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Cultural differences in work-related learning: A cross-cultural comparison of self-directedness and (in)formal learning activities.

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Summary

Informal learning is regarded as an important means for organizations to be innovative and achieve a competitive advantage. In contrast to formal learning, informal learning is unstructured, in control of the learner and often takes place while employees are performing work-related tasks. It is difficult for organizations to make the shift from purely formal trainings to more informal learning programs for employee development, because informal learning and it's outcomes are hard to visualize and measure. Cultural differences poses another difficulty for multinational organizations trying to improve informal learning across locations worldwide. In high power distance cultures for example, employees are used to follow orders, and might not be able or willing to take control over their informal learning activities. Because research on cultural differences in informal learning is scarce, this study aimed to investigate cultural differences in work-related learning (formal and informal). To explain these differences, a self-directed learning orientation and factors related to the work environment (work autonomy and leadership support for learning) were used as mediators between culture and learning. Culture was measured along three cultural dimensions, power distance, individualism and achievement orientation. A survey was conducted among 332 employees working within a high-tech multi-national company. Results indicated that culture did not directly influence work-related learning. However, a small negative indirect effect of individualism and power distance was found on the engagement in both formal and informal learning, This effect was mediated firstly through work autonomy and leadership support and secondly through the self-directed learning orientation of employees. Although more research is needed to confirm these results in other organizations and cultural contexts, these results indicate that in order to improve informal learning, organizations should focus on factors in the environment such as work autonomy and leadership support. As these factors differ cross-culturally, organizations trying to improve informal learning through the work environment should adapt their strategies to the cultural values of different locations across the world.

Keywords
Cross-cultural differences, cultural values, power distance, individualism, achievement orientation, informal learning, work-related learning, workplace learning, SDLO, self-directed learning orientation, work autonomy, leadership support

1. Introduction

In the last decades, being innovative has become increasingly important for organizations in order to be successful. Due to globalization, more organizations are operating within the same markets. Competition has grown significantly and organizations need to be able to stand out from others. Coping with demands from different markets and rapid developments in technology have led organizations to change their work processes continuously in order to stay ahead of the competition (Flynn, Eddy & Tannenbaum, 2006). This need for innovation has also changed organizations' view on employee learning and development (Tynjälä, 2008). Besides formal training and education, continuous learning in the direct work environment has become increasingly important for organizations as it enables employees to adapt to the complex and dynamic work demands. In this changed view on employee development, learning can no longer be separated from work; it needs to be integrated (Park & Jacobs, 2011).

This integration of learning and working can be defined as informal learning. In contrast to formal learning (i.e., structured learning activities to train a predefined set of knowledge or skills, outside day-to-day activities), informal learning occurs while employees engage in their daily work (Choi & Jacobs, 2011). Researches have claimed that informal learning accounts for 70% of all work related learning and 10-30% from formal learning (Marsick, Watkins, Callahan & Volple, 2006). While many organizations today are shifting their focus from costly formal learning programs to less costly and more adaptive informal ways of learning, its implementation is not without challenges.

First, large multinational companies generally have a hierarchical structure and use a top-down approach to implement employee learning. In other words, the implementation of new methods and practices for employees is pre-determined by higher management. This is in stark contrast to informal learning which is unstructured and determined by the employees themselves (Berg & Chyung, 2008). Second, informal learning is generally an intangible process, because it is blended within the work itself, employees are often unaware that they are actually learning. This makes informal learning hard to visualize (Eraut, 2004). In fact, employees could be engaging in informal learning to a great extent already, without organizations being able to capture it. Because it is difficult to make informal learning visible, large organizations that are highly performance driven, have difficulties measuring informal learning outcomes and connecting it to performance (Tynjälä, 2008), and are therefore skeptical about the return-of-investments on efforts to enhance informal learning. Taken together, while there is a strong desire for companies to promote and facilitate informal learning, in practice it is very hard to realize.

In addition to the aforementioned challenges that organizations face when transferring from formal to informal learning, multinational companies also cope with cultural differences between employees located all over the globe. To date, most informal learning practices are based on a Western perspective where employees are expected to be autonomous and show initiative in their work (Kim & McLean, 2014). Such mentality fits very well with informal learning, in which individuals shape and direct their own learning process. However, such mentality differs greatly from non-Western countries, where employees are more used to obey to authority and show less initiative (Hofstede, 1991). An important question is whether these and other cultural differences actually have an impact on how employees learn, and thus how informal learning should be supported for employees from different cultures. To date, cross-cultural research on informal learning is scarce. While some recent studies point out that cultural differences in the work context are likely to affect informal learning (Kim & McLean, 2014), the proportion of studies is small. This study aims to fill a gap in literature on informal learning by creating insight in the cross- cultural differences in work-related learning activities of employees in a high-tech multinational company. Specifically, the first goal of the study is to investigate whether engagement in different types of formal and informal learning activities at work is different across cultures.

The second goal is to investigate whether a potential cause of cross-cultural differences in work-related learning might be employees' personal orientation to learn in a self-directed way. Previous research showed that self-directed learning (SDL) positively impacts the engagement in informal learning (Choi & Jacobs, 2011; Gijbels, Raemdonck & Vervecken, 2010). More importantly, some evidence points out that the degree of self-directedness in learning is influenced by cultural differences (Kim & McLean, 2014). For example, Guglielmino and Guglielmino (2006) found that in highly individualistic cultures, employees are more self-directed than employees from collectivistic cultures. This suggests that SDL could have a mediating effect on the relationship between culture and work-related learning.

This is the first study to connect these dots in the literature by exploring this mediating effect of SDL between cultural values and work-related learning. Insights from this study provide HRD professionals in multinational companies with important tools and insights to understand current challenges in supporting informal learning and how different support strategies may be needed at different locations across the globe.

2. Theoretical Framework

2.1 Work-related learning

2.1.1 The concept of work-related learning

Work-related learning is all learning that leads to the acquisition of new knowledge, skills and attitudes that employees need to perform their work-tasks effectively (Jacobs & Park, 2009). A common distinction within work-related learning is on the job versus off the job learning. Whereas off the job learning is related to learning outside the direct work-environment, on the job learning takes place within the work environment and is therefore often referred to as workplace learning. Human Resource Development (HRD) practices and theories were traditionally built around off the job learning, focusing on the design, implementation and evaluation of classroom trainings (Kessels, 2007). In these trainings, employees were taken out of their work environment to receive a standard learning trajectory. A few decades ago, researchers began to question the effectiveness of this method because of the '*transfer problem*' (Salas, Tannenbaum, Kraiger & Smith, 2012). Transfer is an important outcome of training which refers to how much of what is learned is generalized to the work context and maintained over an extended period of time (Baldwin & Ford, 1988). One main concern of classroom trainings is that only a small portion of what is learned actually transferred to the workplace (Baldwin & Ford, 1988). Another concern is that this type of learning does not suit the increasing demand for continuous development, which allows employees to cope with, and adapt to the changing work environment (Tynjälä, 2008). This has led HRD professionals to shift their attention from the 1990's to other methods for employee development closer to the work environment like continuous, on-the-job, or workplace learning (Kessels, 2007).

With this shift in methods of learning, the theoretical understanding and conceptualization of professional learning has also changed. In the traditional view, learning can be described as a process wherein an individual acquires new knowledge. This process is isolated in the mind of the individual, focusing on thought processes and mental activities only (Tynjälä, 2008). Recent HRD theories however, describe learning as emergent and/or contextual. Learning does not only change our individual thinking, it changes our relation to the environment as well. Moreover, learning is not simply the acquisition of new knowledge, learning is the process of creating new knowledge, through social interactions and participation (Tynjäla, 2008). On the job, or workplace learning can best be described from this second perspective on learning.

Another common distinction within work-related learning is made between formal versus informal learning. *Informal learning* can be described as ill-structured, and directly controlled by the learner. It is often a byproduct of employees' engagement in work-related tasks (Marsick et. al, 2006). Examples of informal learning activities are experimenting, asking questions and observing others. Eraut (2004) describes informal learning as a combination of learning from other people and from personal experience in the workplace. Using interviews and observations to investigate how employees learn at work, Eraut (2004) concluded that informal learning is the greatest contributor to what employees learn at work. He subdivided informal learning into three types: (1) incidental, (2) reactive and (3) deliberative learning. Incidental learning happens on an unconscious level, reactive learning arises spontaneously in a situation and deliberate learning is mostly planned beforehand (Eraut, 2004). Because employees are not aware of their incidental learning, this type of learning is hard to measure. In this study, the main focus will therefore be on reactive and deliberative informal learning.

In contrast to informal learning, *formal learning* can be described as highly structured, and what and how is being learned is predetermined (Berg & Chyung, 2008). Highly structured refers to the extent of planning involved, for example the use of a system approach (e.g. analyze, design, develop, implement and evaluate) (Jacobs & Park, 2009). Pre-determined means that all the learning content and activities are fixed; all are the same for those who participate. An example of formal learning is a classroom training about safety regulations in a chemical laboratory.

On the job, or workplace learning is often defined as informal learning (Eraut, 2004; Gijbels, et al., 2010) and off the job learning if often characterized as being formal (Jacobs & Park, 2009). This

distinction however, offers some ambiguity as the location where learning takes place is not always a defining factor for whether learning is formal or informal. On-the-job training for example, takes place in the natural work setting, where experienced employees train novice employees on a specific work task. This formal learning activity is carried out on the job. In addition, informal learning can also occur outside the workplace, for example when employees are working from home. To clarify the differences between these concepts, Table 2 offers a conceptualization of work-related learning among two dimensions 1) on the job versus off the job and 2) formal versus informal (see Table 1.).

Table 1. *Conceptualization of work-related learning*

	On the job (workplace) learning	**Off the job learning**
Formal	Structured and pre-determined learning in the work-environment (e.g. on the job training)	Structured and pre-determined learning outside the work-environment (e.g. traditional classroom training)
Informal	Unstructured and un-predetermined learning in the work-environment (e.g. learning by doing)	Unstructured and un-predetermined learning outside the work-environment (e.g. learning by doing when working from home)

In this study, the location of where learning takes place will not be used as an distinguishing factor between formal and informal learning. Although most informal learning is on the job and most informal learning is off the job, both can occur inside and outside the direct work environment. Rather it depends on whether learning takes place because the employee decides to engage in a work activity that leads to learning, or whether learning takes place though a structured and pre-determined activity planned by someone else, whether it is classified as informal or formal, respectively. Although informal learning seems preferable over formal learning, formal learning should not be disregarded as an important means for employee development. Several studies point out that formal learning has a positive effect on informal learning (Choi & Jacobs, 2011), as formal training provides employees with the necessary knowledge and tools to engage in informal learning activities at work. Formal and informal learning are complementary and for that reason this study will focus on both components of work-related learning.

2.1.2 Work-related learning activities

One of the goals of this study is to make work-related learning by employees more tangible for organizations by investigating the engagement of employees in concrete formal and informal learning activities at work. While there is a growing interest of HRD researchers and professionals in workplace learning, the number of studies offering concrete typologies of individuals' workplace learning activities is scarce. Moreover, the content of learning activities (LA's) differs across various professional contexts. To date, most empirical studies offering a typology of LA's are conducted among professionals such as teachers and HRD specialists (Berg & Chyung, 2008; Hoekstra, Brekelmans, Beijaard & Korthagen, 2009; Kwakman, 2003; Lohman 2005) or nurses (Berings, Poell & Gelissen, 2008). Some of these LA's are specifically related to the work context of these professions (e.g. experiment with new teaching methods (Berg & Chyung, 2008), considering own teaching practice (Hoekstra, 2009) and contact with patients and family (Berings et al., 2008). As the current study is set in a multinational high tech company, these instruments cannot be directly implemented in this research context.

One of the first empirical studies that aimed to generate a more global typology of work-related LA's applicable to various professional domains was a study by van Woerkom and Croon (2008). Using in-depth interviews, van Woerkom and Croon (2008) operationalized critical reflective work behaviors into six LA's: critical opinion-sharing, openness about mistakes, asking for feedback, challenging groupthink, experimenting and career awareness. Although this non-contextualized taxonomy can applied to this study, it is merely focused on LA's with a reflective nature. Asking questions and seeking information for example are not included in taxonomy by van Woerkom and Croon as they are not part of critical reflective behavior. However amongst others, these activities are considered as important modes of learning (Eraut, 2004).

This has led to the development a new taxonomy of work-related learning activities for this study based on a combination of taxonomies from Berg and Chyung (2008), Berings et al. (2008), Lohman (2005) and van Woerkom and Croon (2008), including all LA's that fit within the broader work-related learning theory, yet fits the high-tech context of this study as well. First, a distinction was made

based between formal and informal LA's. In addition, because informal learning can be either from own experience or from interaction with others (Eraut, 2004), informal LA's are further divided into individual and social activities (Figure 1). Lastly, this study aims to investigate with whom employees learn socially, with their supervisor or with peers. Each type of learning activity is discussed below.

Formal LA's. Most taxonomies of work-related learning activities exclude LA's which are formal with the exception of Berg and Chung (2008) who include "attending a training program" and Berings et al. (2008) who mention "education" as a learning activity. As this study aims to investigate both informal and formal learning, three formal LA's were selected based on the current offerings within the company this study has been conducted; (1) classroom trainings, (2) webinars and (3) e-learnings. In c*lassroom trainings* employees come together in an educational setting, where a trainer gives a presentation on a specific topic. Classroom trainings can also be more active in the form of a workshop where employees practice or solve problems in a controlled setting with guidance of a trainer. *Webinars* are similar to classroom trainings with the exception of being physically in the same room. Webinars are held with an online communication tool (Skype or Lync) which allows for two-way communication and sharing visual content. Like webinars, *E-learnings* are online trainings where digital content is presented to the employee but in contrast to webinars, no trainer is involved. This allows employees to choose their own time and place to complete the online module.

Social informal LA's. Three social informal learning activities were identified in the current study context, namely (1) to share mistakes, (2) to ask feedback and (3) to ask help or advice. All these LA's require social interaction either with a supervisor or with co-workers. *Sharing* mistakes is derived from van Woerkom and Croon (2008). Employees should not try to cover up their errors but rather *share mistakes* with their colleagues as these are great opportunities to learn. Besides sharing mistakes, *asking feedback* is also considered a social informal learning activity (Berings et al., 2008; van Woerkom & Croon, 2008). Feedback can be related to one's performance, opinions or values regarding what is important at work (van Woerkom & Croon, 2008). Talking or interacting with others is an activity found in several taxonomies (Berg & Chung, 2008; Lohman, 2005). However, this activity does not specifically relate to learning (e.g. talking about children or the Christmas party from last year). Therefor 'talking with others' is specified into *asking help or advice.* This includes asking a specific colleague face to face or via mail, or asking a group of people on a social community on a work related issue.

Individual informal LA's. Finally, the individual informal LA's identified for the current research are (1) reflecting on actions, (2) experimenting, (3) searching for information, (4) observing a colleague and (5) learning by doing. *Reflection* is defined as 'examining one's work experiences both in and after action in order to assess one's effectiveness and to improve performance' (van Woerkom & Croon, 2008, p.319). *Experimenting* is often a result of reflection (van Woerkom & Croon, 2008) and has also been defined by others as trial and error (Berg & Chyung, 2008; Lohman; 2005), or making intermediate adjustments (Berings et al., 2008) where employees try out new ways of working. While reflection and experimenting are often related to each other, they can occur independently and therefor taken as two separate LA's. *Searching for information* is a broader term for all activities where employees consult the internet, books, journals and other media for information they need to execute a work task (Berings et al, 2008; Berg and Chyung, 2008; Lohman, 2005). O*bserving a colleague* (Lohman, 2005) involves watching other colleagues performing a task of behavior with the aim to imitate this performance. These LA's are mostly deliberate or reactive in nature. In order to try and capture another important aspect of informal learning, namely incidental learning (Eraut, 2004), a final activity has been added called *learning by doing the job,* or learning by experience.

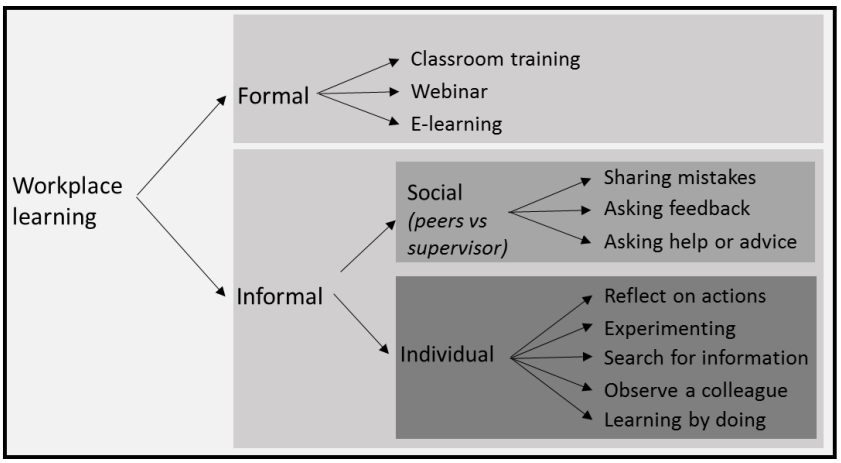

Figure 1. Taxonomy of work-related learning activities

In this study, the frequency of engagement in the learning activities from this taxonomy will be measured to compare work-related learning across cultures.

2.2 Cultural differences in work-related learning

2.2.1 The concept of culture

Although there are many different definitions of culture, most researchers mention culture as the shared values, motives and beliefs that differentiate one group from another (Kim & McLean, 2014). Culture is formed over a relatively long period and is stable over time (Taras, Rowney & Steel, 2009). According to Chhokar, Brodbeck and House (2013), culture can manifest itself in different ways in organizations. At the deepest level, there are implicit values and assumptions. Being of a tacit nature, this level of culture cannot be easily observed by outsiders. These implicit values and assumptions manifest themselves into more observable practices and artifacts (Bishop et al., 2006). Some researchers argue that there is an intermediate level of culture, related to norms and beliefs, as displayed in Figure 2.

Most cross-cultural studies have focused on the value level of culture to differentiate between groups or nations (Tsui, Nifadkar, Amy, 2007). One of the most widely known cross-cultural studies was done by Geert Hofstede, at the multinational company IBM. In 1980, Hofstede published four dimensions of culture which he derived from an extensive research measuring individual values and aggregating them to country level (Hofstede, 1991). Later he added two dimensions to his framework.

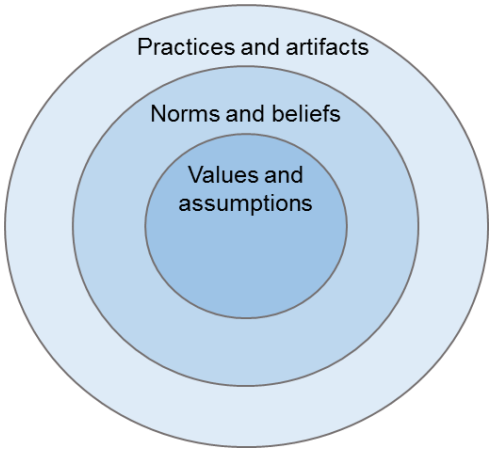

Figure 2. Levels of culture. Adapted from Bishop et al. (2006).

An overview of Hofstede's final six dimensions and their definitions can be found in Table 2. Although widely known, Hofstede's framework has been criticized by many; mostly for the method by which the dimensions have been constructed (Bishop et al., 2006). The main point of critique is that the items used in his scale were not originally designed to measure culture but to assess attitudes and perceptions related to organizational issues (Tarras et al., 2009). Nevertheless, his dimensions still serve as a basis for many researchers today, to examine cross-cultural differences.

Table 2. *Hofstede's cultural dimensions*

Dimension	**Definition**
Individualism/ collectivism	A preference for a loosely-knit social framework in which individuals are expected to take care of only themselves and their immediate families (individualism) or a preference for a tightly-knit framework in society in which individuals can expect their relatives or members of a particular in-group to look after them in exchange for unquestioning loyalty (collectivism).
Power distance	The degree to which the less powerful members of a society accept and expect that power is distributed unequally.
Uncertainty Avoidance	The degree to which the members of a society feel uncomfortable with uncertainty and ambiguity.
Masculinity/femininity	A preference in society for achievement, heroism, assertiveness and material rewards for success (masculinity) or a preference for cooperation, modesty, caring for the weak and quality of life (femininity).

Indulgency	The degree to which a society allows relatively free gratification of basic and natural human drives related to enjoying life and having fun.
Long term orientation/ Short term orientation	A preference to maintain time-honored traditions and norms while viewing societal change with suspicion (short-term) or the encouragement of thrift and efforts in modern education as a way to prepare for the future (long-term).

One such extensive research based on Hofstede's framework was done by House, Hanges, Javidan, Dorfman, and Gupta (2004) in the GLOBE project, investigating cultural differences in leadership and organizational practices. They argue that many of the items used by Hofstede lack face validity as they seem to measure multiple constructs For example masculinity items refer both to gender differences and to assertiveness. House et al. (2004) expanded Hofstede's framework by identifying nine cultural dimensions. Their definitions and connection to Hofstede's framework can be found in Table 3. Masculinity was split into two dimensions, gender egalitarianism and assertiveness. Individualism/collectivism was divided into in-group and institutional collectivism. Long term orientation was renamed into future orientation. The power distance and uncertainty avoidance dimensions were kept intact. Finally, humane orientation and performance orientation were added to the framework. House et al. (2004) report that factor and reliability analysis revealed high reliability and construct validity of these nine dimensions which makes them appropriate to use for this study.

Table 3. *GLOBE cultural dimensions*

Dimension	**Definition**	**Hofstede's dimension**
Gender egalitarianism	The degree to which a collective minimizes gender inequality.	Masculinity/ femininity
Assertiveness*	The degree to which individuals are assertive, confrontational, and aggressive in their relationship with others	Masculinity/ femininity
Institutional collectivism*	The degree to which organizational and societal institutional practices encourage and reward collective distribution of resources and collective action.	Individualism/ collectivism
In-group collectivism*	The degree to which individuals express pride, royalty, and cohesiveness in their organization or society.	Individualism/ collectivism
Future orientation	The extent to which individuals engage in future-oriented behaviors such as delaying gratification, planning and investing in the future.	Long term orientation/ Short term orientation
Uncertainty avoidance*	The extent to which a society, organization or group relies on social norms, rules, and procedures to alleviate unpredictability of future events.	Uncertainty avoidance
Power distance*	The degree to which members of a collective expert power to be distributed equally.	Power distance
Humane orientation	The degree to which a collective encourages and rewards individuals for being fair, altruistic, generous, caring and kind to others.	-
Performance* orientation	The degree to which a collective encourages and rewards group members for performance improvement and excellence.	-

** Included in this study*

In this study, the choice for dimensions and items to be included is threefold. First, the four most common dimensions of Hofstede's framework are chosen (power distance, uncertainty avoidance, individualism/ collectivism and masculinity/femininity) as most research has been done with these dimensions. Second, the framework from the GLOBE study is used to specify individualism/ collectivism and masculinity/ femininity as they represent multiple constructs according to House et al. (2004). With regard to individualism/collectivism, both institutional and in-group collectivism are selected as both are expected to have an influence on the engagement in work-related learning activities. Furthermore, only the assertiveness dimension from the GLOBE study is selected to represent masculinity/femininity. Assertiveness is expected to have more influence on work-related learning compared to gender egalitarianism. These expectations are discussed in paragraph 2.2.2. Third, performance orientation from the GLOBE study is chosen (which is not a dimension from Hofstede's framework), as this dimension represents one of the most important cultural values within the company where this study is conducted and can therefore be of extra value to the recommendations for this company.

2.2.2 The impact of cultural values on work-related learning

As stated before, cultural values are shared assumptions among individuals, which give rise to certain practices and artifacts. Cultural values also govern human behavior (Taras et al., 2006) and can impact the learning behavior in organizations (Bishop et al, 2006). Especially because informal learning is highly contextual, the cultural context in which learning takes place could be of significant importance to the extent of engagement in the different type of informal learning activities. Indeed, several studies show cultural differences in employee learning. For example Flynn et al. (2006) found that coworkers and supervisors are important learning sources for employees in China, while employees in Japan report to learn more from individual experiences. Other cultural differences have been found in learning culture (Watkins & Dirani, 2013), attitude towards knowledge sharing (Sánchez Bengoa, Ruediger Kaufmann, & Vrontis, 2012) and leaning style (Joy & Kolb, 2009). However, all these studies operationalize culture as countries, without actually measuring the cultural values commonly held by the different cultural groups.

A recent review from Kim and McLean (2014) provides some insight into the impact of different cultural values on work-related learning. However, they conclude that empirical evidence so far is incomplete and scattered. Research often only focusses on one aspect of culture or one type of learning activity. To paint the full picture, this research will investigate the relationship between five cultural dimensions and all type of learning activities previously defined. Therefore, the first research question of this study is:

Q1. What is the influence of cultural values on employee's engagement in different types of work-related learning activities?

Cultural values are operationalized by the five cultural dimensions chosen for this study (power distance, uncertainty avoidance, collectivism, assertiveness and performance orientation). To form hypothesis, the relationship of each cultural dimension with work-related learning activities is discussed below based on the (limited) empirical research so far and the review from Kim and McLean (2014).

Power distance (PD). For informal learning to occur, employees need to take control over their own learning and make their own decisions. However, in cultures with high PD values, knowledge and decisions are expected to come from those with more status and power (Kim and McLean, 2014), like a teacher or a manager. PD could therefore negatively impact the engagement in informal learning activities. Looking at the type of informal learning activities, PD could also negatively influence the engagement in social learning activities with the supervisor (asking questions, asking feedback and sharing mistakes). In high PD cultures, communication with supervisors is often one-way, hence asking questions or feedback is often not accepted (Kim & McLean, 2014). In addition, employees from high PD cultures show a strong focus on 'face saving' from their supervisor, which inhibits them to share mistakes. This led to the following hypotheses;

- **H1.1**: Power distance is positively related to the engagement in formal learning activities.
- **H1.2**: Power distance is negatively related to the engagement in informal learning activities.
- **H1.3**: Power distance is negatively related to social learning activities with supervisors.

Uncertainty avoidance (UA). Compared to low UA cultures, in high UA cultures, people feel uneasy by ambiguous and unknown situations while rules and regulations are comforting (Kim and McLean, 2014). It is expected that informal learning occurs less in these cultures as individuals are not comfortable with self-controlled learning activities in an informal setting. They prefer formalized learning from an instructor who provides the information and answers (Kim & McLean, 2014).

- **H1.4**: Uncertainty avoidance is negatively related to the engagement in informal learning activities.
- **H1.5**: Uncertainty avoidance is positively related to the engagement in formal learning activities.

Individualism/Collectivism (IC). A large amount of informal learning occurs through social interaction. It seems logical than, that this cultural dimension has a great impact on the engagement in social learning activities. Indeed, research has shown that there is a closer relationship between employees in collective cultures and information exchange is more likely to occur compared to employees in individualistic cultures (Kim & McLean, 2014). In individualistic cultures, knowledge is seen as a personal tool for power and individuals are reluctant to share this knowledge (Bengoa, Kaufmann & Vrontis, 2012). In addition, Morrison, Chen and Salgado (2004) state that individuals are more proactive and assertive in an individual culture as they pursue their individual goals in order to

look out for themselves. They define what information they need and search for it on their own initiative. Thus, individual learning activities are likely to be more common in individualistic cultures compared to collectivistic cultures.

- **H1.6**: Individualism is negatively related to the engagement in social learning activities .
- **H1.7**: Individualism is positively related to the engagement in individual learning activities.

Assertiveness (AS). Less theory and research has been found regarding this cultural dimension and work-related learning activities. However, in assertive cultures, people have a higher confidence and self-efficacy, which has a positive influence on the engagement in informal learning activities (Kim & McLean, 2014). Also, assertive cultures are highly competitive compared to low assertive cultures which are more nurturing and cohesive. Social learning activities might therefor be less common in assertive cultures.

- **H1.8**: Assertiveness is positively related to the engagement in informal learning activities.
- **H1.9**: Assertiveness is negatively related to the engagement in social learning activities.

Performance orientation (PO). The last dimension included in this research has received too little attention by previous research related to learning to form hypothesis. PO could be expected to have both a positive and a negative influence on the engagement in learning activities. On the one hand, because employees from high PO cultures are encouraged and rewarded to improve and innovate, they may be more motivated to engage in work-related learning activities. On the other hand, employees might be so focused on showing and comparing their performance that they avoid challenging tasks and engaging in learning activities (Button, Mathieu & Zajac, 1996). Although no empirical evidence is available on the PO dimension,

As current cross-cultural research on work-related learning is scarce, it was not possible to form other hypothesis for the relationship between those dimensions. However, this study aims to compare all five cultural dimensions on the engagement in all types of learning activities.

2.3 Self-directed learning orientation

While it is expected that cultural differences have an influence on employees' engagement in workplace learning activities, establishing this direct relationship does not explain the process of how culture translates into learning. In this research, we therefore include the self-directed learning orientation (SDLO) as an important mediating variable that could explain why people from different cultures engage differently in workplace learning activities.

Q2: Does a Self-directed learning orientation mediate the influence of cultural values on employee's engagement in work-related learning activities?

In most studies, self-directed learning (SDL) is described as a "process oriented approach to learning" (Gijbels et al., 2010, p243), wherein the learner steers his or her own learning. This process is closely related to the actual engagement in informal learning activities. Looking back at the conceptualization of culture levels to describe how cultural values shape cultural practices (Figure 2), SDL, like work-related learning activities, can be ascribed to the outer layer of culture, reflecting a 'practice'. In this study, one of the main goals is to describe how the core level of culture (values) shape work-related learning (practices). It would make more sense then, to capture an intermediate level between cultural values and practices to understand this relationship. In contrast to SDL, a self-directed learning orientation (SDLO) refers to a personal characteristic, belief or attitude (Gijbels et al., 2010) and is defined as "relatively stable tendency to take an active and self-starting approach to work-related learning activities and situations and to persist in overcoming barriers and setbacks" (Gijbels et al., 2010, p.243). SDLO can best be ascribed to the intermediate level of culture presented in Figure 2 (norms an beliefs) and might be more fitting to explain how values influences learning compared to SDL. For that reason, self-directedness is conceptualized as an orientation rather than a process in this study.

A self-directed learning orientation can be regarded as an important factor to engage in informal learning activities. as informal learning is in the control of the learner who takes the initiative. Indeed, previous research has shown that a self-directedness has a positive impact on the engagement of employees in informal learning (Choi & Jacobs, 2011; Gijbels et al., 2010). Previous research also shows that culture has an influence on the self-directedness of employees. Employees from high power distance and high uncertainty avoidance cultures are less self-directed in their

learning (Kim et. al., 2014), whereas individualism is positively related to self-directed learning (Guglielmino & Guglielmino, 2006). Although no cross-cultural research exist on the influence of performance orientation and masculinity/femininity on self-directedness, both are expected to be positively related to self-directed learning as employees from a high performance orientation culture are expected to actively look for ways to improve themselves and employees from masculine cultures are more self-reliant and confident (Kim and Mclean, 2014).

This is the first empirical study that investigates the relationship between self-directed learning orientation, cultural values and work-related learning activities. Because previous research shows that culture impacts SDLO, and SDLO impacts workplace learning, a (partial) mediating relationship is expected.

> **H2:** The influence of cultural values on employee's engagement in different types of work-related learning activities is mediated by SDLO.

The conceptual relationship between culture, self-directed learning orientation and workplace learning activities visualized in Figure 3, which will serve as a basis for this research.

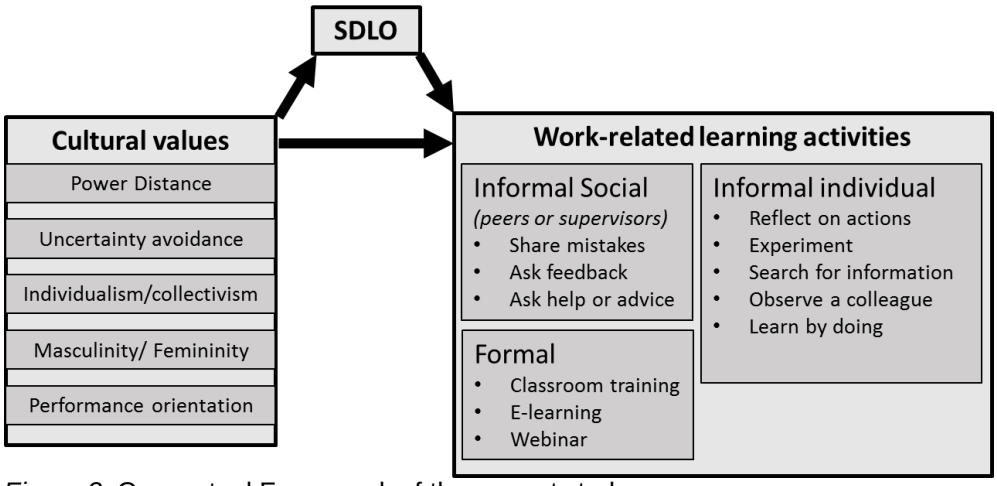

Figure 3. Conceptual Framework of the current study

2.4 Additional variables

Factors related to the work environment have shown to influence the self-directed learning orientation of employees and their engagement in workplace learning as well, such as work autonomy and leadership support. *Work autonomy* is the freedom of employees to decide how they organize their own work (Morgeson & Humphrey, 2006). Work autonomy is positively related to the engagement in work-related learning activities because jobs that allow for more decision making by employees, contain more opportunities to learn (Tynjälä, 2008). In addition, work autonomy is expected to be positively related to SDLO because according to Kohn and Schooler (1982) the extent to which employees are told what to do is related to the self-directed orientation of employees.

Besides work autonomy, l*eadership support* is also regarded as a great contributor to the engagement in work-related learning by employees and can be defined as the 'reinforcement of supervisors for employees to engage in learning on the job (Russ-Eft, 2002). Leadership support for learning is also an important factor that promotes self-directedness (Confessore & Kops, 1998). Indeed, when a supervisor finds professional development important and provides support for learning, employees are more likely to be motivated and stimulated to take an active approach in their learning.

Previous studies also show that culture has an influence on work autonomy (Erez, 2010) and leadership support (House et al., 2004). For example, in high power distant cultures, employees are expected to obey orders and show less initiative (Hofstede, 1991). Work autonomy does not fit in these high power distance cultures (Khatri, 2009), who found that in high power distant cultures, jobs are narrowly specified and employees passively follow orders. In addition, leaders in high power distance cultures are more authoritarian, while leaders in low power distance cultures are more supportive (Kim & McLean, 2014). It seems logical then, that in high power distance cultures, employees perceive less support from their leaders since in this hierarchical culture, leaders are more 'distant' from subordinates. Individualism is also thought to be of influence on the work environment.

Because relationships between individuals are more close and supportive in collective cultures compared individualistic cultures (Kim & McLean, 2014). it is expected that there is less leadership support in individualistic cultures. Second, individualism could have a positive effect on work autonomy, because in individualistic cultures, employees rely more on themselves (Kim & McLean, 2014). This is supported by Inglehart and Oyserman (2004), who stated that individualism and autonomy are highly related to each other.

In this research, work autonomy and leadership support will be used during alternative model testing in order to fully grasp the effect of culture and SDLO on workplace learning. It is expected that both work autonomy and leadership support have a positive effect on SDLO and the engagement in work-related learning activities. Furthermore it is expected that work autonomy is negatively influenced by power distance and positively influenced by individualism and leadership support is negatively influenced by power distance and individualism. How these variables exactly fit within the alternative research model will be determined based on exploratory analysis.

In conclusion, this study aims to investigate in what type of workplace learning activities employees engage in in a multinational high-tech company, if differences in type of learning activities can be found among different cultures and if this effect is mediated by the self-directed learning orientation of employees. Learning activities are categorized into formal learning activities, informal social learning activities (with peers or with supervisors) and informal individual learning activities. It is expected that different patterns of engagement in these types of learning activities can be found among different cultural values, which are operationalized in five cultural dimensions (power distance, uncertainty avoidance, collectivism/ individualism, masculinity/ femininity and performance orientation). Moreover, it is expected that these differences can be explained by the self-directed learning orientation of employees and factors in the work environment. To empirically test these hypotheses and to close the current knowledge gaps in the workplace learning literature, an online survey is conducted among employees working in a high-tech multinational company.

3. Research Method

To reach the goals of this study, an explanatory research was conducted with a cross-sectional design, measuring the relationship between all concepts at one moment in time with an online survey. Benefits of such a design is that it allowed for the inclusion of a large number of participants. This was necessary for a good representation of the different cultural groups within the company with a minimum of time and costs involved. Ultimately, this increased the generalizability of the results. One disadvantage of cross-sectional research is that only provides correlational evidence. Hence conclusions on causality could not be directly made from this research design.

Within this cross-sectional design research, quantitative data was gathered. The advantage of quantitative versus qualitative data is that the strength of relationships between different concepts could be measured, which was needed to answer the relational research questions of this study. Work-related learning was the dependent variable and cultural dimensions were the independent variables. Furthermore, self-directed learning orientation was the mediating variable and nature of work tasks and leadership support were controlling variables.

3.1 Participants

Random sampling method was applied in this study as each employee had the same probability to participate. Sample bias (e.g. positivity bias) could occur because employees voluntarily participated. To collect the research sample, a survey was sent out to 1063 employees by mail. 320 employees opened the link in the email invitation, which yields a response rate of 30.1%. 100 of these responses were incomplete and were excluded from further analysis. To gain more participants, the link to the survey was posted on an online social community page for employees. This led to 173 additional responses, of which 61 were incomplete. In total, 493 responses were collected and after exclusion of incomplete responses, 332 responses remained.

The greater part of these participants work in Europe (66.6%), followed respectively by Asia (19.3%), North America (11.1%), South America (2.4%) and Oceania (0.6%). The average age of the respondents is 38.6 years (SD = 9.1). 55.1% of the respondents are male and 44.9% are female. Most respondents have completed an academic degree or higher (86.1%).

3.2 Procedure

Because this survey included newly developed scales a pilot test was conducted to ensure face and content validity of the instrument and to measure completion time. The pilot test included two researchers from the University of Twente and seven employees from the Netherlands, UK, India, China and Latin America. Based on their feedback, the draft version of the survey was significantly shortened and some questions were rewritten.

The final survey was distributed to 1063 employees by email. The invitation mail included the goals of the study and the link to the online survey. Employees had three weeks to complete the survey and a reminder was send after two weeks. In order to receive more responses, the link to the survey was shared on the internal social community.

For ethical reasons, participation was voluntary and data was collected anonymously; no personal information that could be used to track participants was collected. Furthermore, no other person within the company besides the researcher had access to the individual data. Employees were informed about this at the first page of the survey and had to accept these terms of participation before they could start (see Appendix A). Ethical approval was given from the ethical committee of the University of Twente.

To complete the survey, employees had to fill in all the questions. To increase participation rates, the company raffled three products among the participants. If employees wanted to participate in the raffle they could leave their email address at the end of the survey. The outcomes of this research were shared with the employees through a summary report made available on companies' intranet. Furthermore, a presentation was given to the HRD department with recommendations to improve informal learning support based on the outcomes of this research.

3.3 Instrumentation

The survey consisted of 61 items spread across five sections: Personal background, Culture, SDLO, Work-related learning activities and controlling variables related to the work environment. The complete survey can be found in Appendix A.

Personal background: The first section of the survey included 15 questions, starting with 11 demographic questions like age and gender, country of residence and country of birth, followed by 4 questions related to the work background like work function and work location.

Cultural values: Cultural values were measured on five dimensions: Individualism/ collectivism, uncertainty avoidance, performance orientation, assertiveness and power distance, using the scale from the GLOBE study (House et al., 2004) as a basis. Because most dimensions of organizational values in the GLOBE study contained only 2 items, additional items were added from other instruments as well to improve the construct validity of each dimension. This resulted in 19 items to measure culture with rating statements on a 7-point Likert scale (e.g. *subordinates are expected to obey their manager at all times*, 1 = totally disagree, 7 = totally agree).

Individualism/collectivism (IC) was measured with three underlying constructs; institutional collectivism and in-group collectivism (House et al., 2004) and group work preference (Early, 1993). Each construct contains two items. *Uncertainty avoidance (UA)* contained two items from the GLOBE study and one item from Van Oudenhoven (2001). For *performance orientation (PO)*, the GLOBE study contained only one item. Another item was adopted from Wagner (1995). A third item was developed based on a cultural value promoted within the company. For *Assertiveness* the items from the GLOBE were not deemed fitting. Therefore, four items were used from Hofstede, Hofstede and Minkov (1991) and Yoon, Song, Lim and Joo (2001). One item from the GLOBE study to measure *power distance (PD*) could be split into two items. This resulted in three items for power distance all based on House et al. (2004). All items and their source can be found in Appendix B.

Since this is a newly developed scale to measure culture, the internal validity of the scale was assessed extensively with exploratory and confirmatory factor analysis. Results from these analysis are described in the result section of this paper.

Self-directed learning orientation (SDLO): SDLO is measured with four items from the self-directed learning orientation scale (e.g. *I immediately take opportunities to learn in order to reach my goals,* 1 = totally disagree, 7 = totally agree) (Raemdonck et al., 2012a). Reliability analysis showed a high reliability score for this scale (α = .83).

Work-related learning activities (LA's): This scale consisted of 3 items for formal LA's and 11 items for informal LA's from the taxonomy described previously. To make comparison between cultures more meaningful, engagement in these LA's was measured using interval items (once per month, once per year). This allowed for more statistical analysis procedures because measures are continuous instead of categorical (Field, 2009). No instrument was found that uses this approach to measure learning activities which led to the development of a new scale for this study. The timeframe

for formal LA's was wider (1 = less than once per year, 7 = more than once per month) compared to for informal LA's (1 = less than once per month; 7 = several times per day) to increase variation in answers. To help participants answer these questions, an introduction was included to explain the difference between formal and informal learning and situations in which informal learning can occur before they could indicate how often they engage in these activities. Since this is a newly developed scale, the internal validity of the scale was assessed extensively with exploratory and confirmatory factor analysis. Results from these analysis are described in the result section of this paper.

Additional variables: To measure work autonomy, two items from the Work Design Questionnaire were adapted (e.g. *In my work at [name company] I can make a lot of decisions on my own,* 1 = totally disagree, 7 = totally agree) (Morgeson & Humphrey, 2006). Correlation between these items $r(332) = .57$, $p < .001$. To address leadership support, three items were developed (e.g. *My immediate supervisor takes my professional career seriously,* 1 = totally disagree, 7 = totally agree). Reliability analysis showed a high reliability score for the three items ($\alpha = .90$).

3.4 Data analysis

All data collected in this research is quantitative. The data analysis was conducted in IBM SPSS 21 and in Amos 21: First, factor analyses (exploratory and confirmatory) and reliability analysis were conducted on all scales to ensure validity and internal reliability of the research instrument. Second, variables were computed and descriptive analysis were used to inspect the mean, standard deviations and correlations for all variables.

To answer the research questions of this study, structural equation modeling (SEM) with maximum likelihood (ML) as estimation method was conducted. SEM is a multiple regression analysis method that allows for estimating the relationship between multiple independent, mediating and depended variables at the same time, which makes SEM an appropriate analyzing method to test our research model (Schreiber, 2008). To answer the first research question of this study, a SEM model was developed with all cultural dimensions as independent variables and learning activities as dependent variables. To answer the second research question of this study, the first model was expanded, adding SDLO as mediating variable. SEM was also conducted to test alternative models by adding additional variables (nature of work tasks and leadership support) to the model.

In SEM, a sample size of at least 5-20 samples per estimated value is necessary to achieve statistical power (Schreiber, 2008). For example, if a model contains 30 free parameters to be estimated (regression paths, covariates and variances), we need at least 150-600 observations. Furthermore, missing data and outliers need to be eliminated. In this study, the final sample of 332 observations did not contain missing data. For the continuous variable age (used as controlling variable) two outliers were detected and replaced with the mean value because the values were unrealistic (98 and 4), possibly caused by a typing error.

SEM assumes that the data has a normal distribution and does not contain multicollinearity between variables (Schreiber, 2008). Multicollinearity is checked during preliminary bivariate correlation analysis. Pearson's correlation coefficients between variables should not exceed the .90 threshold (Schreiber, 2008). To check for a normal distribution of each variable, Q-Q plots of normality were inspected as these are most informative for data sets with large sample sizes (Field, 2009). In addition, absolute values of skewness and kurtosis were used to indicate if the data distribution was appropriate for SEM analysis. Using ML as estimation method, an absolute value of skewness < 2 and kurtosis < 7 are acceptable for SEM (Schreiber, 2008).

To test the model fit of confirmatory factor analysis and SEM, the models were assessed with multiple fit indices (χ^2, *RSMEA & CFI*). Because Chi Square χ^2 *(p > .05)* is sensitive for large sample sizes (Hooper, Coughlan & Mullen, 2008), the normative chi-square (χ^2/df) is used to assess overall model fit; a value of $\chi^2/df < 5$ indicates a moderate model fit and $\chi^2/df < 2$ indicates good model fit. Second, the root mean square error of approximation (*RSMEA*) is used to test how well the model fits the population's covariance matrix; a value between .06 < RMSEA < .07 indicates a moderate fit and RSMEA < .06 indicates a good fit (Hooper et al, 2008). Third, the comparative fit index (CFI) compares the covariance matrix of the model to the matrix of the null model wherein the latent variables are assumed to be uncorrelated. A threshold of CFI > .95 indicates good model fit. To compare the model fit between non-nested different models, the Akaike Information Criterion (AIC) was used. A smaller value was preferred, as this indicates a more parsimonious model (Hooper, Coughlan & Mullen, 2008). To compare model fit between nested models, the Chi Square difference test was used. In case of significant differences, the model with the best model fit (lower χ^2) was preferred. If models did not differ significantly, the most parsimonious model was preferred. Explained variances and effects between variables were assessed in case of good model fit. AMOS automatically provided regression weights and their significant values as output of analysis for direct effects. Indirect effects and their

significance were analyzed using the bias-corrected bootstrap method (2000 samples) (MacKinnon, Lockwood & Williams, 2004).

4. Results

4.1 Internal validity of the work-related learning scale and the culture scale

Work-related learning scale.

To test the validity of this scale, first confirmatory factor analysis (CFA) was performed in AMOS to test the theorized model for work-related learning activities. This model indicated a poor fit (χ^2 *(72)* = 266.58, *p* <.001, χ^2*/df* = 3.70 *RSMEA* = .09, *CFI* = .91, *AIC* = 332.58. Modification indices indicated a high covariance between social learning activities with supervisors and with peers. In case of a bad model fit, exploratory factor analysis (EFA) can be used to explore a poor fitting model (Schmitt, 2011).Thus, exploratory factor analysis (EFA) with principle axis factoring (PAF) and Oblimin rotation was conducted. The Keiser-Meyer-Olkin (KMO) measure was used to determine if the data were suitable for EFA. KMO = .84, which exceeds the limit of .5 according to Field (2009). Three factors were found with an eigenvalue over 1. of the variance. Results from this analysis are displayed in Table 6. The first factor represents all informal social learning activities with supervisors and peers, the second factor represents the informal individual learning activities and the third factor represents all formal learning activities. This indicates that both social learning activities with peers and with supervisors belong to the same factor. Combined, these factors explained 53.58% of the variance.

To test this new factor structure, another CFA was conducted with all social learning activities in one factor. Modification indices indicated high covariance between 'observe a colleague' and social learning activities. Indeed, observing a colleague lies conceptually between individual and social learning activities; it does not require interaction but it does involve another colleague. To improve the factor structure, observing a colleague was therefore removed from the individual learning factor. The final factor structure is displayed in figure 4. Covariance between several informal social learning items were drawn based on modification indices.

The model indicated a good fit (χ^2 *(56)* = 110.46, *p* < .001, χ^2*/df* = 1.97 *RSMEA* = .054. *CFI* = .97, *AIC* = 180.46) and all regression weights were significant. Comparing this structure to the theorized factor structure, this model showed better fit and was more parsimonious (AIC is lower compared to first model). Therefore, this three factor structure was kept for further analysis. All three factors showed good reliability scores, informal social *α* = .89, informal individual *α* = *.76* and formal *α* = .71.

Table 6*. Results of exploratory factor analysis on the work-related learning scale (N=332)*

	Rotated factor loadings		
Item	Informal social	Informal individual	Formal
Ask for feedback from your supervisor	**.93**	-.12	-.04
Share your mistakes with your supervisor	**.86**	-.05	.01
Ask for help or advice from your supervisor	**.83**	-.07	.09
Share your mistakes with your colleagues (peers)	**.64**	.24	-.02
Ask for feedback from your colleagues (peers)	**.64**	.15	-.01
Ask for help or advice from your colleagues (peers)	**.51**	.26	.07
Try out new things	.00	**.80**	-.03
Reflect on your work	.07	**.72**	-.08
Learn from experience by doing your job	.00	**.64**	.04
Search for information on the internet or in journals	-.05	**.51**	.07
Observe a colleague	.25	**.50**	.10
Participate in a classroom training or workshop	-.08	.09	**.78**
Participate in an online training (instructor led)	-.02	-.03	**.77**
Follow an e-learning	.08	-.03	**.47**
Eigenvalues	5.50	1.77	1.56
% of variance	36.27	9.60	7.71

Culture scale.

To test the scale for culture, first confirmatory factor analysis (CFA) was performed in AMOS to see if the data fitted the theorized model. Covariance between items from the same factors were drawn based on modification indices. This model indicated a moderate fit (χ^2 *(138)* = 445.79, *p* <.001,

χ^2/df = 3.23 *RSMEA* = .08, *CFI* = .81, *AIC* = 549.79. To further explore the factor structure for culture, a series of exploratory factor analysis with principle axis factoring (PAF) were conducted using Oblimin rotation, followed by reliability analysis for each of the factors obtained from factor analysis. Multiple items revealed low factor scores (< .4) and decreased the reliability of the factor scales, which finally led to the exclusion of 7 items from further analysis. First of all, all items from the UA dimension were excluded from further analysis. From IC, two items were removed and from PO and AS one item was excluded. Factor analysis was repeated with the 12 remaining items (KMO = .85). Three factors were found with an eigenvalue over 1. Combined, these factors explained 44.12% of the variance. Results from this analysis is displayed in Table 7. The first factor represents a combination of AS and PO. The second factor represents IC and the third factor represents PD.

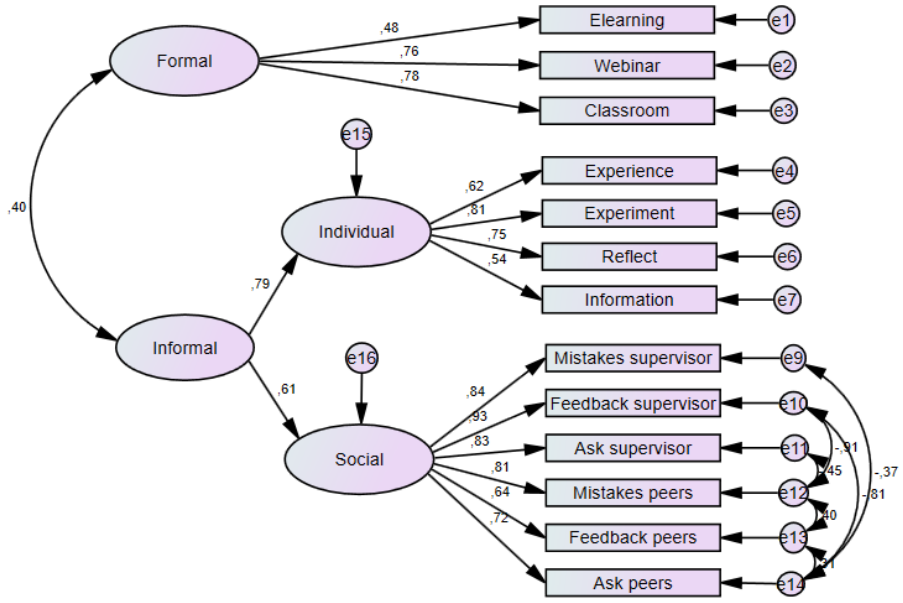

Figure 4. Final CFA model for work-related learning activities.

Table 7. *Results of exploratory factor analysis on the culture scale (N = 332)*

	Rotated factor loadings		
Item	AO	IC	PD
AS3 The fulfillment of tasks is more important than caring for others.	**.72**	-.11	-.06
PO3 The outcome is more important than what you do to get there.	**.60**	.00	-.03
AS1 Money and material things are important.	**.59**	.07	.02
PO2 Doing your best is not good enough, it is important to win.	**.51**	.05	-.00
AS4 A job with high earnings is better than a job with quality of life.	**.46**	-.14	.03
IGC1 Employees take more pride in their own accomplishments than team accomplishments.	-.01	**-.86**	.03
IC2 Employees pursue their individual interests; the collective interests hardly play a role.	-.04	**-.73**	-.12
IGC2 Team leaders take more pride in the accomplishments of individuals than of teams.	.09	**-.70**	.08
GW1 Employees like to work alone rather than in a group.	-.00	**-.57**	.10
PD1 Subordinates are free to question their manager when in disagreement (reversed).	-.10	.00	**.60**
PD3 A person‘s influence is based primarily on the authority of one‘s position, and not one’s personal abilities.	.32	-.16	**.52**
PD2 Subordinates are expected to obey their manager at all times.	.32	-.05	**.42**
Eigenvalues	4.09	1.68	1.17
% of variance	29.88	9.52	4.74

Based on the EFA, the new factor structure was tested in AMOS, combining AS and PO in one factor and excluding the items with low factor loadings. The tested model is displayed in figure 5. The model indicated a good fit, χ^2 *(49)* = 61.17, *p* = .114, χ^2/*df* = 1.25 *RSMEA* = .03. *CFI* = .99, *AIC* = 119.17, all regression weights were significant at p < 0.001. Compared to the theorized model, this model has a better fit and is more parsimonious (lower AIC value). This led to three components of culture for further analysis, power distance (PD), individualism (IC) and assertiveness/performance orientation. Based on the items for this last component, from now on this dimension is referred to as achievement orientation (AO). Reliability analysis showed reliability scores of *α* = .71 for AO, *α* = .76 for IC and *α* = .66 for PD. Although the reliability score for PD is relatively low, due to the low number of items on this factor (three), this reliability can be considered as acceptable (Field, 2009).

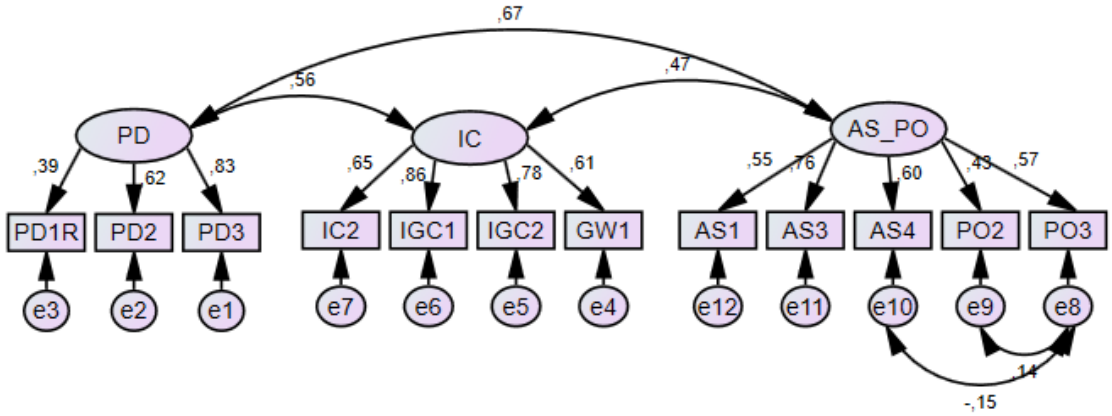

Figure 5. CFA model for culture scale

4.2 Preliminary analysis

Because EFA and CFA for all variables indicated high internal validity of the scales used in this study. and reliability analysis showed acceptable reliability scores, mean scores were computed for all the variables, varying between 1 and 7 for all variables except age and gender.

Variables included the independent variables (power distance, achievement orientation and individualism), dependent variables (formal learning, informal individual learning and informal social learning) and mediating/additional variables (SDLO, work autonomy and leadership support). The average scores (*M*), standard deviations (*SD*), and Pearson's correlation coefficients (*r*) between all variables are presented in Table 8. As no correlation coefficient was above .9, it was safe to assume there were no multicollinearity issues in the data set. Tests for normality were performed by looking at the Q-Q plots, these revealed slight skewness of SDLO and nature of work tasks. However, skewness values for all variables did not exceed the threshold of 2, and kurtosis did not exceed the threshold of 7 (Schreiber, 2008).

Mean scores for all variables showed that on average, the score for achievement orientation (*M* = 4.23, *SD* = 1.02) is higher compared to the scores for power distance (*M* = 3.42, *SD* = 1.11) and individualism (*M* = 3.44, *SD* = 1.16), indicating that the company has a relatively strong achievement orientation culture. In addition, with an average above 5 for all mediating variables, employees have a high self-oriented learning orientation and are on average fairly positive about their work autonomy and leadership support for learning. Furthermore, employees engage more frequently in individual informal learning (between once to four times per week) compared to social informal learning (between once per two weeks to once per week). On average, employees engage in formal learning activities between once per six to once per nine months.

Unexpectedly, correlations between variables showed that with the exception of power distance and formal learning, cultural values did not seem to be related to SDLO and the engagement in work-related learning. However, there were some significant correlations between cultural values and the work autonomy and leadership support. Also, significant correlations were found between SDLO and work-related learning and between SDLO and work autonomy and leadership support. SEM was used to further analyze the relationships between these the variables, as described in the next paragraphs.

Table 8. *Means (M), standard deviations (SD) and correlation coefficients (r) between all variables (N = 332)*

						r					***M***	***SD***
	Age	Gender[1]	IC	AO	PD	SDLO	WA	LS	FL	IIL		
Control variables												
1. Age											*38.60*	*9.06*
2. Gender[1]	*-.285***										*.45*	*.50*
Independent variables												
3. Individualism (IC)	*-.076*	*-.069*									*3.44*	*1.16*
4. Achievement orientation (AO)	*-.130**	*-.076*	*.350***								*4.23*	*1.02*
5. Power distance (PD)	*-.065*	*.036*	*.403***	*.452***							*3.42*	*1.11*
Mediating variables												
6. Self-directed (SDLO)	*-.107*	*.001*	*-.051*	*.068*	*-.033*						*5.91*	*0.74*
7. Work autonomy (WA)	*.158***	*-.024*	*-.023*	*-.032*	*-.219***	*.306***					*5.62*	*0.94*
8. Leadership support (LS)	*-.006*	*-.102*	*-.220***	*-.232***	*-.322***	*.268***	*.208***				*5.16*	*1.38*
Dependent variables												
9. Formal (FL)	*-.078*	*-.079*	*-.039*	*-.090*	*-.154***	*.238***	*.064*	*.160***			*3.49*	*1.37*
10. Informal individual (IIL)	*-.123**	*-.032*	*-.046*	*.034*	*-.018*	*.372***	*.065*	*.101*	*.250***		*4.82*	*1.37*
11. Informal social (ISL)	*-.280***	*.086*	*-.043*	*.040*	*-.064*	*.233***	*-.029*	*.259***	*.267***	*.453***	*3.52*	*1.39*

[1] Gender: Male = 0. Female = 1

***. Correlation is significant at the 0.01 level (2-tailed).*

**. Correlation is significant at the 0.05 level (2-tailed).*

4.3 Influence of culture on work-related learning (RQ1)

The first research question of this study was: "*What is the influence of cultural values on employee's engagement in different types of work-related learning activities?".* To answer this question, SEM was performed in AMOS. Because age showed significant correlations between informal learning activities (Table 8), age was added as covariate in the model. All direct paths between the dependent and independent variables were drawn. In addition, types of learning activities were co-variated, based on modification indices. This can be justified theoretically because formal and informal learning activities are positively related to each other (Choi & Jacobs, 2011). Model fit could not be assessed in this model because it was just-identified (df = 0). To increase the degrees of freedom, the direct path from individualism to formal learning was constrained (fixed at 0) as it was expected that this cultural dimension is only related to social and individual activities. This constraint was justified by the data, standardized regression weight of IC on formal learning was low and non-significant (*ß* = .03. *p* = .61).

The full model, including covariations can be found in Appendix C. A simplified visualization of the model is displayed in Figure 6. In this model, 23 free parameters were estimated; 11 regression paths, 9 co-variances and 3 variances (error terms). With a sample size of 332, there were 14.4 observations per estimate, which is well above the minimum threshold of 5. Model fit indices showed a good model fit (χ^2 *(1)* = 0.26, *p* = .61, χ^2/df = 0.26 *RSMEA* = .00, *CFI* = 1, *AIC* = 54.26. This could be expected due to the low degrees of freedom in this model.

Looking at the regression weights to estimate the effect of culture on the different learning activities while controlling for age, one significant estimate was found with a small negative effect; from power distance to formal learning (*ß* = -.14, *p* = .02). This is in contrast to hypothesis 1.2 which stated a positive relationship between PD and formal learning. No other significant estimates were found which could be expected from the insignificant correlations between the independent and dependent variables (Table 8). Therefor all hypotheses (H1.1 – H1.8) related to the first research question were rejected. In addition, although a good model fit was found, squared multiple correlation coefficients show that only a small percentage of variance in learning activities could be explained by age and culture (2% – 9%).

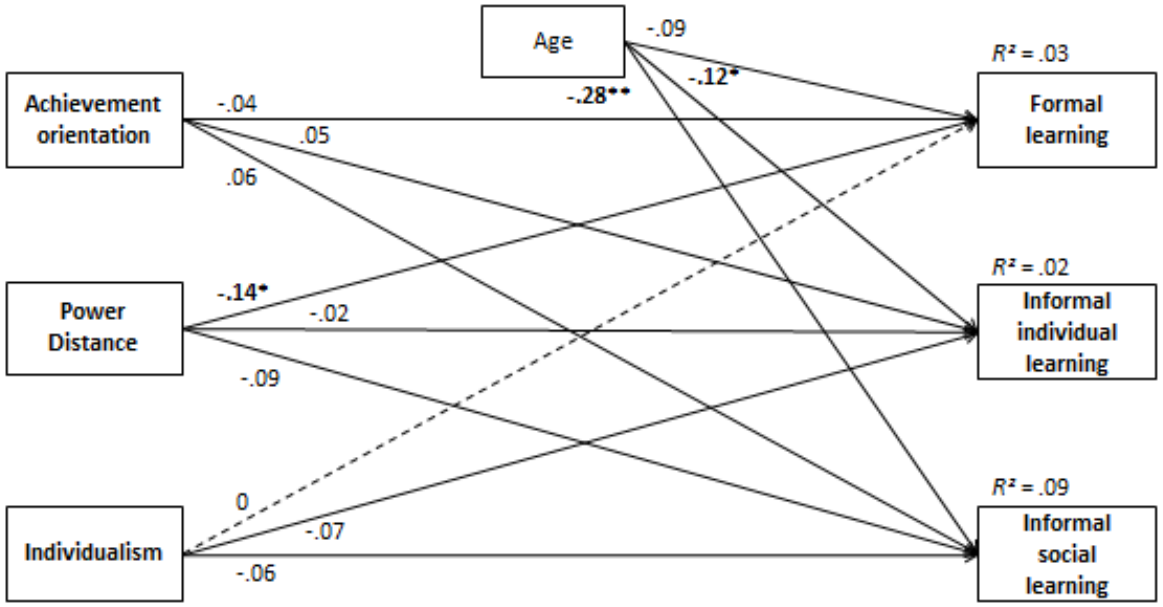

Figure 6. SEM model for RQ1 (**:*ß* is significant at the 0.01 level, *:*ß* is significant at the 0.05 level).

4.4 Mediating role of SDLO (RQ2)

The second research question of this study was: "*Does a self-directed learning orientation mediate the influence of cultural values on employee's engagement in work-related learning activities?".* To answer this question, SDLO was added to the previous model as mediating variable, by including regression paths from cultural values to SDLO and from SDLO to all learning activities. The full model, including covariations can be found in Appendix C. A simplified visualization of the

model is displayed in Figure 7. In this model, 31 free parameters were estimated; 18 regression paths, 9 co-variances and 4 variances (error terms). With a sample size of 332, there were 10.7 observations per estimate, which is well above the minimum threshold of 5.

Model fit indices showed a good model fit (χ^2 *(1)* = 0.65, *p* = .42, χ^2/df = 0.65 *RSMEA* = .00, *CFI* = 1, *AIC* = 70.65. In this model, the explained variance of learning activities has increased to 8-15%, thus this model is a better estimation on the variance in the engagement in learning activities compared to the previous model. Looking at the direct effects of SDLO on learning activities, regression weights were all positive and significant at *p < 001.* However, a direct effect of culture on SDLO was not established as no significant regression weights were found. Because culture did not influence SDLO directly, there is no mediation effect found in this model, which led to the rejection of hypotheses 2.

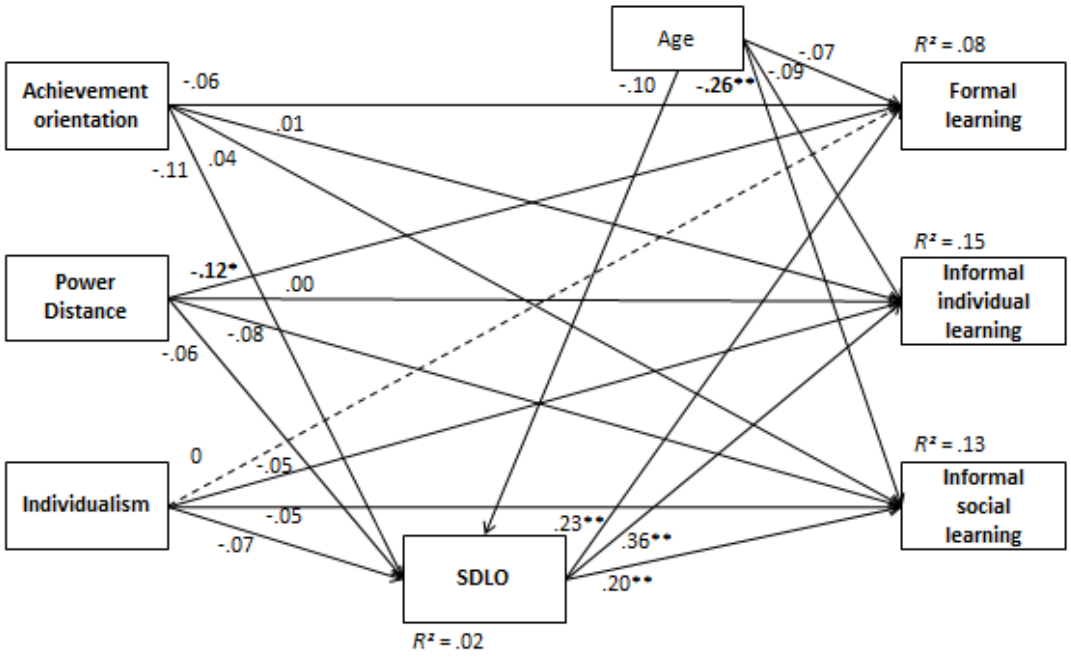

Figure 7. SEM model for RQ2 (**:ß is significant at the 0.01 level, *:ß is significant at the 0.05 level).

4.5 Alternative model

Because the SEM models for RQ1 and RQ2 did not show cross-cultural differences in work-related learning (with the exception of a significant effect of PD on formal learning), an alternative model was tested with additional variables related to the work environment. Correlation coefficients from Table 8. showed that cultural values and factors in the work environment were related to each other. In addition, significant correlations were found between the work environment factors and SDLO (see also Table 8.). This suggests that the work environment could be the missing link between cultural values and learning. The goal of this exploratory phase was to analyze if culture indeed had an effect on the work environment variables and if these variables in turn were able to explain differences in SDLO and work-related learning. To achieve this goal, the model from RQ2 was expanded with work autonomy and leadership support as mediating variables between cultural values and SDLO.

4.5.1 Model development

During the development of the alternative model, first a baseline model was created with only constrained paths from and to the additional variables (fixed on 0). In this restricted model, it was assumed that there was no relationship between LS and WA with the culture, SDLO or learning activities. This model was used for comparison with modified models where paths were added from and to the additional variables. In the baseline model, covariance was drawn between LS and WA. This is justified by previous research; employees with engaging and stimulating supervisors, have more autonomy in their work (Piccolo & Colquitt, 2006). Further support for this covariance came from the data of this study; preliminary analysis showed a significant correlation between LS and WA. The baseline model is displayed Appendix C. In this baseline model, 37 free parameters were estimated; 21 direct paths, 10 co-variances and 6 variances (error terms). With a sample size of 332, there were

8.9 observations per estimate, which is above the minimum threshold of 5. Model fit indices showed a poor model fit; χ^2 *(14)* = 136.44, $p < 0.001$, χ^2/df = 9.745 *RSMEA* = .163, *CFI* = .745, *AIC* = 218.44, indicating that this model was a poor representation of the research data.

Based on theory described in paragraph 2.4, effects between variables were added step by step (restrictions removed) in the alternative model. After each step, the modified model was compared to the previous and the baseline model to analyze if the model significantly improved. If the modified model showed a better fit, this would indicate that by adding a relationship between variables, the model made a better representation of the observed data. Model fit indices after each modification and chi square difference tests to compare models are displayed in Table 9. Each model modification is described below.

Modification 1: It was expected that work autonomy had a positive effect on SDLO. Therefore, a path was added from WA to SDLO in the model. This addition significantly improved the model compared to the baseline model. ($\Delta\chi^2$ = 37.64, $\Delta df = 1, p < .001$).

Modification 2: Leadership support was also expected to be positively related to SDLO. Adding a path from LS to SDLO indeed significantly improved the model compared to the previous model ($\Delta\chi^2$ = 19.31, $\Delta df = 1, p < .001$).

Modification 3: Work autonomy and leadership support were expected to be directly related to the engagement work-related learning activities. First the influence of LS on social learning was added to the model. Model fit was again significantly improved compared to the previous model ($\Delta\chi^2$ = 17.78, $\Delta df = 1, p < .001$). However, adding direct effects from LS on formal learning and individual learning activities, did not improve the model (LS-formal; $\Delta\chi^2$ = 1.05, $\Delta df = 1, p = .306$; LS-individual: $\Delta\chi^2 = 0.05$ $\Delta df = 1, p = .823$). The model could also not be further improved by adding the effect of work autonomy on formal learning ($\Delta\chi^2$ = 0.06, $\Delta df = 1, p = .806$), individual learning ($\Delta\chi^2$ = 0, $\Delta df = 1, p = .999$), and social learning ($\Delta\chi^2$ = 2.54, $\Delta df = 1, p = .111$). Because adding these effects did not significantly improve the model, only the path from LS to social learning was drawn in the alternative model.

Table 9. *Model fit indices and chi square difference tests during the model modification process*

							Δ **Baseline**		Δ **Previous**	
Model	χ^2	**df**	χ^2/df	***RSMEA***	***CFI***	***AIC***	$\Delta\chi^2$	Δdf	$\Delta\chi^2$	Δdf
Baseline	*136.44***	*14*	*9.745*	*.163*	*.745*	*218.44*				
1. AU-SDLO	*98.80***	*13*	*7.600*	*.141*	*.822*	*182.80*	*37.64***	*1*		
2. LS-SDLO	*79.49***	*12*	*6.624*	*.130*	*.860*	*165.49*	*56.95***	*2*	*19.31***	*1*
3. LS-ISL	*61.71***	*11*	*5.610*	*.118*	*.895*	*149.71*	*74.73***	*3*	*17.78***	*1*
4. PD-LS	*32.23***	*10*	*3.223*	*.082*	*.954*	*122.23*	*104.21***	*4*	*29.48***	*1*
5. PD-WA	*17.09**	*9*	*1.898*	*.052*	*.983*	*109.09*	*119.35***	*5*	*15.14***	*1*
6. IC-LS	*12.25*	*8*	*1.531*	*.040*	*.991*	*106.25*	*124.19***	*6*	*4.84**	*1*

*** χ^2 is significant at the 0.01 level.*
** χ^2 is significant at the 0.05 level.*

Modification 4. To analyze if culture indeed shapes the work environment, the effects of culture on LS and WA were also added to the model. First a path between power distance and leadership support was drawn. This significantly improved the model compared to the previous model ($\Delta\chi^2$ = 29.48, $\Delta df = 1, p < .001$). Model fit indices now indicated a moderate model fit.

*Modification 5***.** A negative influence from power distance on work autonomy was also expected. Adding a path from power distance to work autonomy, showed a significantly improved model ($\Delta\chi^2$ = 15.14, $\Delta df = 1, p < .001$). In addition, model fit indices now indicated a good model fit after this modification.

Modification 6. Finally, it was expected that individualism had negative impact on LS and a positive effect on WA. After adding a regression path from individualism to LS, the model significantly improved compared to the previous model ($\Delta\chi^2$ = 4.84, $\Delta df = 1, p = .028$). However, the model could not be further improved by adding a regression path from individualism to work autonomy ($\Delta\chi^2$ = 2.23, $\Delta df = 1, p = .135$). Because no theoretical support for the influence of achievement orientation on leadership support for learning and work autonomy could be found, no other modifications were made to the model.

4.5.2 Model results

In the final alternative model, 43 free parameters were estimated; 27 direct paths, 10 co-variances and 6 variances (error terms). With a sample size of 332, there were 7.7 observations per estimate, which is above the minimum threshold of 5. Model fit indices indicated a good model fit (χ^2 *(8)* = 12.25, p = .141 χ^2/df = 1.531 *RSMEA* = .040, *CFI* = .991, *AIC* = 106.25). Compared to the baseline model,

this model had a significantly improved model fit ($\Delta\chi^2 = 124.19$, $\Delta df = 6$, $p < .001$). This means that by adding paths paths from and to LS and AU, the representation of the observed data was significantly better compared to the baseline model where it was assumed that LS and WA were not related to the other variables in the model.

Because this model showed good model fit, explained variance of the independent variables and effects between variables could be interpreted. In figure 9, a simplified representation of the alternative model is visualized, containing multiple squared correlations (R^2) and the significant direct effects (standardized) between variables. In this model, R^2 for work autonomy is .07, thus 7% of the variance in work autonomy is explained by power distance. 12% of the variance in leadership support is explained by power distance and individualism. 18% of the variance in SDLO is explained by work autonomy and leadership support. Finally, with this model we were able to explain 9% of the variance in formal learning, 15% of informal individual learning and 17% of informal social learning. All direct effects between the variables in this model are displayed in Table 10. Table 11, contains the direct, indirect and total effects for variables with indirect paths.

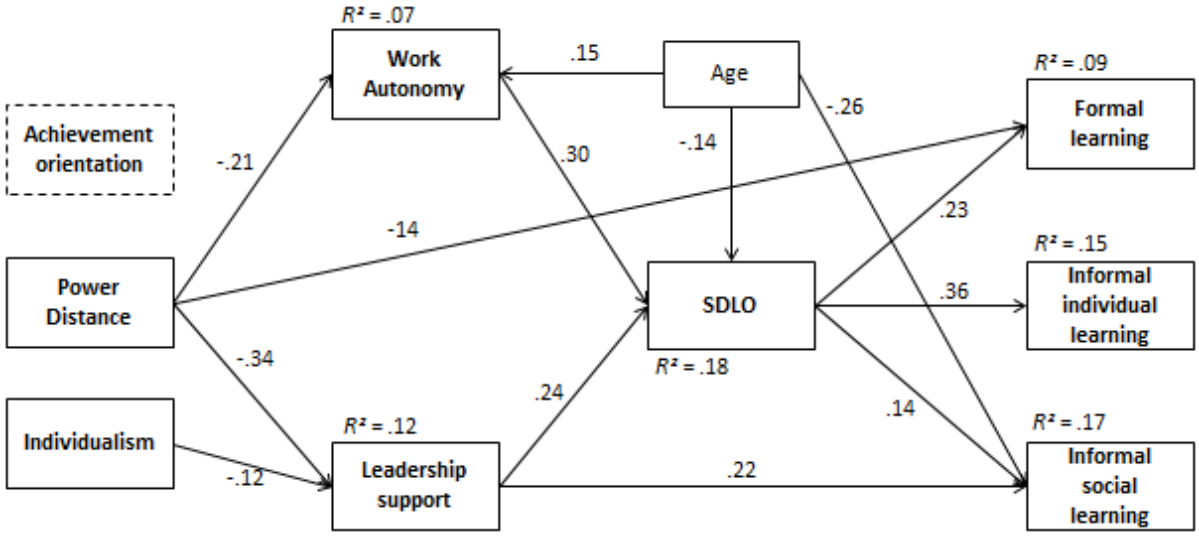

Figure 9. Standardized regression weights of significant direct effects and squared multiple correlations of the final alternative SEM model.

Analysis showed that the controlling variable age, had a significant positive effect on work autonomy (*ß* = .15, *p* = .007) and a negative effect on SDLO (*ß* = -.14, *p* = .006) and informal social learning (*ß* = -.26, *p* < .001). This indicates that older employees have more autonomy in their work. However, older employees have a less self-directed learning orientation and engage less in informal social learning activities. Just like the model from RQ2, SDLO had a positive effect on formal learning (*ß* = .23, *p* < .001), informal social learning (*ß* = .36, *p* < .001) and informal individual learning (*ß* = .14, *p* < .001), indicating that employees with a more self-directed learning orientation engage more in all types of learning activities.

Looking at the influence of the work environment, a positive direct effect from WA and LS on SDLO was found (WA, *ß* = .30, *p* < .001; LS, *ß* = .24, *p* < .001). In addition, LS and WA had a significant positive indirect effect though SDLO on formal learning (WA, *ß* = .07, *p* < .001; LS, *ß* = .06, *p* = .001), informal individual learning (WA, *ß* = .11, *p* < .001; LS, *ß* = .09, *p* = .001) and informal social learning (WA, *ß* = .04, *p* = .004; LS, *ß* = .03, *p* = .005. This means that when employees perceive more autonomy in their work and more support for learning from their supervisors, they are more self-directed in their learning which leads to more engagement in all types of work-related learning activities. Furthermore, leadership support also had a significant direct effect on informal social learning (*ß* = .22, *p* < .001), indicating that the influence of leadership support on informal social learning is partially mediated through SDLO, with a total effect of *ß* = .25, *p* = .001.

The cultural dimension AO had no significant direct or indirect effect on any variable in the alternative model. However, direct and indirect effects from PD were found. First, negative direct effects were found from PD on WA (*ß* = -.21, *p* < .001) and LS (*ß* = -.34, *p* < .001). Second, PD had a negative indirect effect on SDLO through LS (*ß* = -.07, *p* = .001) and WA (*ß* = -.06, *p* = .001). Third, PD had a negative indirect effect on all work-related learning activities through LS and SDLO (formal, *ß* = .02, *p* < .001; informal individual, *ß* = .02, *p* = .001; informal social, *ß* = .01, *p* = .003) and through

WA and SDLO (formal, *ß* = .01, *p* < .001; informal individual, *ß* = .02, *p* > .001; informal social, *ß* = .01, *p* = .002). This indicates that in high power distance cultures, employees perceive less leadership support and work autonomy which in turn leads to a less self-directed learning orientation and finally results in less engagement in work related learning activities. Power distance also had a direct negative effect on formal learning (*ß* = -.34, *p* < .001), which means that the effect from power distance on formal learning is partly mediated through leadership support and SDLO and work autonomy and SDLO, leading to a significant total effect of *ß* = .15, *p* = .04.

Table 10. *Results from alternative SEM model, regression weights (B) and standardized regression weights (ß).*

Outcome variables	**Work autonomy**			**Leadership support**			**SDLO**		
Predictors	*B*	*se*	*ß*	*B*	*se*	*ß*	*B*	*se*	*ß*
Dependent									
IC	-	-	-	*-0.147**	*.066*	*-.123*	*-0.045*	*.036*	*-.070*
AO	-	-	-	-	-	-	*0.075*	*.042*	*.103*
PD	*-0.177***	*.045*	*-.209*	*-0.343***	*.070*	*-.274*	*0.055*	*.041*	*.082*
Mediating									
WA	-	-	-	-	-	-	*0.236***	*.042*	*.297*
LS	-	-	-	-	-	-	*0.129***	*.029*	*.241*
Control									
Age	*.0.015***	*.005*	*.145*	*-0.005*	*.008*	*-.033*	*-0.011***	*.004*	*-.139*
Outcome variables	**Formal**			**Informal individual**			**Informal social**		
Predictors	*B*	*se*	*ß*	*B*	*se*	*ß*	*B*	*se*	*ß*
Dependent									
IC	*0.056*	*.069*	*.047*	*-0.044*	*.067*	*-.038*	*-0.024*	*.068*	*-.020*
AO	*-0.092*	*.081*	*-.068*	*0.016*	*.079*	*.068*	*0.092*	*.079*	*.068*
PD	*-0.172**	*.076*	*-.138*	*-0.002*	*.074*	*.002*	*-0.037*	*.076*	*-.030*
Mediating									
WA	-	-	-	-	-	-	-	-	-
LS	-	-	-	-	-	-	*0.217***	*.051*	*.216*
SDLO	*0.430***	*.098*	*.233*	*.665***	*.095*	*.361*	*0.265***	*.098*	*.142*
Control									
Age	*-0.010*	*.008*	*-.068*	*-0.013*	*.008*	*-.086*	*-0.040***	*.008*	*-.259*

** effect is significant at the .05 level; ** effect is significant at the .01 level.*
PD = power distance, IC = individualism, AO= achievement orientation, LS = leadership support, WA = work autonomy, SDLO = self-directed learning orientation.

Table 11. *Standardized direct, indirect and total effects of dependent, mediating and independent variables in alternative SEM model.*

Outcome variables	**SDLO**			**Formal**			**Informal Individual**			**Informal social**		
Predictors	*Direct*	*Indirect*	*Total*	*Direct*	*Indirect*	*Total*	*Direct*	*Indirect*	*Total*	*Direct*	*Indirect*	*Total*
Independent												
PD	*.082*		*-.046*	*-.138**		*-.148**	*.002*		*-.014*	*-.030*		*-.095*
>LS		*-.066***			-			-			*-.059***	
>AU		*-.062***			-			-			-	
>SDLO		-			*.019*			*.030*			*.012*	
>LS>SDLO		-			*-.015***			*-.024***			*-.009***	
>WA>SDLO		-			*-.014***			*-.022***			*-.009***	
IC	*-.070*		*-.100*	*.047*		*.024*	*-.038*		*-.074*	*-.020*		*-.061*
>LS		*-.030**			-			-			*-.027*	
>SDLO		-			*-.016*			*-.025*			*-.010*	
>LS>SDLO		-			*-.007**			*-.011**			*-.004**	
AO	*.103*		*.103*	*-.068*		*-.044*	*.012*		*.049*	*.068*		*.083*
>SDLO		-			*.024*			*.037*			*.015*	
Mediating												
LS	.241**		*.241***	-		*.056***	-		*.087***	*.216***		*.250***
>SDLO		-			*.056***			*.087***			*.034***	
WA	.297**	-	*.297***	-		*.069***	-		*.107***	-		*.042*
>SDLO		-			*.069***			*.107***			*.042***	

** effect is significant at the .05 level; ** effect is significant at the .01 level.*
PD = power distance, IC = individualism, AO= achievement orientation, LS = leadership support, WA = work autonomy, SDLO = self-directed learning orientation.

Besides PD, IC also showed significant direct and indirect effects in the alternative model. First, a negative direct effect of IC on LD was found (*ß* = -.12, *p* = .027). Second, IC had a negative indirect effect on SDLO though leadership support (*ß* = .03, *p* = .031). Third, individualism had a negative indirect influence on all work-related learning activities through leadership support (formal, *ß* = .22, *p* = .028 informal individual learning, *ß* = .22, *p* = .029; informal social, *ß* = .22, *p* < .022). Thus, in high individualistic cultures, employees perceive less support from learning which leads to a less self-directed learning orientation and finally results in less engagement in work-related learning activities.

5. Conclusion and Discussion

5.1 Discussion of the results

5.1.1 Findings from the hypothesized research model:

The goal of this research was to investigate whether there are cultural differences in the work-related learning behavior of employees in a high-tech multinational company and if these differences could be explained by their self-directed learning orientation. New instruments were developed to measure cultural values and engagement in work-related learning. Based on confirmatory and exploratory factor analysis of the instruments, uncertainty avoidance was dismissed as a cultural dimension and assertiveness and performance orientation were combined into one culture dimension, resulting in three cultural dimensions used for analysis; power distance, individualism and achievement orientation. In addition, social learning with the supervisor and with peers were combined into one variable, resulting in three final types of work-related learning activities, formal, informal individual and informal social.

Results showed that a self-directed learning orientation had a positive effect on the engagement in all types of learning activities, which supports findings from previous studies (Choi & Jacobs, 2011; Gijbels et al., 2010). The effect of SDLO was greater on informal individual activities than on formal activities and informal social activities. Because informal learning requires self-direction while formal learning is often top down (although employees within the company where this study has been conducted can choose to engage in formal learning out of own interest), this result is not surprising. SDLO had the smallest effect on social learning, which indicates that SDLO is a better predictor for informal individual learning than informal social learning. Other factors might be better in predicting social informal learning and knowledge sharing, for example trust and a collaborative environment (Tynjälä, 2008).

Results also showed that power distance had a direct negative effect on the engagement in formal learning activities. This was unexpected as it was hypothesized that employees from high power distance cultures engage more in teacher-centered learning methods. The reasoning behind this hypothesis was that these employees prefer knowledge to come from individuals with status like a teacher, and feel uncomfortable when they need to locate or create their own sources of information for learning (Rodrigues, Bu, & Min, 2000). However, the negative relationship between power distance and formal learning does not indicate that employees prefer formal learning over informal learning, as neither a positive nor a negative direct relation between power distance and informal learning was found. This result merely indicates that employees in high power distance cultures engage less in formal learning activities than employees in low power distant cultures.

There are two possible explanations for unexpected finding. First, it could be that employees from high power distance cultures, have functions within the company of this study wherefore less formal trainings are organized. Indeed manufacturing and supply functions are more common in countries regarded as high in power distance according to the culture compass developed by Hofstede (India, Singapore) while most knowledge workers like engineers, marketing managers etc. are mostly located in countries which are regarded as low in power distance (Netherlands, United states). The latter roles are the current focus of the HRD department of this company and receive more possibilities for trainings. Second, it could be that employees who perceive their work environment as high in power distance are less stimulated to engage in trainings. This is supported by the findings from Politis (2001) who conducted a survey among 227 employees in a high tech manufacturing organization in Australia. In his study, Politis found that the key aspects of power distance, namely participation in decision making and mutual trust and respect for subordinates was positively related to knowledge acquisition and learning enablement. In high power distance cultures, these aspects are less common which could explain the negative relationship between PD and formal learning.

Against expectations, other direct influences of the cultural dimensions on the engagement in the different learning activities were not found, nor did they directly influence the self-directed learning orientation of employees. Thus in this study cultural differences in work-related learning and a mediating effect of SDLO could not be determined and all hypotheses were rejected. This finding is in contrast to the review from Kim and McLean (2014) who reported several cultural differences in informal learning and SDL among Hofstede's cultural dimensions. In their review however, few empirical studies measuring the direct link between cultural dimensions and the engagement informal learning were reported. Most connections between culture and learning were described though other contextual factors like collaborative relationships and challenging tasks. This could indicate that the organizational context could be of more importance to learning than cultural values. No other studies could be found to contradict or support this, however this study further explored this idea by building an alternative model where work environment factors (leadership support and work autonomy) were added as additional mediating variables between culture and SDLO.

5.1.2 Findings from the alternative research model

Results from the alternative model showed that individualism and power distance had a negative influence on work-related learning, but this influence was only indirect, first through work environment factors and second though SDLO. Thus although cultural differences were not found in the hypothesized model, the alternative model did show cultural differences in the work environment which in turn influenced the self-directed learning orientation of employees. And it was this learning orientation that could predict the engagement in work-related learning activities.

Several cultural differences found in the alternative model were in line with previous studies, such as the negative influence of power distance on leadership support (Kim & McLean, 2014) and work autonomy (Khatri, 2009), and the negative effect of individualism on leadership support for learning (Kim & McLean, 2014). The suspected negative influence of individualism on work autonomy was not found, thus although employees are more self-reliant in individualistic cultures, they do not have more autonomy in their work.

The effect of the work environment on SDLO also supports previous research, such as the positive effect of leadership support on SDLO (Confessore and Kops, 1998) and the positive effect of work autonomy on SDLO (Kohn & Schooler 1982). However, the latter effect was not found in a more recent study from Raemdonck et al. (2012). Two important differences between that study and the current study might explain this. First, the study from Raemdonck et al. was conducted among low qualified employees, while this study sample contained a large group of high qualified employees. As Raemdonck (2012) et al. suggested, work autonomy might only positively affect self-directed learning for high qualified employees, as high job autonomy could result in too much stimulation for low-qualified employees and negatively affect SDL. Second, Raemdonck et al. measured SDL behavior instead of SDL orientation. In essence their definition of SDL is more in line with the definition of work-related learning in this study, which entails the actual engagement in learning activities. In this light, results from this study confirmed the study from Reamdonck et al. because no direct effect of work autonomy on work-related learning activities was found.

It was also expected that the work environment directly influenced the engagement in work related learning activities. Results showed that leadership support positively influenced the engagement in informal social learning. This seems logical because half the social learning activities measured in this study included learning activities with the supervisor. Employees with supervisors who support learning will most likely engage more in social learning with this supervisor. No other direct effects of the work environment on learning activities were found. This indicates that the work environment only influences work-related learning through the self-directed learning orientation of employees. Thus although the work environment provides opportunities for learning, it is the individual choice of the employees to use these opportunities. This interaction between the environment and personal characteristics results in the participation of work-related learning (Tynjälä, 2008).

Although direct and indirect influences of culture and environment factors on SDLO and work-related learning were found, the independent and mediating variables in this study were only able to explain a limited percentage of the variance in self-directed learning and the engagement in work-related learning activities. Thus, a large amount is left unexplained and many other factors related to individual characteristics or the work environment could help to understand the predetermines of employees' engagement in work-related learning. Some example factors are discussed in paragraph 5.3.

5.2 Limitations of this research

This research has several limitations which should be kept in mind when interpreting the previously discussed results. One of the limitations is caused by the exploratory nature of the alternative model. Although development and modifications which led to the final alternative model were supported by theory, modifications were accepted or dismissed based on fit with the data from this study. This limits the generalization of the results to other organizations or contexts (Schreiber, 2008). Replication of this alternative model is needed in future studies to see if the same model applies to other contexts as well. In addition, although the results from SEM analysis revealed directional effects between variables, real causation cannot be determined with a cross-sectional research design. Longitudinal designs are recommended in future research to determine the causal relationship between culture, work environment factors, self-directed learning orientation and work-related learning.

Another limitation stems from the inclusion of work autonomy, leadership support and self-directed learning orientation as mediating variables. According to the widely used method for mediation testing by Baron and Kenny (1986) it is only possible to test for mediation when a direct effect between the dependent and independent variables is present. In this study, additional mediating variables (work autonomy and leadership support) were added to the alternative research model, while no significant direct effects of culture were found on SDLO and work-relating learning (except for power distance on formal learning). This is not in line with the Baron and Kenny method. However, recently, researchers have begun to question the Baron and Kenny method for mediation, and stated that it is possible that an independent factor Y influences a dependent factor X indirectly through a mediating variable M, even when a direct effect of Y on X is absent (Hayes, 2009). However, Hayes recommends to refer to these effects as indirect effects, rather than mediating effects, which has been applied in this paper as well to avoid confusion.

The operationalization of culture in this research also has some limitations to the conclusions with regard to cross-cultural differences. First, the analysis of culture was limited to three dimensions, because uncertainty avoidance was excluded and performance orientation and assertiveness were combined into one dimension. The goal of this research to paint the full picture of cultural differences in work-related learning was therefor only partially achieved. Other scales to measure uncertainty avoidance should be used in future research to address this cultural dimension as well.

In addition, culture was measured and analyzed on the individual level, while in fact, culture is a phenomena related to groups of individuals. In cross-cultural research, cultural values are often analyzed on group level, to make comparison possible between different cultural regions or countries (Taras, Rowney & Steel, 2009). In this study however, participants were unequally distributed with regard to their geographical background. Most participants came from the Netherlands, Belgium and Germany and many countries were represented by only one to four participants. The combination of countries into cultural regions similar to the cultural clusters used by House et al. (2004) still resulted in sample sizes which were highly unequal, with one large group (> 100) and several smaller groups (> 50). To conduct multi-group analysis with SEM, based on free estimated parameters, a sample size of at least 115 per group was needed for the model of RQ1, 155 for the model of RQ2 and 215 for the alternative model. Sample group sizes in this study were not sufficient which obstructed multi-group analysis with SEM. As a consequence, cultural differences found in this study cannot be used to directly draw conclusions on differences between countries or regions. Furthermore, this sample is highly represented by employees from West-Europe, this could bias the results because the effects of cultural dimensions on other variables in other regions might differ from West Europe. It is therefore recommended to replicate this study with samples that have a better representation of the different countries across the world, ideally with equal sample sizes.

4.3 Implications for practice and theory

One key question related to this research is how HRD professionals in multinational organizations can improve informal learning. Although a self-directed learning orientation is a good predictor of the engagement in informal learning, this is a personal characteristic that cannot be influenced directly. However, organizations can improve the learning orientation of employees through factors in the work environment such as leadership and work autonomy, for example by redesigning jobs to create more autonomy or to focus on leadership development programs to help leaders to be more supportive in learning for their employees.

Related to this is the question if HRD professionals and organizations should take cultural differences into account when developing informal learning programs for different cultures. Following the results of this study, cultural values are only slightly related to the engagement in informal learning, which indicates that employees across cultures are equally engaging in informal learning, alone or with

others. To make an impact on informal learning, it would be more effective to focus on factors in the work environment than on cultural values. On the other hand, cultural differences should be taken into account when organizations try to improve informal learning though these factors. Take for example power distance, which indicates the existence and acceptance of unequal power distribution in organizations. Redesigning jobs to create more work autonomy in high power distant cultures might have an opposite effect on learning, because employees might actually prefer less autonomy in their work. This is supported by a study from Hui, Au and Fock (2004) who found that employee empowerment had a stronger positive effect on job satisfaction for employees in high power distant cultures than in low power distant cultures. They suggest that empowering employees in low power distant cultures might even have a negative impact on job behavior.

The effect of achievement orientation on the work environment factors was not included in the alternative model because the lack of theoretical support for this relationship. Although this dimension did not directly influence learning, achievement orientation is an important and strongly represented cultural value in this company where this research has been conducted and its effect on the work environment should be further explored as preliminary analysis showed that achievement orientation was negatively related to leadership support.

This research also has some important implications for HRD researchers. This study showed that work-related learning is influenced by a complex interaction of culture, the work environment and personal characteristics. Although some researchers have provided a framework with predetermines of work-related learning including many factors related to personal and contextual factors, the interaction between these factors are often absent. More research is needed to find out which personal characteristics have the most influence on the actual learning behavior. Individual factors influencing the engagement in learning are for example managers' and employees 'responsibility for learning, motivation to learn, time to learn, IT skills and confidence (Tynjälä, 2008). Second, more research is needed to investigate which contextual factors are most likely to affect these personal characteristics. These could be related to work tasks such as work variety and complexity or related to rewards, procedures and policies for learning, work pressure, organizational structure or the use of ICT for learning (Sambrook, 2006).

To fully understand how multinational organizations can improve work-related learning in different locations, more research is needed on how the relationship between contextual factors, individual characteristics and learning behavior is different across cultures. Although this study showed that cultural dimensions are not directly related to learning, the impact of the work environment on employee learning differs among cultures (Choi and Jacobs, 2011). It is therefore recommended for future research to use cultural values as moderators instead of independent variables. Previous studies have found a moderating effect of cultural values on the relation between the work environment and employee motivation and behavior (Hauff, Richter & Tressin, 2015; Hui et al., 2004).

5.4 Overall conclusion

This study was a first attempt to understand work-related learning from a cultural perspective, including both personal factors and contextual factors in a comprehensive research framework in order to explain cultural differences in work-related learning. The findings from this research indicate that cultural differences have only limited implications for employees' self-directed learning orientation and the engagement in work-related learning activities. Furthermore, this study showed that the interaction between a personal orientation towards learning with work autonomy and leadership were effective determines of work-related learning. Multinational organizations that are trying to make the shift towards informal learning, should therefor focus on those organizational context factors as well as individual orientations and motivations to learn in order to provide adapted learning strategies. More research is needed to fully understand which work environment factors and individual factors are most likely to affect informal learning and how this is moderated by different cultural contexts.

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Appendices

Appendix A: Survey

INTRODUCTION

Dear [name company] Employee,

Thank you for participation in this research project.

By participating in this research, you help [name company] to improve the support for employee professionalization and learning worldwide.

- It will take about 20 minutes to complete this survey.
- This is not a test; there are no right or wrong answers!
- Participation is voluntary and you may quit at any given time, however, your responses will not be valid if the survey is not filled out completely.
- Your responses will be anonymous and confidential. [name company] (HR) managers and any other parties within [name company] have no access to your responses.

In return for your efforts, [name company] will raffle €150 worth of products! If you want to win one of the prizes, please leave your email address at the end of this survey (NB: your email will be stored separately from your responses).

Click next to start the survey and to agree with the terms above.

Good luck!

PERSONAL BACKGROUND:

#	Question	Answer possibilities
1	Age	*Open question numerical only*
2	Gender	*a) Man* *b) Woman*
3	Highest completed educational degree. Note: If your educational degree Is not listed, please choose the one that is most similar to yours	*a) No schooling completed* *b) Primary/nursery School* *c) High school* *d) Vocational education* *e) Higher vocational education* *f) Academic education (bachelor degree)* *g) Academic education (master degree)* *h) Ph.D.*
4	Country of birth:	*open question*
5	Current country of residence:	*open question*
6	Years of residence in current country	*Open question, numerical only*
7	In how many other countries have you lived for longer than one year? *Excluding your country of birth*	*Open question, numerical only*
8	Nationality	*Open question*
9	Mother tongue:	*a) Chinese* *b) Danish* *c) Dutch* *d) English* *e) French* *f) German* *g) Greek* *h) Hebrew* *i) Italian* *j) Japanese* *k) Korean* *l) Norwegian* *m) Portuguese* *n) Russian* *o) Spanish* *p) Swedish* *q) Other ___*
10	English Fluency	*a) Very poor* *b) Poor* *c) Average* *d) Good* *e) Excellent*

11	Religion:	*a)*	*No religion / Atheist*	*e)*	*Chinese folk religion*
		b)	*Christianity*	*f)*	*Buddhism*
		c)	*Islam*	*g)*	*Not want to answer*
		d)	*Hinduism*	*h)*	*Other_____*

12	Years/months working at this company	
	Years	*Open question numerical*
	Months	*Open question numerical*
13	Current work location: *If your location is not listed, please choose the location that is closest to yours*	*Dropdown menu of all locations*
14	Type of work at this company	*Dropdown menu all functions*
15	Name of your function	*Open question*

CULTURE

Earlier you indicated that your current work location at is <*location*>. We are interested in your beliefs about the work norms, values, and practices at <*location*>. Please indicate to what extent you agree with the following statements about your work environment. There are no right or wrong answers, and answers do not indicate goodness or badness of the organization.

In my work environment…	Totally disagree			Neither agree or disagree			Totally agree
16… *orderliness and consistency are stressed, even at the expense of experimentation and innovation. (UA)*	1	2	3	4	5	6	7
17… *job requirements and instructions are spelled out in detail so employees know what to do. (UA)*	1	2	3	4	5	6	7
18… *it is possible to try new things and experiment even if the outcome is uncertain. (UA)*	1	2	3	4	5	6	7
19… the pay and bonus system is designed to maximize individual interests more than collective interests. (IC)	1	2	3	4	5	6	7
20… *employees pursue their individual interests; the collective interests hardly play a role. (IC)*	1	2	3	4	5	6	7
21… *employees take more pride in their own accomplishments than team accomplishments. (IGC)*	1	2	3	4	5	6	7
22… *team leaders take more pride in the accomplishments of individuals than of teams. (IGC)*	1	2	3	4	5	6	7
23… *employees like to work alone rather than in a group. (GWP)*	1	2	3	4	5	6	7
24… *employees perform better when working alone than in a group. (GWP)*	1	2	3	4	5	6	7
25… employees are encouraged to strive for continuously improved performance (AO)	1	2	3	4	5	6	7
26… *doing your best isn't good enough, it is important to win (AO)*	1	2	3	4	5	6	7
27… *the outcome is more important than what you do to get there (AO)*	1	2	3	4	5	6	7
28… *subordinates are free to question their manager when in disagreement (-PD)*	1	2	3	4	5	6	7
29… *subordinates are expected to obey their manager at all times (PD)*	1	2	3	4	5	6	7
30… *a person's influence is based primarily on the authority of one's position, and not one's personal abilities (PD)*	1	2	3	4	5	6	7
31…money and material things are important (AS)	1	2	3	4	5	6	7
32… being assertive and ambitious is important (AS)	1	2	3	4	5	6	7
33… the fulfillment of tasks is more important than caring for others (AS)	1	2	3	4	5	6	7
34… A job with high earnings is better than a job with quality of life *(AS)*	1	2	3	4	5	6	7

(UA=Uncertainty avoidance; IC=Institutional Collectivism; IGC=In group collectivism; GWP=Group work preference; AO=Achievement orientation; PD=Power Distance; AS=Assertiveness)

SDLO

The following questions are about your orientation towards learning and your career. Again, there are no right or wrong answers. Please indicate to what extent the following statements represent your own orientation.

	Totally Disagree			Neither agree or disagree			Totally Agree
35. I always search for better ways to execute my work tasks	1	2	3	4	5	6	7
36. I excel in noticing opportunities to learn	1	2	3	4	5	6	7
37. I immediately take opportunities to learn in order to reach my goals	1	2	3	4	5	6	7
38. When I want to learn something new that can be useful for my job I take the initiative.	1	2	3	4	5	6	7

LEARNING ACTIVITIES

In this section, we ask you to indicate how often you engage in learning activities for your work.

Formal learning activities are activities that:

- Take place on a pre-set time and educational setting,
- Outside the direct work context,
- Often involve an instructor or trainer.

Please give an indication of how often you engage in these formal learning activities on a scale of (1) more than once per month to (7) less than once a year.

Note: If you engage in other work-related formal trainings outside your company, you can count these as well

How often do you…

	Less than once per year	every year	Every 9 months	Every 6 months	Every 3 months	Every month	More than once per month
39…Participate in a classroom training or workshop	1	2	3	4	5	6	7
40… Participate in an online training (instructor led)	1	2	3	4	5	6	7
41… Follow an e-learning (online course without instructor)	1	2	3	4	5	6	7

Another type of learning is informal learning. Informal learning activities are those that you do while you are doing your job. How often do you engage in informal learning activities? To answer the questions, please think of situations when..

- ..you needed to know how to perform a work related task,
- ..you were stuck at a task and needed information to continue
- ..you wanted to improve your performance at work.

While you are working, how often do you…

	Less than once per month	Once per month	Once per 2 weeks	Once per week	1-4 times per week	Once per day	Several times per day
42… Search for information on the internet or in journals	1	2	3	4	5	6	7
43… Reflect on your work	1	2	3	4	5	6	7
44… Try out new things	1	2	3	4	5	6	7
45… learn from experience by doing your job	1	2	3	4	5	6	7
46… Observe a colleague	1	2	3	4	5	6	7
47… Ask for help or advice from your colleagues (peers)	1	2	3	4	5	6	7
48… Ask for feedback from your colleagues (peers)	1	2	3	4	5	6	7
49….Share your mistakes	1	2	3	4	5	6	7

with your colleagues (peers)							
50… Ask for help or advice from your supervisor	1	2	3	4	5	6	7
51… Ask for feedback from your supervisor	1	2	3	4	5	6	7
52….Share your mistakes with your supervisor	1	2	3	4	5	6	7

LEADERSHIP AND NATURE OF WORKTASKS

now, we are interested in the role of your immediate supervisor in supporting your professional development and learning. Please indicate to what extent you agree with the following statements:

	Totally disagree			Neither agree or disagree			Totally agree
53. I receive enough support from my immediate supervisor in my professional development	1	2	3	4	5	6	7
54. My immediate supervisor takes my professional career seriously	1	2	3	4	5	6	7
55. My immediate supervisor encourages me to spend time and resources on professional learning and development	1	2	3	4	5	6	7

The following questions are about the nature of your work tasks. Please indicate to what extent you agree with the following statements.

In my work at [name company]…	Totally disagree			Neither agree or agree			Totally agree
56…I can make a lot of decisions on my own (AU)	1	2	3	4	5	6	7
57…I can decide on my own how I do my work (AU)	1	2	3	4	5	6	7
58...I do many different things (VA)	1	2	3	4	5	6	7
59…I perform a wide range of different tasks (VA)	1	2	3	4	5	6	7
60…I only do one task or activity at the time (CO)	1	2	3	4	5	6	7
61…I perform relatively simple tasks CO)	1	2	3	4	5	6	7

(AU: autonomy; VA: variety; CO: complexity)

This is the end of the survey. Thank you for your time!

If you have any questions, remarks of feedback, please indicate in the box below or contact i.rensink@utwente.nl.

- I want to participate in the raffle to win one of the prices (Leave your email below. NB: Your email address will be stored separately from your responses)
- Your email address:

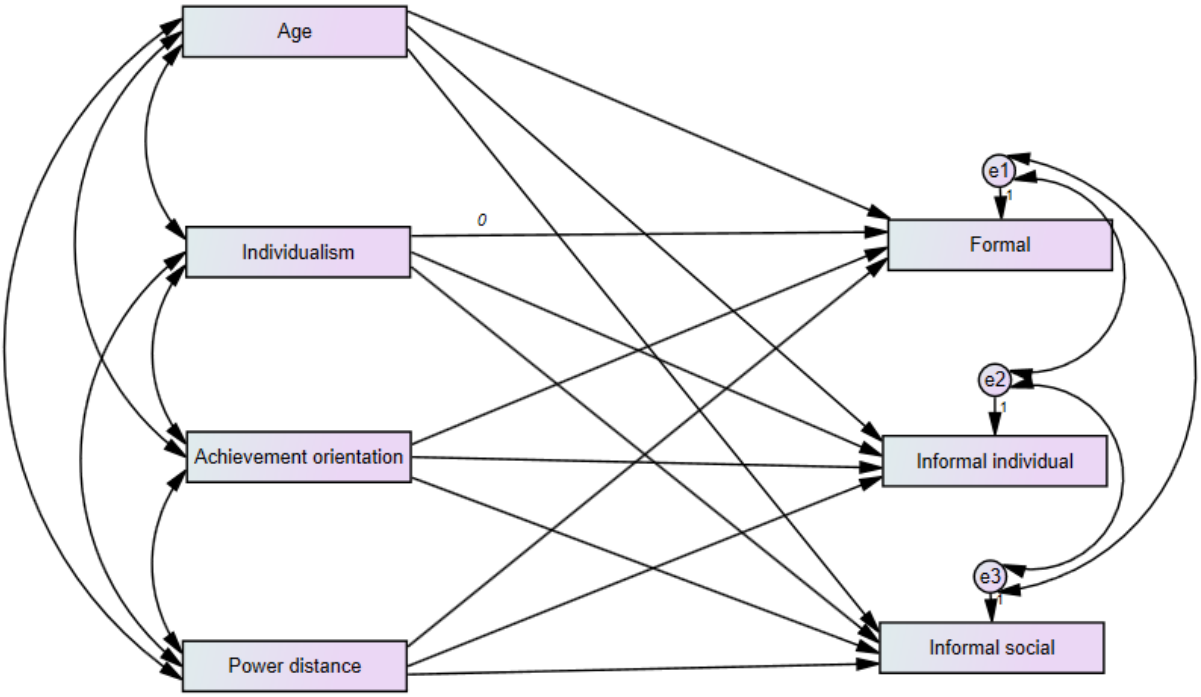
Appendix B. Source cultural items

Table 3 Items and source of cultural values scale

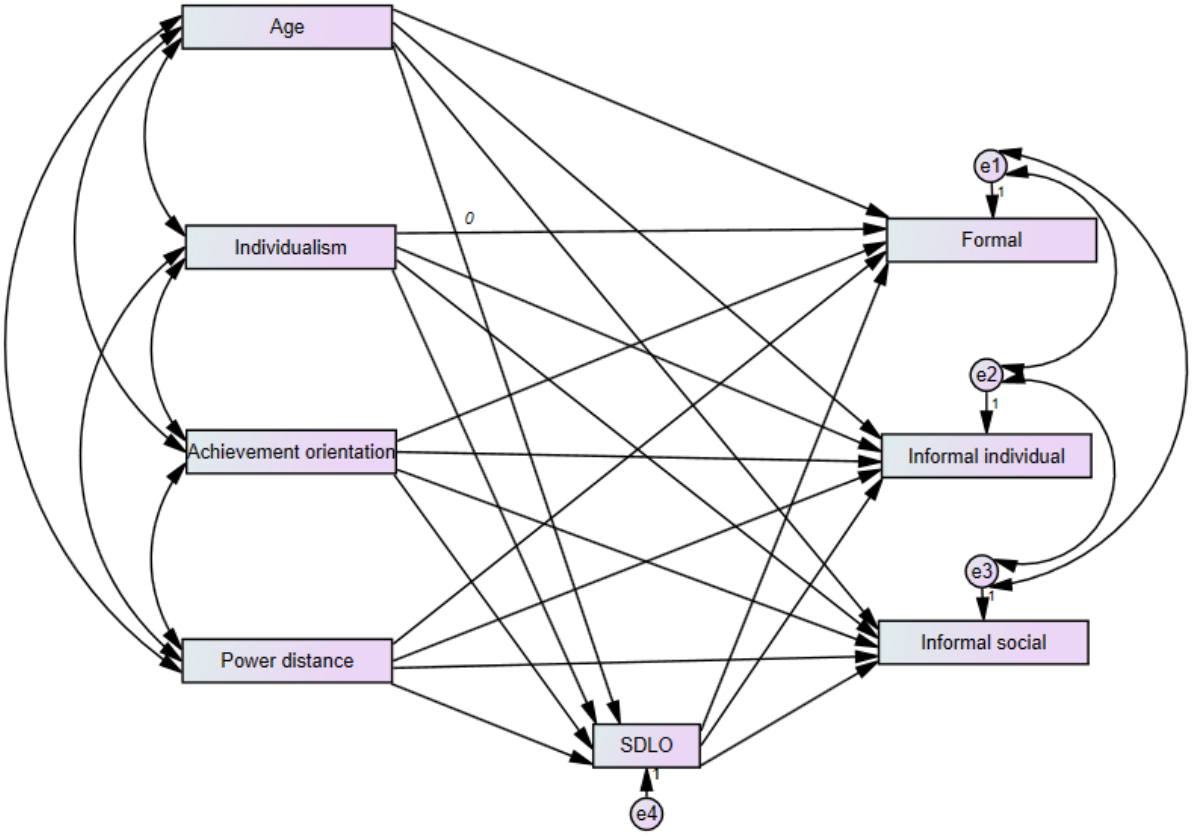
Dimension	Items	Source
Individualism	- *In my work environment , the pay and bonus system is designed to maximize individual interests more than collective interests (IC)*	(House et al., 2004)
	- *In my work environment, employees pursue their individual interests; the collective interests hardly play a role (IC)*	(House et al., 2004)
	- *In my work environment, employees take more pride in their own accomplishments than team accomplishments (IGC)*	(House et al., 2004)
	- *In my work environment, team leaders take more pride in the accomplishments of individuals than of teams (IGC)*	(House et al., 2004)
	- *In my work environment, employees like to work alone rather than in a group (GWP)*	(Early, 1993)
	- *In my work environment, employees perform better when working alone than in a group (GWP)*	(Early, 1993)
Uncertainty avoidance	- *In my work environment, orderliness and consistency are stressed, even at the expense of experimentation and innovation.*	(House et al., 2004)
	- *In my work environment, job requirements and instructions are spelled out in detail so employees know what to do.*	(House et al., 2004)
	- *In my work environment, it is possible to try new things and experiment even if the outcome is uncertain.*	(Van Oudenhoven, 2001)
Performance orientation	- *In my work environment, employees are encouraged to strive for continuously improved performance*	(House et al., 2004)
	- *In my work environment, doing your best isn't good enough, it is important to win*	*(Wagner 1995)*
	- *In my work environment, the outcome is more important than what you do to get there.*	-
Assertiveness	- *In my work environment, money and material things are important*	*(Hofstede et al., 1991)*
	- *In my work environment, being assertive and ambitious is important*	*(Hofstede et al., 1991)*
	- *In my work environment, the fulfillment of tasks is more important than caring for others*	*(Yoon et al., 2001)*
	- *In my work environment,* A job with high earnings is better than a job with quality of life	*(Yoon et al., 2001)*
Power Distance	- *In my work environment, subordinates are free to question their manager when in disagreement*	(House et al., 2004)
	- *In my work environment, subordinates are expected to obey their manager at all times*	(House et al., 2004)
	- *In my work environment, a person's influence is based primarily on the authority of one's position, and not one's personal abilities*	(House et al., 2004)

Appendix C. SEM models

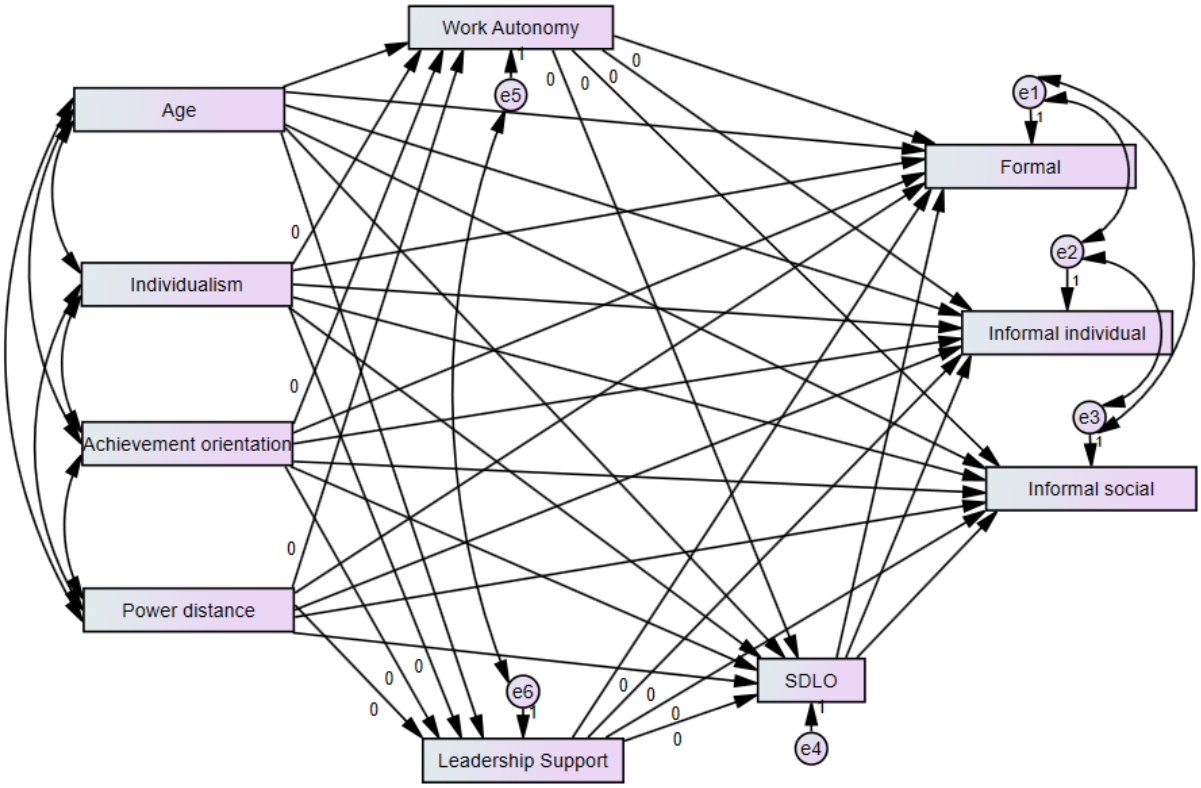
Model RQ1:



Model RQ2:



Baseline alternative model:



Final alternative model: