

Bachelor Thesis Psychology

Human Resource Development

LIFELONG LEARNING OF PROFESSIONALS: THE IMPORTANCE OF
WORKPLACE LEARNING

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Topic:

Deepening analysis on the relations and effects of informal learning, structural empowerment
and proactivity at the workplace among a cross-cultural sample of employees

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Table of Content

Abstract	3
Introduction.....	4
Theoretical Framework	8
Informal learning	8
Structural empowerment on informal learning	10
Proactivity on informal learning	11
Structural empowerment and proactivity on informal learning.....	13
Methods.....	15
Participants	15
Materials	16
Design.....	19
Procedure	19
Data Analysis	20
Results	23
Discussion	29
Limitations.....	34
Future recommendations.....	37
Implications	38
Conclusion	39
References	40
Appendix A	47
Appendix B	48
Appendix C.....	50

Abstract

Due to the increasing speed of technical developments, companies struggle to keep their staff educated. Therefore, efficient learning at the workplace has become very important. Especially informal learning has gained increasing attention. Next to financial benefits for the company, it results in efficiently working employees, increases their satisfaction and increases the retainment rate of skilled employees. Further, factors structural empowerment and proactivity are expected to have a positive effect on informal learning.

Hence, the current study focuses on various relationships between perceived structural empowerment, proactivity and informal learning. Additionally, this is a replication study of Lippers (2022). An experience sampling method with a pre- and post-questionnaire were used over the course of up to ten working days on 21 German or Dutch employees to measure all constructs. In the analysis the influences of proactive personality, proactive behaviour and structural empowerment on informal learning were checked. Furthermore, various interaction effects of structural empowerment and a mediation of proactive behaviour between the connection of proactive personality and informal learning were tested. All major analyses were conducted using a multilevel model analysis.

Among other effects, the results show that perceived structural empowerment and proactive behaviour have a positive effect on informal learning. Structural empowerment might increase informal learning because it is intended to support the employee with work related goals (Amor et al., 2021). Hence, with the goal to learn, structural empowerment would support an employee. Regarding proactive behaviour, it might increase informal learning due to self-directed behaviour which leads to an increased encounter with novel situations to learn from.

Introduction

Due to living in an age of constant technical improvements, the tools and machines that are used, change quicker with every new generation (Moore, 2006). This also leads to the digitalisation at the workplace, like the emerging metaverse (Larsen, 2022). As a result, many employees struggle to meet the increasing expectations about working with technology (National Governors Association, 2022). In other words, the work-field is changing quicker, which forces employees to learn more rapidly. But, when employees fail to learn along this rapid change, they are more likely to seek another occupation (Smith et al., 2008). This leads to missing employees or ineffective workforces (Noe et al., 2014; van Noy et al., 2016).

To support their employees with learning about the constantly developing environment, many organisations rely on types of formal learning, like classroom based and teacher-oriented learning (Manuti et al., 2015). This is usually classified as organised learning outside of the employee's direct working context and environment but in an educational facility, usually in form of classes or courses. Mostly the learner will be rewarded a qualification. (Malcolm et al., 2003; UNESCO Institute of Lifelong Learning, 2009).

Understanding "formality" as a characteristic of learning and depicting it on a dimension, informal learning is placed on the opposite side to formal learning (Malcolm et al., 2003). Thus, it is more likely to be spontaneous, unplanned or personally planned without the instructions of some kind of trainer (Eraut, 2000; Malcolm et al., 2003; Manuti et al., 2015; UNESCO Institute of Lifelong Learning, 2009). Informal learning also happens mostly during everyday practices. It can take place unintentionally because one runs into a problem or has learned something and decides to reflect on it (Zimmerman, 2000). On the other hand, one might also deliberately decide to improve on a deficit they found or on an area which would enhance their team to an extent. Such informal learning processes are not isolated but can include the support or guidance of others (Malcolm et al., 2003; UNESCO Institute of Lifelong Learning, 2009). Thus, an employee may gain through formal learning when participating in a

class, organised by the company, but rather through informal learning during every day work (Halliday-Wynes & Beddie, 2009).

There are several reasons to support informal learning. For instance, research supports that about three quarters of the learning happens in an informal context during work (Halliday-Wynes & Beddie, 2009). Learning through informal ways exceeds especially in small and medium sized companies through the encounter with new situations (Halliday-Wynes & Beddie, 2009). In addition, Halliday-Wynes and Beddie (2009) explain that informal learning can guide employees, who were disconnected from formal education, back to a path of active learning. This is because informal learning can recognise individual skills and builds upon those to develop sustainable and generalisable talents. Skilled workers are retained more likely when informal learning is emphasised. According to Smith et al. (2008), employees stay because informal learning creates a kind of learning culture within a company, which in turn allows workers to use all their skills as well as expand on them. (Smith et al., 2008). Further, different than formal learning that is often offered in courses outside of the working environment, informal learning keeps the employees in the work culture setting at their workplace, which also serves as a reason for skilled workers to stay within the company (Halliday-Wynes & Beddie, 2009; Smith et al., 2008).

Expanding on the usefulness of informal learning, it also is seen as less cost intensive for the company (Hoffman, 2005). Informal learning happens during everyday work, hence the workers are fulfilling their duties while also enhancing their knowledge and skills. Especially in the face of increasing change, informal learning helps to adapt to the new environments more quickly (van Rijn et al., 2013). Not only that, but also the workers manage to develop their potential through informal learning and therefore have a greater job performance (Noe et al., 2014; van Noy et al., 2016). For those various reasons, informal learning has great value for individuals as well as organisations and companies.

While informal learning has a great value, it is influenced by a series of external factors from the surrounding of the learner. Svensson et al. (2004) elaborate on a series of

those elements for workplace learning. They include the people around the learner (teacher, supervisor, fellow workers, & fellow students), study materials (interactive study materials, & study plans) and direct support in various forms by the company (technological support, & stimulating environment). Generally, these factors are forms of structural empowerment because they resemble social structures supporting individuals to achieve their work-related goals (Amor et al., 2021). Also, many of the named aspects can be specifically connected to informal learning (Malcolm et al., 2003). Hence, structural empowerment seems to be a major external factor with an influence on informal learning.

In addition to the external factors, internal factors, within the learner, can affect the informal learning processes. Lohman (2003) illustrates different motivational factors for engaging in informal learning within teachers. He describes initiative to learn, self-efficacy and desire for life-long learning as important personal characteristics (Lohman, 2003). Van Noy et al. (2016) found the same relations in a general workplace context, and add cognitive ability and goal orientation to the impactful internal factors. Those factors are related to self-directedness and therefore to proactivity (Coun et al., 2021; Joo et al., 2013; Saeid & Eslaminejad, 2016). Joo and Ready (2012) conducted research on the impact of the internal factor of proactivity on work satisfaction and discovered a significant relation. Further, Noe et al. (2014) assume a connection between proactivity and informal learning, though it has not been explored sufficiently in this context. Nevertheless, due to the positive effects of proactivity and its relations to constructs that influence informal learning, it may influence informal learning positively as well.

In the study of Lippers (2022) the connection of proactivity and structural empowerment with informal learning has been researched with the use of an experience sampling method. Additionally, he also hypothesised an interaction effect of structural empowerment on the relation between proactive personality and informal learning, as well on the relation between proactive personality and proactive behaviour. As a research method, Lippers (2022) chose a pre- and a post-questionnaire as well as a daily survey about

informal learning, which was filled out for ten consecutive working days. About 53% of his sample, which in total included 19 participants, consisted of workers in the German fitness sector, while the other participants were from various other German organisations (Lippers, 2022). His results showed to be not significant, except for the relation of structural empowerment and informal learning. He found support for his significant results in Doornbos et al.'s (2008) and Schulz and Roßnagel's (2010) studies. Additionally, Lippers (2022) argued that the mere-measurement effect, explained by Morwitz and Fitzsimons (2004), had a positive influence on how the participants perceived structural empowerment after the experience sampling compared to before.

When looking closer, his study also has important limitations. Due to a very specialised working sector, the study of Lippers (2022) may not reliably explain the relations of said constructions for a broader population. Other working environments and sectors may be influenced by other factors and / or attract a different kind of people to work there (Jurgensen, 1978). Also, the small sample size of his $N = 19$ may lead to invalid conclusions because of the low representativeness of the actual study population. Thus, it is possible that in his sample there was no effect, while in the population there might be one, or vice versa. Further in detail, he was researching moderation effects within his constructs but was missing out on possible additional connections, between the interaction of proactive behaviour and structural empowerment on informal learning (Eraut, 2004; Raemdonck et al., 2012). Furthermore, it was not assessed whether proactive behaviour mediates the connection of proactive personality and informal learning. These limitations leave room for improvement.

The current study tries to close the aforementioned gaps as it also researches the relations among proactivity, structural empowerment and informal learning within the workplace through experience sampling. With its methods, it aims to replicate the study of Lippers (2022), confirm the relation between structural empowerment and informal learning and improve on its shortcomings. The population for this study consists of employees from

varying sectors inside of Germany and the Netherlands. This way, in some sense, a general production worker, as well as administrative and managing workers can be included. Also, the sample size needs to be significantly greater. The setup remains very similar.

Participants will conduct a pre- and a post-questionnaire, and for ten working days they will fill out a survey about daily learning and proactive behaviour, which resembles the experience sampling method. The method was chosen because of its increased validity compared to cross-sectional studies in context to proactive behaviour (Ohly et al., 2010). The validity is increased because the experience sampling method is more sensitive to daily variation of behaviour (Ohly et al., 2010). Different to the study of Lippers (2022), in terms of procedure and materials, are slightly adapted questions to fit the new chosen population, as well as a separation into a control and an experimental group. The control group follows the procedure as described, while the experimental group has a shorter pre-questionnaire. This allows to explore the mere measurement effect of the pre-questionnaire.

Theoretical Framework

Informal learning

Learning can be defined and classified in various forms. Important for this study's context is the division of informal and formal learning. Informal learning can be defined as a contrast to formal learning because both can be seen as concepts on opposite sides of one scale (Malcolm et al., 2003). Eraut (2000) delivers a definition of formal learning through the focus on:

- (1) a prescribed learning framework,
- (2) an organised learning event,
- (3) the presence of a teacher or trainer,
- (4) an award or a qualification, and
- (5) an external specification of outcomes.

The scale of formality also is applicable for each component individually (Malcolm et al., 2003). Therefore, deviations from those factors lead to a learning process which becomes more informal. Yet, research is not concrete at what point learning can be seen as informal (Malcolm et al., 2003). Each factor of learning can vary independently of the others. Hence, learning may have formal and informal aspects, which divide opinions on when learning “generally” is formal or informal (Malcolm et al., 2003).

In conclusion, informal learning involves self-directed learning, which mostly happens while working (Malcolm et al., 2003). It might be based on experience, trial-and-error, or shadowing of a colleague or mentor, and it takes place separately from classroom-based courses (Manuti et al., 2015). Eraut (2000) dives deeper into the definitions and adds the factor of consciousness to informal learning. According to him, informal learning can be classified into deliberate, reactive or incidental forms. With those forms he refers to the consciousness of the learners on whether they planned to learn or even were aware of their learning (Eraut, 2000).

Using the definition of Eraut (2000) on formal learning, informal learning creates the opposite on the scale. Hence, in this study informal learning is seen as any kind of conscious learning that:

- (1) happens outside a prescribed learning network,
- (2) is an unorganised learning event,
- (3) does not involve a dedicated teacher or trainer,
- (4) does not result in a reward or qualification, and
- (5) has internally defined outcomes and goals.

The learning needs to be conscious because the participant needs to be aware of it to include it in the survey.

Structural empowerment on informal learning

As previously described and defined by Amor et al. (2021) structural empowerment resembles social structures which support individual employees to reach their goal regarding work. The people around the learner, whether they are supervisors, colleagues, or customers, play a crucial role in this social environment (Laschinger et al., 2004). According to Lohman (2005), teachers and Human Resource professionals engage in informal learning more, when being close to their colleagues' working areas. Additionally, he found that an unsupportive culture hinders those groups of workers in learning (Lohman, 2005).

While the social atmosphere plays a role in learning, the accessibility to needed knowledge does as well (Svensson et al., 2004). Hence, when learners cannot easily gain certain knowledge to perform their task or understand a topic, they are less likely to engage in learning. This is true for when the internet is needed for research, but also when a supervisor needs to be asked (Svensson et al., 2004). It can be connected to an unsupportive work culture because a supervisor who is not accessible or supportive cannot easily be asked a question for help (Lohman, 2005).

Further, the workers need opportunities for them to engage in learning (Hurtz & Williams, 2009). If there is neither time to investigate, nor reflect on new experience, a worker will not have the chance to learn. Svensson et al. (2004) mention the term *flexibility* in relation to this because an environment that is flexible for the workers to make time for learning, increases their engagement in workplace learning. The current study relies on self-report measurements of an experience sampling method. Thus, the data-points are perceptions but not objective measurements of the environment. Due to this and the closeness of named factors to structural empowerment, the following Hypothesis will be tested, equally to Lippers (2022):

H1. Employees who perceive more structural empowerment at their workplace, on average, engage more in informal learning than employees who perceive less structural empowerment at their workplace.

As Morwitz and Fitzsimons (2004) explain with the mere-measurement effect that simply asking a question, can change one's awareness about the context of the question. Being aware of a context may result in a change in behaviour (Morwitz & Fitzsimons, 2004). For this study, the mere-measurement effect could lead to unreliable data, since workers who were asked about the presence of structural empowerment before their analysis of learning, might perceive its presence more prominently. Thus, their learning might differ from those who have not been asked these questions before. To analyse this, the additional hypothesis, replicated from Lippers (2022), is as follows:

H1b. Employees who were asked about structural empowerment, and therefore have been made aware of its presence, before their learning, on average, engage in more informal learning than employees who were not asked questions about structural empowerment beforehand.

Proactivity on informal learning

Proactivity has several connections to workplace achievements. Connected to the workplace setting, Coun et al. (2021) define it as the employees' power to engage in self-directed behaviour with regards to possible future changes. Hence, proactive employees prepare for the future instead of reacting to it. This is seen as an important factor for productiveness of employees because they are more likely to attempt to improve inefficient workflows (van Veldhoven & Dorenbosch, 2008). Additionally, proactivity leads to more career possibilities, a series of attributes of career success and work satisfaction (Fuller & Marler, 2009; Joo & Ready, 2012; van Veldhoven & Dorenbosch, 2008). Due to the findings of Fuller and Marler (2009), Noe et al. (2014) assume proactivity to also lead to an increased engagement in informal learning. Yet, they could not research this connection sufficiently. Further research by Lippers (2022) did not find a significant effect of proactivity on informal learning. This study continues to investigate the relationship between proactivity and informal learning, to generate more insight on the extent and significance of the effect of proactivity on informal learning.

Proactivity is a construct which, on the one hand, relates to a proactive personality and, on the other, to proactive behaviour (Thomas et al., 2010). A proactive personality is defined as one that “is relatively unconstrained by situational forces, and who effects environmental change” (Bateman & Crant, 1993, p. 105). In contrast, proactive behaviour can be defined as actions which “intentionally and directly change one’s” own social and non-social environment (Bateman & Crant, 1993, p. 104). Different to a personality, which is seen as stable over a lifetime, behaviours change depending on the situation (Seibert et al, 2001). This could mean, proactive employees are less likely to avoid new situations in which they learn, but to actively change them towards a desired outcome. This leads to the second Hypothesis of this study, which replicates Lippers (2022):

H2. Employees with a high proactive personality, on average, engage more in informal learning than employees with a low proactive personality.

Yet, Bateman and Crant (1993) could not find a significant connection of a proactive personality and proactive extracurricular behaviour. Hence, an employee with a proactive personality might not engage in proactive behaviour and vice versa (Seibert et al., 2001). Therefore, additionally to the measure of a proactive personality, proactive behaviour will be observed, similarly to Lippers (2022). Also, the relationship between direct proactive behaviour and informal learning is a matter of this study:

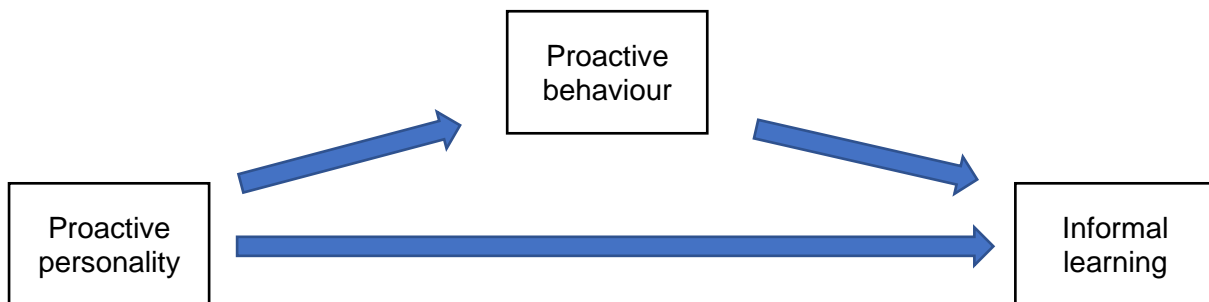
H3. Employees who show more proactive behaviour, on average, engage more in informal learning than those who show less proactive behaviour.

Since a personality usually is displayed in a preference for actions, also a proactive personality is assumed to generally lead to more proactive behaviour (Seibert et al., 2001). Additionally, both, proactive personality and behaviour, are assumed to lead to an increase of informal learning (Hypothesis 2 and Hypothesis 3) (see Figure 1). Considering these connections, it remains unclear whether a proactive personality leads to greater engagement in informal learning in the absence of proactive behaviour. Because proactive behaviour is

influenced by a proactive personality, proactive behaviour is seen as a mediator (Seibert et al., 2001). This assumption exceeds the content of Lippers (2022) study and adds the following hypothesis:

H4. Proactive behaviour mediates the connection between proactive personality and informal learning.

Figure 1. *Mediation effect of proactive behaviour between proactive personality and informal learning*



Structural empowerment and proactivity on informal learning

Adding on the individual effects of proactivity and structural empowerment, a combined effect can be present and needs to be considered. Raemdonck et al. (2012) researched whether, among many variables, a proactive personality and a stimulating participatory staff policy generated a greater increase in self-directed learning combined than individually accessed. While they did not measure the mentioned interaction effect, it was not what they expected based on the previous research, on which they based their study on. The concept of self-directed learning at the workplace is very similar to the one of informal learning at the workplace, and a stimulating participatory staff policy is part of structural empowerment (Amor et al., 2021; Song & Bonk, 2016). Therefore, to generate more insight on the interaction of structural empowerment and proactivity, this study investigates this relation with the experience sampling method opposed to the interview study of Raemdonck et al. (2012).

If hypothesis one, two and three are true, each individual concept (structural empowerment, proactive personality, proactive behaviour) has a positive effect on informal

learning. Yet, a combination of proactivity and structural empowerment might lead to an even greater amount of informal learning, bigger than just the addition of both singular effects (Eraut, 2004; Raemdonck et al., 2012). For example, employees might be proactive and seek to engage in a novel situation to make their work more satisfactory. As this situation is novel, they encounter gaps in their knowledge which they cannot fill on their own. Their learning is now dependent on their structural empowerment, as they might ask a supervisor or take the time to research the information needed. If the perceived structural empowerment is low, they might not take the time to research or their supervisor is not open for such questions. Therefore, despite their proactivity, the employees might be limited in their informal learning. Because, proactivity is measured in two ways, also the interaction effect of structural empowerment will be assessed on both links, proactive personality and proactive behaviour on informal learning. Analysing the interaction effect of structural empowerment on the connection between proactive personality and informal learning was done by Lippers (2022) as well, though the interaction effect on proactive behaviour and informal learning was not accessed beforehand. In conclusion these hypotheses are formulated:

H5a. Structural empowerment positively moderates the relationship between proactive personality and informal learning.

H5b. Structural empowerment positively moderates the relationship between proactive behaviour and informal learning.

At last, the influence of structural empowerment on the relationship between proactive personality and proactive behaviour will be considered. Proactive behaviour clearly is linked to a proactive personality (Crant, 2000). Yet, the behaviours are not only determined by a proactive personality, but vary depending on the situation (Seibert et al., 2001). More specifically, Crant (2000) explained that multiple different contextual factors of a company have an influence on proactive behaviours, like asking for feedback. Those contextual factors mostly resemble some form of structural empowerment (Amor et al., 2021). Hence, Crant (2000) already expressed an effect of some sort of structural empowerment and proactive

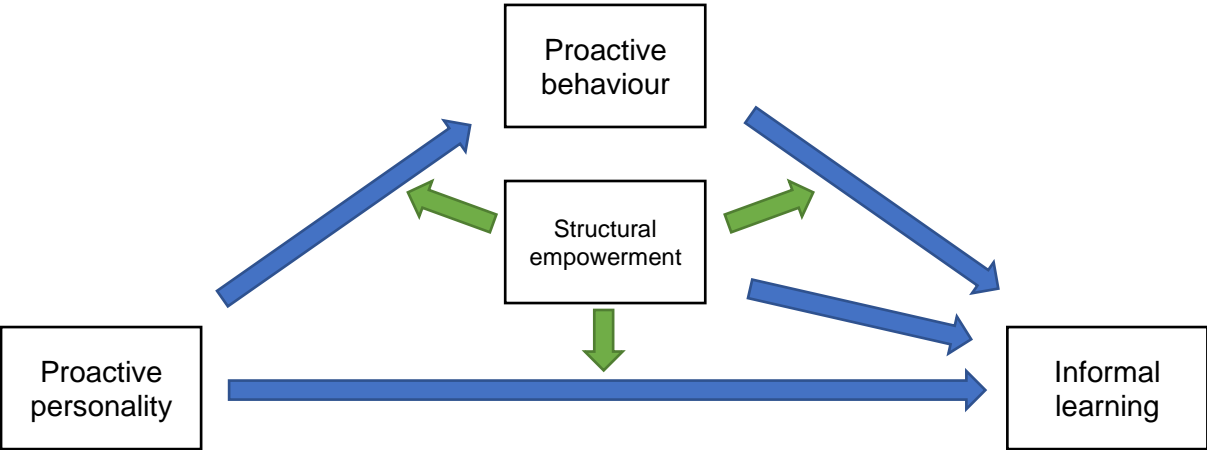
behaviour, yet he did not attempt to explain the effects of a combination of proactive personality and structural empowerment. In addition, Echebiri et al. (2020) recently found a significant positive effect of structural empowerment on employee-driven innovation, a concept which can be linked to proactive behaviour (Bateman & Crant, 1993).

Thus, it is assumed that both a proactive personality and structural empowerment, have a positive effect on proactive behaviour. Yet, except for Lippers' (2022) study, research is missing to what extent structural empowerment moderates the effect of a proactive personality on proactive behaviour. This leads to the final hypothesis, which was not present in Lippers (2022) study:

H6. Structural empowerment moderates the relationship between proactive personality and proactive behaviour.

In conclusion, the major connections researched in this study, except for Hypothesis 1b can be seen in Figure 2.

Figure 2. Display of all major effects, researched within this study



Methods

Participants

Participants of this study were employees of German and Dutch businesses with an average working time of 20 hours or more per week. They were reached through personal

relations of the researcher using face to face communication, email and social media.

Regardless of the native language of the participant, it was brought to their attention that the study is in English so that they decided themselves whether their English would be sufficient.

Participants were N= 21 employees between the age of 22 and 61 years, with a mean age of 33 years. N = 13 of them were male (61.9%) and N = 8 were female (38.1%). They had the following nationalities: German (N = 16) and Dutch (N = 5). The participants' education level ranged from *Berufs- Bildungsreife (Hauptschule) – VMBO* to *Doctor's degree*, while the majority had reached an educational level of a *Bachelor's degree*.

After the first response through the app, communication was made possible through email and telephone calls.

Materials

For this study, the TIIM-app (Twente Intervention and Interaction Machine), designed by the BMSLab at the University of Twente in Enschede in the Netherlands, was used to gather all data from the participants. Through this app, the experience sampling method was enabled. It had timing functions for questionnaires and notifications to make sure the participant could fill out one questionnaire per day and was reminded to do so. Further, pre- and post-questionnaires were made available through this app and data gathering was simplified due to the online storage of the participants' answers.

First, the measurement of a proactive personality is described. The questionnaire "Proactive Personality Scale" from Bateman and Crant (1993) was used to measure the proactive personality of the participants (see Appendix A). It contained 17 items with a coefficient alpha of 0.89 and was measured in a 7-point Likert scale. For example, statement one was: "I am constantly on the lookout for new ways to improve my life." (Bateman & Crant, 1993, p. 112). Participants needed to rate to what extent this statement fits them from 1 (strongly disagree) to 7 (strongly agree).

Second, for the measurement of perceived structural empowerment, a modified version of the Conditions for Work Effectiveness Questionnaire 2 (CWEQ-II) was used (see Appendix B). This measurement allowed comparability as a replication study, since it had been used previously (Lippers, 2022). It was based on the model of Kanter and built upon the Job Activities Scale, Organizational Relationships Scale and the Conditions for Work Effectiveness Questionnaire with Cronbach's alpha of 0.89 (Laschinger et al., 2000; Laschinger et al., 2001). Combining and shortening these surveys into the CWEQ-II allowed to measure the six concluding factors of structural empowerment: formal power, informal power, and perceived access to the work empowerment structures of opportunity, information, support and resources (Laschinger et al., 2001). The questionnaire was separated into these six sections with each three statements, except for the section "How much opportunity do you have for these activities in your present job?", which had four statements. Also, an additional section about global empowerment had been added with two statements (Laschinger et al, 2001). In alignment to Lippers (2022) the following items were adapted because they had been designed to fit the nursing environment. Statement one of section two was changed to "The current state of the business unit", the modification differs to Lippers (2022) who chose the word "company" instead of "business unit". This was done because of the autonomy of each business unit and the probably marginally present interactions among them for most employees. Statement three of section five was changed to "The amount of visibility of my work-related activities within the business unit is". Again, Lippers (2022) chose the word "company" instead of "business unit". In line with Lippers (2022), statement one of section six was changed to "Collaborating with colleagues" and statement four of this section was changed to "Seeking ideas from professionals with a different profession". Though, Lippers (2022) gave examples in his statement, which were left out here due to the variety of professions.

Third, to measure daily learning and proactive behaviour, the daily learning survey from Lippers (2022) was used and modified on behalf of his critiques. It consisted of ten

questions (see Appendix C). The first three questions measured the proactive behaviour. Those were the last questions in the daily learning survey from Lippers (2022). They were moved to the beginning of the survey to set the focus on the global environment instead of prompting the participants' minds towards learning beforehand. This is the opposite reasoning Lippers (2022) used. Here the goal is to measure the behaviour as a whole instead of only an aspect. Participants needed to indicate on a 5-point Likert scale to what extent they *actively attacked problems, did more than they were asked to do, and took the initiative when others did not*. Those questions, also used by Lippers (2022), were from Van Woerkom et al. (2015) on the basis of the personal initiative scale by Frese et al. (1997).

The following questions were concerned with the informal learning which the participant had in one day. These questions were based on Endedijk et al.'s (2015) Structured Learning Report (Lippers, 2022). First, they had to answer whether they could remember a specific thing they have learned. If they could remember, three follow up questions were asked. These follow up questions asked the participant (1) to name the learned skill or knowledge, (2) who was involved and (3) why they had decided to learn it. The latter two were multiple choice questions in which multiple answers could have been selected. In Appendix C, the answer possibilities are displayed. Those questions were implemented due to Endedijk et al.'s (2015) work, and to increase the participants' elaborative thinking on their daily learning, though the answers were not analysed in regard to the hypotheses. (Lippers, 2022).

At last, the participants were asked to indicate on a 5-point Likert scale how much they have learned, how much time they spent on learning in that day, and how important they valued the learned information. Lippers (2022) asked solely the first of these questions. The number of questions asking quantitatively about informal learning was increased with the goal to increase the reliability of this measurement, as more aspects of the construct were taken into account (Halliday-Wynes & Beddie, 2009; Laschinger et. al., 2001; van Rijn et al., 2013). The amount of time spent on informal learning seemed to influence the learning

outcome, and the amount of time could be related to factors of structural empowerment (Laschinger et. al., 2001; van Rijn et al., 2013). These were the reasons for adding the second question. The last question was added to include the (perceived) quality of learning information. Halliday-Wynes and Beddie (2009) expressed an importance on what has been learned, as it may have varied significantly. Furthermore, Lippers (2022) used to ask about the amount of learning before the elaborative questions of Endedijk et al. (2015). This was changed to allow an elaborative view on the daily learning before answering the quantitative questions.

Design

This study had a within- and between-participant design with quantitative measures. For the within-participant aspect proactive behaviour, structural empowerment and informal learning formed the relevant variables. Though, structural empowerment only could be measured twice in the experimental group, hence only for this group and Hypothesis 1b, it was a within factor. For the between subject design, structural empowerment, proactive personality and informal learning were the important variables. The method of experience sampling was used so that, for ten consecutive working days, participants used the mobile application to fill out a daily survey and an additional pre- and post-questionnaire before and after those ten days.

Procedure

An information sheet, which explained the basics of his research, how to participate and to contact the researcher for any questions or concerns, was shared through hangouts in companies as well as through the network of the researcher. Participants would follow the steps of the information sheet. This included how to download the TIIM-app, how to register an account and how to enrol in the study. Once these tasks were finished, the first step was to agree to the informed consent. Without agreeing, the participants were thanked for their effort and got explained that this excludes them from any data collection via an automated email. The second step was, to answer whether they worked equal to or more than 20 hours

per week. If the participants indicated they were not working more than 20 hours, they were also excluded from the study and got informed through the automated email. The participants who fit the study did continue to answer demographic questions about their age, gender, nationality and level of education. The next step was to fill out the Proactive Personality Scale by Bateman and Crant (1993). Finalising the sign up, participants were thanked for their participation and reminded that they may contact the researcher for any comments and questions about this study.

Prior to beginning the diary study, the experiment group got to fill out the CWEQ-II by Laschinger et al. (2001) to measure their perceived structural empowerment. The control group did not receive this task.

Next, the diary survey was provided to all participants over the course of 10 working days. It measured the informal learning from that day and the proactive behaviour. Answering the daily survey took the participants approximately between two to five minutes every day. The app was designed so that twelve hours after answering one diary survey the next one was made available with a notification. After additional twelve hours, another notification was sent to remind them of filling out this daily survey.

The last step for all participants, after all ten daily surveys, was to fill out the post-questionnaire, consisting of the CWEQ-II by Laschinger et al. (2001). It has the same questions as the pre-questionnaire which the experimental group already answered.

Data Analysis

In this study, concepts and variables were analysed on correlations. Structural empowerment, proactive personality and proactive behaviour were seen as independent variables in most analyses which were assumed to have an effect on informal learning as the dependent variable. Yet, also proactive behaviour and structural empowerment served as dependent variables to test the Hypotheses 1b, 4 and 6. The data was gathered and collected by the TIIM-application and analysed with the software R-studio. The analysis on

the hypotheses were conducted with varying multilevel model analyses and evaluated with a significance level of $\alpha = 5\%$.

Data on a personal level consisted of the demographic data, the answers from the CWEQ-II and the answers from Proactive Personality Scale. Further, data on the daily-personal level consisted of the daily measures of proactive behaviour and informal learning.

Before the analysis, the data was prepared. The daily-scores for the proactive behaviour measures and the daily informal learning measures, which were from the daily-personal level data, were created by calculating a mean of the relevant questions from that day. As a result, every participant received one ***proactive-behaviour*** score and one ***informal-learning*** score for each day. Aligning with Laschinger et. al. (2001) and Bateman and Crant (1993), for each participant, mean-scores from the Likert scales of the CWEQ-II pre- and post-questionnaires and the Proactive Personality Scale were created to have one score representing each construct of the personal level data. Therefore, on the personal level data, each participant now had one ***post-structural-empowerment*** score and one ***proactive-personality*** score. The experiment group also had a ***pre-structural-empowerment*** score. Every personal level data was grand-mean centred. This allows for a better comparison of the outcomes.

The first investigation was a descriptive analysis for all concepts and the demographic variables. Additionally, a correlation matrix with all factors was created. The next steps followed the order of hypotheses to test them.

To test Hypothesis 1, a multilevel model analysis was conducted with ***pre-structural-empowerment*** as independent variable and ***informal-learning*** as dependent variable.

Hypothesis 1b could not be tested due to missing data on the involved constructs. Only two participants gave an answer to the ***post-structural-empowerment*** score, hence only the ***pre-structural-empowerment*** scores could have been used for any analysis and no comparison could have been made.

Hypothesis 2 was tested with multilevel model analysis with *proactive-personality* as independent and *informal-learning* as dependent variable.

A multilevel model analysis was conducted to test Hypothesis 3. *Proactive-behaviour* was set to be the independent variable and *informal-learning* the dependent.

Hypothesis 4 required many multilevel analyses due to the multiple effects displayed in the mediation effect. The first connection between *proactive-personality* and *informal-learning* already was established by testing Hypothesis 2. Also, the connection of *proactive-behaviour* and *informal-learning* was established through Hypothesis 3. Additionally, two multilevel analyses needed to be conducted. First, the correlation of *proactive-personality* as independent and *proactive-behaviour* as dependent variable was inspected. Second, the effect of *proactive-personality* on *informal-learning* was observed, when *proactive-personality* and *proactive-behaviour* were independent variables in the multilevel model analysis and *informal-learning* the dependent. To validate the mediation effect, the Sobel-test was conducted.

Testing Hypotheses 5a and 5b was done in similar fashion to testing Hypotheses 2 and 3. For Hypothesis 5a a multilevel model analysis was conducted with *proactive-personality*, *pre-structural-empowerment* and a combination of both variables (*proactive-personality * pre-structural-empowerment*) as the independent variables and *informal-learning* as dependent. This was just like the analysis done to test Hypothesis 2, except that additional independent variables were added. Testing Hypothesis 5b was done just like testing Hypothesis 3, but with additional independent variables as well. A multilevel model analysis was done with *proactive-behaviour*, *pre-structural-empowerment*, and a combined variable of both (*proactive-behaviour * pre-structural-empowerment*) as the independent variables and *informal-learning* as the dependent variable. It had to be noted, that the variable *structural-empowerment* remained at one value for one participant, while *proactive-behaviour* varied on a daily basis.

At last, Hypothesis 6 was tested with another multilevel model analysis. Independent variables were *proactive-personality*, *pre-structural-empowerment* and the combined variable (*proactive-personality * pre-structural-empowerment*). The dependent variable was *proactive-behaviour*.

To reason for each multilevel model analysis, an intraclass correlation coefficient (ICC) was calculated every time from the variances of these models. The participants were seen as the classes because of the multiple measures per person. An ICC which is larger than ICC = 0.10 was considered as an indication for clustering (Sommet & Morselli, 2021). Further, we aim to create linear (mixed) models. Hence, for each linear regression, the four assumptions of linear models were tested to ensure the presence of a linear effect. Those assumptions were (1) linearity of the correlation, (2) homoscedasticity across values, (3) normal distribution of residuals, and (4) independence of the variables. A histogram of the residuals was calculated to test the normal distribution (3). A scatterplot with the residuals on the y-axis and the dependent variable on the x-axis was used to test homoscedasticity (2) and linearity (1). The independence (4) was tested with a scatterplot of the conducted regression.

Results

First, to consider in the results are the correlations between the relevant variables. Table 1 shows a correlation-matrix of including all 21 respondents. The variable post-structural-empowerment was excluded due to only two people answering the questions and receiving a score. The correlation-matrix shows several significant correlations. Most relevant for the hypotheses of this study were the correlations with Informal-learning. Pre-structural-empowerment $r(21) = 0.38$, $p < .001$, proactive-personality $r(20) = 0.24$, $p = .011$, and proactive-behaviour $r(21) = 0.56$, $p < .001$ all correlated with informal-learning. Further, the correlation between proactive-behaviour and proactive-personality $r(20) = 0.45$, $p < .001$, was relevant for Hypothesis 4. At last, the correlations of pre-structural-empowerment with

proactive-personality $r(20) = 0.21$, $p < .003$, and proactive-behaviour $r(21) = 0.53$, $p < .001$ were important.

Table 1. *Correlation-Matrix of all constructs*

	1.	2.	3.	4.	5.	6.	7.	8.
1. Gender	1.00							
2. Age	0.19**	1.00						
3. Education	-0.35***	0.29**	1.00					
4. Nationality	-0.21**	-0.10	0.37***	1.00				
5. Pre-structural-empowerment	0.32***	0.00	0.01	0.31***	1.00			
6. Proactive-personality	-0.13	-0.19**	-0.10	0.09	0.21**	1.00		
7. Proactive-behaviour	0.07	-0.08	0.11	0.16	0.53***	0.45***	1.00	
8. Informal-learning	-0.16	-0.21*	0.11	0.38***	0.38***	0.24*	0.56***	1.00

Note. *. $p < 0.05$, **. $p < 0.01$, ***. $p < 0.001$.

Gender: male = 0, female = 1.

Education: Berufs- Bildungsreife (Hauptschule) – VMBO = 0, mittlere Reife (Realschule) – HAVO = 1, Fach-; Hochschulreife (Fach-; Abitur) – VWO = 2, Berufsschule/ Ausbildung – MBO = 3, Bachelor’s Degrees = 4, Master’s degree = 5, Meister/ Techniker = 6, Doctor’s Degree = 7.

Nationality: German = 0, Dutch = 1.

Next, Hypothesis 1 was tested with a multilevel analysis with the structural empowerment scores from the CWEQ-II, which was asked before the experience sampling, as independent variable. The logarithm of the daily informal learning scores formed the dependent variable. Checking for the four assumptions of linear models, the assumption of homoscedasticity was violated. To counteract this, the logarithm of informal learning was used in this model. The ICC was calculated and equals $ICC = 0.24$. This shows large clustering within the participants (Sommet & Morselli, 2021). Therefore, a mixed model was preferred over a regular linear model. The effect of structural empowerment on informal learning was significantly positive, $b = 0.27$, $t(20) = 2.79$, $p = .012$. Hence, structural empowerment significantly positively predicted informal learning and Hypothesis 1 was supported.

Hypothesis 1b could not be tested due to an insufficient number of answers for the post CWEQ-II.

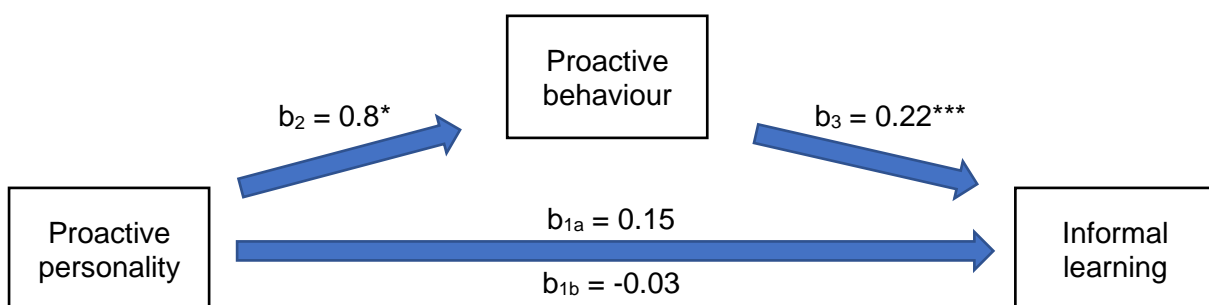
A multilevel model analysis was conducted to test Hypothesis 2. The logarithm of informal learning as dependent variable was predicted by proactive personality as independent variable. Similarly to Hypothesis 1, also here the logarithm of informal learning was used to align with the assumptions of linear models. The ICC was calculated for this model $ICC = 0.31$ and showed large clustering within the participants (Sommet & Morselli, 2021). The multilevel model analysis showed that a proactive personality did not have an effect on informal learning, $b = 0.15$, $t(19) = 1.30$, $p = .212$. As a result, Hypothesis 2 was rejected

Hypothesis 3 was tested through a multilevel model analysis with proactive behaviour as independent variable and the logarithm of informal learning as dependent. The logarithm of informal learning was used to meet all assumptions of linear models and fix the heteroscedasticity of the residuals. With a coefficient of $ICC = 0.22$, large clustering within the participants was seen (Sommet & Morselli, 2021). Nevertheless, proactive behaviour had a positive effect on informal learning, $b = 0.22$, $t(20) = 6.07$, $p < .001$. Therefore, Hypothesis 3 was supported.

Hypothesis 4 assumed that proactive behaviour mediates the connection between proactive personality and informal learning (see Figure 3). The assumptions for linear models have been checked and aligned by using the logarithm of informal learning in the following analysis. The multilevel model analysis used to test Hypothesis 2 was not significant. Nevertheless, the predicted effect of proactive personality on the logarithm of informal learning was $b_{1a} = 0.15$. In contrast, the analysis for Hypothesis 3 was significant. It showed that proactive behaviour had a positive effect on informal learning $b_3 = 0.22$. In addition, the effect of proactive personality on proactive behaviour was tested with a multilevel model analysis. The ICC for this analysis was $ICC = 0.45$; this showed very large clustering within the participants (Sommet & Morselli, 2021). The analysis revealed significant results, $b_2 =$

0.80, $t(19) = 2.78$, $p = 0.013$. Hence, a proactive personality had a positive influence on proactive behaviour. Further, another multilevel model analysis was conducted with proactive personality and proactive behaviour as independent variables and the logarithm of informal learning as dependent. While the effect of proactive personality on informal learning remained not significant, $b_{1b} = -0.03$, $t(19) = -0.28$, $p = .783$, its estimated effect on informal learning reversed when proactive behaviour got controlled for. When being a single independent variable, proactive personality had an estimated effect of $b_{1a} = 0.15$ and when proactive behaviour was controlled for the effect changed to $b_{1b} = -0.03$. At last, the Sobel-test was conducted. It is used to check for the general validity of all analysis used to test the mediation effect and was significant, $S = 2.47$, $p = .014$. Therefore, Hypothesis 4 was supported.

Figure 3. Mediation effect of proactive behaviour on proactive personality and informal learning with estimated effect values



Note. *. $p < 0.05$, **. $p < 0.01$, ***. $p < 0.001$.

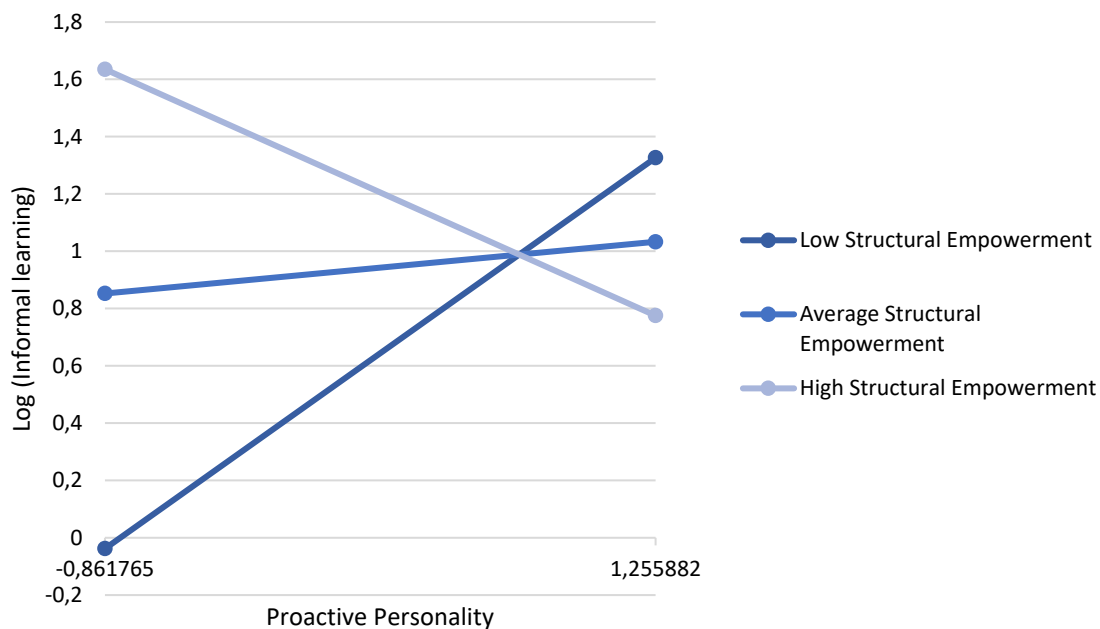
b_{1a} = effect of proactive personality on informal learning without controlling for proactive behaviour

b_{1b} = effect of proactive personality on informal learning with controlling for proactive behaviour

Hypothesis 5a was tested by multilevel model analysis where the logarithm of informal learning is the dependent variable. Proactive personality, structural empowerment and a combined effect (proactive personality * structural empowerment) of both were the independent variables. Through the use of the logarithm of informal learning, all assumptions of linear models were met. The ICC for this model was $ICC = 0.12$. It showed moderate clustering within the participants (Sommet & Morselli, 2021). The moderation effect was

significant, $b = -0.43$, $t(19) = -3.27$, $p = .004$, but the effect of proactive personality remained not significant, $b = 0.09$, $t(19) = 1.042$, $p = .311$. Nevertheless, Hypothesis 5a was rejected because the results show a negative moderation effect. This means informal learning increased in the absence of structural empowerment when proactive personality increased, and informal learning decreased in the presence of structural empowerment when proactive personality was increased (see Figure 4).

Figure 4. Line graph of the effect of proactive personality on informal learning with the interaction effect of structural empowerment.

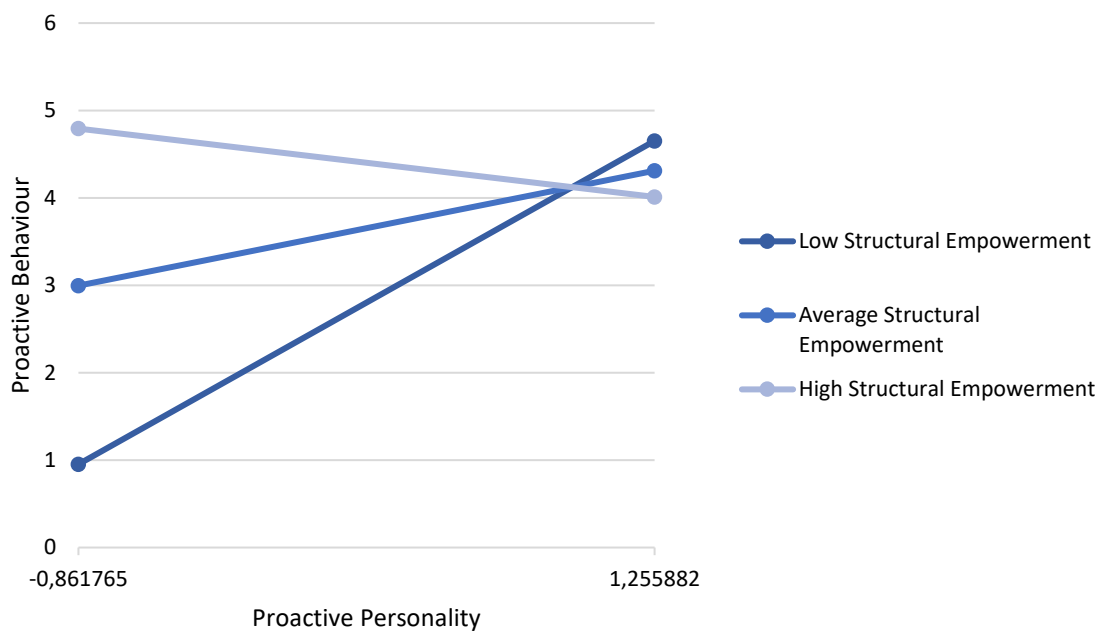


Note. Smallest and biggest points on the X-axis represent the lowest and highest proactive personality score within the sample. The graphs for Low, Average and High structural empowerment were calculated with the lowest, average and highest answers of structural empowerment within the sample.

Similar to Hypothesis 5a, Hypothesis 5b was tested with a multilevel model analysis where the logarithm of informal learning was the dependent variable. This time proactive behaviour, structural empowerment and a combined effect (proactive behaviour * structural empowerment) formed the independent variables. All assumptions were met after changing the variable informal learning to the logarithm of it. Calculating the ICC, $ICC = 0.22$, showed large clustering within the participants (Sommet & Morselli, 2021). Proactive behaviour by

itself had a significant effect on informal learning, as tested in Hypothesis 3. While controlling for structural empowerment, the variance of the random fixed effects remained equal at $r^2 = 0.09$, but the moderation effect was not significant, $b = -0.05$, $t(20) = -1.00$, $p = .318$. Hence, Hypothesis 5b was rejected.

Figure 5. Line graph of the effect of proactive personality on proactive behaviour with the interaction effect of structural empowerment.



Note. Smallest and biggest points on the X-axis represent the lowest and highest proactive personality score within the sample. The graphs for Low, Average and High structural empowerment were calculated with the lowest, average and highest answers of structural empowerment within the sample.

At last, Hypothesis 6 was tested with the last multilevel model analysis. Proactive behaviour was the dependent variable with proactive personality, structural empowerment and a combined effect (proactive personality * structural empowerment) of both as independent variable. The ICC for this model, $ICC = 0.26$, reasoned for large clustering within the participants (Sommet & Morselli, 2021). The model met all four assumptions of linear models and explained a significant negative moderation effect, $b = -0.87$, $t(19) = -2.48$, $p = .023$. This explained that the effect of proactive personality on proactive behaviour was

smaller in the presence of more structural empowerment. Therefore, Hypothesis 6 was supported.

Summarising, the Hypotheses 1, 3, 4 and 6 were supported, while Hypotheses 2, 5a and 5b were rejected. Hypothesis 1b could not be tested due to missing data.

Discussion

This discussion approaches every hypothesis at a time before continuing with limitations and finishing with future recommendations and implications, which result in a final conclusion.

The analysis supports Hypothesis 1, which means that, the greater structural empowerment is perceived by employees, the more informal learning happens takes place. This conclusion is directly supported by Lippers (2022), as he found the same effect in his study. The size of the effect of perceived structural empowerment on the logarithm of informal learning is $b = 0.27$. This value is significant because, when converting the analysis back to the (non-logarithmic) normal scale, the difference between no perceived structural empowerment and full perception of structural empowerment results in an increase of informal learning that is bigger than 50% of its scale. Additionally, Svensson et al. (2004) found a similar relationship between workplace learning and various aspects of informal learning (Amor et al., 2021).

A reason for this effect could be, that structural empowerment is meant to support the employee with work related goals (Amor et al., 2021). Thus, when an employee has the goal to learn, the presence of structural empowerment could enable this. Lohman (2003) specifically mentions proximity to co-workers' working area as a core concept for workplace learning. Lohman (2005) supports this and adds that an unsupportive working environment hinders learning. Additionally, time and flexibility to learn, but also the availability of information play a crucial role in informal learning (Hurtz & Williams, 2009; Svensson et al., 2004). They further argue that an employee requires access to knowledge to actively learn.

Therefore, perceived structural empowerment positively effects informal learning because social proximity, time to learn, and availability of information are needed to engage in informal learning.

Hypothesis 2 was not supported by the analysis. In conclusion, the informal learning of employees is not affected by how proactive their personality is. Lippers (2022) also did not find a significant effect of a proactive personality on informal learning. But those results were unexpected because Lohman (2003) and Van Noy et al. (2016) found several constructs, which were associated with proactivity, to have a positive effect on learning (Coun et al., 2021; Joo et al., 2013; Saeid & Eslaminejad, 2016).

Proactive employees are more likely to prepare for possible changes in the future, thereby they are learning (Coun et al., 2021). Due to their constant preparation for future possibilities, they would be more likely to encounter unknown possibilities. In contrast this means, when the employees are in a rather static environment, they might not need to prepare for any change which, in context, means that they do not need to engage in additional learning to adapt to changes. This especially could be the case in for factory worker, who are producing the same products on the same machines for many years. Adding another possible reason, why no effect of a proactive personality on informal learning was found, Crant (2000) explained that some proactive behaviours are more focused on socialisation or stress management, rather than informal learning. This is supported by Schürmann and Beusaert (2016) because when employees commit to socialisation or stress management instead of committing to learning it also results in less workplace learning. Concluding, the proactivity of employees' personalities did not have an effect because there may have been no need or motivation to learn in a work-related context.

In contrast to Hypothesis 2, Hypothesis 3 was supported by the results. This means employees who behave proactively are more likely to engage in informal learning. The effect size of proactive behaviour on informal learning is $b = 0.22$, which also results in an increase of informal learning by more than 50% of the scale, when comparing no proactive behaviour

with maximum proactive behaviour. Therefore, the effect is considered relevant. Again, the studies of Lohman (2003) and Van Noy et al. (2016) are relevant in this context. They support that proactive behaviour has a positive influence on informal learning. In contrast, Lippers (2022) did not find a significant effect of proactive behaviour on informal learning.

A possible explanation for this effect can be seen when employees behave proactively, they might be using their knowledge and gather additional information to learn about possible outcomes (Coun et al., 2021). In contrast, employees without proactive behaviour could not learning about possible outcomes and may also not aim to understand all consequences of an event. They probably do not have a strong desire for learning (Schürmann & Beausaert, 2016). The kind of self-directed behaviour that occurs when preparing for a future event was found to be related to informal learning (Lohman, 2003; Coun et al., 2021). Thus, employees who engage in proactive behaviour might more likely to also have the desire for self-directed learning which, as a result, increases the informal learning at the workplace.

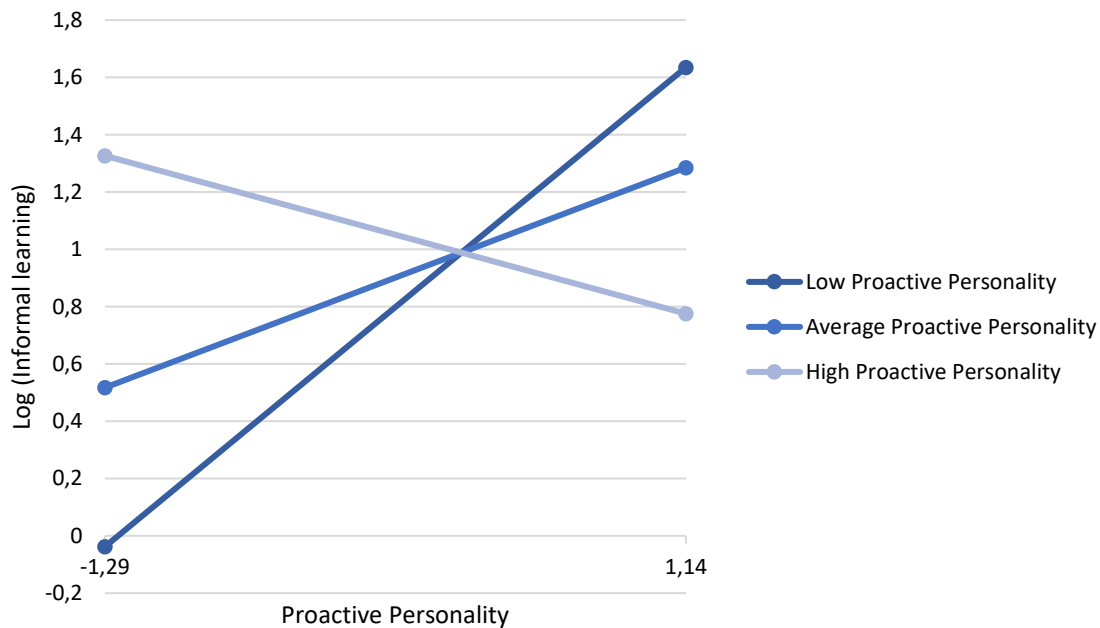
Further analysis on the effects of proactive personality and behaviour show that proactive behaviour mediates the relationship of proactive personality and informal learning, aligning with Hypothesis 4 (see Figure 3). This means a proactive personality has an effect on informal learning only through its direct effect on proactive behaviour. This analysis was conducted beyond the extent of Lippers' (2022) study, through an additional multilevel model analysis and the Seibel-test, because of similarity of the constructs and the effect of a proactive personality on proactive behaviour (Seibert et al., 2001). Yet, Seibert et al. (2001) explain the positive correlation of a proactive personality and proactive behaviour. A proactive personality identifies through "a stable disposition to take personal initiative in a broad range of activities and situations" (Seibert et al., 2001, p. 847). Therefore, the only effect of proactive personality should be an increased likelihood for proactive behaviour. Concluding, when proactive behaviour is controlled for, there should be no additional effect of proactive personality on informal learning.

Considering the Hypotheses 2, 3, and 4 together, an explanation is needed for why a proactive personality, which results in the tendency for proactive behaviour, did not predict informal learning, while proactive behaviour does. According to the theory of planned behaviour every planned behaviour needs an intention (Ajzen, 1991). Therefore, employees would need an intention to behave proactively. This intention is influenced by more than just the proactive personality, namely personal initiative, role breadth self-efficacy and taking charge (Crant, 2000). Thus, a proactive personality may not explain enough variance of proactive behaviour, which results in non-significant effects on informal learning. Additionally, the measurements may have had an influence on the results (Ohly et al., 2010). Proactive behaviour and informal learning were measured on a daily basis, while proactive personality was only accessed once before the experience sampling. Therefore, there are many more datapoints for the analysis of proactive behaviour on informal learning than for proactive personality on informal learning, which result in a more reliable analysis (Ohly et al., 2010). In conclusion, the different outcomes for Hypotheses 2 and 3 are most likely because proactive personality can predict proactive behaviour only partially. Yet, a proactive personality seems to result in nothing but the tendency to behave proactively and therefore has no additional effect on informal learning, which can be deduced from its definition (Seibert et al., 2001).

Hypothesis 5a was rejected by the analysis. The hypothesis assumed a positive moderation effect, while the results show a negative moderation effect with the absence of a significant connection of proactive personality on informal learning. Hence, when all employees would perceive great structural empowerment, the employees who have a more proactive personality are less likely to engage in informal learning than those, who have a less proactive personality. This effect is reversed in the absence of perceived structural empowerment. These results were unexpected because Eraut (2004) and Raemdonck et al. (2012) reasoned for a positive interaction with proactivity. Eraut (2000; 2004) argued that employees need to be proactive but also require support by their work environment to

engage in a challenge and learn informally. On the other hand, Lippers (2022) did not find any significant interaction effect of structural empowerment in his study.

Figure 6. Line graph of the effect of structural empowerment on informal learning with the interaction effect of proactive personality.



Note. Smallest and biggest points on the X-axis represent the lowest and highest structural empowerment score within the sample. The graphs for Low, Average and High proactive personality were calculated with the lowest, average and highest answers of proactive personality within the sample.

To reason why such negative mediation effect was found, a deeper understanding of the analysis is needed. In the multilevel model analysis, proactive personality, a combined variable of proactive personality multiplied with structural empowerment (the moderating variable), but also structural empowerment formed the independent variables. Hence, proactive personality is also moderating the connection of structural empowerment and informal learning. Using the definition of a proactive personality can give further insight. Bateman and Crant (1993) specify that somebody with a proactive personality “is relatively unconstrained by situational forces, and who effects environmental change” (p. 105). Therefore, employees with a proactive personality might be less likely to be impacted by the presence of perceived structural empowerment. This is also seen in the results (see Figure

6). Looking at the interaction effect from this perspective, may grant a better understand for why it has a negative effect.

Hypothesis 5b was not supported because no moderation effect of structural empowerment on the connection of proactive behaviour on informal learning was found. Hence, the learning of employees was neither amplified nor minimised when combining proactive behaviour and structural empowerment. Similar to the previous moderation effect, Eraut (2004) and Raemdonck et al. (2012) expected a positive effect, while Lippers (2022) did not find said effect. To reason for this outcome, the knowledge of Hypothesis 6 is needed.

The last hypothesis is Hypotheses 6 and it is supported by the results. This means proactive behaviour increases within employees, who have a proactive personality, when they do not perceive structural empowerment, compared to when they perceive structural empowerment. In addition, if they do not possess a proactive personality, they are more likely behave proactively when structural empowerment is present, compared to when structural empowerment is absent. Seibert et al. (2001) explain that proactive behaviour varies depending on the situation. Further, Crant (2000) names varies forms of structural empowerment that promote proactive behaviour (Amor et al., 2021). Crant (2000) adds that they work in a combination with internal factors, which, among others, is proactive personality. This is contrasting to the negative interaction effect found in the results. In conclusion, a positive moderation effect was expected, but the results support a negative moderation of structural empowerment.

This could be explained, using the definition of proactivity. According to the theory, situational forces are less impactful to one with a proactive personality (Bateman and Crant, 1993). A similar explanation was given for Hypothesis 5. Adding to this, Crant (2000) explained that multiple factors might influence the tendency to behave proactively. It remains difficult to measure to what extent these factors were present and have influenced the employees. Nevertheless, these additional factors could possibly explain why proactive

behaviour was decreasing among employees with a proactive personality, when structural empowerment was increasing.

Reflecting on Hypothesis 5b with the knowledge from Hypothesis 6, it seems like structural empowerment engages with proactive behaviour not as an interacting effect towards informal learning, but as an influential negative moderator for proactive behaviour (Amor et al., 2021; Lohman, 2005; Seibert et al., 2001). The additional possibilities through structural empowerment do not seem to increase informal learning, which is based on proactive behaviour. In contrast, structural empowerment hinders proactive behaviour, which results in minimising learning effects. Summarising this means, structural empowerment has a negative influence on proactive behaviour despite its positive effect on informal learning.

Limitations

To truly understand the results, this study has to be analysed with a critical eye. First, the sample size remains critical for this analysis. Lippers (2022) explains the need for a bigger sample size for the use of the experience sampling method. Ohly et al. (2010) agree to this statement and add that running the diary study for more days also increases the significance. The sample size of the current study is $N = 21$, which increases the sample size from Lippers (2022) by two participants. As a result, the likelihood for the sample to be diverse enough and to represent the study population is small. Therefore, one has to be careful when generalising the results to the study population.

Furthermore, the sample of this study, which was gathered through convenience sampling, represents a variety of different employees, but the differences in environment, tasks and responsibilities was neither measured, nor analysed. Lippers (2022) aimed to focus on employees of the fitness sector. This results in participants of similar work environments with similar tasks. In the current study, the aim is to analyse an effect for a general population of employees. Without taking the differences of their employment into account, it is impossible to check whether certain effects occur only among employees within specific conditions. For example, for learning to happen, there needs to be further knowledge

or behaviour to be learned (Marsick & Watkins, 2001). When employees work in an environment where this is not given, their learning might be different regardless of structural empowerment or their proactivity, yet this cannot be controlled. Hence, missing background information on the employees could have increased the uncontrolled variance of the analysis.

Additionally, the impact of the mere-measurement effect could not be analysed. The perception of structural empowerment may have changed from before the experience sampling to after it (Morwitz & Fitzsimons, 2004). Further, Lippers (2000) found an effect of perceived structural empowerment on informal learning only when using the post-questionnaire, but not with the measures done before the experience sampling. Therefore, an impact of the mere-measurement effect on the results was expected. Since it could not have been analysed, the effect remains hidden within this study.

The last aspect of concern is the reliability of the measurement tools for informal learning. The proactive personality was measured with the reliable Proactive Personality Scale (Bateman & Crant, 1993) and structural empowerment was measured through the CWEQ-II (Laschinger et al., 2000). Also, proactive behaviour was measured using three questions previously constructed and used by Frese et al. (1997) as well as Van Woerkom et al. (2015). In contrast, informal learning was measured through three questions which have not been validated beforehand. Participants needed to indicate (1) how much they have learned, (2) how much time they spend on learning in that day, and (3) how important they value the learned information. To indicate that one invested much time to learn, one had to be conscious about this decision, while Eraut (2000) specified that informal learning may happen without the awareness or intention of learning. Within the current study, informal learning was defined to be conscious, due to awareness of the shortcomings of the measurements. Regardless, participants may have learned a lot without spending active time on it, or they would not always recognise that they have learned something. Hence, also the questions in this study, might have failed to measure a great extent of informal learning, but

focused only on the most conscious aspect of it. This finalises the most important limitations of this study.

Future recommendations

Keeping in mind the limitations but also results of this study, certain recommendations for future research can be expressed. Firstly, the connections within this study should be investigated further by future research. On the one hand, this study replicated and aimed to improve the study of Lippers (2022). Though, it has its own shortcomings and limitations, and found differing results to its predecessor. Hence, additional research is required to validate the findings. The experience sampling method is a reliable tool for this kind of research, but a sample size of about 100 participants is recommended (Ohly et al, 2010). Therefore, future studies should investigate the connections within the current study with a greater sample size.

Secondly, the effect of further constructs on informal learning, but also on the connections within this study, should be analysed in future studies. In the discussion, connections among many constructs were assumed. Yet, these connections could not be analysed with the current set up. For example, opportunities for learning through contextual factors of one's area of work were assumed to influence informal learning (Marsick & Watkins, 2001). Also, the impact of the mere-measurement effect was not analysed. Hence this study revealed additional possible effect within the domain of informal learning at the workplace. Future research should focus on the assumptions of this study with the aim to validated, why certain effects were or were not measured, so that the knowledge gets more applicable.

At last, future studies should research valid measurements for whole extent of informal learning. As Eraut (2000) expresses, due to the unconscious and spontaneous aspects of informal learning, it remains difficult to measure. The current study used three questions to investigate the conscious aspects of informal learning to predict the complete amount, but with that could not statistically measure any learning that remained unconscious.

Other studies mostly used interviews for their data-gathering, but also could not be certain that every aspect of informal learning was covered (Eraut, 2004). Therefore, future research has to investigate on how to access the aspects of informal learning which remain hidden until now.

Implications

The results of this study are scientifically significant, but they may also be relevant beyond the science sector. This study revealed that the perception of structural empowerment and proactive behaviour have a direct and indirect influence on informal learning at the workplace. Hence, implications focus on the workplace. Furthermore, informal learning has many advantages for the employee but also employer, which is why it should be facilitated (Halliday-Wynes & Beddie, 2009; Smith et al., 2008).

On the one hand, perceived structural empowerment increases informal learning, as well as proactive behaviours which also improve informal learning. Therefore, employers should emphasize the perception of structural empowerment of their employees. They may focus on specific facilitating aspects of structural empowerment like social closeness to co-workers, flexibility and time to learn and access to information (Hurtz & Williams, 2009; Laschinger et al., 2004; Lohman, 2005; Svensson et al., 2004). In an area of change, this will help the employee to adapt to the situations quicker. Also, among other benefits, employers are more likely to retain skilled employees (Halliday-Wynes & Beddie, 2009; Smith et al., 2008). Therefore, the employer should focus on increasing the perceived structural empowerment.

On the other hand, employers should aim to reach an increased level of proactivity among the employees. The results show a positive effect of proactive behaviours on informal learning. Hence, proactive employees can learn quicker and remain productive in an environment, which is changing quickly. Since proactive behaviours are influenced by the stable factor of a proactive personality, the employer should focus on the proactivity already in the hiring processes (Seibert et al., 2001). Furthermore, situational factors like structural

empowerment have an influence on proactive behaviour. Therefore, an employer should create an environment which supports proactive behaviour. In conclusion, employers should focus on increasing the proactivity among their employees through a set focus in the hiring process, as well as through supportive structures.

Conclusion

The results of this study indicate that structural empowerment and proactive behaviour predict informal learning at the workplace among German and Dutch employees. Those results partially differ from the study of Lippers (2022) which it aimed to replicate. More significant effects were found in the replication and it remains unclear which changes led to said differences. In addition, the study shows that proactive behaviour is affected by a proactive personality as well as other uncontrolled factors, which is why a proactive personality was not able predict informal learning in this sample. Hence, to predict informal learning of employees, multiple factors need to be assessed and analysed. Nevertheless, the results encourage employers to promote informal learning through proactive behaviour and structural empowerment within the company because it yields benefits for both parties.

References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-t](https://doi.org/10.1016/0749-5978(91)90020-t)
- Amor, A. M., Xanthopoulou, D., Calvo, N. & Abeal Vázquez, J. P. (2021). Structural empowerment, psychological empowerment, and work engagement: A cross-country study. *European Management Journal*, 39(6), 779–789. <https://doi.org/10.1016/j.emj.2021.01.005>
- Bateman, T. S. & Crant, J. M. (1993). The proactive component of organizational behavior: A measure and correlates. *Journal of Organizational Behavior*, 14(2), 103–118. <https://doi.org/10.1002/job.4030140202>
- Coun, M. J. H., Peters, P., Blomme, R. J. & Schaveling, J. (2021). 'To empower or not to empower, that's the question'. Using an empowerment process approach to explain employees' workplace proactivity. *The International Journal of Human Resource Management*, 33(14), 2829–2855. <https://doi.org/10.1080/09585192.2021.1879204>
- Crant, J. M. (2000). Proactive Behavior in Organizations. *Journal of Management*, 26(3), 435–462. <https://doi.org/10.1177/014920630002600304>
- Doornbos, A. J., Simons, R. J. & Denessen, E. (2008). Relations between characteristics of workplace practices and types of informal work-related learning: A survey study among Dutch Police. *Human Resource Development Quarterly*, 19(2), 129–151. <https://doi.org/10.1002/hrdq.1231>
- Endedijk, M. D., Brekelmans, M., Slegers, P. & Vermunt, J. D. (2015). Measuring students' self-regulated learning in professional education: bridging the gap between event and aptitude measurements. *Quality & Quantity*, 50(5), 2141–2164. <https://doi.org/10.1007/s11135-015-0255-4>

- Eraut, M. (2000). Non-formal learning and tacit knowledge in professional work. *British Journal of Educational Psychology*, 70(1), 113–136.
<https://doi.org/10.1348/000709900158001>
- Eraut, M. (2004). Informal learning in the workplace. *Studies in Continuing Education*, 26(2), 247–273. <https://doi.org/10.1080/158037042000225245>
- Frese, M., Fay, D., Hilburger, T., Leng, K. & Tag, A. (1997). The concept of personal initiative: Operationalization, reliability and validity in two German samples. *Journal of Occupational and Organizational Psychology*, 70(2), 139–161.
<https://doi.org/10.1111/j.2044-8325.1997.tb00639.x>
- Fuller, B. & Marler, L. E. (2009). Change driven by nature: A meta-analytic review of the proactive personality literature. *Journal of Vocational Behavior*, 75(3), 329–345.
<https://doi.org/10.1016/j.jvb.2009.05.008>
- Halliday-Wynes, S. & Beddie, F. (2009). *Informal Learning: At a Glance*. National Centre for Vocational Education Research. <https://eric.ed.gov/?id=ED507131>
- Hoffman, B. (2005). *Informal Learning (Illustrated)*. Association for Talent Development.
https://www.google.de/books/edition/Informal_Learning/clixnFPYZ4cC
- Hübner, S., Haijen, E., Kaelen, M., Carhart-Harris, R. L. & Kettner, H. (2021). Turn on, Tune in, and Drop out: Predictors of Attrition in a Prospective Observational Cohort Study on Psychedelic Use. *Journal of Medical Internet Research*, 23(7), e25973.
<https://doi.org/10.2196/25973>
- Hurtz, G. M. & Williams, K. J. (2009). Attitudinal and motivational antecedents of participation in voluntary employee development activities. *Journal of Applied Psychology*, 94(3), 635–653. <https://doi.org/10.1037/a0014580>
- Joo, B. B. & Ready, K. J. (2012). Career satisfaction. *Career Development International*, 17(3), 276–295. <https://doi.org/10.1108/13620431211241090>

- Joo, B. K. B., Park, S. & Oh, J. R. (2013). The effects of learning goal orientation, developmental needs awareness and self-directed learning on career satisfaction in the Korean public sector. *Human Resource Development International*, 16(3), 313–329. <https://doi.org/10.1080/13678868.2013.782993>
- Jurgensen, C. E. (1978). Job preferences (What makes a job good or bad?). *Journal of Applied Psychology*, 63(3), 267–276. <https://doi.org/10.1037/0021-9010.63.3.267>
- Larsen, A. B. (2022). Why is the world moving towards the metaverse? *Gulf Business*. <https://gulfbusiness.com/why-is-the-world-moving-towards-the-metaverse/>
- Laschinger, H. K. S., Finegan, J. E., Sbamian, J. & Wilk, P. (2001). Impact of Structural and Psychological Empowerment on Job Strain in Nursing Work Settings. *JONA*, 31(5), 260–272. https://journals.lww.com/jonajournal/Fulltext/2001/05000/Organizational_Trust_and_Empowerment_in.00006.aspx?casa_token=aUUbca6VXFUAAAAA:KCUnp8nOnhAtJRyQ61rBRZKESBnfjQUVNIoaxo_Oq9N9OcmsYD-1jIRYy_NhyYRPkSKiLEfY9QvGewalHBW7CibhiJE
- Laschinger, H. K. S., Finegan, J. E., Shamian, J. & Casier, S. (2000). Organizational Trust and Empowerment in Restructured Healthcare Settings. *JONA: The Journal of Nursing Administration*, 30(9), 413–425. <https://doi.org/10.1097/00005110-200009000-00008>
- Laschinger, H. K. S., Finegan, J. E., Shamian, J. & Wilk, P. (2004). A longitudinal analysis of the impact of workplace empowerment on work satisfaction. *Journal of Organizational Behavior*, 25(4), 527–545. <https://doi.org/10.1002/job.256>
- Lippers, T. J. (2022). Lifelong Learning of Professionals: The Importance of Workplace Learning: Understanding The Role of Structural Empowerment and Proactivity in Informal Learning [Ba Thesis]. University of Twente. <https://purl.utwente.nl/essays/91465>

- Lohman, M. C. (2003). Work Situations Triggering Participation in Informal Learning in the Workplace: A Case Study of Public School Teachers. *Performance Improvement Quarterly*, 16(1), 40–54. <https://doi.org/10.1111/j.1937-8327.2003.tb00271.x>
- Lohman, M. C. (2005). A survey of factors influencing the engagement of two professional groups in informal workplace learning activities. *Human Resource Development Quarterly*, 16(4), 501–527. <https://doi.org/10.1002/hrdq.1153>
- Malcolm, J., Hodkinson, P. & Colley, H. (2003). The interrelationships between informal and formal learning. *Journal of Workplace Learning*, 15(7/8), 313–318. <https://doi.org/10.1108/13665620310504783>
- Manuti, A., Pastore, S., Scardigno, A. F., Giancaspro, M. L. & Morciano, D. (2015). Formal and informal learning in the workplace: A research review. *International Journal of Training and Development*, 19(1), 1–17. <https://doi.org/10.1111/ijtd.12044>
- Marsick, V. J. & Watkins, K. E. (2001). Informal and Incidental Learning. *New Directions for Adult and Continuing Education*, 2001(89), 25. <https://doi.org/10.1002/ace.5>
- Moore, G. E. (2006). Cramming more components onto integrated circuits, reprinted from *Electronics*, volume 38, number 8, April 19, 1965, pp.114 ff. *IEEE Solid-State Circuits Society Newsletter*, 11(3), 33–35. <https://doi.org/10.1109/n-ssc.2006.4785860>
- Morwitz, V. G. & Fitzsimons, G. J. (2004). The Mere-Measurement Effect: Why Does Measuring Intentions Change Actual Behaviour. *Journal of Consumer Psychology*, 14(1–2), 64–74. https://doi.org/10.1207/s15327663jcp1401&2_8
- National Governors Association. (2022). *Lessons Learned In Workforce Innovation: How Six States Are Planning to Advance Digital Skills for Equitable Economic Participation*. National Governors Association. <https://www.nga.org/publications/lessons-learned-in-workforce-innovation-how-six-states-are-planning-to-advance-digital-skills-for-equitable-economic-participation/>

- Noe, R. A., Clarke, A. D. & Klein, H. J. (2014). Learning in the Twenty-First-Century Workplace. *Annual Review of Organizational Psychology and Organizational Behavior*, 1(1), 245–275. <https://doi.org/10.1146/annurev-orgpsych-031413-091321>
- Ohly, S., Sonnentag, S., Niessen, C. & Zapf, D. (2010). Diary Studies in Organizational Research. *Journal of Personnel Psychology*, 9(2), 79–93. <https://doi.org/10.1027/1866-5888/a000009>
- Raemdonck, I., van der Leeden, R., Valcke, M., Segers, M. & Thijssen, J. (2012). Predictors of self-directed learning for low-qualified employees: a multi-level analysis. *European Journal of Training and Development*, 36(6), 572–591. <https://doi.org/10.1108/03090591211245495>
- Saeid, N. & Eslaminejad, T. (2016). Relationship between Student's Self-Directed-Learning Readiness and Academic Self-Efficacy and Achievement Motivation in Students. *International Education Studies*, 10(1), 225. <https://doi.org/10.5539/ies.v10n1p225>
- Schulz, M. & Roßnagel, C. S. (2010). Informal workplace learning: An exploration of age differences in learning competence. *Learning and Instruction*, 20(5), 383–399. <https://doi.org/10.1016/j.learninstruc.2009.03.003>
- Schürmann, E. & Beusaert, S. (2016). What are drivers for informal learning? *European Journal of Training and Development*, 40(3), 130–154. <https://doi.org/10.1108/ejtd-06-2015-0044>
- Seibert, S. E., Kraimer, M. L. & Crant, J. M. (2001). What do proactive people do? A longitudinal model linking proactive personality and career success. *Personnel Psychology*, 54(4), 845–874. <https://doi.org/10.1111/j.1744-6570.2001.tb00234.x>
- Smith, A., Oczkowski, E. & Smith, C. S. (2008). To Have and to Hold: Retaining and Utilising Skilled People. NCVET. <https://eric.ed.gov/?id=ED503419>

- Sommet, N. & Morselli, D. (2021). Keep Calm and Learn Multilevel Linear Modeling: A Three-Step Procedure Using SPSS, Stata, R, and Mplus. *International Review of Social Psychology*, 34(1). <https://doi.org/10.5334/irsp.555>
- Song, D. & Bonk, C. J. (2016). Motivational factors in self-directed informal learning from online learning resources. *Cogent Education*, 3(1), 1205838. <https://doi.org/10.1080/2331186x.2016.1205838>
- Svensson, L., Ellström, P. & Åberg, C. (2004). Integrating formal and informal learning at work. *Journal of Workplace Learning*, 16(8), 479–491. <https://doi.org/10.1108/13665620410566441>
- Thomas, J. P., Whitman, D. S. & Viswesvaran, C. (2010). Employee proactivity in organizations: A comparative meta-analysis of emergent proactive constructs. *Journal of Occupational and Organizational Psychology*, 83(2), 275–300. <https://doi.org/10.1348/096317910x502359>
- UNESCO Institute for Lifelong Learning. (2009). Global report on adult learning and education. <https://eric.ed.gov/?id=ED540497>
- van Noy, M., James, H. & Bedley, C. (2016). Reconceptualizing learning: A review of the literature on informal learning. Education and Employment Research Center, School of Management and Labor Relations, Rutgers, the State University of New Jersey. <https://doi.org/10.7282/00000129>
- van Rijn, M. B., Yang, H. & Sanders, K. (2013). Understanding employees' informal workplace learning. *Career Development International*, 18(6), 610–628. <https://doi.org/10.1108/cdi-12-2012-0124>
- van Veldhoven, M. & Dorenbosch, L. (2008). Age, proactivity and career development. *Career Development International*, 13(2), 112–131. <https://doi.org/10.1108/13620430810860530>

- van Woerkom, M., Oerlemans, W. & Bakker, A. B. (2015). Strengths use and work engagement: a weekly diary study. *European Journal of Work and Organizational Psychology*, 25(3), 384–397. <https://doi.org/10.1080/1359432x.2015.1089862>
- Zimmerman, B. J. (2000). Attaining Self-Regulation. *Handbook of Self-Regulation*, 13–39. <https://doi.org/10.1016/b978-012109890-2/50031-7>

Appendix A

Answers were given on a 7-point Likert scale where (1) means “I totally disagree” and (7) “I totally agree”.

1. I am constantly on the lookout for new ways to improve my life.
2. I feel driven to make a difference in my community and maybe the world.
3. I tend to let others take the initiative to start new projects.
4. I tend to let others take the initiative to start new projects.
5. I enjoy facing and overcoming obstacles to my ideas.
6. Nothing is more exciting than seeing my ideas turn into reality.
7. If I see something I don't like, I fix it.
8. No matter what the odds, if I believe in something I will make it happen.
9. I love being a champion for my ideas, even against others' opposition.
10. I excel at identifying opportunities.
11. I am always looking for better ways to do things.
12. If I believe in an idea, no obstacle will prevent me from making it happen.
13. I love to challenge the status quo.
14. When I have a problem, I tackle it head-on.
15. I am great at turning problems into opportunities.
16. I am great at turning problems into opportunities.
17. I am great at turning problems into opportunities.

Appendix B

All questions were answered with a 5-point Likert scale. In the brackets after each section heading, first the meaning of the minimal score and then the meaning of the maximum score is displayed.

How much of each kind of opportunity do you have in your present job?

(None – A lot)

1. Challenging work
2. The chance to gain new skills and knowledge on the job
3. Tasks that use all of your own skills and knowledge

How much access to information do you have in your present job?

(No Knowledge – Know a lot)

1. The current state of the business unit
2. The values of top management
3. The goals of top management

How much access to support do you have in your present job?

(None – A lot)

1. Specific information about things you do well
2. Specific comments about things you could improve
3. Helpful hints or problem solving advice

How much access to resources do you have in your present job?

(None – A lot)

1. Time available to do necessary paperwork
2. Time available to accomplish job requirements
3. Acquiring temporary help when needed

In my work setting/job:

(None – A lot)

1. The rewards for innovation on the job are
2. The amount of flexibility in my job is
3. The amount of visibility of my work-related activities within the company is

How much opportunity do you have for these activities in your present job:

(None – A lot)

1. Collaborating with colleagues
2. Being sought out by peers for help with problems
3. Being sought out by managers for help with problems
4. Seeking out ideas from professionals with a different profession

How much of each kind of opportunity do you have in your present job?

(Strongly Disagree – Strongly Agree)

1. Overall, my current work environment empowers me to accomplish my work in an effective manner.
2. Overall, I consider my workplace to be an empowering environment.

Appendix C

Each statement / question is followed by the range of a Likert scale or all answer possibilities.

1. Today, I actively attacked problems.

5 I completely agree – 1 I completely disagree

2. Today, I did more than I was asked to.

5 I completely agree – 1 I completely disagree

3. Today, I took initiative immediately even when others did not.

5 I completely agree – 1 I completely disagree

4. Can you recall something that you learned today from work?

Yes / No

5. What did you learn from work?

Open question

6. What other people were involved in this activity?

A colleague from my workplace, A colleague outside my workplace, My superior,

A customer, client or user of my product or service, no other people were

involved

7. What was the main reason to learn this?

I was unsatisfied with my earlier experience, I wanted to practice something, I

wanted to prepare myself for future situations, Out of curiosity, Other stimulated

me to develop myself in this, It was necessary for my role in the team

8. Today, I learned from my work.

5 A lot – 1 Nothing

9. Today, I spent time on learning.

5 A lot of time – 1 No time

10. Today's learning fit my learning style.

5 A lot – 1 Nothing