Glaser & Strauss, 1967). Given the resources available to the researcher, no more further interviews were planned after theoretical saturation was reached. Due to the above considerations, six interviews proved to be sufficient in answering the central research question.

Table 8, interviewed BL Experts

#	Organisation	Industry	Function
1	University of Twente	Education	Centre of Expertise in Learning and Teaching.
2	Tinten Training & Advies	Well-being	Responsible for learning programmes for well-being employees and volunteers.
3	Tergooi Academie	Healthcare	Responsible for learning programmes for healthcare professionals in hospital in Hilversum.
4	ROC Rivor	Education	Responsible for delivering learning programmes for employees and students.
5	Urenco Nederland	Manufacturing	Responsible for learning programmes of all employees.
6	GGZ Delfland	Healthcare	Responsible for learning programmes for mental healthcare professionals.

4.3 DATA ANALYSIS

The following subchapters describe how the semi-structured interviews are analysed. Additionally, the validity and reliability of this study are addressed. Five techniques are available in case study analysis: pattern matching, explanation building, time-series analysis, logic models, and cross-case synthesis. Of these techniques pattern matching is considered the most desirable, since it strengthens the internal validity of a study (Yin, 2009, p. 136). In pattern matching, patterns are first predicted from theory after which they are tested in practice. Chapter 3.1 (conceptual framework) provides the theoretical concepts of this study, which are worked out into TP's in chapter 3.2. The analysis consists of analysing whether the theoretical predictions are confirmed in practice by the BL Experts. Additionally, the responses of the BL Experts were analysed by summarizing them into a cross case analysis in chapter 6: Analysis. The primary output of the interviews was collected through voice recordings of the interview itself. After administering the interview, the voice recordings were transcribed to text. The text was then structured by putting the relevant excerpts in a matrix. The upper side of the matrix contains the accounts and the left side the interview questions (see Appendix B for the matrix). The topics of the interview questions are the same topics presented in chapter 3.2 'theoretical propositions'.

4.3.1 VALIDITY AND RELIABILITY

For this research to have impact, careful consideration is given to validity and reliability. In social research, there are different kinds of design tests to be considered for the design to have a high quality: validity and reliability.

The different kinds of validity were taken into account. Validity addresses how well a measure reflects what it is supposed to measure (Dooley, 2001, p. 88). There are different kinds of validity:

- *Construct validity, addresses whether the correct operational measures have been established for the concepts that are being studied.* In this study, construct validity is taken into account by using multiple cases of evidence and establishing a chain of evidence by using tables.
- *Internal validity, controls whether a causal relationship has been established*. In this study, internal validity is guaranteed by using pattern matching through cross-case analysis (chapter 6.2) and searching for negative cases wherein alternative explanations are accounted for.
- *External validity, proves that the domain of a case study can be generalized*. In this study, external validity is addressed by an in-depth explanation of the research design (chapters 1.2, 1.3, and 4.2). By presenting an extensive research design, this research can be reproduced, thus improving external validity.

Reliability assesses the extent to which a measure reflects some consistent aspect of people or events rather than random error (Dooley, 2001, p. 93). Consistency, herein, means whether the research can be replicated. To guarantee consistency, semi-structured interviews are used. This method allows for gathering of data through interviews in a structured manner. The interview protocol is presented in Appendix A, this transparency improves replicability of this study.

Since interviews with persons of companies are performed in this study, ethical approval was requested from the Faculty of BMS. Only with this permission, the field work research could be performed. The ethical conditions for the data collections techniques can be found in Appendix C.

5 EMPIRICAL CASE STUDY

This chapter presents the results of the empirical case study. The chapter is structured according to the uncovered concepts set out in chapter 3 (operationalization of concepts). The goal of the case study was to discover patterns throughout the interviewed BL Experts. The results of the interviews are presented by giving the relevant excerpts in a matrix. The interview matrix can be found in Appendix B 'Interview matrix', the interview protocol can be found in Appendix A. The left-hand side of the interview matrix contains the (coded) interview questions per topic; the upper side the BL Experts. The interview questions rely on TP's, the results are compared to the TP's with the BL Experts in the next chapter. Patterns are then summarized by means of a cross-case analysis in Chapter 6: Analysis.

5.1 BLENDED LEARNING IN GENERAL

The first topic consists of two questions about BL in general as well as a statement with which the BL Experts can relate with or not. The underlying TP is general in nature. The results on this topic are interpreted by means of the TP in the next chapter.

The BL Experts all have affinity with BL. Most BL Experts are responsible for the learning and development of employees for their respective organisations, except for the University of Twente (UT). The goals of these departments are to train their own employees, Tinten Training & Advies (TTA), GGZ Delfland (GGZ), and UT serve and additional purpose—their training programmes are also open to healthcare professionals outside of their organisation. The Centre of Expertise in Learning and Teaching at the UT focuses on both students of the university and professionals, and develops programmes for these target groups. The department has experience with flipping classrooms (shorts blends) and longer blends. Examples of such blends are a specialist international blended educational experience on rural energy planning (ICREP), and different Massive Open Online Courses (MOOCs). Interesting first remarks came from the Tergooi Academie (TA) and GGZ. TA said they experienced pure *face-to-face learning took too much time and did not deliver*. They tried pure e-learning after, but found out soon enough this was not the answer to their learning question either. As a result, they switched to BL—*BL enables for educational experiences to be delivered in small chunks*. GGZ mentioned that, although BL is considered a new trend in the field of professional training, a lot of these methods have been used for a long time. Perhaps a new thing that BL brings is that you can now first *cover theory by yourself after which practice is performed face-to-face*.

Out of the six BL Experts, four believe *BL provides better results than traditional teaching methods*. Granted, *thoughtful* decisions have to be made: there should be *short learning periods*, there should be *workplace learning* involved, and the *e-learning should be understandable* for all ages of employees. The UT and GGZ say the results of BL are dependent on the *learner*. GGZ says the learner should follow instructions accordingly, if they skip a certain part, the result of the BL educational experience will disappoint. Furthermore, the UT says the key in learning lies in interactions of learners with each other and with the teacher—*collaboration*.

When asked whether BL combines the best of the teacher with the best of technology, all BL Experts, except one, agree. They did place some comments on the statement, *BL can combine the best of the teacher and the classroom* on a few conditions: 1. You must acknowledge that *every educational situation is different*, 2. The online environment must be interactive, 3. You need to really understand which knowledge needs to be transferred, cut out all the rest, 4. *Workplace learning* must be involved, 5. Classrooms must be used to go in more *depth* than the online environment. Urenco Nederland (Urenco) does not agree with the statement. They mention the learner determines the yield of the process of learning, therefore *the learner is the most important element of BL*.

5.2 TECHNOLOGY

The topic of Technology consists of four questions and one statement, the questions have two separate TP's. The underlying TP's address classroom usage and the LMS. After the results on this topic have been presented the TP's are interpreted in the next chapter, a conclusion is then drawn whether there is a match.

All BL Experts have experience with e-learning, varying from little to expert experience. The UT and TTA mention that *e-learning should be interactive*, in that learners are able to *collaborate* with each other. TA, ROC Rivor (ROC), and GGZ use external e-learning platforms to teach their employees in soft skills. Soft skills train personal attributes that improves ones' functioning. GGZ says they have good results with e-learning, only due to work-pressure (being a given in the healthcare industry) employees indicate they cannot really find the time to do it. Additionally, GGZ make use of thirty to forty healthcare specific trainings through e-learning through GGZ Ecedemy, a country wide initiative of GGZ. ROC mentions their LMS is used to put in all the educational materials by five dedicated employees, the LMS is effectively used as a container of information. TA mentions it is paramount that *modules in e-learning should be short*. Urenco comments they have both good and bad experiences with e-learning. They acknowledge Virtual Reality (VR) has great potentials, in the future a part of the practise, which is at the moment performed in class, could shift to an online VR environment. There were also cases where Urenco encountered badly designed e-learning modules, from these cases sprung considerable trust issues from within the employee base. In later stages when new e-learning modules was introduced, considerable effort was needed to convince employees of the benefit of e-learning.

On the topic whether e-learning had in itself proven to satisfy the existing training need, three BL Experts were disagreed and the other three had mixed results. The negative answers came from TTA, ROC, and Urenco. TTA indicates *seeing face-to-face and being able to discuss is just too valuable to ignore.* Urenco suggests that just e-learning does not work for their organisation, since there is no *workplace learning* involved. *Without face-to-face activities, there is no place to bring the newly gathered knowledge into practise.* The mixed answers came from the UT, TA, and GGZ. The UT says you need *collaboration* in learning, only when e-learning accomplished this, it can work. TA mentions it is possible for some topics, such as learning to use Microsoft Office, but *some things you can only learn through practical experience*. GGZ mentions the real-world changes constantly, but e-learning cannot accommodate this. In this way, it can never address the existing learning need.

When asked whether *trainers are the most important part of technology* in BL the UT, TTA, TA and ROC agreed. For this agreement, different arguments were given: 1. *The teacher/trainer should oversee the learning process, answers questions, and facilitate discussion* (also in the online environment), 2. *Learners need practise activities* to retain what was learned, *a trainer facilitates this*, and 3. *The trainer is there to enthuse and inspire the learner*. In summary, the trainer becomes a *facilitator of learning* in BL. Urenco and GGZ disagreed. Urenco stipulates that not the teacher, but the *learner* is most important element of BL.

The next topic in Technology is the requirements of the LMS. All BL Experts gave comparable answers, for clarity all requirements are summed up. The LMS should:

- Be as simple and clear as possible (*user friendly*);
- Have *personalized* dashboards which tells uses what is available (and how much time it will take), what has been done, and what the results were;
- *Promote collaboration* and exchanges between knowledge groups who normally do not have contact in the workplace;
- Be highly *customizable* and flexible for an admin, allowing to bind the online and offline environments together;

With regards to the compatibility of a possible BL system the company may want to introduce, the BL Experts all said it should be *compatible*, except for the UT. However, the UT mentioned that learning management systems all run on universal languages such as LTI or SCORM, so *there is always a possibility for organisations who have an LMS to read out information from other systems*. Urenco is a unique outsider in this category since their processes are confidential—they enrich uranium. Given the fact they have confidentiality rules, it would be unwise to link external systems to their system.

5.3 PLACE

The topic of Place consists of three questions, the questions have two separate TP's. The underlying TP's address the concept of where learners learn best based on Bloom's taxonomy, and the concept of reduced seat time. After the results on this topic have been presented the TP's are interpreted in the next chapter, a conclusion is then drawn whether there is a match.

The first two questions centre around which learning activities should be performed *face-to-face* and which *online*. For clarity, the results are displayed in table 9, Place: learning activities. A table is chosen since all BL Experts unanimously responded to the questions about learning activities and place. Additional meaningful information is outlined below the table. Both the UT and ROC mentioned that the classroom environment should not be used to give lectures. However, the UT did note that if you were to give a lecture in class, the teacher should at least be inspiring. Summarizing Urenco remarked, that face-to-face learning should be used when beforehand it is not yet clear which path the learning will take, face-to-face learning smooths this uncertainty, since it is *interactive*. For the online environment, the UT argued that *the lower levels of Bloom (Remembering and Understanding) can be easily performed online*. However, the UT argues that *higher stages can also be performed online*, these higher stages depend on *collaboration* of learners, a LMS that facilitates this would then be required.

Table 9, Place: learning activities

Environment	Purpose	Learning activities
Face-to-face	Deepening knowledge, collaboration, exchanging experiences, practise of knowledge, specializations, learning new skills/knowledge.	Discussion, giving feedback, presentations, role playing with actors, one-on-one settings, workplace learning (for bringing into practise of what is learned).
Online	Learning/gathering (base) knowledge/theory, presenting groups chunks of theory of the same topic.	E-learning, VR.

On the statement whether BL can reduce organisational costs, the BL Experts are divided. The BL Experts that do agree give different arguments. TTA mention they have to *book less classroom time* in BL, which saves money, and are subsequently more *flexible* in their schooling budget. ROC and GGZ say the benefits of BL will appear over time. ROC mentions that their *employees still have to get used to BL*. On the other hand, GGZ mentions that *BL is easier to organize*, additionally employees are away for shorter times from their workplace which is *efficient*. The BL Experts that disagree with the statement too have varying arguments. Urenco mention they miss out on the *scalability* efficiency of BL, given the fact that they have a relatively low number of employees (260). The UT mentions there is a misconception on the process of designing an educational experience. *After compilating setting up, it will still need work in the future. In this way BL is more time consuming to manage than either classroom or online learning*. TA mentions that, compared to the previous situation (classroom learning), *costs now shift to other functions of the organisation*. TA does experience that *BL is more time efficient for their employees*.

5.4 DESIGN

The topic of Design consists of two questions and one statement, the questions have two separate TP's. The underlying TP's address the concepts social presence and learning styles. After the results on this topic have been presented the TP's are interpreted in the next chapter, a conclusion is then drawn whether there is a match.

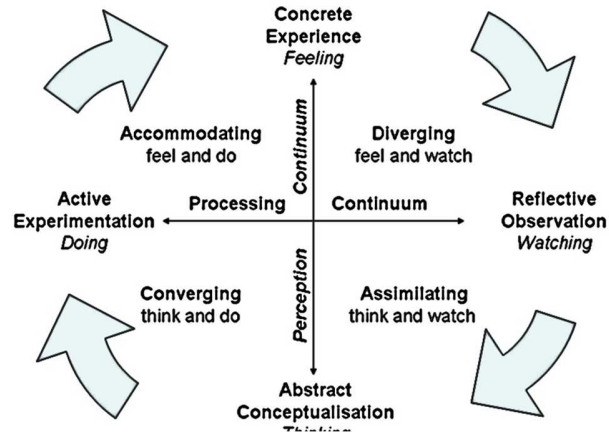
The BL Experts were first questioned whether they thought it important to plan activities at the beginning of a BL training which are not directly related to the educational content. TTA, TA, and Urenco said they do not do this, the main reason for not doing so is *work related time pressures.* The UT, ROC, and GGZ all propose that *learners need to see each other face-to-face to create social cohesion*. This *social cohesion lowers the threshold in the online environment to ask questions and work together*. The UT and ROC add to this by stating that *collaboration* in learning is needed in order to get a good learning experience. GGZ mentions that *in most cases, already some social cohesion is present, since learners are most of the times colleagues who regularly work together*.

When asked which activities require learner control, two different patterns emerge. TA, TOC, Urenco, and GGZ mentioned learners should have the *freedom* to learn in the way they want to, because *learners have individual learner styles*. Urenco added to this by mentioning that learners should be aware of the fact that they have *ownership* over their own learning process, and should

be facilitated as such. The UT went for an abstract approach for this question. They make a distinction between *asynchronous and synchronous activities*. Asynchronous activities can all be done in learners' their *own time*, and therefore *learner control* is possible. *Asynchronous* activities are reading an article, doing a quiz, watching a (interactive) video, and doing games. These activities allow for learning to gain a deeper insight and reflect on what was learned, the disadvantage is that these activities do not allow for collaboration. *Synchronous* meeting, meetings in real-time, do allow for this, and are useful for *deeper learning*.

All BL Experts agree with the statement if learner control increases results in learning. The UT and Urenco mention that a heightened level of *autonomy* in the learning process produces better results. GGZ mentions learners who take *responsibility* and are *motivated* is key. TTA mentions that mandatory learning does not work for their employees, the more they say learners need to do something, the more likely they will not do it. Therefore, they experience better results when learners have greater *autonomy* over their learning process. ROC mentions that Kolb (2005) identifies four different *individual learning styles*, for clarity these learning styles are presented in this section. The styles are: Accommodating, Diverging, Assimilating, and Converging—see figure 6 to the right (Kolb, 2000). In his model Kolb (2000), builds on his experiential learning model. The experiential learning cycle is presented as the outer rim in figure 6, the steps are: 1. Concrete Experience, 2. Reflective Experience, 3. Abstract Conceptualisation, 4. Active Experimentation. The individual learning style addresses in which experiential stage a learner should begin to get an *optimal learning results*.

Figure 6, Kolb's learning styles



5.5 GETTING THE RIGHT BLEND

The topic of getting the right blend consists of three questions, the questions is backed by one TP: there is no optimal blend in blended learning. After the results on this topic have been presented the TP is interpreted in the next chapter, a conclusion is then drawn whether there is a match.

The first question revolved around the model figure 3: 'blends in blended learning'. BL Experts were asked which blend they prefer in their organisation. Almost all BL Experts mention that *the model does not work in their organisation*, they give two reasons for this. First, *every learning situation is different*, therefore they cannot say which strategy fits for all their educational needs. Second, *face-to-face training is fixed*, with a little bit flex, since most of the time employees can choose which timeslot they want to attend. For organisations, *the online environment is always flexible.* This is because a learner can choose when to do a training, there is no fixed time set for this. Generally, organisations want to provide their trainings as *flexible* as possible. Again, both sides of the model do not line up for every situation. The BL Experts that eventually did indicate

which strategy they use mention they use *face-to-face* instruction in majority, with a *flexible* part of e-learning.

The second questions revolve around figure 2: Bloom's taxonomy in flipped learning. All BL experts had some level of affinity with Bloom's taxonomy. The BL Experts were asked whether they think flipped learning is applicable to professional development training. Overall, *the BL Experts are positive about flipped learning in the workplace*, where some are quite enthusiastic about the learning model. *They all employ the first two stages of Bloom (Remembering and Understanding) through an online environment*. TA and Urenco mentioned that *for the higher stages (Evaluating and Creating) classrooms* are not suitable, but *workplace learning* is more applicable. Urenco mentions they *place workplace learning on top of in-class* activities in Bloom's taxonomy. *In the workplace learners apply their newly gained knowledge, which in the end they innovate—the Creating phase in Bloom's taxonomy*. Urenco notes that doing practise exercises in the classroom cannot be considered as 'the real thing', since the classroom is a safe and controlled environment; it does not reflect the real world. Still, there are challenges to introducing flipped learning in the workplace. The UT says that for it to work, the *face-to-face activities must stand in connection to the online environment*. TTA and TA both mention their employees need to adjust to working with BL through flipped learning, they are both convinced the new way of learning is something everybody can learn. TA herein makes a distinction between 'young' and 'old' employees, wherein young employees mostly do the first two stages of Bloom by looking everything up on a digital device, older employees still have to get used to this idea of learning theory on your own. ROC says that when you introduce flipped learning in BL, you should keep in mind that *everybody learns differently, therefore learners should have the freedom to pick a way that is closest to them*. GGZ mentions they let employees teach other in the workplace, most of the times there are hierarchical differences, which leads to employees taking the typical leading role. They conclude that there should be *collaboration* for learning to take place, so they try to educate their employees as such and minimize the typical teacher role.

When asked whether an optimal blend in BL exists the answer is unanimously no. The UT, TA, and Urenco herein argue that no optimal blend is possible since *every learning situation askes for a different solution*. Additionally, the UT mentions that BL lies in the domain of the social sciences, for this reason there is always debate whether something works or not. TTA and ROC again mention that people have *individual learning styles*, if BL is to work, these learning styles have to be *accommodated* as such. Finally, GGZ mentions the possibility of there being *optimal blends per training theme*, however, the success factor ultimately lies with the *learner*. The learner really has to be activated in that they get into the learning mode, this is key for any learning situation.

5.6 CLOSING REMARKS

In the final part of the interview two closing questions are asked. Given the general nature, no new TP's are coined. The first question revolves around the topics whether the BL Expert would rather buy a BL training in a specialist or broad topic. Four BL Experts respond that they rather have a *specialist* topic. The arguments they give for this is that specialist topics are more *concrete* in nature and allow for learning of *deep knowledge*. Another argument they give is the need from within their organisation, in the healthcare industry *specialist knowledge is needed*, this plays a

role in the training needs of these organisations. ROC and Urenco mention that the desired topic for BL *depends on the theme*, it can either go specialist or general. General skills do fit BL, since general knowledge can be made scalable through e-learning. The final question of the interview revolves around the fact whether all types of trainings can be delivered through BL. Overall *the BL Experts agree that all trainings can be instructed through BL*, however, just because it can be done does not mean it should be done. For example, the UT and TTA mention that there are some things you can only learn by doing (art), consequently there are some topics which work better instructed purely online (software skills). ROC and Urenco mention that the *learner should be accommodated* at all times, taking into account their *individual learning style*, only then can BL work.

6 ANALYSIS

This subchapter serves as a recap of what was said by the BL Experts during the interviews. Table 10 'cross-case analysis' displays the resulting pattern(s) per question. The questions of the interview serve as a means of testing the theoretical propositions, which are shown above each set of supporting questions in the table.

Table 10, cross-case analysis

Topic		Patterns
1.1	Introduction	The BL experts (6 in total) all have affinity with BL. 5 cases are responsible for learning and development within their organisation; 1 case directs their BL trainings primarily at students instead of professionals.
1.2		4 cases think BL provides better results than traditional teaching methods. 2 cases says BL relies on the depending factors of 1. Results are dependent on the learner, and 2. The key of better results lies in collaboration of learners.
1.3		5 cases think BL combines the best of the teacher with the best of technology. The case that disagrees with the statement puts forward the results are dependent on the learner, therefore the learner is the most important element of BL.
TP		*Blended learning is the future in learning.*
2.1	Technology	All BL experts have experience with e-learning. In their eyes, requirements of e-learning is that it should be interactive so that it fosters collaboration, and learning modules should be short.
2.1.1		3 cases mention e-learning in itself has never been able to satisfy their training need, the other 3 cases had mixed results.
2.2		4 cases agree with the statement that trainers are the most important element of technology in BL. 2 cases stipulated that not the trainer but the learner is the most important element.
TP		*Administering theory and practices only through online platforms is not enough, face-to-face learning is needed.*
2.3		All cases gave comparable answers. In summary, an online environment should be user friendly, be personalized, be promoting collaboration, and be highly customizable.
2.4		All cases think components of online trainings should be compatible with their LMS.
TP		*Instructional media should be compatible with the LMS of customers.*

Topic		Patterns
3.1	Place	Cases responded unanimously: face-to-face meetings should be used for interactive learning. 2 cases put forward the classroom should not be used to give lectures on theory.
3.2		Cases responded unanimously: the lower stages of Bloom's Taxonomy can be performed online.
TP		*Understanding and remembering of theory should be performed online, whereas applying, analysing, evaluating, and creating theory is best performed face-to-face.*
3.3		3 cases agree and 3 cases disagree. On the one hand, BL is more difficult to organize than regular teaching in classrooms, therefore more knowledgeable learning professionals are needed, this increases costs. On the other hand, BL is leads to more flexible use of professional development training by employees, which is the ultimate goal.
TP		*Shifting a part of the training from face-to-face to online helps reduce costs for companies, in part due to a lowered seat time.*
4.1	Design	3 cases do organize activities not related to the content of the training in order to create social cohesion between learners. The 3 cases that do not organize such activities mention it being not possible due to work related time pressures of their employees.
TP		*Creating social presence early in the training is essential to the success of blended learning.*
4.2		5 cases put forward learners should have freedom in how they want to learn because they have individual learning styles. 1 case made the distinction between synchronous and asynchronous learning activities, wherein asynchronous learning activities enables learner control.
4.3		All cases agree with the statement.
TP		*Learners have individual learning styles, therefore learning activities that require learner control should be performed online, whereas interactive learning activities should be performed face-to-face.*
5.1	Blend	The cases mentioned that the sides of the model do not line up. Generally the BL experts go for the most flexible solution possible in the blend.
5.2		Overall the cases are positive about flipped learning in the workplace. All cases administer the first two stages of Bloom's Taxonomy through an online environment.
5.2.1		For higher stages of learning workplace learning is needed, the online environment must stand in connection to the face-to-face environment, and learners should be able to choose to learn in such a way that fits their learning style.
5.3		All cases state there is no optimal blend in BL possible. Per training theme an optimal blend might be possible, but there is no optimal blend possible since every learning situation is different.
TP		*There is no optimal blend in blended learning.*
C.1	Closing	4 cases mention they prefer specialist topics, specialist topics are more concrete in nature and allow for learning of deep knowledge trough BL. The other 2 cases mention that it depends on the theme of the topic—general topics do fit in BL since these topics are scalable to large audiences through e-learning.
C.2		All cases agree that all types of trainings can be administered through BL, however, just because it can be done does not mean it should be done.

7 DISCUSSION & CONCLUSION

This chapter first discusses the analysis of the previous chapter. First the theoretical propositions are discussed, after which the theoretical model is revisited. Finally, an conclusion to the central research question is drawn after which future research within the topic of BL for professional development training is highlighted.

7.1 DISCUSSION

In this study, blended learning is defined as: educational experiences delivered through the thoughtful combination of face-to-face and online activities. Herein **Place** and **Technology** relate to *face-to-face* and *online* learning environment, **Design** relates to *thoughtful combination* between these two environments. The concepts in the dimensions were operationalized into theoretical propositions and are concluded on in this chapter by means of the cross-case analysis as presented in chapter 6.2. The TP's are provided with a coloured backdrop. The backdrops indicate whether the TP is confirmed (green), there are mixed results (yellow), or the TP is contradicted (red). The purpose of the TP's is to provide empirical evidence to the theoretical findings. The empirical evidence for each TP is outlined under each statement.

General TP: blended learning is the future in learning.

All BL Experts have expereriency with applying BL in professional environments. The BL Experts recognize the additional ways of learning inherent to BL and consider this a needed development. They mention that face-to-face time is used much more effectively in BL, since the theory part is already sorted. Additionally, one BL Expert mentioned '*face-to-face learning took too much time and did not deliver'*, this is a general consensus in between the BL Experts. Summarizing, the BL Experts all think BL combines the best of the online environment and face-to-face learning. They do stress workplace learning, collaboration, interactivity, and acknowledging that every learning situation is different, is key. Only then BL functions better than past learning methods, therefore the TP is coloured yellow, since there are many factors reliant on the functioning of BL.

Technology TP: administering theory and practices only through online platforms is not enough, **face-to-face learning is needed**.

Empirical evidence indicates that the organisational learning need cannot be satisfied by just by e-learning. Arguments for this is that professional development training is not possible through e-learning, without classrooms no practise can take place (deepening of knowledge). E-learning cannot keep up with the real world, and the trainer/teacher is needed to facilitate the learning process (also in the online environment). One BL Expert mentioned '*seeing face-to-face and being able to discuss is just too valuable to ignore*', which encapsulates the general dispositions to face-to-face learning of all BL Experts. Furthermore, the general consensus between the BL Experts is that in BL the trainer is the most important part of technology, not the online environment. This empirical evidence suggests that face-to-face learning is still relevant.

Technology TP: instructional media should be **compatible** with the LMS of customers.

With the possible introduction of a platform by Explainit, the empirical evidence suggests there should be compatibility with the LMS the customer is using. Most LMS's operate languages such as LTI or SCORM for their background processes, therefore there is almost always a possibility to link learning systems to each other. Furthermore, requirements such as user friendliness, personalization, collaboration, and customizability are all asked of the LMS.

Place TP: understanding and remembering of theory should be performed online, whereas applying, analysing, evaluating, and creating theory is best performed face-to-face.

The empirical evidence is in line with the theory of flipped learning, the BL Experts answered unanimously. Theory (knowledge) should be instructed through asynchronous online learning activities, thus fulfilling the Remembering and Understanding blocks of Bloom's taxonomy. However, the online environment must stand in connection with the face-to-face activities. The face-to-face environment should be used for knowledge deepening activities, collaboration, practising—not for giving lectures. The face-to-face environment can be divided into classroom activities and workplace learning. The Applying and Analysing phases of Bloom's taxonomy are best served in class, given that classrooms are a controlled environment, newly gained knowledge can be harmlessly put into practise. The latter stages of Evaluating and Creating are best served through workplace learning, which enables learners to implement what was learned in the 'real world', and to in the end innovate their field of expertise. Admittedly, understanding and remembering can be performed online, one BL Expert mentioned that higher stages can also be performed online, these higher stages depend on collaboration of learners, a LMS that facilitates this would then be required.

Place TP: shifting a part of the training from face-to-face to online helps **reduce costs** for companies, in part due to a **lowered seat time**.

Empirical evidence suggests that BL is easier to organize than other learning methods, however, that does not necessarily mean BL reduces organisational costs. There is a notion that existing costs shift to other places. Before, the employee (learner) had to be away for an extended time from their workplace, now more effort is put in creating good BL programmes. This evidence postulates that lowered seat time for employees is a perceived concept in the workplace, but it does not necessarily lower organisational costs.

Design TP: creating **social presence** early in the training is essential to the success of blended learning.

There is empirical evidence proposing social presence is a great way to form social cohesion, and in so doing fusing the face-to-face and online environment together. However, evidence suggests that such social activities are not always organized in practise, because of work related time pressures; it would be inefficient to organize such activities. To add to this, most of the times learners are colleagues, thus social presence is already existent. For this reason, the TP is coloured yellow, since BL Experts do admit that social presence is a helpful concept fusing the two learning environments together, but it is hard to find time for their learners to organize this.

Design TP: learners have **individual learning styles**, therefore learning activities that require **learner control** should be performed online, whereas interactive learning activities should be performed face-to-face.

There is empirical evidence suggesting learners need freedom (or autonomy) in their learning experience. Freedom herein means learners can choose how they want to learn according to their individual learning style. To add to this, evidence proposes learner control adds to getting better results in learning. A distinction between synchronous and asynchronous activities is made. In asynchronous activities learner control is possible, therefore learners should be able to choose how they want to learn in these activities. The four individual learning styles by Kolb is introduced with the accommodating experiential learning cycle. Only when the individual learning styles are accommodated—Diverging, Assimilating, Converging, Accommodating—BL can work for professionals.

Blend TP: there is **no optimal blend** in blended learning.

There is substantial empirical evidence for there not being an optimal blend in BL. All BL Experts respond negatively on whether an optimal blend in BL exists. The main reason for this is that every learning situation is different, and learners have individual learning styles, thus the defining factor in BL is the learner itself. Only when the learner can be enthused and motivated to take responsibility over their own learning process BL will reap the benefits. The model presented in figure 3 does not work, since the two sides of the model do not line up. In each situation, different decisions have to be made regarding the face-to-face and online environment, in practise these decisions are seldom the same for both environments.

7.1.1 APPROPRIATENESS OF CONCEPTUAL FRAMEWORKS

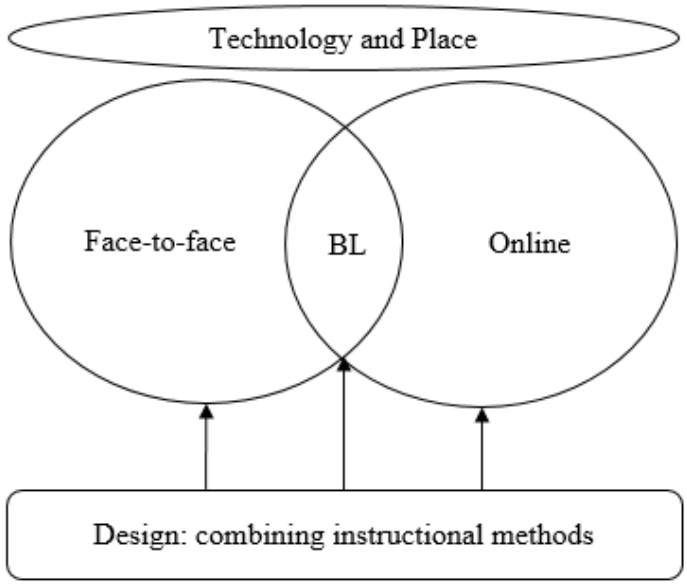
In chapter 3.1 ‘Conceptual framework’, two models are introduced. Figure 3 ‘Blends in blended learning’ takes the BL models by Horn & Staker (2015) and puts the types of environment on the horizontal axis and the way of instruction on the vertical axis. Empirical evidence suggests that these sides of the model do not line up. Given the fact that face-to-face instruction is a *synchronous* activity and is therefore fixed (with a possible flexible capacity), whereas online instruction is an *asynchronous* activity and therefore almost always flexible (with a possible fixed element). Empirical evidence suggests learner control increases results in learning and learner control is possible in asynchronous activities. Therefore, model is better represented as decisions one makes in designing a BL training. The decisions are represented in table 11. The table can be used to give background to important initial decisions which have to be taken in designing a BL training. Since this decision model does not represent the BL models by Horn & Staker (2015) it can be concluded that these models do not work for BL in professional development training.

Table 11, coming to a blend

Decision	Description
Step 1	Is the majority of teaching face-to-face or online?
Step 2	Is the delivery of face-to-face instruction flexible or fixed?
Step 3	Is the delivery of online instruction flexible or fixed?

The conceptual framework chapter (3.1) does not make a distinction between *classroom*- and *workplace learning* in face-to-face instruction. Empirical evidence suggest that higher stages of learning should be performed through workplace learning, whereas practising acquired knowledge is best performed in classrooms.

Figure 4, conceptual framework of dimensions in blended learning



From these findings, a table is drawn up which indicates which learning activities are available in the different instructional methods/media. The activities are listed in table 12.

Table 12, learning activities per environment

Instructional media	Instructional methods / type of activity	Learning activities
E-learning	Online (asynchronous)	(interactive) Video lectures, reading material, practise exercises (quizzes), serious gaming.
Classrooms	Face-to-face (synchronous)	Peer-to-peer discussion and collaboration, giving feedback, presentations, role playing with actors, one-on-one settings.
Workplace learning	Face-to-face (synchronous)	Bringing into practise what is learned, apprenticeships, peer-evaluation, intervision.

The table gives an overview of learning activities suitable for professional development training according to the theory and backed by empirical evidence.

7.2 CONCLUSION

The key findings of this study are displayed below in *italics* and are underlined. The central research question is answered in the last paragraph of this subchapter.

The central result that BL Experts in this case study put forward, is that *the learner is the most important element of BL*. The learner has to be motivated and needs to understand he/she is in control of his/her own learning experience. For this purpose, *individual learning styles* and *learner control* have to be facilitated in creating a blended learning environment.

Another conclusion is *the importance of collaboration in learning*. Collaboration is possible in face-to-face learning but should also be possible in the online environment. A LMS that facilitates collaboration is vital to the success of BL. For collaboration to occur in the online environment, *social presence* should be formed. Most of the times in professional development training the learners are colleagues, in these cases social presence is already formed. However, when unacquainted professionals meet it is vital a face-to-face activity is planned in order to lower the threshold for collaborating with other learners in the online environment.

For a satisfying learning experience in BL *the online and face-to-face must environment stand in* connection to each other. Not providing a link between the environments will cause the learner to disengage. Furthermore, *conveying theory through classrooms should be avoided*, unless the trainer can truly inspire learners. Furthermore, BL trainings should preferably be designed for specialist topics rather than broad topics. The training and development market already sufficiently offers e-learning on the more broader topics. For specific topics, the expertise of the trainer is needed and the trainer can best display this expertise in face-to-face learning. Additionally, *just because a training can be designed in a blended format, does not mean it should be.* Some training is best served either in a face-to-face or e-learning design. Given the flexible nature of BL, it can be marketed as a *cost saving measure*. Learners can learn the required theory in their own time and space, after which face-to-face learning is used to fully grasp the required knowledge. The face-to-face time can be offered on a first-come first-served basis, thus improving flexibility. Professionals under time constraints now spent less time in face-to-face meetings and can flexibly

organize their own learning experience more. Finally, because of the fact that learners have individual learning styles and every learning situation is different there is no optimal blend possible in practise.

The goal of this study is to get an answer to the question '*how can an organisation who markets professional development training offer blended learning*?'. The answer is as follows: BL can be offered in professional development training by means of the flipped learning concept. In this way, classrooms are not used for transferring theory but the online environment is used for this goal. The learner gathers the required knowledge beforehand and face-to-face time can now fully be used for interactive learning activities. Organisations using BL make a gradation in face-to-face learning; first *classrooms* are used to practice newly gathered knowledge in a safe setting, then *workplace learning* is used to implement practiced knowledge in the real world, and possibly eventually innovate it. Through the flipped learning theory, learners should be able to learn in their own selected time, thus enabling learner control. Learner control allows the learner to study according to their own individual learning style. Face-to-face time should be used for interactive learning activities, in which the newly gathered knowledge can be practised and eventually be introduced to the workplace.

7.3 FUTURE RESEARCH

Research is never complete until possible further research has been addressed. For applying BL in professional development training some distinct themes emerge. This study outlined the different learning styles postulated by Kolb: Diverging, Assimilating, Converging, and Accommodating. Future research, preferably by an educational expert, should be performed on how these individual learning styles can best be accommodated for professional development training. Furthermore, in conventional professional development training, the trainer is used to convey theory through use of classrooms. In BL the theory is conveyed through an online environment, where the trainer is present too in order to answer questions of learners. This shift in learning suggests a change in how trainers function. The new functions of the trainer have to be mapped, and the feasibility of this shift should be clarified.

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APPENDIX A: INTERVIEW PROTOCOL

Topic: Blended learning in general		
1.1	Introduction	What is your experience with blended learning?
1.2		Do you think blended learning provides better results than traditional teaching methods?
1.3		Do you agree or disagree with this statement? *'Blended learning combines the best of the teacher with the best of technology.'*
Topic: Technology: combining instructional media		
2.1	Technology	What are your experiences with e-learning?
2.1.1		If e-learning is/was used: has e-learning in itself proven to satisfy your training need?
2.2		Do you agree or disagree with this statement? *'trainers are the most important element of technology in blended learning, they are the decisive factor whether blended learning succeeds or not'*
2.3		What should an online learning environment offer?
2.4		Do online components of blended learning trainings have to be compatible with the LMS your organisation is using?
Topic: Place: combining face-to-face and online learning		
3.1	Place	Which learning activities should be performed face-to-face?
3.2		Which learning activities should be performed online?
3.3		Do you think blended learning can reduce financial costs?
Topic: Design: combining instructional methods (activities)		
4.1	Design	Do you think that activities not directly related to course content are important at the beginning of the training?
4.2		Which learning activities require learner control?
4.3		Do you agree or disagree with this statement? *'Increased control of learners over their own learning process leads to better results in education.'*
Topic: Getting the right blend		
5.1	Blend	Which blend do you prefer in your organisation?
5.2		What are your thoughts on flipped learning for workplace learning?
5.2.1		Follow up: what are the challenges?
5.3		Do you think an optimal blend in blended learning exists?
Closing questions		
C.1	Concluding	Would you rather purchase blended learning trainings with a broad topic or in specialist topics?
C.2		Can every training be given in a blended form?

APPENDIX B: INTERVIEW MATRIX

Q/C		1. University of Twente	2. Tinten Training & Advies	3. Tergooi Academie
1.1	**Introduction**	With the Centre of Expertise in Learning and Teaching we are always involved in BL projects. We have experience in short (flipping a class) and long blends. Long blends consist of entire modules (5ECTS), a course called ICREP (International Course on Rural Energy Planning), and MOOCs (Massive Open Online Courses).	We started in 2013 with creating and offering BL programs in the well-being industry. In designing the first trainings we worked together with the Hanzehogeschool in Groningen. From the start we decided on using a blended delivery in the trainings. In so far we are quite satisfied with how it is going.	We are currently working extensively with BL, but do not have a lot of experience with BL. In our eyes classroom learning takes too much time and does not deliver. So we switched to e-learning, but that was not the solution either. BL gives us the chance to deliver learning in small chunks, this works well for us. For this purpose we are building our own LMS.
1.2		Depends. The added value for BL lies in the fact that you can do different things in classrooms. The key lies in interaction of learners with each other, but also with the teacher.	Yes. A big advantage of BL is the e-learning component, which previous to 2013 our organisation did not use.	Yes, but only when you schedule short learning periods.
1.3		Yes. However, every educational situation is different, therefore it is difficult to compare different situations.	Yes. However, you must use the right technology. The e-learning must be interactive and the teacher must be progressive.	Yes. This is the case if you extract the best things out of both environments. You really need to understand which knowledge needs to be transferred and cut out all the rest.
2.1	**Technology**	Different kinds of experiences. I think, in e-learning, you should have more than just a video and a quiz, you should also have possibilities to interact and have collaborative learning facilities.	In the beginning we used the portal from the Hanzehogeschool. At the moment we are working with Pynter for e-learning. In this LMS, the interactive possibilities are very important. What I think will be great about this system is that people who use it will be able to see what others are doing and in the end can ask questions to teachers. By seeing what other people answered users can get to new insights.	We work with Goodhabitz to train our employees in their soft skills. We are quite satisfied with this, since it is presented in a playful way and invites our employees to use it, since each module is quite short. We use 120 modules at the moment to train in soft skills.

2.1.1		It can, but only when you can collaborate and ask questions to the lecturer. You need these elements in learning, you could do these in e-learning. Also next to little chunks of learning facilities, a big assignment should be available in order for learners to grasp the full the entire content.	No. We work with people who are active in the social/healthcare sector. These people, in general, really have to get used to the new way of working. Next to that, I think that seeing each other face-to-face and being able to discuss, using actors, is too valuable not to use.	For some topics (using Microsoft Office) it is possible. But when dealing with topics such as giving feedback, we use modules in e-learning in combination with practice in class, since you cannot learn some practical things without practical experience.
2.2		Yes. It is a common misconception that you can rid yourself of a lecturer if you have installed e-learning. The teacher needs to oversee the learning process and answer questions and oversee discussion, also in the online environment.	More yes than no. Learners need activities by which they can retain what they have learned, in my opinion you can only do this by using trainers.	Yes, I think it is. The trainer needs to hook the learner and enthuse them to learn.
2.3		1. The process should be as simple as possible, with a clear dashboard. 2. The system should be flexible and easy to find the right materials. 3. Provide rich media possibilities, which promote collaboration.	1. Personalized dashboards. 2. Summary of what is available and how much time each part will take. 3. The ability to register for courses.	1. Measurability of results. 2. workplace assessments. 3. Reflection on what was learned. All this together produces a certificate, which we need in healthcare.
2.4		Most systems use universal languages like LTI or SCORM. Having these languages at the base of your LMS provides the possibility to switch to another, or to export results to other LMS.	Yes, that would be convenient. In a perfect scenario all training should be available in our own LMS, so that learners do not have to switch between systems.	Yes, our LMS produces certificates which are linked to other (governmental) systems.
3.1	**Place**	Classrooms should not be used for lectures, but should promote collaboration and discussion, to enable higher levels of learning. When a lecture is given in class, the teacher should be inspiring.	Bringing into practice of knowledge, learning new skills/methods.	Practice, exercises (with actors) and exchanging experiences.
3.2		The lower levels of Bloom can be performed online. However, you can do higher levels of learning online, but you need a LMS that enables this.	Gathering knowledge.	Learning theory.

3.3		Depends on how you design it. It takes time to implement, design, and develop a good blended course. There is a misconception that once a part of the course is created it doesn't need work anymore, in this way BL is more time consuming to manage.	Yes, it can reduce costs on training. Additionally, we have to book less classrooms to do our trainings in, in this way we save money and are more flexible with our schooling budget.	No. I think with BL, costs shift to other places. Designing BL programmes takes time and resources. We experience that BL is more time efficient for our employees, since most of them operate with not enough time on their hands, we consider this a good thing.
4.1	**Design**	Yes. For professionals it is very important that they get a community feeling, so that they know each other and after the course they also have a network of professionals. This also help to lower the threshold in the online environment for people to ask each other questions.	No, we do not do this. We start with E-learning so that everyone has the same base knowledge. We then use classrooms to practice the new gained knowledge.	No, we prefer to keep the trainings on point, due to time constraints of our employees.
4.2		I make a distinction between asynchronous and synchronous activities. Asynchronous activities, all those you can do in your own time, they need learner control. These activities can be reading an article, doing a quiz, watching a (interactive) video, doing games. The strength of those activities is that they offer a possibility to reflect and to get a deeper understanding of the different materials. The disadvantage is that it doesn't offer interaction with other learners or lecturers. For the synchronous meeting (meetings in real time) you can use webinars or virtual classrooms but I think it should be performed in physical meetings.	Our learners want to have control over every aspect of their learning experience, only this is not practical. For e-learning this is possible, but we do stress that you need to finish your e-learning module 1 week in advance of a classroom activity. We plan many classroom sessions, our learners can then choose which classroom session fits them best on a first-come first-served basis.	We provide learning modules per theme. For these themes our employees can choose which modules they want to follow, which they deem necessary for their job. In these modules learners can choose to attend classes or do e-learning, the choice lies with them. We believe everyone has their own learning style and we try to accommodate this.
4.3		Yes, I think this is true for professionals and lifelong learners. Learners need to have autonomy in their learning process.	Yes. The more we say our learners need to do something, the more they say they do not want to do it. Of course we deal with compliance trainings everybody needs to do, we call these 'base training' while the non-mandatory training are called 'open trainings'.	Yes. In our experience we notice employees need freedom in their learning. We try not to include too many mandatory elements. There are some mandatory learning modules which deal with compliance (such as hygiene standards), but our employees are aware that these are necessary.

5.1		There is no typical BL model. Each educational situation needs to be treated differently which leaves no room for a universal solution. We try to be as flexible as possible while trying to majorily give possibilities to learn online. However, both sides of the model do not really line up for every situation.	Our learners are flexible in when they want to learn, and they are free to do the learning activities during worktime. At the moment we are majorly (80%) using face-to-face instruction, so we fit in the flex model. However, in the future we want to do more online, so we want to go to the self-blending model.	This model does not really fit in our situation. Face-to-face is fixed, with a little bit flex since employees can choose which timeslot they want to be in a classroom. Online is always flexible.
5.2		I think it can work for professionals.	Personally, I think it is an improvement to the way learning was previously done. In practice, it does not work for everybody, but for the big majority it does.	Understanding and Remembering, we do this with e-learning. For the higher stages not everything has to be set in a classroom, some things you can only learn by doing it in the workplace.
5.2.1	**Blend**	A big challenge is to not translate traditional boring lectures to the online environment. The online platform should be richer than traditional lectures. Next to the online environment, the face-to-face activities need to be of good value and must stand in connection to the online environment.	Learners need to learn working with flipped classroom learning and its new methods, but it is something everybody can learn. Over time I hear less and less questions about this way of learning.	Old and young employees differ from each other on learning in mind-set. Young employees mostly do the first two stages of Bloom by looking everything up on a digital device, older employees have to still get used to this idea.
5.3		No, because every situation is different. Additionally, BL lies in the domain of social sciences, for this reason there is always debate whether it works or not.	Optimal, no. Our BL courses are getting better, but the key lies in retention of what was learned. We need to provide different methods in which our learners can learn so that everybody can learn in their own learning style. In this way, there is no optimal blend possible.	No. You always have to look for the right fit for the situation, since topics and target groups differ.
C.1		Start with a specialist topic, because it's very concrete and to the point. In this way the objectives are more clear. For the broad topics: it is easy to get distracted and do all kinds of things, then you lose focus.	Specialist. We are in the well-being industry. It is therefore better to get deep knowledge on themes rather than broad knowledge.	Specialist. Given the target audience that we have in our organisation a specialist approach would fit better as it would fit better with how things operate in the workplace.
C.2	**Closing**	No, I do not think everything should be offered in a blended form. There are some things you can only learn by doing. Also there are some things which you can learn purely online.	Yes, eventually. But you need to have people who can provide a meaningful and challenging learning experience.	I think some skills trainings are not suitable for BL. In my opinion some things can be better done only in-class or online.

Q/C		4. ROC Rivor	5. Urenco Nederland	6. GGZ Delfland
1.1	Introduction	To our organisation BL is a rather new concept. Our teachers do not yet possess the required ICT skills to use BL. Given the notion that BL can be more time efficient, we would like to increase using it, since everyone in education operates under time pressure. At the moment when we use BL, we use it from third parties, not from our own organisation.	At our company we blend our courses according to the need of our employees. Sometimes we choose not to do a blend.	In training our employees we are increasingly looking for blended solutions. BL considered a new development, so there is some hype around the subject. However, I think BL is not as new as some people think, a lot of these methods have been used for a long time. Perhaps a new thing that BL introduces is that you first cover the theory by yourself after which you practice face-to-face.
1.2		Yes. I think that BL in combination with workplace learning get better results than classroom learning. We rather have that our teacher go to companies and see how things are done in practise than that they follow a training.	Yes, but only if you make thoughtful decisions in your design. However, we are careful with the online part of BL, since our workforce has an average age of 50 and we are talking about processing jobs.	Not necessarily. Planning of learning is easier in BL and classroom time is better used. In this way BL works efficiently for us. The success of BL greatly depends on how learners follow instructions, if they skip a certain part of the blend, the results will be disappointing.
1.3		Yes. For our teachers the future is that they are going to work directly in the workplace where learners is active. When learners are active in the workplace, they can learn new theory through e-learning.	No. I think the learner is the most important component of BL. In the end the yield of learning is determined by the learner.	A careful yes. I think BL offers new possibilities in learning. Giving standardized information is easy to do through BL, the classroom time can then be used to go in depth into the topic.
2.1	Technology	Little experience. We have five employees who are specialized in our LMS (Itslearning). These individuals put all the course materials in the LMS, so it is effectively used as a container. For e-learning we make use of the HEMA Academie for teaching soft skills to our staff functions (not teachers).	Varying experience, both good and bad. Virtual Reality offers great possibilities in the future, learners can practice certain processes which are not possible to simulate in the real world, due to the costs or safety risks. I also have bad experiences with e-learning, in these cases the design of the training was very badly designed. This causes great damage, since I have to convince the learners later on that e-learning can have advantages.	We have 30-40 healthcare specific trainings through GGZ Ecademy, through Goodhabitz we make use of approximately 80 soft skill trainings. In the last 1,5 year, 3.800 e-learning courses have been successfully completed, we have 1.000 employees. Our employees are enthusiastic about e-learning, but indicate that they cannot really find the time to do it due to work pressure.

2.1.1		No. There is always a combination of face-to-face and online learning.	No. For us this is not possible since we need workplace learning, without face-to-face activities there is no place to bring the newly gathered knowledge into practice.	The problem with just e-learning is, that when you finish it, that is it. Most of the times the real world changes, e-learning does not accommodate this. However, first aid trainings and fire-drills we trained through e-learning. However, we did not have a fire drill lately, so we did not yet test the knowledge.
2.2		Yes. Teacher get different roles, they go to a facilitator of learning, and they must be active in the workplace where learners are.	No. The learner decides on their own learning process. Learning is giving meaning to what you see, only the learner can do this.	No. The learner, the employee, is responsible for the result. The learners should be aware of their learning goals and be motivated to learn. Only then can the trainer have a high impact on learning results.
2.3		1. Customizable. 2. User friendly. 3. Coupling should be possible with other systems. 4. Results of learners. 5. Summaries of concepts.	1. Keeping track of what is learnt. 2. Insight in what a learner has done, how he/she learns, how he/she experienced it. This is especially useful to a mentor. 3. Different knowledge groups should be able to meet each other on the platform, in order to increase the sharing of knowledge and interactive learning.	1. Easy to navigate and provide an overview of what can be, and is learned. 2. Should be flexible and highly customizable for an admin. 3. it should be easy to combine online and offline elements and insert videos. 4. Learners should be able to form groups and collaborate with each other online.
2.4		For external parties the systems does not have to be coupled.	For us, no. Since our operations are confidential we cannot participate in such open systems.	In our LMS employees can gain points for courses which are then transferable to other systems to gain specific certificates. In this way external systems should be compatible with our system.
3.1	**Place**	Knowledge deepening activities through: discussion, presentations, giving feedback (intervision). The classroom should not be used to present the theory.	For specializations (we have some people who have solo occupations). One-on-one settings. Workplace learning. In short: for situations in which you cannot predict which turn the learning will go.	Practicing with actors, discussions, and presentations. There are some actions in our line of work, like giving injections, which you can in the end only learn by doing, in this way we also practice workplace learning, albeit, in a later stage.
3.2		Gathering base knowledge.	For presenting groups chunks of theory of the same topic.	Theory can be easily prescribed through e-learning. In the future some practice can be shifted to online through the use of Virtual Reality.

3.3		Yes. Although, this is going to take a while, since our teachers need to get adjusted to the new way of education. In the past the teacher had the status as the one who know how things work, nowadays learners can look everything up, this changes the role of the teacher.	In our case, no. We do have not enough people employees to reap the benefits of the scalability. However, our processes do not rapidly change, so our videos are long lasting.	On the short-term no, on the long-term hopefully yes. Learning becomes easier to organize through BL. Additionally employees are away for shorter times from their workplace which is efficient.
4.1	**Design**	Yes. So that the learners have seen each other face-to-face before they are going to use the online part, this lowers the threshold of seeking contact. Collaboration and learning from each other is key.	No, only activities regarding learning goals.	This is not a bad idea, but it will cost a lot of time. However, creating a group feeling in a face-to-face setting stimulates collaboration in the online part of the blend. Additionally, the activity should have some resemblance to the course objective. In our case there is almost always some social cohesion present as the learners are colleagues.
4.2		Learner control enables learners to stop at a certain point and picking up the next day where they left off, and that they can choose how and what courses they are going to follow. There should be freedom in how learners want to learn.	Virtually all of them. Learners have to be aware of the fact they have ownership over their own learning process and should be facilitated as such.	I think people all learn in their own style. Control over your own learning process enables to learn in your own pace and in your own style.
4.3		Yes, but it should be coupled to moments of reflection in class. Otherwise the knowledge will not be retained.	Yes. The more autonomy, the better the results we see. This is true for learning and work in general. We treat autonomy as the freedom for our employees to voice their needs.	Yes, for me this is a no-brainer. However, control of learners only works when the learners take responsibility and are motivated.
5.1	**Blend**	Rotation for class, self-blending for online. This model does not fit in the real world.	Depends on the training need. This model is therefore not applicable to our organisation.	Majority face-to-face instruction and we offer our education on a flexible basis. Within our organisation we cannot pick one specific block in the model, it differs per training.

5.2		I agree with the model that you can do the first two stages online, I think this can work in practice.	Learning theory can be performed in learners' own time. In this way I am positive about the flipped classroom. However, in our organisation I ask our learners to raise questions on the work floor on what they are going to discuss in class. Not only focus on the theory.	I am not an educational expert, but from what I hear from colleagues flipped classrooms sounds quite logical. In our organisation we do try to let learners prepare theory before classroom time. Additionally, we ensure that trainers cooperate with learners, not taking the typical leading teacher role.
5.2.1		When you follow this model you should keep in mind that everybody learns differently, therefore learners should have the freedom to pick a way that is closest to them.	What I miss in this flipped learning model is workplace learning. In my view workplace learning is performed on top of the in-class activities, since in the workplace learners apply their newly gained knowledge and in the end innovate. Consequently, doing practice in class is not the real thing since the classroom is a 'safe' place.	We let employees teach each other, but sometimes there is some hierarchical difference, which leads to employees taking the typical leading teacher role. Next to that, it is hard to convince our board on the usefulness of these news ways in learning, it could be that our ideas are more progressed than our organisation is.
5.3		It can be, however, BL courses should then accommodate all different learning styles. Kolb has proposed four learning styles, which do work in practise.	No. Every situation demands different learning goals.	Maybe there are optimal blends per theme, but the success factor lies within the learner. You really have to get them to get into learning mode, that is the key.
C.1	**Closing**	Depends on the situation. Specialist: subject content of a specialist teacher. Broad: pedagogical/didactic skills, which applies to everyone.	Can be both, but broad topics would fit BL better because of the scalability of the online component. Specific trainings, for example for 1 person, are not scalable and therefore too expensive to design.	Specialist. When buying BL courses I would rather have them specified to a specialist topic. So, buying specific blocks to the needs we have. Broad topics can be more efficiently covered through e-learning.
C.2		Yes, but you should take in mind that everyone learns differently.	Yes, providing multiple ways for a learner to gather new knowledge works in my opinion. However, it does depend on whether the learner should be accommodated at all times.	Yes, but only when there is theory involved which has to be learned. Furthermore, the online part of the blend should be sustainable, regular changes to the online part are costly.

APPENDIX C: ETHICAL CONDITIONS

For this research to be ethical, the following conditions are applied to **interviews**:

2. Participants are whenever possible informed about the aim and nature of the research activities in advance of the research.
3. Participants are asked for explicit consent before the research starts. Interviews in general will not take more than 2 hours.
4. Responses and/or interactions between respondents are recorded on audio, respondents will always be asked permission for such recording before the recording starts. Participants are asked for confirmation with the written reproduction of their recordings.
5. Participants are made aware that they can withdraw from the research any time without giving their reasons, and such withdrawal is respected.
6. The researcher takes care that participants at the end of the interview are clearly informed about the next steps in the research, and whether and how they are approached during these steps.
7. Participants can indicate whether they would like to be informed about the results of the research, and the researcher takes care that those participants who are interested are informed as soon as possible.

In this study, the interviewed participants are audio recorded using a smartphone. The information provided in these talks are transcribed to text, which are put to analysis. The data is only used for this study and is not be distributed further. The data is to be deleted after the research is complete. Since the study is made public by the University of Twente, no real names of respondents are displayed in this report, in this way the privacy of the respondents is guaranteed.