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Culture and learning in a high-tech environment: The relationship between cultural values and informal learning activities of highly qualified employees.

Master Thesis
Educational Science and Technology

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Table of contents

Summary

Informal learning is seen as one of the most important approaches of knowledge acquisition in high-tech multinational organisations in order to gain a competitive advantage, but still is difficult to identify. In general, informal learning provides a simple contrast to formal learning or training. It is unstructured and suggests greater flexibility or freedom for learners, ingredients which are related to innovation. Even more challenging is the fact that multinational organisations have to create a working environment where employees from all around the world are able to work together. However, employees who are from a culture where working individually is valued as more productive might find it more difficult to operate in a team. Until now, the knowledge gap between learning and culture is only partially understood and gaining insight is beneficial for providing suitable learning opportunities for each individual. It is clear that each individual has its own cultural values, but it is unclear whether the cultural values also influence the performed informal learning activities. Therefore, the purpose of this study is to determine what the relationship is between cultural values have and informal learning activities. It is hypothesized that self-directed learning orientation, supervisor support and job autonomy mediate the relationship between cultural values and informal learning activities. A digital survey was conducted among 394 employees working in a high-tech multinational environment. Results indicated that some of the cultural values impacted on informal learning activities. Self-directed learning orientation did not seem to mediate the relationship between cultural values and informal learning activities, but supervisor support and job autonomy did. Thus, in order to improve informal learning organisations should focus more on giving the right amount of supervisor support and job autonomy. However, more research is needed to further clarify the nature of the relationship in other contexts.

Keywords: Informal learning, self-directed learning, self-directed learning orientation, job autonomy, supervisor support, culture, organisation culture, cultural values.

1. Introduction

In today's globalizing and changing society it is for leading high-tech multinational organisations essential that employees learn how to quickly obtain information and predict how the market will change. For high-tech organisations freedom and flexibility are essential aspects in order to be innovative (Sarros, Cooper, & Santora, 2008). In exploring the individual level of learning it is important to note that 80% of workplace learning takes place through informal means, while only 20% of what organisations invest in learning is dedicated to enhancing informal learning (Cross, 2007). Informal learning is often not acknowledged as learning within organisations (Boud & Middleton, 2003), because informal learning is so ingrained in the daily activities that it is difficult to recognise (Werquin, 2010). Informal learning can be defined as the opposite of formal learning or training that suggests greater flexibility or independency for learners (Eraut, 2004). Informal learning is also viewed as the most important method of obtaining and expanding competencies which are required at the work floor (Eraut, Alderton, Cole & Senker, 1998; Skule, 2004). Marsick and Watkins (2001) discussed that informal learning for example arised in an individual, in interactions amongst individuals, in organisations. High-tech multinational organisations in general have lots of different layers in the chain of command in order to run the organisation as smooth as possible. However, this perception of hierarchy conflicts innovativeness where freedom and flexibility are envisioned. Although informal learning is difficult to recognize, it is possible that employees already implement informal learning activates during their practices without the organisations knowledge. Kim and Mclean (2014) stated that settings for learning in the workplace can only be fully understood when exploring the cultural perspectives. This most certainly applies for multinational organisations where people from with different nationalities come together to solve highly complex problems at hand. Given the increased globalization and interdependencies of organisations among nations, the need for better understanding of cultural values has never been greater (House, et al., 1999). Schein (2004) explained that the shared culture amongst a group of people appears as a sort of basic expectation or deeply-held beliefs; values and behaviours which are normally different for every individual. More specifically, the beliefs, values and behaviours are shown via for example symbols, practices and artefacts that are easily observed (Schein, 2004). Furthermore, Felstead et al. (2005) found that the culture (in which a group operates) influenced and changed how people learn at the workplace. Lots of research has already been done on culture, but research which connects cultural dimensions with informal learning is rare. However, Kim and McLean (2014) recently found that several national cultural dimensions influenced informal learning and discussed which factors influenced informal learning. Kim and Mclean (2014) debated that it is likely that supervisor support and autonomy influence informal learning and concluded that in strong uncertainty avoidance cultures more guidelines are necessary for learning, while in weak cultures more autonomy is acceptable. However, they concluded that it is too early to determine what the best approach is to promote informal learning. This research aims to provide more evidence in order to better understand the relationship between cultural values and informal learning for highly-qualified employees operating in a high-tech multinational organisation. More specifically, to first goal of this study is search to what extent cultural values influence informal learning activities. The second goal is to investigate whether employees' personal impression towards learning mediates the relationship between cultural values and informal learning activities. The third goal is to find out if support from ones supervisor and job autonomy will mediate the relationship between cultural values and informal learning.

2. Theoretical framework

2.1 Informal learning activities

Eraut (2004) described informal learning as learning the opposite to formal learning or training. Furthermore, Eraut (2004) explained that with informal learning there is more freedom and flexibility and emphasized the importance of learning from other people. Marsick and Watkins (2001) more specifically define informal learning as: "a category that may occur in institutions, but it is not typically classroom-based or highly structured, and control of learning rests primarily in the hands of the learner. It can be deliberately encouraged by an organisation or it can take place despite an environment not highly beneficial towards learning" (p.25). Examples include networking, coaching, mentoring, and performance planning that include opportunities to review learning needs (Marisck & Watkins, 2001; Berg & Chyung, 2008). Berg and Chyung (2008) stated that informal learning is typically seen as a certain action that arises outside the training room. These clarifications have in common that informal learning mostly happens outside an official prearranged setting, but also show that is still is difficult to specify. Based on the definition over Marsick and Watkins, informal learning activities will be defined for this study as learning activities that occur outside the classic classroom setting and are initiated by the individuals, for example reflection, observing other people's behaviour or searching the web for extra information. Kim and Mclean (2014) point out that informal learning could happen everywhere in the workplace as long as people are given opportunities and are encouraged to learn from it. Furthermore, Kim and McLean (2014) discussed that in recent years studies on informal learning combined literature at the individual level with organisational learning in the workplace. This opens up possibilities to better understand informal learning. For example, Gijbels, Raemdonck and Vervecken (2010) found that individual characteristics play a key role in determining whether the individual will or will not take advantage of the learning opportunities offered by the working environment. More specifically, Gijbels et al. (2010) found that self-directed learning orientation is an important predicting element in relation to behaviour associated with work. Other examples which showed key elements of the effective learners in their study were: planning (including the ability to set goals), monitoring, evaluating; and keeping a positive learning attitude (Gijbels et al., 2010). Similarly, Milligan, Fontana, Littlejohn and Margaryan (2015) discussed that theories about self-regulated learning also have been applied in informal learning studies. Moreover, their study revealed that in knowledge intensive workplaces employees were required to learn constantly as job roles become more dynamic and employees were expected to take more responsibility for planning their learning path. Milligan et al. (2015) found that the context of the workplace influenced the 'workplace learning activities' and that the individual self-regulated behavioural characteristics influenced this relationship. Milligan et al. (2015): "The effective learners showed to possess a range of strategies, and knew when to use them, and when to change strategies if they prove ineffective in a given situation" (p.398). This description seems closely related with informal learning. Still, when learning in organisations become more important or acknowledged, in order for learning on different levels to occur, building learning competencies becomes necessary (Confessore & Kops, 1998). Marsick and Watkins (2001) debated that the organisational context produces different assignments, which lead to different opportunities for learning. By providing diverse supporting materials for learning such as a library with references, subscriptions to a journal, video courses or computer based courses, organisations can encourage employees to work and learn collaboratively (Marsick & Watkins, 2001). Via this method employees were stimulated with new materials which they can use to solve a task. Nevertheless, if the organisation on the one side invested in improving its learning capabilities, then on the other side one could expect that the employees should use the opportunity to improve his or her own learning path. De Long and Fahey (2000)

stated that a certain affinity with creative thinking and continuous improvement were likely to provide a fruitful base for learning and argued that cultural assumptions can influence how, and the amount of learning that occurs during conversations. Similarly, Schein (2004) discussed that there are strong indications that different cultures influence the amount and type of learnings that arises. In particular, Schein (2004) mentioned assumptions to what constitutes as 'valuable' knowledge, how to deal with new knowledge, the appropriate 'location' of knowledge in an organisation or group of individuals, and concluded that the form and function of social interactions all seem to have a deep impact on learning.
Since informal learning is not always recognized, one of the goals of this study was to gain a better insight in informal learning activities to support organisations in facilitating a suitable learning environment for its employees. Although interest in the topic of informal learning is rising, researchers still attempt to find a solid classification of informal learning activities. Eraut (2004) divided informal learning by levels of intention and time of focus, see figure one appendix A. Berg and Chyung (2008) also investigated the types of informal learning activities people participated in at work and divided informal learning by formal vs informal learning, and intentional & unintentional learning activities. According to Berg and Chyung (2008) it appeared that older workers were more likely to perform informal learning. Unfortunately, these classifications cannot be implemented directly since the context of both studies are different. After reviewing both studies and searching for a more general framework of learning, a connection was found with the theory of London and Sessa (2007). London and Sessa (2007) examined the learning process of groups and divided learning in three forms: Adaptive learning, generative learning and transformational learning (figure two, appendix A). London and Sessa (2007) explained adaptive learning as the automatic reaction of the group when the environment is changing so that the group is able to adapt. The adaptive type of learning showed a similar description with Eraut's reactive learning and somewhat with Berg and Chyungs' unintentional learning. Generative learning is explained by London and Sessa (2007) as a situation where the group on purpose is pro-active, generating and using new knowledge, skills, and behaviours. However, the form and its purpose remain the same. The generative type of learning showed a similar description with both Eraut's deliberative learning and Berg & Chyungs' intentional learning. Transformative learning indicates a transformation of the whole group and in the process of transformation they learn to use the three different forms of learning and interacting (London & Sessa, 2007). Transformative type of learning is for the first part of its description different from Eraut (2004) and Berg & Chyung (2008), but the second part showed similarities as stated above. In addition, London and Sessa (2007) mentioned that the theory is suitable for individual level of analysis and ways how group leaders can facilitate group learning (figure three, appendix A). Therefore, in this study the classification of London and Sessa (2007) will be used to further identify the types of informal learning.

2.2 Cultural values

Hofstede (2011) defined culture: "culture is the collective programming of the mind that distinguishes the members of one group or category of people from others" (p.3). More specifically, culture is basically being shaped by a set of values, assumptions or taken-for-granted understandings that are shared by the members of a social group (Frambach, Driessen, Chan, & van der Vleuten, 2012). According to Hofstede (1984) there are in essence two levels. The first level shows that there are values which he called the 'deep' level of culture. The 'deep' level is a broad, fundamental and generally implicit principle that leads members of a social group to "prefer a certain state of affairs over others" is shared and which leads to a common definition (Hofstede, 1984, p.18). The second level of culture Hofstede (1984) called that 'shallow' level of culture. According to Hofstede they include: "a) symbols (e.g. corporate

branding, logos, physical and geographical arrangements); b) heroes/heroines (role models on whom members of the organisation can model themselves and their values); c) rituals (e.g. structural meetings or ways of greeting people in order to maintain social relations rather than to achieve specified objectives)" (Hofstede, 1984, p.19). Bishop, Felstead, Fuller, Jewson, Lee, and Unwin (2006) debated that there are more levels to culture and that the term beliefs and values should be used separately (figure two, appendix A), but emphasized that there is no universal agreement or model in which culture should be understood. In addition, Hofstede (1998) points out that one could study culture at the level of an entire corporation, a national subsidiary, the department, the product or even a work group. This study used the aforementioned definitions as a basis to define cultural values as the collective set of values that distinguishes individuals from one group or category of individuals. Giddens (1984) described that culture within organisations are often seen as 'structured' systems that generate self-maintaining social practices. So if an entire organisation can been seen as a social group and can be studied even at a work group, then it is also likely that within organisations other cultures or subcultures exist. Hofstede (2011) emphasized that cultures 'belong' to social groups and that the organisation is just one type of social group from many others around which cultures can unite (Hofstede, 1998). Concluding, the national cultural dimensions Hofstede created could probably be used to determine the cultural values of a subculture in an organisation. Over the years Hofstede has measured culture in five dimensions: (1) power distance, (2) uncertainty avoidance, (3) individualism-collectivism, (4) masculinity-feminity and (5) long-short term achievement orientation. Summarized, Hofstede (2011) explained the following dimensions as:

> "Power Distance has been defined as the extent to which the less powerful members of organizations and institutions (like the family) accept and expect that power is distributed unequally. This represents inequality (more versus less), but defined from below, not from above. Uncertainty avoidance indicates to what extent a culture programs its members to feel either uncomfortable or comfortable in unstructured situations. Individualism on the one side versus its opposite, Collectivism is the degree to which people in a society are integrated into groups. Masculinity versus its opposite, Femininity characteristic, refers to the distribution of values between the genders which is another fundamental issue for any society, to which a range of solutions can be found. Long-term short term achievement orientation is explained as prioritizing these two existential goals differently by societies." P.9-13

More recently, Hofstede identified a sixth dimension called indulgence/restraint, but due to the lack of literature the sixth dimension has been excluded. Similarly, the GLOBE research program initiated by House et al. (2004) studied how culture related to societal, organisational and leadership effectiveness. The GLOBE study found how different cultures describe outstanding leaders and based their search on some of Hofstede's dimensions. The comparison between the used dimensions are shown in table one, appendix B. The assumption of GLOBE is based on the premise that leader effectiveness is contextual, that it is embedded in the societal and organisational norms, values and beliefs of the people being led. In other words, an effective leader or employee has to adapt to the context where he or she operates to be effective. Schein (2004) points out that although leadership behaviour is important to influence the culture, this is only partially. Culture is the outcome of a complex learning process that is only partially influenced by the leaders' behaviour which is similarly discussed by Hofstede (2001) who debated that culture is somewhat manageable. In addition, Smith (2000) emphasized that individual employees think and feel different in their own way and that employees are unique individuals who do not simply receive and accept information transmitted form people with more power without questioning it. People interpret information based on their own values and act as they think is best. Here two different vision collide with each other. On the one side

organisations and its leaders could create a cultural environment for the employee where they can develop themselves, while on the other side employees could be more self-directed in their learning path and adapt to the context where he or she operates. Concluding, in an ideal situation organisations create an environment where employees work autonomous with a certain extent of support and employees will take advantage of the given autonomy to work self-directed resulting in a sort of learning supportive cultural environment.
Kim and McLean (2014) used Hofstede's dimensions and their findings indicated that informal learning is influenced by each national cultural dimension. However, they also concluded that it is too early to determine the best approach to promote informal learning for certain cultures. This study continued to determine to what extent cultural values influence informal learning activities. Since a lot of research has already been conducted on the subject culture, the four dimensions of Hofstede (power distance, individualism/collectivism, uncertainty avoidance, and masculinity/feminity) were used in order to better determine the cultural values of employees. Still, House et al. (2004) point out that individualism/collectivism and masculinity/feminity represent multiple constructs and used another framework that specified both constructs. Therefore, instead of individualism/collectivism, institutional and in-group collectivism are used, and instead of masculinity/feminity only the assertiveness dimensions is used from House et al.'s framework. In addition, Kim and Mclean (2014) findings point to ways that the power distance dimension influenced informal learning on: "Attitudes on feedback, involvement in knowledge sharing, self-directedness, and preference for learning source may be different by the degree of sensitivity in the relationship with people who have power" (p.51). As mentioned earlier, Gijbels et al. (2010) found that self-directed learning orientation was an important predicting element in relation to work related performance. The found relationships of these two studies indicated that the self-directedness of people are likely to influence the relation between cultural values and informal learning. The next section explored self-directed learning orientation.

2.3 Self-directed Learning orientation

According to Ellinger (2004) self-directed learning (SDL) has been a significant adult learning theory within adult education and variously defined in the literature. Still, Knowles (as cited in Ellinger, 2004) provided the most widely accepted definition which defined SDL as:

> "SDL exists of eight elements: (a) it is a process (b) that is initiated by the individual, (c) which may or may not involve the help of others, (d) to identify their learning needs, (e) develop learning goals from these needs, (f) find the resources to attain these goals, (g) select the proper learning strategies to meet their goals, and (h) determine how to measure learning outcomes." (p.18)

SDL is described as a self-learning style where people are responsible for planning, executing, and evaluating their own learning activities (Ellinger, 2004). More specifically, Gijbels et al. (2010) defined self-directed learning orientation (SDLO) as: "Self-directed learning orientation is a 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" (p.243). Furthermore, Gijbels et al. (2010) found that employees displayed learning initiative, undertook learning activities and continuously tried to overcoming barriers. Raemdonck et al. (2012) examined factors influencing self-directed learning and found that important predicting elements of self-directed learning orientation on the individual level were: "A proactive personality, striving for knowledge work, past learning initiative, task variety and the growth potential of the job" (p.572). The economic sector in which the low-qualified employee was employed played in particular a striking role in the prediction of self-directedness, as did presence of an involved staff policy on the organisational level. Raemdonck et al. (2012) concluded that the findings are potentially relevant for highly-qualified employees and stated

that the best jobs for promoting cognitive growth are the ones where the individuals have a high level of person control, because this combination provided contextual challenges and opportunities for successful learning. Likewise, Artis and Harris (2007) tried to implement the concept SDL into the marketing domain and argued that managers have to vary their support and assistance depending on the type of SDL pursued by the employee. It was necessary for people to have diverse skills and incentives to effectively achieve organisational goals. For managers who have entrusted lots of employees it appeared that it was even more difficult to find the appropriate amount of support and assistance. Some employees explicitly told what kind and amount of support were necessary, while others were less clear how the supervisor could support them. Nevertheless, as self-directed learning is such a wide concept, some variables which predict self-directed learning showed that in order to encourage this behaviour organisations needed to provide orientation, support and guidance (Ellinger, 2004; Merriam, 2001).

2.4 Supervisor Support and Job Autonomy

According to London & Smither (1999) a close manager or supervisor was essential when forming an environment where people can learn which supported self-development through motivating employees' believe of autonomy and taking the initiative. Kottke and Sharafinski (1988) define supervisor support as: "an employee's global beliefs that his/her supervisor vales the employee's contribution and cares about his/her general welfare". Maurer and Tarulli (1994) found that at the managerial and leadership ranks employees' managers and supervisors influenced many of the conditions that supported self-development. Supervisors and managers also support and guide development needs by serving as coaches, mentors, learning facilitators and providing multi-source feedback (Ellinger, 2004). In addition, the extent to which manager should support or assist is discussed by Raemdonck et al. in relation to autonomy. Raemdonck et al. (2012) define job autonomy as: "The degree to which the job provides substantial freedom of judgement to the employee in scheduling work and determining the procedures to be used" (p.581). Moreover, Raemdonck et al. (2012) concluded that autonomy has no significant impact on self-directed learning orientation. However, the article also stated that the best jobs for stimulating mental growth were the ones where the individuals have a high person control, because the combination provided contextual challenges and opportunities for successful learning. In the past, Batt and Valcour (2003) found that autonomy on the job increased employees' perceptions of having control about how they can organize their own work. If employees felt they have control over their jobs, then one would expect to feel more responsible and possibly be more self-directed in order to perform well on the job. Merriam (2001) described the relationship between autonomy and self-directedness and explained that the autonomy of an individual varies from situation to situation. A learner that has shown autonomy in one situation might not show this in later situations.

The present study aimed to find to what extent five of the cultural values dimensions influence informal learning activities. The first research questions of this study is:

1. To what extent do cultural values influence informal learning activities of highly-qualified employees operating in a high-tech multinational environment?

Based on the findings of Kim and McLean (2014) several hypotheses will be formulated to test the research model of this research. Kim and McLean (2014) concluded that that attitudes on feedback, involvement in knowledge sharing, self-directedness, and a certain liking for learning are possibly different in the relationship with people who have more power. Moreover, they discussed that employees who operated in a large power distance environment were afraid of punishment when sharing knowledge, while employees in a low power distance environment

did not worry about the consequences. Assuming that the current PD in the multinational organisation is large, it is hypothesized that PD negatively influences informal learning.
For the IC dimension Kim and McLean (2014) discussed that possibly the better the individual relationship between colleagues the more informal learning occurred. Kim and Mclean (2014) concluded that people who came from a collectivistic culture were likely to prefer group activities compared to people from individualistic cultures, and appeared to have more informal contact with co-workers. However, it wat not clear what kind of informal contact they meant, so it could be both work as social related. Assuming that the current state of the high-tech multinational organisation is more collective orientated, it is hypothesized that IC negatively influences informal learning since the higher the IC dimension is the more individualistic people are.
For the adapted assertiveness dimension there is little theory found and research conducted. However, people who are in general assertive show more confidence and probably have a higher self-efficacy. Self-efficacy is described by Raemdonck (2006) as beliefs about people's capability of performing a broad range of work tasks, which according to Kim and McLean (2014) have a positive influence on informal learning activities. Looking at the MF dimension of Hofstede, Kim and McLean (2014) discussed that individuals from masculine cultures are more responsive to cheerful, honoured, and proud emotions in relation to their work, whereas people from a feminine cultural were more likely to be open to relaxed, peaceful and comfortable emotions. Kim and Mclean (2014) concluded that in feminine cultures, individuals tend to care more about the social aspect within the team, group or organisation, whereas in masculine cultures people were usually goal orientated and tended to emphasize the outcomes. Assuming that the current state of the high-tech multinational organisation is more masculine, it is hypothesized that assertiveness positively influences informal learning.
For the UA dimension Kim and McLean (2014) discussed based on Hofstede et al. (2010) that people from strong uncertainty-avoiding countries preferred less change, more rules, busier work and more formalization, while people from low uncertainty avoidance cultures revealed a higher acceptance towards change, more autonomy, only essential work, and acceptance of obscurity. Kim and McLean (2014) concluded that in strong uncertainty-avoidance cultures more specific and clear guidelines were necessary for learning activities, while in low uncertainty-avoidance cultures autonomy was acceptable and sometimes even demanded. Assuming that the current state of uncertainty avoidance of the high-tech multinational organisation is high, it is hypothesized that AO negatively influences informal learning.
For the AO dimension Kim and McLean (2014) discussed that people from long-term achievement orientated cultures were likely to learn for future positions, jobs, and unexpected changes, while people from short-term achievement orientated cultures viewed learning as a solution to confronting challenges and as a performance tool. Kim and McLean (2014) concluded that people from long-term achievement orientated cultures see informal learning as something that could be expected to be premeditated for self-development, but mostly likely not work performance, while in short-term achievement orientated cultures, informal learning could be practical but is not something for long-term development. Assuming that the current state of the high-tech multinational organisation is long-term orientated, it is expected that achievement orientation positively influences informal learning.

Looking at the adapted model of culture (figure one, appendix A) cultural values are visualized in the inner layer, beliefs/norms in the middle and the practices in the outer layer. Informal learning activities are more or less practices accomplished on the job by employees which could be visualized as the outer layer. Earlier, self-directed learning orientation was defined as: "a relatively stable tendency to take an active and self-starting approach". This definition showed that an employee has to actually believe that learning is beneficial otherwise employees would not initiate the learning by themselves. It seems suiting that self-directed

learning orientation mediates the relationship between cultural values and informal learning. Moreover, Gijbels et al. (2010) concluded that individuals who were highly self-directed orientated in their learning, learn more in a work-related way. Choi and Jacobs (2011) showed that personal learning orientation should be viewed as a significant influencing factor on informal learning. Kim and Mclean (2014) found that the self-directedness of employees were likely to differ towards those who have more power and discussed that employees are likely to perceive feedback as interference or oppression of their autonomy. Moreover, Kim and McLean (2014) debated that employees identified feedback and support from supervisors not as suggestions, but as important directions or commands in large power distance cultures. Thus, it seemed that how employees interpret feedback in relation to the power distance could indicate whether or not the barrier will be overcome, or extra support is necessary, or employees will continue to work autonomously. Important to note is that all three variables seem to play a key role. Therefore, the second research question is:

2. Do self-directed learning orientation, supervisor support and job autonomy mediate the relationship between cultural values and informal learning activities?

However, due to the lack of research on the dimensions only for the PD dimension a hypothesis was formulated. Nevertheless, in order to fully understand cultural values other dimensions were added as mentioned in paragraph 2.2. Concluding, it is expected that self-directed learning orientation, supervisor support and job autonomy mediate the relationship between for at least one of the chosen cultural values and informal learning activities.
The figure below shows the conceptualisation of the relationship between cultural values, informal learning activities, self-directed learning, supervisor support, and job autonomy.

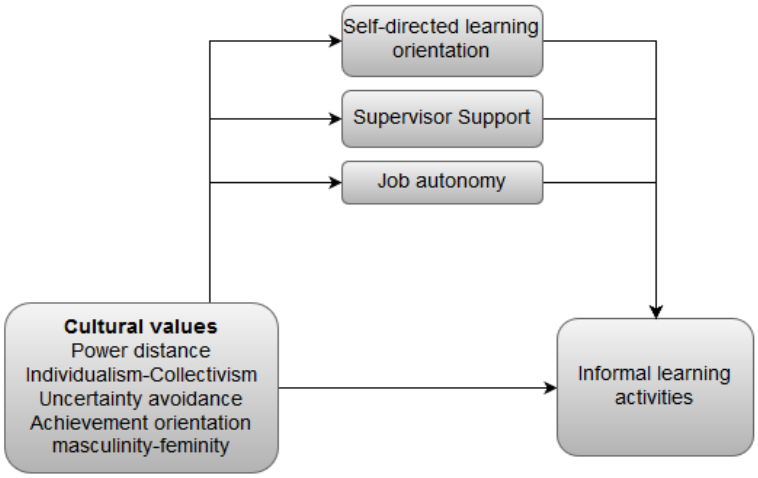


Figure 5. The model shows the design for this study.

2.5 Additional variables

This study focused on the individual level of employees working in a high-tech multinational organisation. Since context of the study consist of a high-tech multinational organisation, the variety or diversity of employees operating within the organisation is enormous just as the organisational structure. To better understand and to increase the validity of the designed research model additional variables were included. The included variables were: age, gender, nationality, educational degree, working time for the organisation (in years), work location (continent), department, working hours (per week), job type, job grade, and English fluency.

3. Method

3.1 Design

An explanatory study was conducted with a cross-sectional design. A cross-sectional design was preferred, because there were no additional expenses required and the amount of time for a longitudinal design was not possible. The goal of the study is to find a relationship between the mentioned variables and to determine if there is a causal relationship. With this research design quantitative data was gathered. The data collection method is obtrusive. In obtrusive data collection, the subjects are aware of the fact that they are being studied, which can influence their response or behaviour (Boudah, 2010). The dependent variable was informal learning. The independent variable was cultural values namely 'individualism-collectivism', 'power distance', 'achievement orientation', 'uncertainty avoidance', and 'assertiveness'. The mediating variables were self-directed learning orientation, supervisor support, and job autonomy.

3.2 Participants

It was possible to send out the survey to a maximum of 1000 employees from a department which is roughly three to four times greater. A stratified sample method was applied in this study in order to represent and equal percentage of nationalities, this also indicated that a sample bias could occur. A sampling bias is a bias in which the collection of the sample is held in such a way that some members of the intended population are less likely to be included (Boudah, 2010). In order to reduce the bias, the HR department randomly picked 1000 e-mail addresses according to the specified strata mentioned by the researcher. Employees were invited on voluntary bases via a digital invitation to participate in this research.

Analyses showed that 436 employees opened the link to the survey, which yields a response rate of 43.6%. 42 responses were incomplete and excluded from further analysis. Thus, in total 436 responses were collected and after the removal of incomplete responses, 394 remained. From the remaining 394 employees, the majority of employees is male (85.5%) and 15.5% is female. 58.8% of the employees worked Europe and 41.2% worked in America. The nationalities of employees working at the organisation are American (36.5%), Asian (9.1%), Dutch (30.5%), European 'other' (23.1%) and African (0.8%). The average age of the respondents is 53.2 years (SD = 11.25). More than half of the respondents have completed an academic degree or higher (67%). Overall the employees rated their English fluency: Excellent (50.3%), Good (37.4%), Average (12.1%) and only 0.3% thought it was very poor, indicating language complications were not an issue.

3.3 Instruments

To reach all the employees an online survey has been used. Benefits are that there are minimal costs involved and it will increase the generalizability of the results. The digital questionnaire will be based on the questionnaires from the authors: Hofstede (2008), House et al. (2004), Raemdonck et al. (2006), and Milligan et al. (2015) the complete survey can be found in Appendix C. The benefits of a digital questionnaire are that it is easy to send out and migrate the data. Disadvantages are that respondents can easily ignore the e-mail provided with the link and that the questionnaire has some digital flaws. Employees had four weeks to complete the digital questionnaire. The survey consisted of 60 items spread across four sections: demographics including control variables, cultural values, SDLO, supervisor support, job autonomy, and informal learning.

In the first section, the instrument from Hofstede (2008) and House et al. (2004) about culture was used. Fourteen demographical questions were asked (e.g. country of birth from participant, mother and father; current location, ethnic background and English fluency).

In the second section, cultural values were measured on five dimensions: (1) Uncertainty Avoidance, (2) Individualism-Collectivism, (3) Achievement orientation, (4) Power distance, and (5) Assertiveness. The instrument of House et al. (2004) contained 2 items for some values so additional items were added from other instruments to improve the construct validity. Individualism collectivism was divided into three constructs: *institutional- and in-group collectivism* (House et al. 2004), and *group work preference* (Early, 1993). One item from Van Oudenhoven (2001) was added to the UA dimension. One items from Wagner (1995) was added to the *achievement orientation* dimension and a third item was created based on the cultural value promoted by the organisation. For *assertiveness* four items from Hofstede, Hofstede and Minkov (1991) and Yoon, Song, Lim and Joo (2010) were used. After reviewing the PD items from House et al. (2004), it was determined that one item would fit better if split in two which resulted in a total of three items for PD. In appendix B table five, all items including their source can be found. In total nineteen statements about cultural values were asked based. An example, (on a scale from 1-7) "In the work environment employees are encouraged to strive for continuously improved performance?"

In the third section, nine statements based on the instrument from Raemdonck et al. (2006) for self-directed learning were used. An example, "When I want to learn something new that can be useful for my job, I take the initiative." Followed by three questions from Tracey (2005) about supervisor support. An example, "I receive enough support from my immediate supervisor in my professional development." Followed by six statements from the instrument of Milligan et al. (2015) for the workplace learning context (WLC) which are labelled in this study as job autonomy. An example, "I can choose my job assignments (on a scale from 1-5)".

In the fourth and last section, eleven additional statements based on the instrument from Milligan et al. (2015) about informal workplace learning activities will be used (e.g. reflection moments, feedback seeking behaviour, recognizing patterns, solving and anticipating problems) where respondents can indicate the amount of time spend on a certain activity. The employees could indicate the amount of time on a scale from 1-8. The scales consisted of once and multiples times 'a year, a month, a week, or a day' instead of the original scale names 'never, once or twice, sometimes, many times, very often or always', because the chosen scale names would give more accurate insight in the amount of time spend on informal learning activities. An example, "receiving feedback on tasks from work colleagues".

The questionnaire was made with the online survey tool 'Qualtrics' from the University of Twente. The estimated time to fill in the questionnaire will be approximately ten minutes.

After four weeks the data was transferred to IBM SPSS22 and prepared for analyses. A series of exploratory factor analyses (EFA) based on principle axis factoring (PAF) with Oblimin Direct rotation were performed on all items of 'Cultural values, SDLO, supervisor support, job autonomy, and informal learning' to determine which factors could be extracted from the formulated items. Subsequently, reliability analysis for each of the factors were executed. After the determination of the factors, normality will be tested to see if it is possible to do correlation analysis. The Keiser-Meyer-Olkin (KMO) measure was used with the items to determine if the data were suitable for EFA. If KMO's test > 0.5 it exceeds the limit and showed the data is suitable (Field, 2009).

Multiple items revealed low factor scores (< 0.4) and decreased the reliability of the scales which led to the exclusion of 7 items from the culture variable on further analysis. The excluded items were: all items from Uncertainty avoidance, 1 item from Individualism-Collectivism, 1 item from Achievement Orientation (AO), and 2 items from Masculinity-

Feminity (MF). KMO = .84 and EFA demonstrated that 4 factors could be extracted from 12 remaining items, all with Eigenvalues > 1.00, explaining in total 50.13% of the variance. Oblimin Direct rotation resulted in 4 interpretable factors, labelled Power Distance (1), 'Individualism-Collectivism' (2), Masculinity-Feminity (3) and work preference 'Solo-Group' (4). See for rotated factor loadings table 2 Appendix B. All four factors showed acceptable reliability scores, Power Distance (1) Cronbach's α = 0.80, interest 'Individualism-Collectivism' (2) Spearman Brown = 0.75, Masculinity-Feminity (3) Cronbach's α = 0.68, work preference 'Solo-Group' (4) Cronbach's α = 0.69.

KMO = .84 and EFA demonstrated that 4 factors could be extracted from the 16 items, all with Eigenvalues > 1.00, explaining in total 53.55% of the variance. Oblimin Direct rotation resulted in 4 interpretable factors, labelled Self-direct Learning Orientation (1), Supervisor Support (2), Job Autonomy (3) and Job Complexity (4). See for rotated factor loadings table 3 appendix B. Three factors showed acceptable reliability scores, Self-direct Learning Behaviour (1) Cronbach's α = 0.84, Job Autonomy (3) Cronbach's α = 0.74, Job Complexity (4) Cronbach's α = 0.68. One factor showed an excellent reliability score Supervisor Support (2) Cronbach's α = 0.92

KMO = .87 and EFA demonstrated that 2 factors could be extracted from the 11 items, all with Eigenvalues > 1.00, explaining in total 48.37% of the variance. However, one item loaded < 0.4 and did not differ significant compared to the other items, therefore it was excluded from further analyses. Additional EFA based on PAF demonstrated again that 2 factors could be extracted from the 10 items, all with Eigenvalues > 1.00, explaining in total 49.46% of the variance. Oblimin Direct rotation resulted in 2 interpretable factors, labelled informal Generative learning (1) and informal Adaptive learning (2). See for rotated factor loadings table 4 appendix B. The factors showed good reliability scores, generative learning (1) Cronbach's α = 0.82, and adaptive learning (2) Cronbach's α = 0.82.

3.4 Procedure

After obtaining approval a short pilot test was conducted to determine the approximate time of completion and to ensure content validity. In the mail provided by the researcher, the employees were shown a short informational text about the research, the benefits for the employees and a link to the digital survey will be provided. After four weeks the link would expire and employees were no longer able to complete the survey. Employees who would like to be kept informed personally could send an e-mail to the researcher.

To safeguard ethical standards, participation was voluntary. Data was collected anonymously and no personal information has been asked. Only the researcher had access to the gathered data. Employees were informed about the terms & conditions on the first page before starting the survey. By clicking on the next button it was assumed that the employees had read and accepted the terms & conditions. The final survey was distributed to 1000 employees. Furthermore, ethical approval had been obtained by the University of Twente to conduct the research. The general results will be communicated to the corresponding persons after the report has been completed via the desired mediums of the organisation.

3.5 Data analysis

In order to reach a high degree of validity and reliability the data was prepared according to the aforementioned analyses in paragraph 3.3 with the support of the statistical program IBM SPSS version 22. First, the analysis focused on the general descriptive statistics (e.g. mean, standard deviation and frequencies) between the variables cultural values, self-directed learning orientation, supervisor support, job autonomy, job complexity and adaptive- and generative learning. Mean scores were computed for all the factors, varying between 1 and 8 for all factors mentioned above. To answer the first research question the mean scores were

computed and a correlation analysis was executed follow by a multiple regression analyses including the additional variables mentioned in paragraph 2.5. To answer the second research question mediation analysis was performed. However, it is not possible for SPSS to perform a mediation analysis without macros. Therefore, a macro for SPSS called PROCESS created by Andrew F. Hayes will be installed which allows SPSS to perform the necessary steps to execute a mediation analysis (Hayes, Introduction to Mediation, Moderation, and Conditional Process Analysis: a regression-based approach, 2013).

Concluding, the included independent variables were: Power Distance, 'Individualism-Collectivism', Masculinity-Feminity and work preference 'Solo-Group'. The included dependent variables are: generative learning and adaptive learning. The included mediation variables are: SDLO, Supervisor Support, Job Autonomy and Job Complexity. To conduct regression analysis assumptions of normality should be met. Inspections of histograms and q-q plots revealed slight skewness of PD, SDLO and Supervisor Support. However, since the Skewness value did not exceed -1 it can be assumed that there is a normal distribution.

4. Results

4.1 Mean scores and Correlation

Mean scores for all cultural values variables on a scale of 1-7 showed that on average the score for Masculinity-Feminity (M = 3.78, SD = 1.07) was a bit higher compared to the scores for Individualism-Collectivism (M = 3.17, SD = 1.20), Solo-Group (M = 3.18, SD = 1.21), and Power Distance (M = 3.28, SD = 1.39). See also table 5 on the next page. This indicated that although the culture is perceived as semi competitive, the collective interest comes first and employees think working in a group is more beneficial. However, the score on Power Distance indicates that employees strive a bit to equalise the distribution of power and demand justification for inequalities of power.

The mean score of 5.72 (SD = 0.74) on SDLO indicates that employees are highly self-directed learning orientated on a scale of 1-7. The mean score of 4.98 (SD = 1.48) on Supervisor Support indicates that employees experience the support of their supervisor as sufficient (scale also 1-7). Job Complexity (M = 3.97, SD = 0.61) indicated that the job is complex requiring creativeness, skill and learning new things (scale 1-5). Employees indicated that sometimes (scale 1-5) they can perform their job autonomous (M = 3.22, SD = 0.76). In addition, employees engage more in adaptive informal learning (M = 4.89, SD = 1.30), than generative informal learning (M= 3.50, SD = 1.25) based on a scale of 1-8. On average employees perform adaptive informal learning almost once per week and informal generative learning between once per month and multiple times per month.

Table 5. Mean (M), standard deviations (SD), amount of questions (N) and scale.

	Abbreviation	M	SD	N	Scale
Age	Age	53.22	11.251	390	0-100
Individualism-Collectivism	IC	3.1711	1.19603	376	1-7
Solo-Group	SoGr	3.1755	1.21481	376	1-7
Power Distance	PD	3.2817	1.38835	365	1-7
Masculinity-Feminity	MF	3.7845	1.07045	367	1-7
SDLO	SDLO	5.7240	.74303	367	1-7
Supervisor Support	SupSupp	4.9763	1.47925	366	1-7
Job complexity	JobComp	3.9685	.61200	365	1-5
Job autonomy	JobAuto	3.2178	.75500	365	1-5
Adaptive learning	AdapLearn	4.8864	1.29705	361	1-8
Generative learning	GeneLearn	3.5047	1.25401	361	1-8

The next step was to execute a correlation analysis which is shown in table 6 on the next page. The rows and columns in the table show the variables which are used in the analysis. By following where the row and column intersect one will find a 'box' with two numbers. In these boxes, you will see a value for Pearson's r and Sig. (2-tailed) value. When the Pearson correlation is close to 1 it indicates that there is a strong relationship between variables that intersect in that box. When the Pearson correlation is close to 0 it indicates that there is a weak relationship between variables that intersect in that box. Moreover, when the Pearson correlation is positive it means that as one variable increases in value, so will the other increase in value. When the Pearson correlation is negative it means that as one variable decreases in value, so will the other variable decrease in value. Sig. (2-tailed) value tells if there is a statistically significant correlation between the two intersecting variables. Below the table one can find the cut-off value when a relation is significant.

In contrast to the hypothesis, the correlations analysis showed that the cultural values did not seem to correlate with SDLO. However, with the exception of Power Distance on Supervisor Support, all cultural values showed significant correlations with Supervisor Support and Job Autonomy. Furthermore, significant correlations were found between SDLO and Supervisor Support, Job Complexity and Job Autonomy. In addition, significant correlations were found between SDLO, supervisor support, job autonomy, job complexity and informal adaptive- and generative learning. Since, SDLO did not correlate with any cultural values SDLO shall be excluded from further regression analyses in regard to Cultural Values. In the next paragraph the relations will be described.

Table 6. Correlation analysis outcome.

		Age	IC	SoGr	PD	MF	SDLO	SupSupp	JobComp	JobAuto	AdapLearn	GeneLearn
Variable												
Age	Pearson Correlation	1										
	Sig. (2-tailed)											
Independent												
IC	Pearson Correlation	.044	1									
	Sig. (2-tailed)	.396										
SoGr	Pearson Correlation	.050	.419**	1								
	Sig. (2-tailed)	.336	.000									
PD	Pearson Correlation	-.066	.448**	.355**	1							
	Sig. (2-tailed)	.210	.000	.000								
MF	Pearson Correlation	.079	.409**	.310**	.462**	1						
	Sig. (2-tailed)	.135	.000	.000	.000							
Mediating												
SDLO	Pearson Correlation	.071	-.037	.041	-.031	-.024	1					
	Sig. (2-tailed)	.180	.481	.431	.556	.649						
SupSupp	Pearson Correlation	.065	-.315**	-.128*	-.361**	-.182**	.319**	1				
	Sig. (2-tailed)	.217	.000	.014	.000	.000	.000					
JobComp	Pearson Correlation	-.175**	-.095	-.081	-.066	-.015	.372**	.247**	1			
	Sig. (2-tailed)	.001	.070	.121	.209	.774	.000	.000				
JobAuto	Pearson Correlation	.017	-.204**	-.217**	-.510**	-.186**	.217**	.368**	.320**	1		
	Sig. (2-tailed)	.742	.000	.000	.000	.000	.000	.000	.000			
Dependent												
AdapLearn	Pearson Correlation	-.024	-.159**	-.128*	-.154**	-.111*	.339**	.342**	.448**	.291**	1	
	Sig. (2-tailed)	.658	.003	.015	.003	.036	.000	.000	.000	.000		
GeneLearn	Pearson Correlation	.147**	-.047	-.071	-.160**	-.041	.332**	.276**	.298**	.212**	.555**	1
	Sig. (2-tailed)	.005	.373	.180	.002	.435	.000	.000	.000	.000	.000	

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

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

4.2 Multiple regression analyses

The first sub research questions was: "T*o what extent do cultural values influence informal learning activities of highly-qualified employees operating in a high-tech multinational environment?*"

To answer this questions multiple regression analysis was performed and the additional variables described in paragraph 2.5 were included. To include the additional variables, it was necessary for some to create dummy variables. A dummy variable is a variable created to represent a subgroup of an item with two or more distinct categories or levels used in regression analyses. Dummy variables were created for nationality and work location. Nationality 'Dutch' and work location 'Europe' were left out of the analysis meaning that if one of the nationalities or work location significantly impacted, the impacted dummy variables would be compared for nationality to employees with a Dutch nationality and for work location to employees working in Europe.

Since the factor analysis point out that informal learning activities consisted of informal adaptive learning and informal generative learning, the analysis was performed first for adaptive learning and second for generative learning. Regression analysis revealed that three of the predicting variables were significant for informal adaptive learning, $R^2 = 0.28$, F (3, 351) = 44.31, p <.001. Investigation of the parameters showed that job complexity positively impacted b = .435, SE = .063, t = 6.91, p < .000, as well as supervisor support, b = .111, SE = .026, t = 4.37, p < .000, as well as SDLO b = .354, SE = .124, t = 2.86, p < .000.

Table 7. Multiple regression analysis.

Model c	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	b	Std. Error	Beta		
(Constant)	-.072	.103		-.700	.484
Job complexity	.435	.063	.342	6.905	.000
Supervisor support	.111	.026	.212	4.370	.000
SDLO	.354	.124	.145	2.861	.004

a. Dependent Variable: Adaptive learning

The second regression analysis revealed that five of the predicting variables were significant for informal generative learning, R^2 = 0.21, F (6, 348) = 15.64, p <.001. Investigation of the parameters showed that SDLO positively impacted b = .467, SE = .127, t = 3.69, p < .000, as well as job complexity, b = .272, SE = .065, t = 4.16, p < .000, as well as Age b = .003, SE = .001, t = 2.673, p = .008, as well as NationalityAsian b = .099, SE = .028, t = -2.05, p = .022. While, PD negatively impacted b = -.058, SE = .028, t = -2.05, p = .041.

Table 8. Multiple regression analysis

Model f	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	b	Std. Error	Beta		
(Constant)	-.236	.129		-1.836	.067
SDLO	.467	.127	.198	3.688	.000
Job complexity	.272	.065	.221	4.155	.000
Age	.003	.001	.134	2.673	.008
Supervisor Support	.055	.028	.107	1.960	.051
Nationality Asian	.099	.043	.114	2.303	.022
PD	-.058	.028	-.107	-2.050	.041

a. Dependent Variable: Generative learning

The second research questions was: "*Does self-directed learning orientation mediate the relationship between cultural values and informal learning activities*?"

In order to see whether there is a mediation via SDLO, first a multiple regression analysis was conducted. Regression analysis revealed that five of the predicting variables were significant for SDLO, $R^2 = 0.30$, F (5, 352) = 29.81, p <.001. Investigation of the parameters showed that job complexity positively impacted b = .162, SE = .024, t = 6.64, p < .001, as well as supervisor support b = .044, SE = .010, t = 4.35, p < .001, as well as English fluency b = .029, SE = .007, t = 4.32, p < .001. While, Work Time (years) negatively impacted b = -.003, SE = .001, t = -5.16, p < .001, as well as job grade b = -.012, SE = .006, t = -1.99, p = .047. It appeared that none of the cultural values impacted on SDLO. Furthermore, the correlation analysis also showed that none of the cultural values impacted on SDLO. Therefore, SDLO will be excluded from mediation analysis. The next chapter will further explain the mediation analysis.

Table 9. Multiple regression analysis.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	b	Std. Error	Beta		
(Constant)	.466	.042		11.147	.000
Job complexity	.162	.024	.311	6.635	.000
Work Time (years)	-.003	.001	-.237	-5.161	.000
Supervisor Support	.044	.010	.203	4.352	.000
English Fluency	.029	.007	.197	4.318	.000
Jobgrade	-.012	.006	-.093	-1.994	.047

a. Dependent Variable: SDLO

The third research questions was: "*Do supervisor support and job autonomy mediate the relationship between cultural values and informal learning activities*?"

In order to see whether there is a direct mediation via supervisor support and job autonomy, first multiple regression analysis was performed for supervisor support and second job autonomy. Regression analysis revealed that eight of the predicting variables were significant for supervisor support, $R^2 = 0.32$, F (8, 349) = 20.20, p <.001.

Investigation of the parameters showed that job autonomy positively impacted b = .491, SE = .109, t = 4.51, p < .001, as well as SDLO b = 1.102, SE = .222, t = 4.97, p < .001, as well as Nationality American b = .267, SE = .085, t = 4.19, p < .001, as well as Nationality Asian b = .276, SE = .085, t = 3.23, p = .001, as well as Nationality European Other b = .161, SE = .063, t = 2.55, p = .011. While, IC negatively impacted b = -.225, SE = .063, t = -3.59, p < .001, as well as PD b = -.214, SE = .061, t = -3.51, p = .001, as well as English fluency b = -.075, SE = .035, t = -2.13, p = .034.

Table 10. Multiple regression analysis.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	b	Std. Error	Beta		
(Constant)	.872	.236		3.701	.000
Job autonomy	.491	.109	.250	4.505	.000
IC	-.225	.063	-.182	-3.593	.000
SDLO	1.102	.222	.237	4.970	.000
PD	-.214	.061	-.201	-3.506	.001
Nationality American	.267	.064	.261	4.193	.000
Nationality Asian	.276	.085	.161	3.230	.001
Nationality European Other	.161	.063	.137	2.547	.011
English Fluency	-.075	.035	-.109	-2.133	.034

a. Dependent Variable: Supervisor Support

The second regression analysis revealed that four of the predicting variables were significant for Job autonomy, R^2 = 0.43, F (4, 353) = 65.86, p <.001. Investigation of the parameters showed that job complexity positively impacted b = .365, SE = .052, t = 7.04, p < .001, as well as supervisor support b = .089, SE = .023, t = 3.90 p < .001. While, PD negatively impacted b = -.219, SE = .024, t = -9.23, p < .001, as well as NatAmerican b = -.139, SE = .022, t = -6.440, p < .001.

Table 11. Multiple regression analysis.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	b	Std. Error	Beta		
(Constant)	.732	.079		9.251	.000
PD	-.219	.024	-.402	-9.229	.000
Job complexity	.365	.052	.296	7.037	.000
Nationality American	-.139	.022	-.266	-6.440	.000
Supervisor Support	.089	.023	.174	3.896	.000

a. Dependent Variable: Job Autonomy

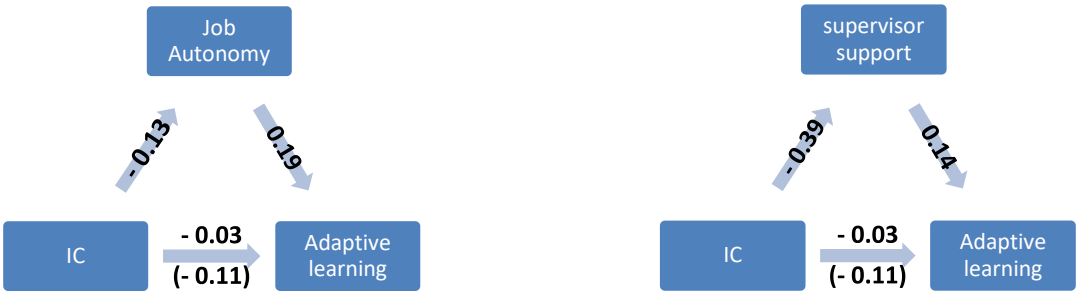
It appeared that some of the cultural values impacted on supervisor support and job autonomy. Since the correlation analysis showed that all the cultural values correlated supervisor support and job autonomy all the cultural values variables will be included in the mediation analysis. The next chapter will further explain the mediation analysis.

4.3 Mediation analyses

A mediator is a third variable that links a cause and an effect and whose purpose is to enhance a deeper and more refined understanding of a causal relationship between an independent variable and dependent variable (Wu & Zumbo, 2008). In this research the cultural values were the independent variables, informal learning activities the dependent variable and SDLO, supervisor support and job autonomy were the mediator variables. Important to note is that SDLO did not correlate with any of the cultural values and was therefore left out of the mediation analysis. In the next paragraphs the output of the analyses is shown. First, all the cultural values variables on informal adaptive learning will be displayed. Second, all the cultural value variables on informal generative learning will be displayed.

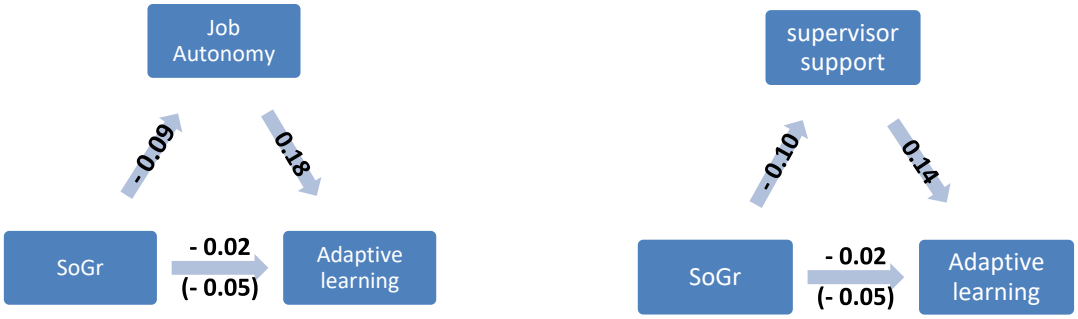
4.3.1 Cultural values on informal adaptive learning

Individualism-Collectivism



There was a significant direct effect of IC on informal adaptive learning through job autonomy, ab=-0.025, BCa CI [-.052, -.007]. The mediator could account for roughly a quarter of the total effect, $P_m = 0.24$.
There was a significant direct effect of IC on informal adaptive learning through supervisor support, ab = -0.055, BCa CI [-.093, -.027]. The mediator could account for roughly half of the total effect, $P_m = 0.52$.

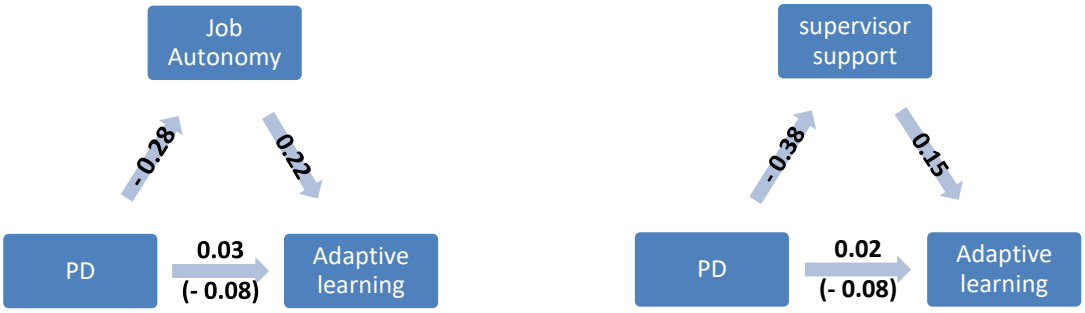
Work preference 'Solo-Group'



There was a significant direct effect of SoGr on informal adaptive learning through job autonomy, ab = -0.016, BCa CI [-.036, -.004]. The mediator could account for roughly a third of the total effect, $P_m = 0.30$.

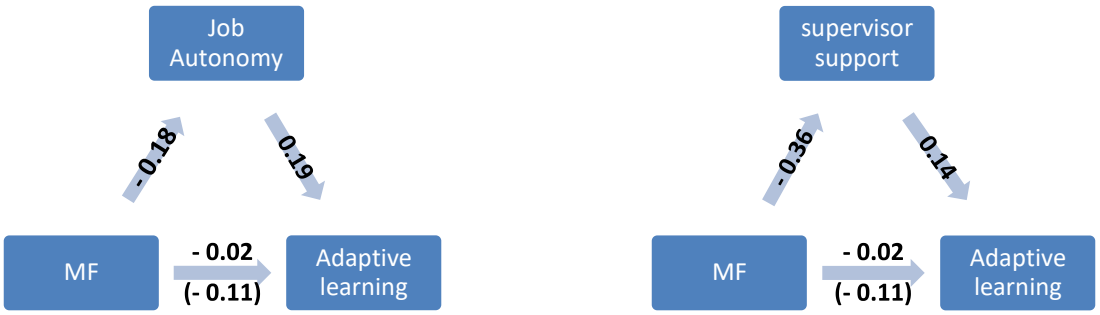
There was a significant direct effect of SoGr on informal adaptive learning through supervisor support, ab= -0.015, BCa CI [-.034, -.003]. The mediator could account for roughly a third of the total effect, P_m = 0.27.

Power distance



There was a significant direct effect of PD on informal adaptive learning through job autonomy, ab = -0.062, BCa CI [-.106, -.019]. The mediator could account for roughly three quarter of the total effect, P_m = 0.71.
There was a significant direct effect of PD on informal adaptive learning through supervisor support, ab= -0.055 BCa CI [-.090, -.029]. The mediator could account for roughly two-thirds of the total effect, P_m = 0.64.

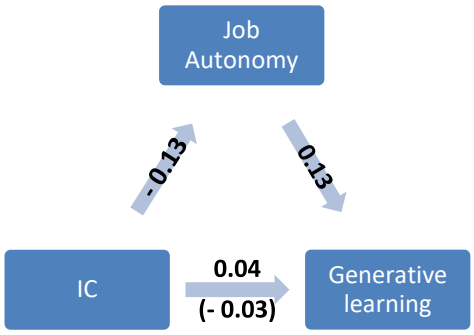
Masculinity-Feminity

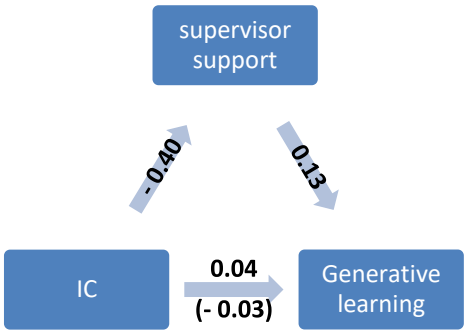


There was a significant direct effect of MF on informal adaptive learning through job autonomy, ab = -0.035, BCa CI [-.076, -.009]. The mediator could account for roughly a third of the total effect, P_m = 0.32.
There was a significant direct effect of MF on informal adaptive learning through supervisor support, ab= -0.050, BCa CI [-.094, -.020]. The mediator could account for roughly half of the total effect, P_m = 0.47.

4.3.2 Cultural values on informal generative learning

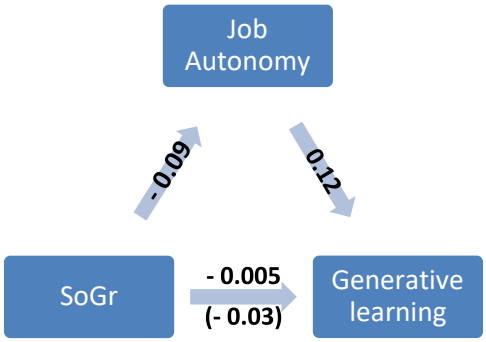
Individualism-Collectivism

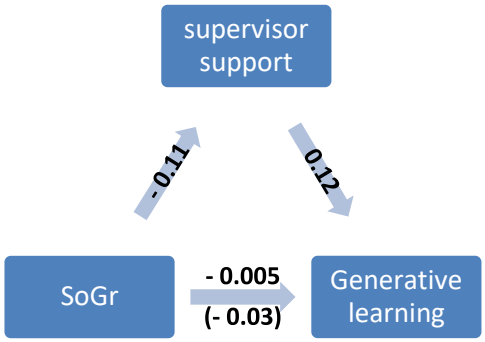




There was a significant indirect effect of IC on informal generative learning through job autonomy, ab = -0.017, BCa CI [-.042, -.002]. The mediator could account for roughly half of the total effect, $P_m = 0.54$.
There was a significant indirect effect of IC on informal generative learning through supervisor support, ab = -0.051, BCa CI [-.087, -.026]. The mediator could account for roughly two-thirds of the total effect, $P_m = 1.65$. Since P_M is higher than zero and there is a significant indirect effect, it is likely that IC is a suppressor variable. A suppressor variable has zero or close to zero correlation with the criterion, but is correlated with one or more of the predictor variables (Ludlow & Klein, 2014). When other IVs are added or removed, the suppressor can suddenly stop suppressing or resume suppressing or change the focus of its suppressing activity.

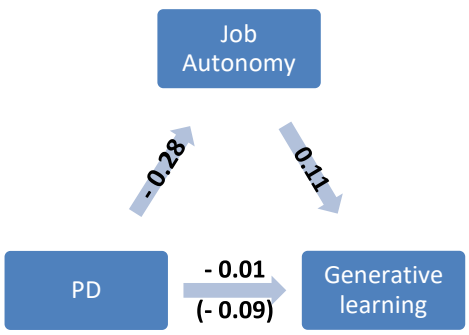
Work preference 'Solo-Group'

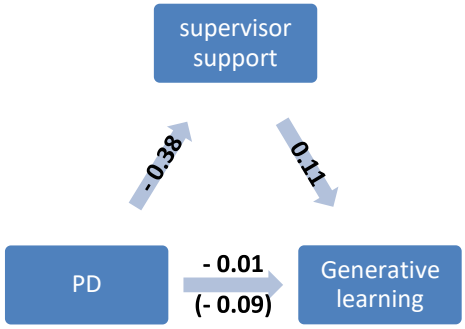




There was a significant indirect effect of SoGr on informal generative learning through job autonomy, ab= -0.011, BCa CI [-.026, -.0001]. The mediator could account for roughly a third of the total effect, $P_m = 0.37$.
There was a significant indirect effect of SoGr on informal generative learning through supervisor support, ab= -0.013, BCa CI [-.029, -.003]. The mediator could account for roughly half of the total effect, $P_m = 0.44$.

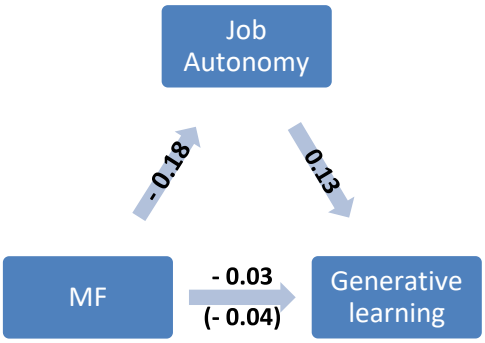
Power distance

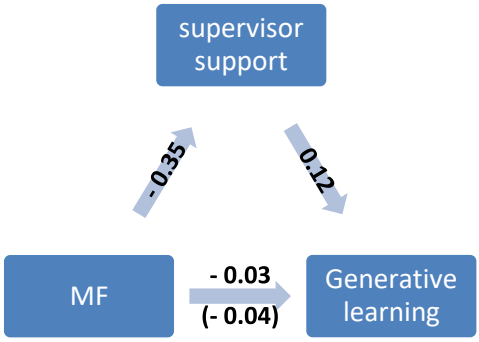




There was a non-significant effect of PD on informal generative learning through job autonomy, ab = -0.030, BCa CI [-.070, -.006]. The mediator could account for roughly a third of the total effect, $P_m = 0.35$.
There was a significant direct effect of PD on informal generative learning through supervisor support, ab= -0.043, BCa CI [-.072, -.022]. The mediator could account for roughly half of the total effect, $P_m = 0.49$.

Masculinity-Feminity





There was a significant indirect effect of MF on informal generative learning through job autonomy, ab = -0.022, BCa CI [-.057, -.002]. The mediator could account for roughly two-thirds of the total effect, $P_m = 0.61$.
There was a significant indirect effect of MF on informal generative learning through supervisor support, ab= -0.041, BCa CI [-.080, -.016]. The mediator could account for roughly a tenth of the total effect, $P_m = 1.14$. Since P_M is higher than zero and there is a significant indirect effect, it is likely that IC is a suppressor variable.

5. Conclusion

The aim of the present study was to investigate the relationship between cultural values and informal learning activities of high-qualified employees operating in a high-tech multinational environment. Based on several validated questionnaires a new instrument was created to measure the cultural values of high-qualified employees and their engagement in informal learning activities. Data was gathered during a period of four weeks. Based on the data from exploratory factor analyses on the cultural items, all items from Uncertainty avoidance, one item from Individualism-Collectivism, one item from Achievement Orientation (AO), and two items from Assertiveness were excluded due to inadequate factor loadings. Two remaining items from AO were combined with Assertiveness and renamed to Masculinity-Feminity (MF) due to their fit with the original MF dimension from Hofstede. Thus, four cultural dimensions were used for analysis: Power Distance, Individualism-Collectivism, Masculinity-Feminity, and work preference 'Solo-group'. Factors extracted from the workplace learning context items were: Job Autonomy, and Job complexity. Factors extracted from the informal learning items were: informal adaptive learning and informal generative learning.

First, it was hypothesized that the cultural values would influence informal learning activities. Results of the relationship analysis showed that PD negatively impacted on informal generative learning, indicating that by increasing the PD the less informal generative learning activities will be performed. In addition, people with an Asian nationality positively impacted on informal generative learning, indicating that in comparison with people who have a Dutch nationality, Asian employees are more likely to perform informal learning activities. This is partially in line with our hypothesis.

Second, it was hypothesized that self-directed learning orientation, supervisor support and job autonomy would mediate the relationship between the cultural values and informal learning activities. Results showed that none of the cultural values variables correlated on SDLO which means that the assumption for a mediation is not met and SDLO was therefore excluded from mediation analysis. This was not in line with the hypothesis. However, results showed that SDLO impacted positively on both informal adaptive learning as informal generative learning. In other words, when people are more self-directed learning orientated, both the informal adaptive as generative learning activities will increase. In addition, results of the relationship analysis showed that both IC and PD negatively impacted supervisor support, indicating by an increase of the IC or PD the supervisor support will be less. In addition, people with an American, Asian, and European 'other' nationality all positively impacted supervisor support, indicating that employees with these nationalities in comparison with employees with a Dutch nationality perceive a better support from their supervisor. Results for job autonomy showed that PD impacted negatively, indicating that by increasing the PD the job autonomy will be less. In addition, employees with an American nationality impacted negatively on job autonomy, indicating that these employees in comparison with employees who have a Dutch nationality perceive their job autonomy as less.

Results of the mediation analysis showed that supervisor support and job autonomy both directly affected the relationship between all the cultural values variables and informal adaptive learning. Furthermore, results revealed that both supervisor support and job autonomy indirectly affected the relationship between almost all cultural values variables and informal generative learning. This was in line with the hypothesis.

6. Discussion

The first research question was: "To what extent do cultural values influence informal learning activities of highly-qualified employees operating in a high-tech multinational environment?" Results showed that only PD negatively impacted on informal generative learning. In addition, SDLO, job complexity and supervisor support impacted positively on both informal generative as adaptive learning, while only age and Asian nationality impacted positively on informal generative learning. The difference between PD and the other variables could be that PD is more focused on hierarchy (above-below) in relation to the people they work with, while the other variables are more focused on categorisation (left-right) which is more flat. In other words, the way employees perceive hierarchy influences to the performed informal learning activities and if employees perceive the distance towards the supervisor as high, then they are less likely to perform informal generative learning activities. The fact that supervisor support and job complexity both positively impacted on both forms of informal learning also shows for example that even when the relation between employees with a higher power and low power becomes smaller or the task at hand becomes more difficult, supervisor support still is vital in order to learn. In addition, it appeared that employees who were older of age performed more informal generative learning. A possible explanation could be that the size of a multinational organisation is so immense that it can take some time for younger employees to get familiar with everything the organisation has to offer. So before they can focus on developments of problems, ideas or performing new tasks they have to focus on the task at hand. However, one employee could need more time to get familiar with the organisation, than another employee which quickly creates a picture or mental image of the organisation. This again also could depend size of the job description or the people with whom they have to work with. Another explanation could be that when younger employees mature they get more knowledge, responsibilities or more complex tasks which require them to find solutions outside their area of expertise. It is likely that the matured employees created a more efficient work routine which allows them to, for instance, create time and search for new information. Moreover, results revealed that employees who were more self-directed learning orientated also performed more informal learning activities. In other words, when people have the competencies or skills and are able to self-direct their learning, than they are more likely to perform informal learning activities. This is in line with research by Gijbels et al. (2010) who concluded that SDLO would be connected more work-related learning behaviour, somewhat with Berg and Chyung (2008) who perceived self-directed learning as an intentional informal learning activity, and with Choi and Jacobs (2011) who concluded that personal learning orientation had a significant positive effect on informal learning.

In addition, results showed that employees with an Asian nationality performed more informal generative learning than people with a Dutch nationality. In the years that Hofstede (2001) investigated the difference in culture it was found that overall the Asian culture in general have a high acceptance rate towards PD. Hofstede described that where there is a high PD culture individuals are influenced by formal authority and sanctions, are in general optimistic about people's capacity for leadership and initiative, and people should not have aspirations beyond their rank. Since people with an Asian nationality should not have aspirations beyond their rank in their culture, it is likely that instead of formally striving their ambitions they do this informally in order to for example better prepare themselves for upcoming challenges and showing their leader they are capable to handle more advanced tasks. Furthermore, White and Thobo-Carlson (2002) discussed that employees in large power distance societies recognized support and feedback as important directions or commands from their supervisors. However, when one follows a suggestion as direction or command one might also expect the supervisor

to be aware of the informal performed tasks. If this is not the case, then it is possible that the employee could be demotivated to perform an informal tasks next time a suggestion is mentioned. On the other hand, if the supervisor is not aware that his or her suggestion is interpreted as a direction or command, then the employee could make the supervisor aware of the performed informal learning task. However, as aspiration beyond ranks is not valued in Asian cultures and (although it is not mentioned by Hofstede) maybe even other cultures, it is likely that employees with an Asian nationality will not inform the supervisor of his or her informal performed tasks which again could demotivate employees to perform informal learning tasks next time an opportunity arises.

The second research question was: "Do self-directed learning orientation, supervisor support and job autonomy mediate the relationship between cultural values and informal learning activities?" Results showed that none of the cultural values impacted SDLO which already indicated mediation was not possible. The thought process behind the mediation was that each individual has its own motives to accept responsibility and the degree of self-directedness will very likely differ as everyone has a different cultural value towards learning. Kim and McLean (2014) pointed out that the factors of informal learning may work differently in various context. It could be that there is more to the concept of value towards learning then initially discussed and perhaps the context in this study was not suitable enough. However, job complexity, supervisor support, and English fluency all positively impacted SDLO. This is partially in line with Schooler et al. (2004) who stated that an environment which is intellectually more demanding will increase people's functioning and self-directed orientation. It also is conceivable that in a multinational organisation where the main spoken language is English one could expect when an employee can verbally express him- or herself better and understand what has been written on paper, then the employee is also more likely to engage in conversations with others and as the results revealed is more self-directed learning orientated. Furthermore, when a job becomes too complex it is likely that people on occasion do not know how to continue. Therefore, it seems suiting that supervisor support also increases SDLO, because a supervisor can give the necessary support so that an employee can continue working on the task at hand. Working time for the organisation and job grade negatively impacted SDLO, meaning to longer one works for the organisation or the higher the job grade the less SDLO one will be. It could be that when people work for a longer period at the organisation one develops a kind of routine which makes them feel less SDLO. When people operate in higher levels of the organisation more pressure most likely will come with the job which again can make the employee feel like they are forced to do certain tasks which decreases the SDLO aspect. Another explanation could be that the pursuit of knowledge at work decreases as people will become satisfied with their job level and stay in their routine. This is partially in line with Kuijpers (2003) and Raemdonck et al. (2005) who found that 'pursuit of knowledge work' gave a good indication about the amount of self-directed learning for higher-qualified employees.

Results also showed that for supervisor support the variables job autonomy, SDLO, nationality American, Asian and European other positively impacted, while IC, PD and English fluency negatively impacted. In other words, employees with an American, Asian and European Other nationality perceived the received supervisor support as more sufficient, than people with a Dutch nationality. Employees with a Dutch nationality possibly value support from their supervisor as more important. Unfortunately, this study did not focus on the kind of support that was given, but rather how employees perceived it. Searching for similar perceived supervisor and organisational support, Thompson and Prottas (2006) concluded that informal organisational support among which supervisor support was related to attitudes and well-being, as did the study of Uchida, Kitayama, Mesquita, Reyes and Morling (2008) showed that the effect of perceived emotional support on well-being is moderated by culture. Although both

studies did not explicitly mentioned that people with a Dutch nationality perceived the supervisor support as more important, it still showed that there is more to supervisor support than meets the eye. Results for job autonomy showed job complexity and supervisor support impacted positively, while PD and nationality American impacted negatively. Interesting to note was that job autonomy positively impacted supervisor support and supervisor support also positively impacted job autonomy. This indicated that for example by increasing the job autonomy the supervisor support should increase and when the supervisor support increases the job autonomy should also increase. As these results showed that PD negatively impacted job autonomy, it is key for supervisors to find the correct amount concerning the sort of support that is given in order to let the employees autonomous organise their work. In addition, results showed that employees with an American nationality perceive the job autonomy as less in comparison with employees with a Dutch nationality. In the years that Hofstede (2001) investigated the difference in culture it was found that overall the United States in general have a society that is loosely-knit in which the expectation is that people look after themselves and their immediate families only and should not rely (too much) on authorities for support. Since, people from the United States score higher on Hofstede's model it is possible that they rely more on people to look after themselves, then people with a Dutch nationality thus people with an American nationality usually experience more freedom to shape their work. A somewhat unusual finding is that English fluency negatively impacted supervisor support, indicating that by an increase of the English fluency the supervisor support will decrease. In the high-tech multinational organisation English in the main spoken language, so one could expect that the supervisor would better support and understand the employee when the English fluency is better. A possible explanation could be that when an employee increase the English vocabulary more technical terms might rise in conversations which make it more difficult for supervisors to understand what the employee is trying to communicate as not every supervisor understands the technical complexity of a project.

To continue, the mediation analysis showed that supervisor support and job autonomy both directly affected the relationship between all the cultural values variables (IC, SoGr, PD, and MF) and informal adaptive learning. Furthermore, results revealed that both supervisor support and job autonomy indirectly affected the relationship between almost all cultural values variables and informal generative learning. These results indicate the importance of autonomy and also supervisor support. For example, even though the employees experience the PD as high, receiving a sufficient amount of support from their supervisor and/or receiving a sufficient amount of autonomy, positively affects the informal adaptive learning activities. What a sufficient amount is could possibly depend on the size of a project, skills and influence employees have in order to perform the necessary informal learning activities. If a project is experienced by the employee as large or abstract which takes additional steps to complete, it is likely that more support is required. Since, job complexity did not impacted supervisor support, then perhaps support from someone else such as a colleague could provide the answer.

Suggestions for future research are to search how other or similar factors would react in diverse contexts in order to better understand the relationship between culture and learning. Another suggestion is to vary or combine qualitative and quantitative research methods. More in depth interviews could better determine employees' perception of the kind of support that is necessary to increase the informal learning activities. The present study contributed by providing insight in the relationship cultural values and informal learning activities for high qualified employees in a high-tech multinational context.

6.1 Limitations of the research

When interpreting this research some limitations should be taken into account. For example, the construct cultural values is very broad whereas this research ultimately focused on five dimensions from which two dimensions were combined due to better factor loadings. Other dimensions and instruments could be used in the future to better determine how the cultural values of people are interpreted. Moreover, culture most often is seen as something that happens on and relates to group level manifestations, whereas this study focussed on the individual level of employees. However, Bishop et al. (2006) discussed that culture could be studied at different levels from an entire corporation to a single work group. Since a group exist of individuals it is debatable to what extent there can truly be spoken of group or individual level. Furthermore, as Frambach et al. (2012) pointed out culture is shared by members of a social group and the organisation could be seen one type of group. It is very likely that a group will not be the same as time goes by. A group will evolve and will go through different stadiums just as the organisation will evolve. Cultural values will likely change with the organisation and it would be interesting to see in future research how the cultural values are on that moment. Therefore, it is recommended to use longitudinal designs in order to better determine the relationships.

Another limitation was that there can only be spoken of a true mediation when there is a direct relationship between the dependent and independent variables (Baron & Kenny, 1986). Since some relationship analyses revealed that not all cultural values not impacted on informal learning, there cannot be spoken of true mediation in all cases. However, more recently Hayes (2009) stated that it is possible that an independent factor influences a dependent factor indirectly through a mediating variable, even at the absence of a direct effect. Furthermore, he states that modern thinking about mediation analysis does not impose the requirement of an association between independent and dependent variable in order to estimate and test hypotheses about indirect effects. In the future one could also use different research methods such as interviews to gain more in depth insight or combine both qualitative and quantitative research.

Another limitation was that employees who filled in the questionnaire could be biased towards the research positively or negatively. To minimize this bias the researcher gained a list with randomly chosen e-mail addresses where the researcher again randomly chose one thousand employees as its target group. Moreover, the location(s) in Asia could not be reached, because it was not part of the concerning department. It is suggested when replicating this study to include other location(s) in for example Asia or Afrika.

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Appendices

Appendix A.

A typology of informal learning

Time of focus	Implicit learning	Reactive learning	Deliberative learning
Past episode(s)	Implicit linkage of past memories with current experience	Brief near-spontaneous *reflection* on past episodes, events, incidents, experiences	*Discussion* and *review* of past actions, communications, events, experiences
Current experience	A selection from experience enters episodic memory	*Noting* facts, ideas, opinions, impressions; *asking* questions; *observing* effects of actions	*Engagement* in decision making, problem solving, planned informal learning
Future behaviour	Unconscious expectations	*Recognition of* possible future learning opportunities	*Planning* learning opportunities; *rehearsing* for future events

Figure 1. Typology of informal learning by Eraut (2004).

Continuous Learning	Learning Processes	Learning Outcomes
Adaptive	Reactive/coping • Reactive to outside pressures and challenges • Automatic (unplanned, possibly imperceptible, and unconscious) • Trial and error • Building from current capabilities, skills, and knowledge • Incremental changes and improvements • Making adjustments to work routines and interactions	• Reducing/eliminating external pressures • Maintaining homeostasis and constancy within a changing environment • Instituting changes in group operations, structure, etc., in response to changes in the environment or to feedback
Generative	Purposefully proactive • Proactive initiatives stimulated within the group • Learning new skills, knowledge, and behaviors and trying them out in the group • Trying new behaviors and interaction patterns and evaluating the effects of these changes • Exploring alternative methods • Observing competitors • Identifying, modifying, and adopting best practices	• Instituting new procedures to meet current and future contingencies • Incorporating new skills, behaviors, and knowledge into group practice
Transformative	Radically re-creative • Giving up old behaviors and interaction patterns • Creating radically new modes of operation • Dialogue, appreciative inquiry, reflection • Evaluating ideas by experimentation • Choosing new modes of operation based on results	• Introducing wholly new behaviors and outcomes • Adopting new goals • Creating new products or services • Going after new markets • Forming new alliances

Figure 2. London and Sessa (2007) learning processes and outcomes.

Learning Processes	Stimuli for Learning	Readiness for Learning	Support and Resources for Learning	Capturing the Learning
Adaptive	• Provide strong, clear, and consistent stimuli for learning across multiple channels	• Assess capabilities • Assess stage of group development • Support group identity • Overcome resistance to change	• Assign roles • Encourage trying new behaviors • Try new methods while perfecting old methods • Outline steps for changes in procedures • Create a climate that supports calculated risks	• Document changes • Teach members assessment methods
Generative	• Invite group to stimulate own learning • Hold group strategy sessions • Have group members use their own products or services to do their work	• Help the group to use boundary spanners, scouts, and ambassadors • Help the group self-analyze • Help group see its role in the organization	• Help locate resources and best practices • Survey competition • Provide training • Encourage members to express new ideas and try them • Be a role model for learning • Teach continuous quality improvement methods • Shift roles to give fresh perspectives • Create a climate where failure is a learning experience • Allow groups time to practice	• Provide ways to evaluate change • Codify new business practices • Evaluate outcomes and methods • Inculcate continuous quality improvement methods • Make generative learning methods a habit • Help groups determine when generative learning is necessary and when it is not.
Transformative	• Communicate compelling vision of outcome and process • Invite group to stimulate own learning • Elicit expressions of support and commitment	• Help group to use boundary spanners, scouts, and ambassadors • Help members analyze the group's development and how the group fits in the organization • Bring in new members • Evaluate and support member identification with the group's openness and maturity	• Provide mechanisms for transformation including dialogue, appreciative inquiry, and reflection • Experiment; compare old and new • Practice new routines, evaluate, and improve • Be a role model for new behavior • Demonstrate the value of what is learned • Schedule practice • Change membership (unfreeze and get needed talents, attitudes, and perspectives)	• Assess learning outcomes • Describe/share common vision for the future • Routinize and document • Spread the learning to new members and other groups • Discuss feelings of uncertainty

Figure 3. London and Sessa (2007) ways group leaders can facilitate group learning.

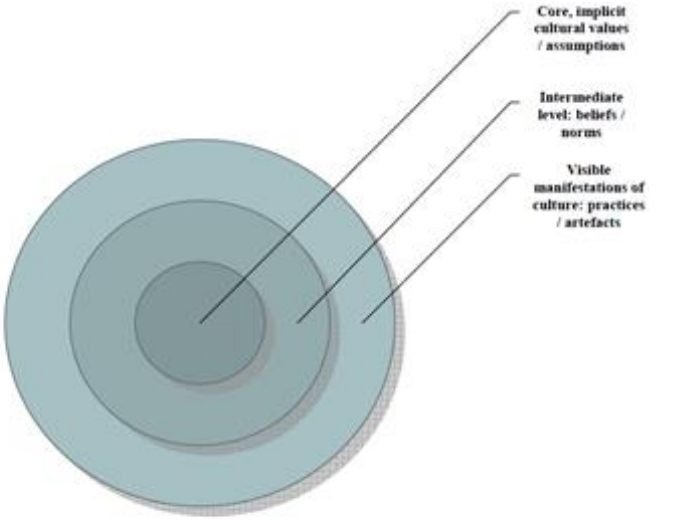

Figure 4. The figure shows the adapted model of culture from Bishop et al. (2006).

Appendix B.

Table 1. GLOBE cultural dimension compared to Hofstede's 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 behaviours 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.	-

Table 2. Results of EFA on Cultural Values.

Item	Rotated factor loadings

	PD	IC	MF	SoGr
IC1 - … employees pursue their individual interests; the collective interests har...		**-.575**		
IC2 - … employees take more pride in their own accomplishments than team accompli...		**-.898**		
IC3 - … team leaders take more pride in the accomplishments of individuals than o...		**-.531**		
SoGr1 - … employees like to work alone rather than in a group.				**.757**
SoGr2 - … employees perform better when working alone than in a group.				**.599**
MF1 - … doing your best isn't good enough, it is important to win.			**.481**	
MF2 - … the outcome is more important than what you do to get there.			**.587**	
PD1 - … subordinates are limited to question their manager when in disagreement.	**.751**			
PD2 - … subordinates are expected to obey their manager at all times	**.818**			
PD3 - … a person‘s influence is based primarily on the authority of one‘s positio...	**.588**			
MF3 - … the fulfillment of tasks is more important than caring for others.			**.648**	
MF4 - … A job with high earnings is better than a job with quality of life.			**.525**	
Eigenvalues	3.91	0.87	0.64	0.60
% of variance	32.56	7.21	5.54	5.01

Table 3. Results of EFA on Self-directed Learning.

	Rotated factor loadings			
Item	SDLO	SupSupp	JobAuto	JobComp
SDL1 - I find learning an important aspect of my working life.	**.541**			
SDL2 - Last year, I learned a lot of new things for my job on my own initiative.	**.497**			
SDL3 - I will never be too old to learn new things for my job.	**.475**			
SDL4 - When I want to learn something new that can be useful for my job, I take th...	**.682**			
SDLO1 - I always search for better ways to execute my work tasks.	**.678**			
SDLO2 - I excel in noticing opportunities to learn.	**.763**			
SDLO3 - I immediately take opportunities to learn in order to reach my goals.	**.837**			
SupSupp1 - I receive enough support from my immediate supervisor in my professional de...		**-.822**		
SupSupp2 - My immediate supervisor encourages me to spend time and resources on learni...		**-.958**		
SupSupp3 - My immediate supervisor lets me know that continuous learning is important...		**-.879**		

SRLWQ1 - My job requires me to be creative.				**.505**
SRLWQ2 - I can choose my job assignments.			**.791**	
SRLWQ3 - I have opportunities to develop my own special abilities.			**.624**	
SRLWQ4 - I can vary how I do my work.			**.617**	
SRLWQ5 - My job requires a high level of skill.				**.736**
SRLWQ6 - My job requires me to learn new things.				**.608**
Eigenvalues	4.61	1.95	1.22	0.79
% of variance	28.82	12.18	7.62	4.92

Table 4. Results of EFA on Informal Learning Activities

	Rotated factor loadings	
Item	GeneLearn	AdapLearn
InLearn1 - Acquiring new information (e.g. by searching the internet)		**-.458**
InLearn2 - Working alone or with others to develop solutions to problems		**-.689**
InLearn3 - Working alone or with others to develop new ideas		**-.923**
InLearn4 - Following new developments in your field		**-.679**
InLearn5 - Performing new tasks		**-.617**
InLearn6 - Attending a training course or using self-study materials	**.504**	
InLearn7 - Observing or replicating colleagues' strategies to complete a task or solve...	**.768**	
InLearn8 - Finding better way to do a task by trial and error	**.764**	
InLearn9 - Reflecting on previous actions	**.696**	
InLearn10 - Receiving feedback on tasks from work colleagues	**.651**	
Eigenvalues	4.06	0.89
% of variance	40.57	8.89

Table 12. Items of cultural values (including source)

Dimension	**Items**	**Source**
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)
Individualism-Collectivism	- 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)	Early (1993)

	-	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)	
Achievement 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.	Created.
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)
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 fulfilment 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)

Appendix C.

Questionnaire

Demographic background

Question	Answer possibilities
Q1 - What is your gender?	Male Female
Q2 - What year were you born?	1921 1922 1923 Etc t/m 2000
Q3 - What is your current nationality?	American Asian Dutch European other Other
Q3_5_TEXT - Other, namely...	Text
Q4 - Was your nationality at birth different?	Yes No
Q5 - What was your nationality at birth?	American Belgian Chinese Dutch Indian Other
Recode_Q5 - What was nationality at birth?	American Asian Dutch European other African
Q5_6_TEXT - Other, namely...	Text.
Q6 - What is your highest completed educational degree?	High school Trade/technical/vocational education Associate degree Bachelor's degree Master's degree PhD Other…
Q6_7_TEXT - Other, namely...	Text
Q7 - How long do you approximately work for ASML in years?	Getal
Q8 - What kind of contract do you have?	Fixed Flex Internship
Q9 - At what location are you employed?	Locations organisation
Q9_4_TEXT - Other, namely...	Text
Q10 - At which cluster are you employed?	Cluster organisation
Q10_6_TEXT - Other, namely...	Text
Q11 - How many hours per week do you work according to your contract?	Getal.
Q12 - What is your job at [Name organisation]?	Jobs organisation
Q12_14_TEXT - Other, namely...	Text
Q13 - What is your job grade?	Grades organisation

	I don't know
Q14 - How would you rate your English fluency?	Very poor Poor Average Good Excellent

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

Items from: (Raemdonck, Self-directedness in learning and career processes. A study in lower-qualified employees in Flanders, 2006) Chapter two (p.92)

	Totally disagree			Neither agree or disagree			Totally agree
I find learning an important aspect of my working life. (SDL)	1	2	3	4	5	6	7
Last year, I learned a lot of new things for my job on my own initiative. (SDL)	1	2	3	4	5	6	7
I will never be too old to learn new things for my job. (SDL)	1	2	3	4	5	6	7
When I want to learn something new that can be useful for my job, I take the initiative. (SDL)	1	2	3	4	5	6	7
I always search for better ways to execute my work tasks (SDLO)	1	2	3	4	5	6	7
I excel in noticing opportunities to learn (SDLO)	1	2	3	4	5	6	7
I immediately take opportunities to learn in order to reach my goals (SDLO)	1	2	3	4	5	6	7

Supervisor support

Items from: Tracey, J. B. (2005). Construct Validity of a General Training Climate Scale. *Organizational Research Methods, 8*(4), 353-374. doi:10.1177/1094428105280055

	Totally disagree			Neither agree or disagree			Totally agree
I receive enough support from my immediate supervisor in my professional development	1	2	3	4	5	6	7
My immediate supervisor encourages me to spend time and resources on learning and development	1	2	3	4	5	6	7
My immediate supervisor lets me know that continuous learning is important to successful job performance.	1	2	3	4	5	6	7

Job complexity and job autonomy

Items from:

- Self-Regulated Learning in the Workplace Questionnaire (SRLWQ)

(Milligan, Fontana, Littlejohn, & Margaryan, 2015)

WORKPLACE LEARNING CONTEXT Scale: WLC
Question/Guidance: Please indicate the extent to which your current role provides opportunities for learning and development.
There are no correct or incorrect responses to these questions.
Scale: 1= never, 2= once or twice, 3= sometimes, 4 = many times, 5= very often or always
Items

1. My job requires me to be creative
2. I can choose my job assignments
3. I have opportunities to develop my own special abilities
4. I can vary how I do my work
5. My job requires a high level of skill
6. My job requires me to learn new things

Informal learning activities

Items adapted from:

- LEARNING ACTIVITES *Scale*: LA (Milligan, Fontana, Littlejohn, & Margaryan, 2015)

Question/Guidance:
Knowledge workers learn continually as they work, though they may not always be aware that they are learning. This section presents some possible learning activities you may have experienced during your work.

How frequently have you participated in the following learning activities in the last year? (on a 5 point scale)

1=Once a year or less, 2=multiple times per year, 3=once per month, 4= multiple times per month, 5= once per week, 6= multiple times per week, 7=once per day, 8=multiple times per day.

1. **[R-1]** Acquiring new information (e.g. by searching the internet or company knowledge base)
2. **[R-2]** Working alone or with others to develop solutions to problems
3. **[R-3]** Working alone or with others to develop new ideas
4. **[R-4]** Following new developments in your field
5. **[R-5]** Performing new tasks
6. **[S-1]** Asking colleagues for advice
7. **[C-1]** Attending a training course or using self-study materials
8. **[C-5]** Observing or replicating colleagues' strategies to complete a task or solve a problem
9. **[C-6]** Finding better way to do a task by trial and error
10. **[C-8]** Reflecting on previous actions
11. **[C-9]** Receiving feedback on tasks from work colleagues

By : Milligan, C., Fontana, R. P., Littlejohn, A., & Margaryan, A. (2015). Self-regulated learning behaviour in the finance industry. *Journal of Workplace Learning*, *27*(5), 387-402.