

Digital Coach [2020-1-DE02-KA202-007683] - Intellectual Output 06

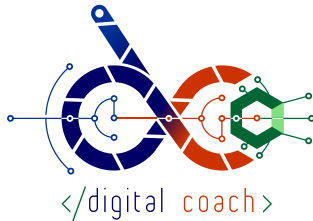
# Self-study module Limits and possibilities of learning transfer effectiveness

Self-study module for the digital coach

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# Limits and possibilities of learning transfer effectiveness

Self-study module for Digital Coaches

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## 0. Introduction

Particularly due to changes in society, such as demographic change and digital transformation, the willingness to change is increasingly becoming a prerequisite for organizational survival (Lauer, 2019). Accordingly, the acquisition of skills related to organizational members and organizations is seen as a key role in promoting digitalisation in organizations. To this end, further development measures such as training courses and the like are indispensable for companies. Nevertheless, practitioners report a gap between what has been learnt and what is applied in practice following a further development measure. This is because it is not only important how and what we learn, but also when and in what form this learning is used in everyday working life. In line with the challenges mentioned before, this self-learning module focuses on how skills development measures can be designed in a transfer-orientated manner and therefore more efficiently and effectively. In addition to traditional further development measures, new concepts of learning, such as the learning factory, are also presented. The aim of these alternative forms of learning is to promote digital transformation in organizations and enable the acquisition of the relevant skills.

With regard to the acquisition of skills which are important from the perspective of the digital transformation of organizations and the economy, the learning factory (Sudhoff et al. 2020, Kröll, 2021) and the teaching factory approaches (Kröll et al. 2023c) are assigned a special significance. So far, however, the question of how the learning transfer problem presents itself in the context of these special skills development activities has hardly been considered. This self-learning module addresses this gap.

### 0.1. Learning objectives of the self-study module

After working through this self-study module, the readers of this module should be able to design activities for skills development in the context of digital transformation in a transfer-oriented and workplace-oriented manner in order to improve the degree of success and sustainability of the learning process of learners (Solga, 2011). Readers of the self-study module will be able to explain the possibilities and limitations of learning transfer as well as possible measures for shaping extrinsic factors of learning success and will be familiar with tools for measuring and interpreting learning success. In addition, they will be able to advise companies on relevant and realistic alternatives to current less than optimal training courses and pass on their knowledge to those responsible for training and personnel development in organizations. They will also be familiar with the possibilities and limitations of organizing various learning venue collaborations between training companies, (vocational) schools and teaching/learning factories.

This self-study module focuses on the following learning objectives:



- Design transfer-orientated and workplace-oriented training courses to increase learning success and sustainability.
- Explain the possibilities and limitations of learning transfer and possible measures to create the extrinsic factors of successful learning transfer.
- Assessing resistance and potential for learning transfer and dealing with it appropriately.
- Suggestions for improving the training design of current skills development measures to ensure learning transfer.

## 0.2. Structure of the self-study module

The aim of the self-study module on learning transfer is to teach learners how individuals having taken part in a training course on promoting digital transformation in an organization, for example, can put the skills they have acquired into practice in their organization or workplace. The possibilities and limits of learning transfer depend on the respective context, e.g. the training and the subsequent field of application. In this self-learning module, this context is characterized by the desire to promote digital transformation in organizations. The concept of the learning factory (Abele et al. 2010, Heinze et al. 2021, Sudhoff et al. 2020, Kröll, 2021) or teaching factory approaches (Kröll et al. 2023c) is seen as a methodological concept for teaching and acquiring the relevant and necessary skills in relation to digital transformation.

The starting point for this module is the typical problem situations with which the responsible stakeholders are confronted in relation to learning transfer issues in the context of digital transformation. After the difficulties of transfer-oriented learning have been worked out using typical problem situations, the relevance of the learning transfer problem is highlighted. This is followed by chapters on transfer-orientated training design, effects of learning transfer and influencing factors. A distinction is made here between the influences of the environment, the learners and the training design. In order to be able to apply the content described, methods for increasing learning transfer are also focussed on. The module concludes with a summary of all the chapters and finally offers a series of tasks for the learner to check the competences acquired. Suggestions for possible solutions to the tasks can be found in the appendix.

The decisive question is which resistances and which potentials exist with regard to the transfer of learning and how the resistances can be dealt with and the potentials utilized. It should always be borne in mind that resistance and potential vary greatly depending on the respective problem situation and the respective organization-specific context. The task of the digital coach could be to capture these organization-specific circumstances in a sufficient form and with a reasonable amount of effort.

### 0.3. Target group of the self-study module

The target group of the self-learning module includes all stakeholders who are responsible for the skills development of organizational members so that they have the opportunity to acquire the skills required for the digital transformation and use them in their organization and at their workplace. This task can be taken on by the respective organizational member themselves, but also by managers and/or those responsible for personnel development in the organization, but is viewed overall as a holistic task of the organization (Müller & Soland, 2009). At the same time, this task can be taken on by the internal digital coach, who is a member of the organization, or by an external digital coach (Kröll et al. 2023a, Kröll et.al, 2023b). The latter can be a freelance trainer and/or a member of the relevant Chamber of Industry and Commerce or Chamber of Crafts.

## 1. Starting point

### Learning objectives

#### The learners can ...

- ... explain the challenges of digital transformation.
- ... name typical problems that occur in the context of learning transfer.
- ... describe the learning factory approach in terms of learning transfer.
- ... explain the learning factory as an alternative approach to teaching skills that are relevant to the digital transformation.



#### Key question

What are the challenges of digital transformation?

### 1.1. Typical problem situations in the context of digital transformation

The first question to be clarified is what features characterize the problem situations when it comes to digital transformation and the use of IT and AI solutions in organizations (Hoberg et.al, 2018, Krcmar, 2018, Oswald





& Krcmar, 2018, Rogers, 2023). It would also be necessary to work out whether there are typical, e.g. frequently recurring problem situations. When working out the characteristics and typical problem situations, attention should be paid to the relevance of these with regard to the learning transfer problem. Problems arise due to ...

- ... **an increasingly complex and uncertain future:**

Constant changes in the world of work present employees with new challenges. In digital and technical areas in particular, technological developments are unpredictable (Kröll, 2020). These challenges also place new demands on training and skills development measures. For example, future development measures must impart competences that are also useful to employees with regard to uncertain changes and requirements.

- ... **an ever faster pace of change:**

It is well known that technological progress is advancing at an ever-increasing pace (Rogers, 2023). However, the associated changes to skills development are often ignored. Development measures should tie in with changes and impart competences that help employees to react to rapid changes.

- ... **the lack of or insufficient acceptance for the use of a digital solution**

As a rule, the use of newly acquired skills also has an impact on the stakeholders with whom the learner works, be it the supervisor, colleagues, employees and, if applicable, the customers and suppliers of the respective organization. A prerequisite for the successful transfer of learning is that the necessary acceptance (Kohnke, 2015, Venkatesh & Bala, 2008, Kollmann, 1999) exists among the stakeholders affected by the use of the competences.

In this context, it is of central importance to convince the members of the organization and, in particular, the management of the introduction of new digital solutions if the use of the newly acquired skills is also associated with the use of new IT or AI solutions. This is a prerequisite for increasing the likelihood of acceptance and effectiveness of the digital solution in the organization (Venkatesh & Bala, 2008). However, for various reasons, it can be difficult to generate interest in the introduction of a new digital solution. Members of the organization may not see the benefits and advantages of a digital solution. In addition, they may not realize to what extent it makes sense to invest the necessary financial and time resources to implement the digital solutions.



In addition, the effects of using digital solutions can or will only become visible after a certain period of time. A certain degree of patience on the part of the company's managers is therefore advantageous in this respect.

However, it is not only the promotion of digital transformation in companies that leads to problems or typical problem situations. Rather, certain challenges are also associated with the skills development measures that are intended to create the conditions for the digital transformation to succeed. These can be ...

- ... **the inadequate visualization of the learning content**

One problem is that the content taught during the training is too theoretical and not practical enough. For example, too few practice-orientated tasks are mentioned and explained during the training to illustrate the content clearly.

- ... **the lack of support in the workplace**

The possibilities and limits of learning transfer depend on the respective environment in the company in which the newly acquired skills can or should be implemented or utilized. For example, the necessary changes may be rejected at departmental or team level. As a result, the newly acquired competences are ultimately not applied.

- .... **the lack of motivation of the organizational members concerned**

Organizational members who have taken part in learning activities to promote digital transformation lack the motivation to apply and use the newly acquired skills in the work context.

- .... **the inadequate design options in the workplace**

In addition, the members of the organization concerned are not given the necessary freedom to implement the newly acquired skills by their superiors, for example.

## 1.2. Case studies

### First case study



A participant in a training programme who has dealt with new digital solutions and qualified the participants accordingly returns to his medium-sized company. There, he is initially very motivated to convince the other colleagues of the newly acquired ideas in order to drive the digital transformation in the company forward profitably. He tells them about the possibility of digitizing invoices and accounting by installing a simple administration system on their computers and sending invoices to customers in PDF format. The colleagues and management are in favour of this idea. The following week, the organization member who has acquired the relevant skills tries to set up the system on the computer in order to enter the accounting data digitally. However, he realizes that the operating system used in the training was completely different, which is why he now does not know how to install the administration programme and enter the data. Fortunately, he quickly finds a more technically experienced colleague who can help him set up the programme. The first few weeks with the new system go well, but there are still a few colleagues who do not want to support the application of this innovation and continue to issue and file invoices in paper form only. The colleagues, who were very motivated at the beginning, are infected by this aversion to the new system and ultimately also stop digitizing the invoices, which is why the company has returned to the old, paper-based system one year after implementing the new administration system.

### Second case study

A generational problem can occur, particularly in small and medium-sized companies. For example, in a small family business, the son of the family can take part in further training activities on digital transformation and is expanding his skills in this area with the help of various training courses. The company is an architectural firm with around 60 members. The training focussed on agile project management methods, with an emphasis on learning about the Scrum method and its possible applications. Now the son would like to implement the new skills in the company and make parts of the value creation process in the family business more agile. However, the father, who manages the company together with the son, feels that the new skills acquired by the son are not very helpful and sees no need to use them in the company, as things have always gone well in the company in the past without these skills. The father therefore opposes the implementation of the son's new ideas. At the same time, the son has realized that he cannot easily implement the new skills relating to agile management methods in the company. The son is subsequently very frustrated. He asks himself why he should continue his training at all in the future.

## 1.3. Alternative concepts for skills acquisition: the learning factory or teaching factory approach



### Key question

What criteria must be taken into account in a learning factory with regard to learning transfer and quality?

With regard to the problem of learning transfer, it is crucial how the training is organized. The following needs to be clarified: What are the learning objectives of the learning unit or training course? What content is addressed? Which methods are used? Who is the target group of the learning unit? Who moderates the teaching-learning process or the corresponding events? How are the objectives or the acquisition of the relevant competences checked with the help of the respective teaching-learning activities?

The learning factory or teaching factory approach is a special way of promoting the acquisition of new skills that are particularly relevant for digital transformation in organizations. A learning factory is defined as "... a place with a realistic production environment, real products and direct access to new production processes and conditions" (Initiative of European Learning Factories, 2013). It goes on to say: "This enables problem- and action-orientated learning and offers the necessary freedom to explore new approaches."

In addition to the simulation of real value creation processes, the learning factory is particularly concerned with the active involvement of learners. There are also the prerequisites for interactive collaboration between teachers and learners (Abele, et al. 2017). Both formal and informal learning take place in the learning factory. In particular, learning takes place close to the workplace and learners can gain practical experience in relation to new technical developments (Heinze, et al. 2021).

The answers to the following questions may provide initial indications of quality criteria for the learning factory:

- To what extent does the learning/teaching factory offer the opportunity to gain new technical experience?
- To what extent is not only explicit but also implicit knowledge picked up, passed on and built up with the help of the learning/teaching factory?
- To what extent does the learning/teaching factory offer the opportunity to achieve a higher level of reflection on digital solutions?
- To what extent does the training concept of the learning/teaching factory support the transfer of the skills acquired into the world of work?



Against this background, the topic of learning transfer effectiveness plays a central role in the context of learning units in the learning factory. This topic is therefore of particular relevance for the further development of the learning factory concept.

In the learning factory, realistic production environments are presented that are used for vocational training and research (Wagner et al., 2015). Learning factories are often located in large production facilities of various companies or at universities. Ruhr-Universität Bochum also uses a learning factory for research and teaching purposes. Within various workshops and teaching units, skills can be acquired in relation to the question of how the use of robotics changes and enables the automation of production systems, for example. Important safety standards, the advantages of human-robot collaboration, trying out different ideas and using the learning factory as a "playground" also play a relevant role here. Participants will then test what they have learnt in various production projects.

The number of learning factories has increased enormously in recent years, and not only in Germany (Heinze et al. 2021). Learning factories are now standard at technical universities in Germany in particular. They were initially generated and developed in the context of engineering didactics and methodology (Pittich & Tenberg, 2020). Learning factories offer skills acquisition in a special way (Pittich & Tenberg, 2020). According to their understanding, a person has competences if they not only have theoretical knowledge, but also act on it. In this sense, learning factories play a particularly important role in building competences. According to Pittich and Tenberg (2020), reflective action has two facets: 1. the development of the ability to act requires learning by doing and 2. the development of independence requires learning by understanding. Learning factories offer the opportunity for action-based and comprehension-based learning. Consequently, the advantage of learning factories is that the respective learners can gain new experiences in the sense of learning by doing and learning by understanding in relation to selected technologies. It is known from empirical studies that the experience of technology has a particular influence on the acceptance of a technology and thus the use of the technology (Kohnke, 2015). In addition, the concept of the learning factory offers the opportunity for the respective actors to acquire both explicit and implicit knowledge. This is based on the findings of empirical studies, which state that 60-80 % of relevant knowledge in the workplace is tacit knowledge (Kröll, 2020).



### Example of a group task in the learning factory



Specifically, for example, the Learning Factory at Ruhr University Bochum works with the Quick Check method (Kuhlenkötter & Hypki, 2020). The aim is to carry out a quick and objective assessment to identify the potential of human-robot collaboration. This assessment should take no longer than one hour to complete and the quick check method should be generally accepted within the company. The check should be easily adaptable, expandable and modifiable and should be particularly suitable for existing and future assembly workstations. For this purpose, there is a catalogue of questions with exclusion criteria relating to the extent to which an assembly scenario is suitable for human-robot collaboration. The method can be carried out in group work, for example, so that participants gain an overview of the collaboration potential within a short space of time. This example can be used to explain that the concept of the learning factory is a central tool for developing the necessary competences for the constantly progressing changes due to the digital transformation. This creates opportunities for active and understanding learning.

However, there are also limits to the utilization of the learning factory concept. Here are just a few examples. One of the challenges of the learning factory or teaching factory is that not every company or university has the resources or access to one. This means that the learning factory as an alternative form of learning in the context of digital transformation cannot be used by all companies in the same way. It is therefore important to look for and test other alternative forms of learning. It also became clear that ensuring the transfer of acquired skills from the learning environment to the workplace is a key problem. In the further course of this self-study module, additional methods for increasing the transfer of learning will be presented so that this module can be widely utilised.

## Summary

- ... The digital transformation poses new challenges for organizations and their HR development.
- ... In every organization there are inhibiting and conducive aspects to learning transfer.
- ... In the context of the alternative concept of skills development of the learning factory, the problem of learning transfer effectiveness arises anew.
- ... When implementing and evaluating learning units that are carried out in the context of learning factories, certain quality criteria must be taken into account.

## Exercises

1. What could be inhibiting or promoting aspects of learning transfer in your organization?
2. How could the inhibiting points sensibly be dealt with?
3. To what extent can learning factories be used as alternative approaches to teaching skills that are relevant to the digital transformation? What are the opportunities and where do you see challenges?

## 2. Relevance and embedding of learning transfer in the training context

### Learning objectives of this chapter

The learners can ...

- ... differentiate between the various characteristics of learning transfer.
- ... explain the characteristics of the transfer gap and apply them in everyday situations.
- ... recognize the influence of learning transfer on the learner's work design.
- ... name and explain factors influencing the transfer of learning within a person, from the training and from the working environment.
- ... explain what constitutes a suitable time for the transfer of learning.



### Key question

What are the defining characteristics of learning transfer?

## 2.1. Characteristic features of learning transfer

In this self-learning module, transfer of learning is understood as the degree to which the competence acquired during competence development activities is transferred to the work process and results in significant changes in work performance (Blume, et al., 2010). Kauffeld and colleagues (2008) define learning transfer as "the application and generalization of new knowledge and skills at work" (p. 50). This raises the question of the success of skills development activities, i.e. the extent to which these measures contribute to more effective and efficient work in order to ensure the quality of the corresponding products or services. In this context, it is also about the justification and rationale for these measures: Are the skills development activities justifiable at all in light of the expected benefits and the effort required?

Empirical studies indicate that only 12 to 15 per cent of what is learnt in training is transferred to the work context (Baldwin & Ford, 1988; Khasawneh, Bates & Holton, 2006; Weinbauer-Heidel, 2016; Hall et al., 2014). The results show that the transfer of acquired skills is unsuccessful in around 85% of cases. Of these, attempts are made to apply the competences in around 70% of cases. However, the application is withdrawn due to the obstacles encountered. In around 15% of cases, learners do not attempt to use the new skills at all.

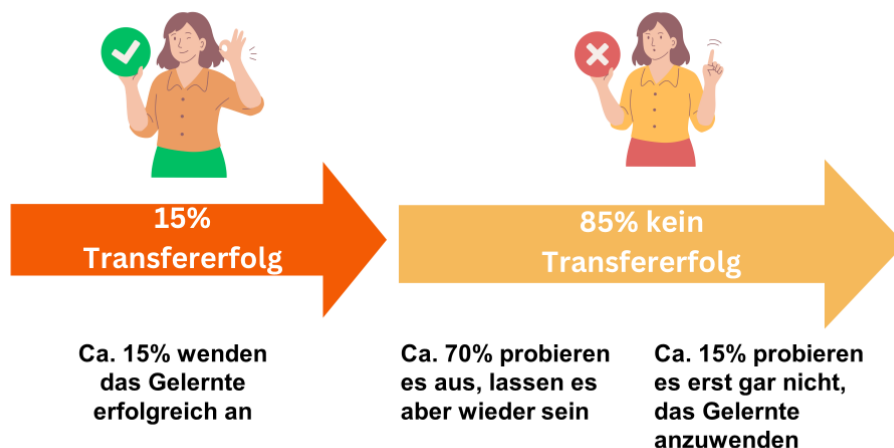


Fig. 1: Transferring what has been learnt into practice (based on Weinbauer-Heidel, 2016; Hall et al., 2014).

Why are the competences applied in some cases and not in others? One obvious explanation for this is that greater attention is paid to the transfer of learning in some training programmes, while this factor may be less important in other further training measures (Weinbauer-Heidel, 2016). This finding suggests that the



factors that promote and inhibit the transfer of what has been learned into everyday working life should be taken into account when designing training if the benefits of investing in training are to be maximised. This benefit or learning transfer is influenced by learner characteristics as well as the working environment and the training design (Blume et al., 2010; Burke & Hutchins, 2007). On the learner side, factors such as pre-existing skills and abilities, motivation, self-efficacy and personality play a major role. The working environment is characterized by social support (e.g. from superiors, colleagues or management) and opportunities to try out and apply what has been learned in training in everyday working life (Blume et al., 2010; Burke & Hutchins, 2007). A training design is based on various learning principles, time structures and training content, among other things. The content conveyed in the training leads to a more or less strong increase in knowledge, skills and abilities as well as to a change in attitude (Baldwin & Ford, 1988). In addition, a correlation between training intervention methods, such as goal setting and an optimistic attitude, and successful transfer has been demonstrated (Blume et al., 2010; Burke & Hutchins, 2007). This is where the question of learning transfer comes in, i.e. the extent to which these learnings can also be transferred to everyday working life and the workplace and applied there. The influencing factors are discussed in more detail in Chapter 3.

## 2.2. Impact of learning transfer: possible reorganization of areas of responsibility



### Key question

What influence does learning transfer have on the learner's work organization?

It should also be noted what consequences the use of the newly acquired competences has on the learner's working environment in terms of positive learning transfer. First of all, the resulting changes in the behaviour of the relevant members of the organization, if the newly acquired skills are to be implemented in the work environment, entail a **change in the learner's area of responsibility**. Not infrequently, this also has an **impact on** the work areas of the organization member's **colleagues**. **The** reassignment of the organizational member's area of responsibility can pose a challenge for the respective manager, as they have to organize the associated new assignment of tasks. The use of newly acquired skills and their transfer and integration



from the learning environment to the working environment is at the centre of the learning transfer problem (Kauffeld, S. (2016).

- **Competences of individual and collective actors**

In this context, however, it is not only about the use of individually acquired competencies, but also about the competencies of the organization in the sense of task fulfilment routines (Doz, 1996, Kröll, 2020). This can have a double effect: On the one hand, the use of acquired individual competencies can lead to a change in existing task performance routines in the organization or workplace, and on the other hand, new task performance routines can be acquired during training and then subsequently integrated into the organization. The latter can be achieved by replacing the existing task fulfilment routines in whole or in part and/or by supplementing, expanding or further developing the existing task fulfilment routines with the new ones. The transfer of new skills, e.g. in the sense of individual skills or integrated task fulfilment routines (as organizational skills), generally requires a readjustment of the relationship between technology, personnel and organization. Based on the promotion of digital transformation, it is advantageous to consider the interaction of the relevant personnel, organizational and technical dimensions.

- **Socio-technical approach: interaction between personnel, organization and technology**

In this context, it is particularly beneficial to address the relevant personnel, organizational and technical dimensions and their interaction with the digital transformation in organizations. The mutual influence of personnel, organization and technology can be interpreted as a complex reciprocal system (Herrmann & Nierhoff 2019; Hirsch-Kreinsen 2018). The design of this system is at the centre of the corresponding socio-technical process design approach. The intention of process design is to analyze the reciprocal relationships in this system and to shape these relationships (Herrmann 2012). The decisive factor here is that the promotion of digital transformation is not just about technical aspects. Rather, the focus is on optimizing the interaction between technology, personnel and organization. This makes it clear how important it is to further develop the skills of the members of the organization and the organization itself. A key point for this to succeed is that the skills acquired are also applied in the work context and that the transfer of learning is successful.

- **Learning transfer problem: the transfer gap**

In order for the transfer of skills to be successful, they must be embedded in the existing organizational conditions, including the respective value creation process and the respective distribution of tasks among the members of the organization. If this is the case, it leads to the (further) development of the organization

(Kauffeld, 2016). Ensuring the transfer of learning is a quality feature of successful skills development activities. The extent to which the latter can be organized in a transfer-oriented manner (Lemke, 1995) is explained in the following sections.

In order to clarify the learning transfer problem, it is useful to refer to the transfer gap (see Figure 2). One of the aims of the preparation and implementation of a training course is to ensure that the skills acquired in the training course are later implemented in the organization and in working life (target state). Here too, the distinction between individual and organizational competencies must be taken into account. Unfortunately, it is not uncommon for the respective organizational members who have acquired the competencies to be only partially successful in implementing some of these competencies in their working lives (actual state). The difference between the actual and target state leads to a transfer gap. The next step is to clarify the reasons why this transfer gap occurs. Influencing factors are explained in the next chapter in order to shed light on the possible factors of a transfer gap.

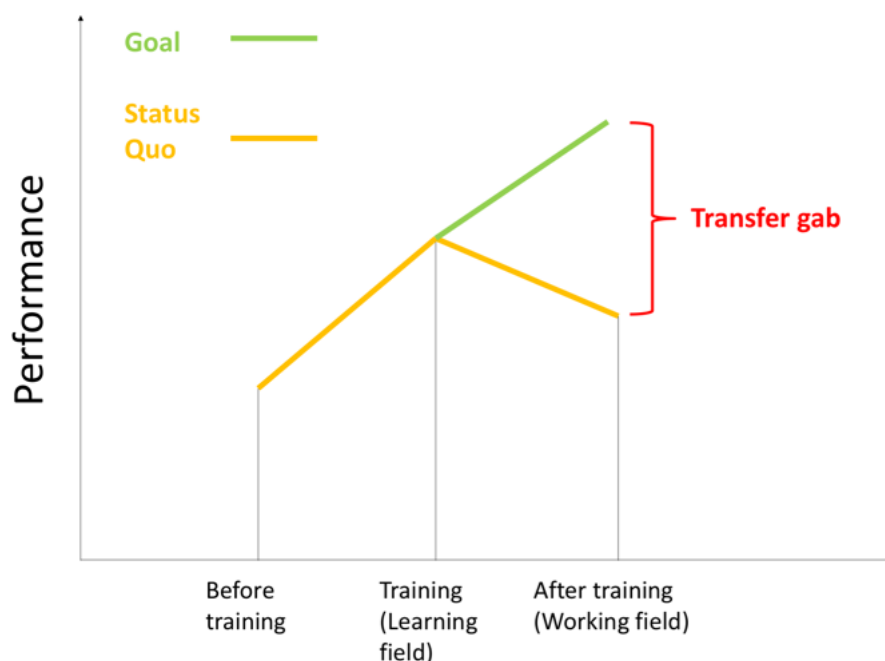


Figure 2: Performance level before, during and after training (own illustration based on Bethke, 2003) ].

- **Overview of factors influencing the transfer of learning**

The following sub-chapters focus on possible factors influencing a transfer gap. In transfer research, a distinction is made between process-orientated and product-orientated approaches (Baldwin & Ford, 1988). A process-oriented approach, which is focussed on in the following section, considers all transfer determinants in interaction. Factors at training, individual and organizational level are examined. In a study, Gnefkow (2008) identifies a large number of potential transfer determinants. In the empirical study, determinants relating to participant characteristics such as learning ability and intrinsic learning and transfer incentives proved to be particularly important. With regard to the training design, the learning content proved to be the most important factor for transfer success, followed by the methodology and media used as well as factors relating to the group of participants and the trainer. With regard to aspects that can be attributed to the organizational or working environment, the social environment and the influence of superiors proved to be important determinants. Gnefkow (2008) describes in his model (see Fig. 3) that these determinants can hinder or favour learning success and thus have an influence on transfer success.

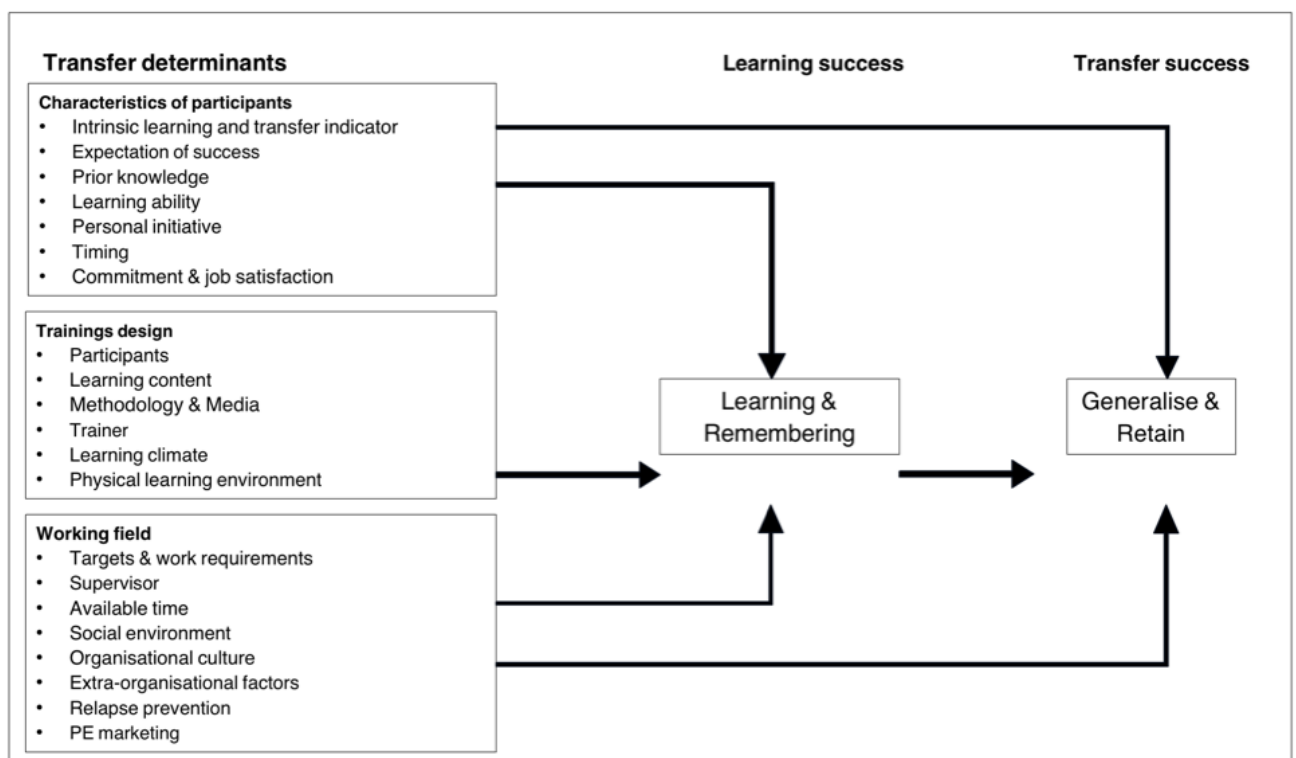


Figure 3: Modified transfer process model (Gnefkow, 2008; Baldwin & Ford, 1988)

In addition to the study by Gnefkow (2008), Kauffeld and colleagues (2008) also analyzed influences on transfer success. This study contains data from a total of 13 different organizations from consulting, further education, the packaging industry, the automotive (supply) and electrical industries, public and social institutions and a company that sells tradesmen's supplies. The study analyzed which factors of technical and interdisciplinary training, e.g. leadership, sales and moderation training, significantly influence the transfer of learning. In total, they identified 17 variables that had a more or less strong influence on learning transfer (see Table 1). Learning transfer was measured in three ways, firstly as an individual increase in performance, secondly as the number of steps transferred from the training into practice and thirdly as the average degree of transfer from the training into the work context. Table 1 shows the significant influencing variables, which are explained in more detail below.

	<b>Individualised performance enhancement</b>	<b>Number of steps implemented</b>	<b>Degree of realization</b>
<b>Distance</b>	No connection	Positive correlation	No connection
<b>Clarity of expectations</b>	Positive correlation	No connection	No connection
<b>Motivation for learning transfer</b>	Positive correlation	Positive correlation	Positive correlation
<b>Transfer design</b>	No connection	Positive correlation	No connection
<b>Sanction by the superior</b>	No connection	Negative correlation	Negative correlation
<b>General self-efficacy conviction</b>	No connection	No connection	Positive correlation
<b>Improving performance through effort</b>	Positive correlation	No connection	No connection
<b>Feedback</b>	Positive correlation	No connection	No connection

Table 1: Variables influencing transfer success (based on the results of the Kauffeld et al. study, 2008)

In the study by Kauffeld and colleagues (2008), it can be seen that clarity of expectations, motivation to transfer learning, performance improvement by effort and feedback are significant predictors of individual performance improvement after training. In addition, the variable "number of steps taken" was found to be a significant predictor with a positive correlation between the time interval from training, motivation and transfer design. At the same time, Kauffeld and colleagues demonstrated that a sanction by superiors is negatively associated with the number of steps implemented as well as with the degree of implementation. This negative correlation can be explained by the fact that participants in a training programme are less likely

to apply what they have learned if the implementation of what they have learned is negatively assessed or sanctioned by their superiors. The variables motivation and general self-efficacy conviction are also significant predictors of the degree of implementation. In general, the success factors should be considered and planned for before designing or implementing a skills development programme. Recommendations for action can be derived from the individual determinants to help close the transfer gap.

Overall, it can be seen that the learning transfer determinants can be summarized in three categories: (1) on the part of the participants, (2) the training and (3) the working environment. The respective categories are characterized by different features, which are discussed in the following subsections.

### 2.3. Influencing factors on the part of the learner



#### Key question

Which individual factors have an influence on the transfer of learning?

The same skills development measures do not lead to the same success in acquiring and applying new skills for all participants. One of the reasons for this is that different participants have different prerequisites. The prerequisites that learners and teachers bring with them in terms of the target group system according to the Cologne Structural Model for Business Didactics are decisive for the design of skills development activities (Kröll, 2020). According to Kauffeld et al. (2008a) (Kauffeld, 2016), the characteristics of motivation to transfer learning, general self-efficacy conviction and performance improvement through effort on the learner's part have a significant influence on the success of training. Hatz and colleagues (2022) also cite personal transfer capacity, transfer motivation and self-efficacy as important factors influencing learner transfer. A meta-analysis by Blume et al. (2010), which explored factors influencing learning transfer on the basis of 90 empirical studies, shows similar results. They also identified (1) self-efficacy beliefs, (2) motivation and additionally (3) learning goal orientation, (4) cognitive abilities and (5) professional commitment as predictors of transfer retention.

Gnefkow (2008) investigates the fundamental influence of the participants' characteristics on transfer success and finds that it is of great importance for the participants' learning and transfer process which aspects they themselves consider important for transfer. The characteristics of the participants can only have



a favourable influence on transfer success if they are aware that their personal characteristics have an impact on transfer success.

### 2.3.1 Motivation for the transfer of learning

The motivation to transfer learning describes the "direction, intensity and duration of the effort to utilise skills and knowledge learned in training in the work environment" (Kauffeld et al., 2008a, p. 53). Highly motivated people look forward to trying out what they have learnt in their work. Hinrichs (2016) examines the transfer motivation of participants **during** further training, in contrast to other studies which often look at transfer motivation following further training. It turns out that transfer motivation remains at a high level throughout a training programme and only decreases minimally. Two components were identified which together are responsible for 25 per cent of the small change in motivation described during further training: These are the **attitude of the manager** and the **transfer situation in the workplace**. In addition, Hinrichs (2016) came to the conclusion in her empirical study that the transfer of content from further training to the workplace begins in the middle of the implementation of the further training measures. According to Hinrichs' (2016) study, the transfer orientation of the training, the transfer motivation of the participants, the transfer situation, the transfer climate in the team and the transfer support provided by the manager are cited as supporting elements for this. Finally, it is pointed out that it is useful to evaluate transfer success during the course of the training programme in order to identify possible barriers that hinder or prevent transfer success.

### 2.3.2 Self-efficacy

Self-efficacy beliefs describe a person's conviction that they are generally able to change their performance if they want to (Kauffeld et al., 2008a, Hartz et al. 2022). Bandura (1993) explains that self-efficacy describes confidence in one's own abilities and also how people feel, think and motivate themselves. Bandura (1993) differentiates between four different processes: (1) In the context of cognitive processes, the author describes that the higher a person's self-efficacy beliefs, the higher the goals they set themselves and the greater their commitment to achieving them. People with low self-efficacy beliefs are more likely to imagine failure scenarios in which they fail, whereas people with high self-efficacy beliefs imagine success scenarios. Accordingly, perceived self-efficacy influences performance directly and through the effects on a person's goal setting.

(2) The motivational processes influence which goals a person sets for themselves, how much effort they invest and how resilient they are in the face of difficulties or failure. If the level of self-efficacy conviction is

low, most people give up quickly as soon as they are confronted with failure. However, when self-efficacy beliefs are high, most people find it easier to tackle challenges and make a greater effort.

(3) Affective processes describe the extent to which self-efficacy beliefs influence the level of perceived stress and emotions. Self-efficacy beliefs are particularly relevant here, as the perceived control over the stressor depends on self-efficacy beliefs. People with a high level of self-efficacy have a stronger sense of control and a correspondingly lower level of arousal, while the opposite is true for people with a low level of self-efficacy.

(4) The fourth process, the so-called selecting process, is that people have the choice to select certain processes in the course of their lives. This selection naturally has an impact on a person's interests, networks and competences, which in turn can have a significant influence on their personal development. This also includes career choices and personal development. The higher the level of self-efficacy conviction, the more interest and career options a person has.

In relation to further training measures, a high level of self-efficacy can have a positive effect on the transfer of learning (Weinbauer-Heidel, 2016). Reasons for this can be: Individuals are more open to goals and new opportunities, and they are more resilient to setbacks. Participants with high self-efficacy expectations are therefore more confident in applying the new skills learnt during training in the workplace and are usually more convinced that they can complete even challenging tasks.

### 2.3.3 Individual effort

Individual effort refers to the "expectation that efforts in transfer learning will lead to changes in work performance" (Kauffeld et al., 2008a, p. 54). People with a high level of individual effort are therefore convinced that their work performance will improve if they also apply what they have newly learnt in the work context. This transfer determinant is positively related to self-efficacy expectations, among other things (Gnefkow, 2008, Kauffeld, 2016).

## 2.4. Influencing factors on the part of the training



Key question



## Which training factors influence the learner's success?

The respective design of a training course or learning unit offers the teacher, i.e. the training instructor or lecturer, many opportunities to influence the transfer of learning either positively or negatively (Weinbauer-Heidel, 2016). Particular attention must be paid to the transfer design and the consistency of the training and working environment. According to Kauffeld et al. (2008a), the training design has a particularly strong influence on the success of training (Hinrichs, 2016).

### 2.4.1 Transfer design

The transfer design describes the extent to which the training design offers opportunities for transfer and the extent to which the training exercises prepare for the actual work requirements (Weinbauer-Heidel, 2016; Kauffeld et al., 2008a). This means, among other things, that the trainers use many examples to show the trainees how they can apply what they have learnt at work. At the same time, it would be advantageous if the participants were given the opportunity to apply the acquired competences - in whatever form - during the training. This offers the opportunity to take the first steps together with the learners, increasing the likelihood that the skills will be utilized later on. The aim is to ensure that learners are not left alone with the task of applying the competences in the workplace, for example. In addition, during the implementation of the skills development measures, problems and/or resistance that may arise during the utilization of the newly acquired skills can be discussed and solutions can be jointly developed. These measures should make it easier for learners to apply what they have learnt in their everyday working life.

It is advantageous if, when implementing skills development measures, thought is already given to how the skills can later be used in the working environment. This applies not only, but especially, to measures designed to promote digital transformation in organizations. 2.4.2 Matching the training and work situation

With regard to the potential for links between the training and work environment, the decisive factor is the extent to which the training situation matches or is largely similar to the situation in the workplace, in particular the corresponding requirements (Kauffeld, 2016; Griefkow, 2008; Grossmann & Salas, 2011). This includes, for example, that the learning content of the training and the tasks in the workplace can be related to each other or that there is the opportunity to build on the learning content in the workplace. In addition, the transfer can be strengthened if the training design, including the methodology used, is comparable with the professional situation or if there are parallels between the two situations.

Efforts to transfer learning in relation to the learning factory approaches (Abele et al., 2017) or the concepts around the teaching factory approach (Kröll et al. 2023c) can build on these considerations. For example, the learning factory offers the opportunity to acquire new skills in a real production environment. These conditions could be comparable to the later situation in the workplace. If the training situation is largely the same or similar to the later working environment, it makes it easier to apply the skills acquired in the learning factory.

## 2.5. Influencing factors on the part of the working environment



### Key question

Which work environment factors influence the learner's success?

Not only does the similarity between the work and learning situation play an important role, but the other conditions present in the work situation in the work environment can also tend to promote or hinder the transfer of learning (Grossmann & Salas, 2011). According to Kauffeld et al. (2008a), the characteristics of clarity of expectations, sanctions by the supervisor and feedback have a significant influence on the success of training (Gnefkow, 2008).

### 2.5.1 Clarity of expectations

Clarity of expectation describes the extent to which the trainee knows what to expect. A positive attitude towards a competence development programme is positively related to transfer success. Against this background, it is advantageous when organizations and supervisors see it as their task to prepare participants for a development measure (Koch, 2023).

### 2.5.2 Feedback

Feedback describes the informal and formal feedback on the trainee's individual work performance at work. This includes feedback from both superiors and other colleagues. In particular, support and feedback from colleagues results in increased motivation to transfer and this has a positive effect on the performance of the learning transfer (Bossche et al., 2010).

### 2.5.3 Sanction by superiors

Sanctions by superiors describe the extent to which trainees perceive negative reactions from their superiors when they apply what they have learnt in training. This includes, for example, that the supervisor may be against the application of new working methods that the trainee has learnt during training. This can manifest itself in a negative attitude on the part of the line manager, but also in doubts about the efficiency of the new method that the trainee is trying to apply. Consequently, managers and supervisors are assigned a key role in promoting the transfer of learning (Blume et al., 2010).

## 2.6. The right time to promote the transfer of learning



### Key question

When is the right time to promote the transfer of learning?

As already explained, the transfer determinants in this self-learning module are interpreted as process-orientated. Against this background, the question of when is the right time to start promoting learning transfer is investigated. In an empirical longitudinal study, Hinrichs (2016) examines one of the most important factors for transfer success, transfer motivation. In this study, contrary to the approach used in most other studies, transfer motivation was evaluated during continuing education.

Hinrichs (2016) conducted her empirical study at three survey points: The first before the competence development (KE) measure, the second during the training and the third at the end of the training. The study was conducted with a large training provider. In terms of content, the competence development measure focussed on the topic of "project management". In the empirical study by Hinrichs (2016), 290 people took part in the first survey, 271 in the second and 242 in the third. The KE programme comprised a "kick-off" day, 10 attendance days and a certification. The attendance days were spread over 3-4 block events. The qualification programme itself lasted approx. 4 months. The empirical study does not objectively measure learning transfer. Rather, the results are based on the self-assessment of the learners, e.g. in relation to their motivation to transfer learning and the realization of the learning transfer. As the interviewees were working adults, Hinrichs (2016) assumes that they are capable of a realistic self-assessment (Gessler, 2012).

Hinrichs comes to the overall conclusion that the focus of learning transfer should be changed. It would fall short of the mark if only the end of further training activities were primarily considered in order to promote

transfer. Rather, it would be premature to start transferring learning during the implementation of the CE measures. To make this clear, Hinrichs (2016) also speaks of collateral learning transfer or parallel learning transfer. This means that the skills acquired are applied in the workplace during the course of the training programme (in this specific case, this took place over a period of around 4 months). In contrast, traditional or sequential learning transfer only takes place after the end of the training programme. Only then are efforts made to promote the application of the skills learnt in the workplace.

The results of the empirical study by Hinrichs 2016 thus suggest that it is advantageous to start thinking about and developing strategies to promote learning transfer during the EC measures. At the same time, it does not appear to make sense to measure or assess the success of learning transfer at a later stage. However, this approach is sometimes suggested in the corresponding scientific debate. It is pointed out that it is only three months later, for example, that learners have the opportunity to utilize the skills they have acquired in the workplace (Leitl & Zempel-Dohmen, 2006).

In her empirical study, Hinrichs (2016) comes to the conclusion that transfer motivation only decreases to a small extent during further training. The author identifies two factors that contribute to transfer motivation changing during the training programme, i.e. decreasing slightly, by the end of the programme: Attitude of the manager and the transfer situation at the workplace. The study shows that the influence on transfer success can already be determined during further training and that the possible transfer barriers in the workplace can be determined at an early stage (Hinrichs, 2016). The factors identified that have a positive influence on learning transfer can serve as quality criteria for the selection of competence development (CD) measures. Measures that fulfil these criteria better than other CD measures can be given preference. If it is recognized that the CD measures will not meet these requirements, they can be discontinued. This also applies to measures offered in the learning factory.

## 2.7. Outlook: Boundaries and open questions

When discussing the problem of learning transfer, it is often pointed out that managers and supervisors should take on an active role. In this context, however, it should be noted that managers often only have limited methodological and didactic expertise. In addition, their time resources are often limited. Furthermore, they often lack knowledge of what specific skills the members of the organization have acquired and to what extent these specific skills can be used at all.

Ultimately, the suggestion that managers should take on new tasks with regard to transfer promotion should be interpreted as a shift in the problem. It is actually the task of the lecturer or teacher to take care of the learning transfer problem. Especially as they often have the methodological and didactic skills to organize their training in a way that promotes transfer.

In the meantime, empirical studies, including corresponding meta-studies, have more or less proven which factors favour the success of learning transfer. Ultimately, the corresponding approaches to uncovering success factors have reached their limits. Reference can also be made to the considerations of Nicolai & Kieser, (2002): They point to the unsuccessfulness of success factor research. If the implementation of competences in the workplace is interpreted as an innovative project, then the possibilities and limits of implementation always depend on the respective context. However, this context cannot be taken into account by referring to generally applicable success factors for the promotion of learning transfer. Against this background, it makes more sense to work out the specific resistances and potentials that hinder, prevent or enable learning transfer based on the respective context. The more concretely this is done, the more likely it is to enable and promote learning transfer.

In addition, the focus of previous efforts and discussions on the problem of learning transfer has been on the competences of individual actors. How the transfer of organizational skills, i.e. the establishment of new integrated task fulfilment routines, succeeds remains unclear.

## Summary

... The transfer gap is the difference between the generally low level of application of what has been learnt (actual state) and the optimal application of the new skills (target state).

... Relevant factors influencing learning transfer success are: participant characteristics (motivation, self-efficacy, individual effort), the training design (transfer design, match between training and work situation) and the working environment (clarity of expectations, feedback, sanctions by superiors).

## Exercises

1. Describe the transfer gap.
2. Name the three categories of transfer determinants and categorize 4 determinants that you know from your work context.
3. In your opinion, which transfer determinants are easy or difficult to change? Give reasons for your answer.

4. To what extent are transfer determinants, learning and training transfer related?

## 3. Methods to favour the transfer of learning

### Learning objectives of this chapter

The learners can...

- ... describe interventions how the transfer of learning can be positively influenced by the learner, the trainer and the working environment.
- ... describe the transfer strength method and explain how it can have a positive effect on the transfer of learning.

The three areas of influencing factors presented above (participant characteristics, training design and working environment) can now be organized in a specific way to promote the transfer of learning from training to the working environment.

### 3.1. The learners



#### Key question

How can the learner positively influence the transfer of learning?

The following interventions can be carried out by learners (Weinbauer-Heidel 2016):

- It makes sense for learners to start by concretizing their further training goals and to gain clarity about their motivation in relation to the later transfer of their skills. In this context, they could, for example, ask the other learners how they motivate themselves to apply their newly acquired competences later on.
- If the learners are pursuing the goal of increasing the success of the transfer of their acquired competences, then it is advantageous if the learners check how strong their self-efficacy conviction

is. The more pronounced this is, the more likely they are to succeed in positively influencing the transfer of learning.

- If they recognize that their self-efficacy conviction is comparatively low, they could try to increase it through appropriate activities. For example, they could make a "contract with themselves" to make transparent for themselves what they have achieved.
- A further starting point would be for learners to try to obtain constructive feedback from work colleagues, other training participants or their superiors in order to reflect together on the possibilities and limitations of applying the newly acquired competences.



The use of self-assessment questionnaires

Self-assessment questionnaires can be used to measure the transfer of learning within a continuing education programme (see Chapter 4 "Evaluation") and to increase participants' personal responsibility (Weinbauer-Heidel, 2016).

If the learners of the skills development measure want to use a new IT application in relation to their workplace, one question within the questionnaire could be: "I can use programme XY and know how to modify it for my purposes." Participants should then evaluate this question using two dimensions: What is my current status (the actual value) and what should it be after the training (the target value).

Self-assessment questionnaires can be used for any training and help learners to concretize the goals they are pursuing with the KE measures. In this way, they can increase their commitment and motivation. In addition, it helps participants to reflect on the extent to which they are familiar with the training content. The questionnaires can be sent to participants before a training course. The answers could be discussed during the training or afterwards.



### Self-assessment form



The following questions can be used by the trainer to create a self-assessment sheet for a CE measure. The statements in the table refer to an example of processing invoices using a new IT programme. As mentioned, the sheet could be used before the training to compare the actual value (i.e. the status before the training) and the target value (the status after the training).

**Example instruction:**

Dear participant,

You will soon be taking part in the training for the IT programme XY. Please answer the table below. You will see various dimensions in the left-hand column. Please answer the questions from 1-10, where 1 is the lowest value (i.e. you do not agree with the statements below at all) and 10 is the highest value (i.e. you strongly agree with the tasks below). Filling out this table should help you to see what you could work on in particular during the training and to see to what extent the training has helped you.

**Example questions:**

Dimension	What is my current level of knowledge, skills and application? (actual value)	What should the level be after training? (target value)
I feel confident when processing invoices using programme XY.		
I enjoy using the programme and know my way around it.		
I could explain the programme to my colleagues.		
I can also solve more difficult tasks using this programme.		
I have the necessary knowledge to be able to use the programme.		



## 3.2. The trainer or the training



### Key question

How can the trainer positively influence the transfer of learning?

Trainers can use the following interventions, among others, to promote the transfer of learning when implementing their training programmes (Weinbauer-Heidel 2016):

- Firstly, it makes sense to obtain information about the expectations of the learners and the problems they face in their workplace. These could, for example, be collected using online survey tools such as mentimeter (<https://www.mentimeter.com/>) or digital pinboards such as Padlet (<https://padlet.com>).
- By knowing the work situation of the learners, the teacher can build on this in the further design of the KE measures.
- In addition, the trainer can - as far as possible - establish a similarity between the learning situation and the work situation.
- Where possible and appropriate, the teacher can simulate the application of the newly acquired competences in the workplace, e.g. with the help of a case study.
- The learners and teachers can work out together which resistances and/or potentials arise when implementing the newly acquired competences and how these can be dealt with appropriately.

**The use of kick-offs - unnecessary or useful?**



One way to promote the learning transfer success of a CE measure, e.g. to support the digital transformation, which lasts four months, could be to hold a kick-off meeting. In addition to the learners, this meeting could also be attended by representatives of the company management and/or those responsible for human resources, including line

managers. The trainer could explain the aims and benefits of the CE programme to the participants.

The participants could explain their expectations in relation to the CE measure. In addition, initial information could be obtained on how the subsequent utilization of the acquired skills can be ensured.

These kick-off meetings could be organized together with a company's digital coach. As experts in digital transformation and process promoters within their companies, they can support the trainer at this meeting, or they could take on trainer tasks themselves. The digital coach can, for example, pay attention to transfer goals that are particularly important for the digital transformation and thus encourage learners to apply their skills later on.

Other helpful methods and options that can be used by trainers for transfer-orientated training are (Weinbauer-Heidel, 2016):

- Work out together with the learner during the CE measure which arguments can be used to convince superiors and/or company management of the benefits of using the newly acquired competences.
- Clarify and emphasize the benefits and purpose of the CE measure with the aim of encouraging learners to apply the new skills.
- To promote the self-organization skills of the learners in order to increase their self-efficacy so that the transfer of learning is successful. Real-life cases, active learning and practical exercises can be used for this purpose.

**How can a transfer intervention be introduced in the most useful and sensible way?**



It proves to be advantageous if the measures for CE and the corresponding measures to promote the transfer of learning are linked to the respective context or work situation and the corresponding tasks of the learners. In the broadest sense, this means that the

teacher should not focus primarily and solely on measuring the competences acquired. Rather, the corresponding activities could already initiate the first steps towards promoting the transfer of learning (Weinbauer-Heidel, 2016).

For example, the check would involve the following instructions from the teacher:

The teacher or trainer hands out a multiple choice test at the end of the learning unit to check what has been learnt.

In contrast, it would be beneficial if, at the end of the learning unit, the teacher gave the learners the task of working out how they can apply what they have learnt in their workplace. For example, each learner could work out three to five suggestions. The learners could then analyze and justify what resistance there is to implementing the suggestions and what potential there is to implement the suggestions.



Can transfer orientation be better planned?

The trainer or teacher could already think about which activities could be helpful during the implementation of the EC measure in order to promote the transfer of learning before the EC measure. Corresponding planning activities also include the concretization of possible transfer objectives and the necessary actions.

The teachers could then discuss with the learners in the respective learning unit which transfer objectives are to be pursued and how they want to initiate the transfer, as well as where they see the opportunities and risks. They could also consider which task fulfilment routines the learners can build on in the world of work. They could also work out whether they need to change the corresponding task fulfilment routines if they want to use the newly acquired skills. If they need to change the routines, they could work out during the CE measure how this can be achieved and what options for action should be taken in this context.

### 3.3. The organization and the working environment



#### Key question

How can the working environment positively influence the transfer of learning?

At this point, it would be useful to clarify which integrated task fulfilment routines prevail in the workplace of the person to whom the CE measures can be linked. The challenge for the learner may be to tie in with the respective routines. This requires the learner to be clear about the routines that prevail in the workplace. Another challenge arises when the learner has to change the prevailing task fulfilment routines in the workplace if they want to use their newly acquired skills. In this case, the question arises as to whether he can do this or whether this is only possible in consultation with his line manager, for example. The necessary change in task fulfilment routines may also require some new behaviour from colleagues. In this context, it is advantageous to coordinate the corresponding change with the colleagues concerned.

The internal digital coach could help to make the working environment more conducive to transfer. The following measures could be taken in this context, for example:

- Together with the learners, work out what challenges exist in the workplace with regard to implementation,
- Encourage the affected colleagues or work teams to use the new skills and discuss the consequences for them.
- Ask your superiors for support in giving you the freedom to apply your new skills and ask them to understand that you need to be tolerant of mistakes in order to be able to use your newly acquired knowledge.

Emphasizing the importance of CE measures by the HR and managers in the organization has a positive effect on the learners' motivation to transfer (Weinbauer-Heidel, 2016).



Research on the problem of learning transfer comes to the conclusion that learners of a CE measure are more motivated if they receive support from their colleagues and superiors. This can be realized, for example, by supervisors or members of management personally explaining why a CE measure is relevant. An invitation email to the measure could be written with a friendly greeting from the company management, for example. Positive video messages from relevant people in the company could also be used (Weinbauer-Heidel, 2016).

### 3.4. The transfer strength method



#### Key question

What are transfer strength methods and how can they positively influence the transfer of learning?

As explained above, transfer success depends on the working environment, training design and the characteristics of the learners. The transfer strength method is at the centre of the following explanations. This relates to the last area, the participant characteristics of the learners. Figure 3 shows where this method starts.

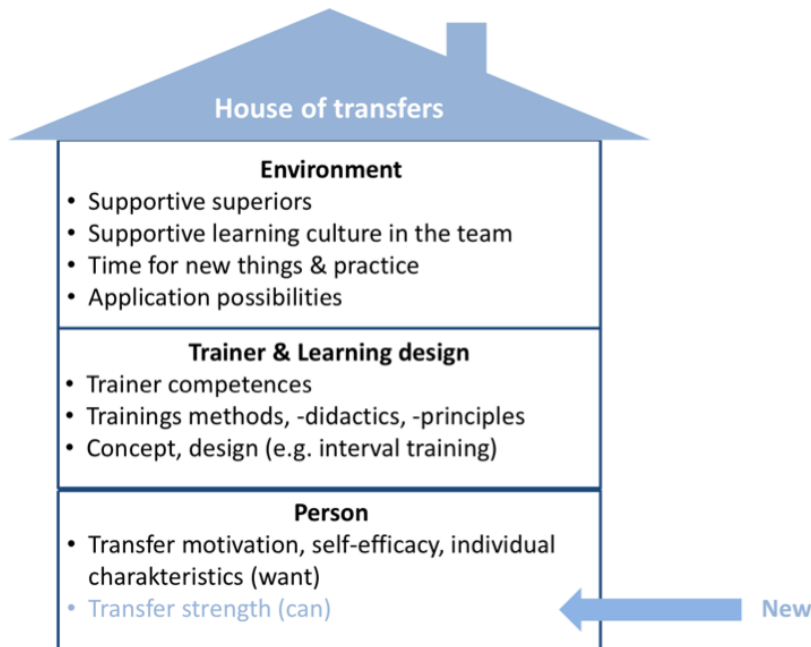


Figure 3: What learning transfer depends on (Koch, 2018, 2023)

According to Koch (2018, 2023), the method pursues three overarching objectives:

1. It emphasizes the learner's personal responsibility for the transfer of learning.
2. It supports learners in increasing the transfer of learning.
3. It promotes learners' self-learning and self-change skills.

In view of the challenges of digital transformation, this objective is proving to be particularly relevant.

In this context, reference can be made to the empirical study by Graf, Gramß & Heister (2016), in which around 10,000 organizational members took part. The respondents stated that they highly value the relevance of learning due to changing requirements. 63 per cent of respondents are happy to take responsibility for their skills development. However, there are major problems when it comes to implementation; 27 per cent estimate that they have a high level of transferability and only 23 per cent feel that they have a high level of perseverance.

The process of the transfer strength method is explained below. Prior to a CE measure, the transfer strength method can be used to analyze the current transfer strengths of learners (Koch, 2023). Within this analysis, the extent to which learners are open to learning impulses before competence development, have the ability to engage in positive self-talk in the event of setbacks, practice relapse management in everyday working

life and are responsible for the implementation success of their newly acquired competences in a pronounced manner is worked out. In the transfer strength method, these four factors are determined by means of a questionnaire prior to the CE programme.

The transfer strength of the working environment is also analyzed. The learners carry out the corresponding assessment. They address the following three categories: (1) time for new things, (2) motivating team culture and (3) the support and interest of superiors.

Based on the results of this analysis, the learners then create a to-do list that can be worked on in the CE measure. Further tips to promote transfer strength are listed in Figure 4.

Openness for training impulses	Personal responsibility for successful implementation	Relapse management in everyday working life	Positive self-talk in the event of setbacks
<ol style="list-style-type: none"> <li>1. View exercises as a protected space</li> <li>2. Think according to the Edison principle</li> <li>3. Co-design training courses</li> <li>4. Consider the principle of repetition</li> </ol>	<ol style="list-style-type: none"> <li>1. Define small, feasible steps</li> <li>2. Use mental cinema</li> <li>3. Keep the benefits in mind</li> <li>4. Involve learning partners</li> </ol>	<ol style="list-style-type: none"> <li>1. Increase commitment</li> <li>2. Be patient with yourself</li> <li>3. Recognise precursors for relapse prevention</li> </ol>	<ol style="list-style-type: none"> <li>1. use the stop technique</li> <li>2. see small successes</li> <li>3. realistically utilise benefits</li> </ol>

Figure 4: Tips for promoting transfer strength (Koch, 2018)

The special thing about this method is that some efforts are already made to promote the transfer of learning before the CE development measure. During the CD measures, the transfer strength method involves learners gathering information on their learning objectives and drawing up an action plan based on this. It is also important to work out what has come out of the CE measures, which competences can be applied in everyday working life and which to-do's need to be considered afterwards. At least two follow-up appointments will take place after the CE measure, in which transfer support can be guaranteed through telephone contact or a personal meeting. This gives learners the opportunity to reflect on the transfer and ask questions (Koch, 2018). To summarize, the transfer strength method combines the methods already explained to strengthen the transfer of learning. In addition, the methodology offers a structure in its implementation and once again points out that promoting the transfer of learning is also relevant before and after training.

Finally, it should be critically noted that the transfer strength approach has a very individualistic character. In the context of the challenges of learning transfer and the desired solutions, it proves to be advantageous to

always consider the entire network in the sense of an ecosystem in which the learner is located (Tonhäuser & Büker, 2016; Poell, 2017).

## Summary

... Interventions can be made by learners, trainers and the organization or working environment to promote transfer success.

... Tools that can be used for this include self-assessment questionnaires and kick-off events. The working environment can also be designed to be conducive (e.g. fault tolerance, involving work colleagues, etc.).

... The transfer strength method is a structured way to promote learning transfer and shows that it is not only important to strengthen transfer during a CE measure, but that it should also be considered before and after a training programme.

... The transfer strength method takes an overarching approach and considers the three categories of environment, trainer and person as well as transfer strength. The aim is to increase personal responsibility, learning transfer and self-learning and change competence.

## Exercises

1. Name four ways to favour the transfer.
2. Which of these possibilities and how could you implement this within your organization?
3. What requirements would you place on skills development measures to ensure the transfer of learning?

## 4. Evaluation of the learning transfer

### Learning objectives of this chapter

The learners can ...

... explain what evaluation means and how it is used.



... differentiate between results-orientated and process-orientated evaluation

... name and differentiate between the four levels of training evaluation.

... explain how an evaluation can be made measurable.

## 4.1 Starting point



### Key question

How can the learning transfer itself be evaluated?

At this point, the question arises as to how the learning and transfer objectives of a CD development programme can be achieved. Evaluation can be both result- and process-oriented (Kirkpatrick & Kirkpatrick, 2006). With regard to the implementation of an EC measure, an outcome-oriented evaluation often serves to make a statement as to whether this EC measure is or was useful. However, in order to gain further insights into whether the EC measure is useful or less useful, it makes sense to look for corresponding reasons. For this purpose, process-related evaluation proves to be advantageous. It analyzes which process variables hinder the measure and which are or were beneficial (Kauffeld, 2016). The two types of evaluation are discussed in the following subchapters.

### 4.1.1. Results-based evaluation

According to Kirkpatrick (1996), there are four levels at which results-based evaluation can take place. The levels are illustrated in Figure 5. The first level of "reaction" refers to the extent to which learners are satisfied with the EC measure. The second level, "learning", measures the extent to which principles, facts, strategies, techniques etc. have been learnt and can be reproduced by the learners (Kirkpatrick & Kirkpatrick, 2006). The third level, which evaluates the learners' "behaviour", describes the extent to which a change has taken place in the learners' everyday working life. This is surveyed following the CE programme, as soon as the learners have returned to work. The last level, the "result level", assesses the extent to which the CE measure has had long-term consequences. For example, cost savings or improvements in the quality or quantity of work could be determined here.

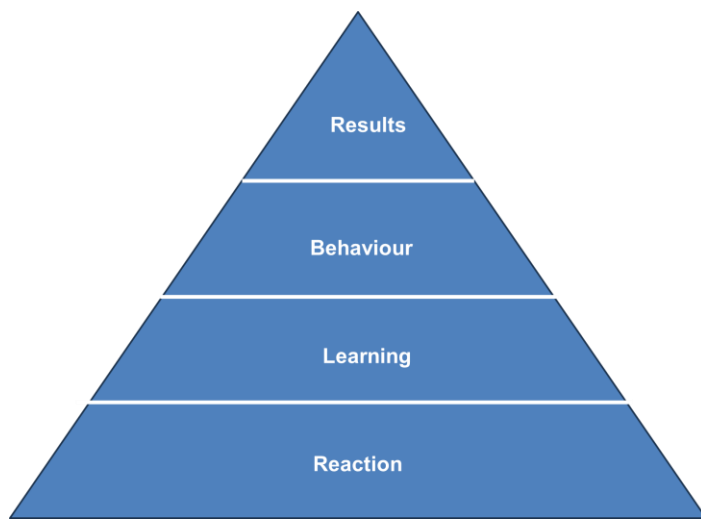


Figure 5: Four levels of a results-based evaluation (own illustration based on Kirkpatrick & Kirkpatrick, 2006)

#### 4.1.2. Process-related evaluation

The preceding evaluation can be supplemented by process variables. Process variables not only focus on the result, as is the case in Kirkpatrick's (1997) four-level model described above, but also explore the "adjusting screws" in the process. The advantage of analyzing both result and process variables is that the reasons for the lack of transfer are identified. The aim is to overcome these as far as possible. Based on a process-related evaluation, catalysts and challenges for transfer can thus be developed and these can be changed or optimized accordingly (Kauffeld, 2016). Potential barriers to transfer can be identified on the basis of the transfer determinants presented. According to the three categories (factors at participant, training and environmental level), these can occur at different times. For example, a potential barrier can already occur before the CE measure if it is conceptualized in such a way that only theoretical knowledge and little practical application is practised. Learners may then find it difficult to apply the theoretical knowledge in everyday working life. At this point, a process-related evaluation helps to identify hindering factors and initiate appropriate steps to deal with them appropriately.

Process-related evaluation can also help to identify known transfer problems prior to a CE measure (Kauffeld, 2016). Influencing factors on the part of the learners can be, for example, their transfer motivation as described above. If, for example, some learners only have a low transfer motivation, the teacher can try to improve this through appropriate learning units during the CE measures. For example, they could show examples of best practice in which the new skills acquired have been successfully transferred to the workplace.

### 4.1.3. Combination of outcome and process-related evaluation



#### Case study

A CE measure involving a new IT-supported software programme is carried out in a small insurance company. The learners are enthusiastic about the measure and intend to apply their skills with regard to the software programme in their everyday work. As the training is transfer-orientated and the learners are very motivated, this transfer to everyday life works very successfully. However, the managing director of the small company wonders how this success can be measured. This is where the result or process-related evaluation comes into play. At the reaction level, the reaction of the participants can be recorded directly afterwards, for example as part of a feedback round or a questionnaire. To assess what has been learned, learners could demonstrate how the programme works and the manager could record the behavioural level by seeing whether the learners actually apply what they have learned. Some time after the CD programme, it could also be measured what new results have been achieved as a result of the skills acquired during the CD programme. For example, it could be checked whether more insurance cases are now being processed with the help of the IT software programme, or whether the organization members are more satisfied with their work because, for example, they are relieved of their documentation duties by using the new software programme. This view only includes the results-orientated evaluation. But what if the managing director realizes that the KE measure does not only have positive consequences? At this point, the process-related evaluation can be applied by the managing director identifying specific levers in the process. For example, the challenges posed by the new software programme could be identified and where the members of the organization still need support. It could also be checked whether the use of the new software program has significantly increased the workload of the organization members.

This example clearly shows that a combination of both evaluation options can be advantageous for an organization. An outcome-based evaluation can often be used to "justify" an EC measure because the (financial) benefits and results of a measure can be demonstrated. However, if a measure turns out to be inefficient, a process-related evaluation can show the potential for optimization by identifying the individual process variables.

## 4.2. Questions and methods for conducting the evaluation



### Key question

Which questions and methods are suitable for evaluating learning transfer success?

The importance of evaluating the success of learning transfer is undisputed in academic debate (Weinbauer-Heidel 2016). But which questions and which methods prove to be helpful in this context? For example, the following questions could be asked at a certain distance from the EC measure:

- Has what you have learnt proved its worth in your day-to-day work?
- Did the KE measure have a high practical relevance for me?
- Do I use what I have learnt frequently in my day-to-day work?
- To what extent have my actions changed as a result of the skills I have acquired in the training programme?
- Can I apply the contents of the KE programme every day at work?
- How successfully do you apply what you have learnt?

These questions can and should be adapted to the respective EC measure. For example, if a CE measure was used to apply a specific new IT software programme, the following points could be discussed:

- I regularly use the software programme I learnt during the KE measure at work.
- I successfully manage to use the software programme.
- The software programme makes it easier to manage my tasks.

These questions and points can be used to measure the previously defined transfer objectives (Weinbauer-Heidel, 2016).

The previous questions and considerations are primarily related to the results of the KE measure, i.e. the results-orientated evaluation. With regard to a process-orientated evaluation, the following questions arise:

- What has helped you to implement what you have learned (e.g. using the new IT programme)?
- What made it difficult for you to implement what you had learnt?

Level	When can this be queried?	Why should I collect this variable?	How can it be queried?	Example
Pretest	Before training	In order to have a "baseline" and be able to calculate what effect the training actually had	By means of a questionnaire	"How would you rate your knowledge of the IT programme XY?", "How confident do you feel in using this programme?"
Reaction	Directly after the training	To know how the participants "react" to the training and how satisfied they were with it	By means of a questionnaire / Feedback round	"How satisfied are you with the training?"
Learning	After training	To ascertain what knowledge and skills the participants have learnt	By means of a "test" / questionnaire	"Describe the task sequence for processing an invoice in the IT programme XY"
Behaviour	After a certain period of time after training	In order to ascertain what the participants implement back in their everyday working lives as a result of the training	Questionnaire, observation, key figures	"How often do you use the new programme?"
Results	After a certain period of time after training	To evaluate the long-term effects (e.g. on the utilization of systems, employee satisfaction or monetary changes) of the KE measure	Key performance indicators (KPIs), questionnaire	"To what extent has the processing time for invoices been reduced by using the new programme?", "How much time have employees been able to save as a result?"

As already explained, the enquiry of the process-oriented evaluation supports the clarification of which adjusting screws in the process promote the learning and transfer of a CE measure and which prevent this.

Table 2 provides an overview of when, why and how a KE measure can be evaluated. This is exemplified by a KE measure for a new IT software programme for processing invoices.

Table 2: Overview of the survey methods (Weinbauer-Heidel, 2016).

## Summary

... An evaluation can be defined as an assessment of the effectiveness of a training programme to determine the extent to which learning and transfer objectives have been achieved.

... Evaluation can take place on four levels (reaction, learning, behaviour, results).

... Depending on which level we want to evaluate, different times and methods are selected.

... A distinction is made between process-orientated and results-orientated evaluation. Process-oriented evaluation can help to identify and overcome known transfer problems before and during a training programme.

## Exercises

1. If you think back to your last training programme, which aspects promoted learning transfer and which hindered it? To what extent were these aspects evaluated?
2. Create a checklist that can be used to determine the extent to which a training programme is transfer-oriented.
3. Describe the key differences between outcome- and process-based evaluation.

## 5. Outlook

### Learning objectives of the chapter

The learners can...

... describe how digital solutions (especially the LeWIT tool) could be used to solve the transfer problem.

... summarize the current state of research on the problem of learning transfer.

## 5.1. Promotion of learning transfer and digital solutions



### Key question

What role will artificial intelligence play in the transfer of learning in the future?

In order to promote the transfer of learning, various digital solutions have been developed in recent years (e.g. Kauffeld, 2016). In particular, the aim is to support the transfer of learning with appropriate apps. IT and AI tools could be used to strengthen learning transfer in the future. For example, the evaluation of EC measures could be recorded using an IT tool, and learners could be suggested different support programmes with the help of AI. Depending on where the learner has problems with the application of a measure, this can be automatically adapted.



### Example

Markus, Pia and Timo work as electricians in a medium-sized company and are sent on a training course by Monika from the HR department to learn how to use a new software programme. After successfully completing the training, the three return to their day-to-day work. After two months, it turns out that Pia and Markus have only been able to apply a little of what they have learnt, while Timo has benefited more from the training. This could be due to many different reasons. For example, Markus only had limited opportunities to apply his knowledge, and Pia had to take several calls and complete an urgent task at the company during the KE measures. She therefore missed some time and now does not have the full knowledge. Timo, on the other hand, was able to apply most of what he had learnt and would now like to tell his colleagues about his new skills. Monika from the HR department would not normally see how and whether the members of the organization were able to apply their newly acquired skills after further training. To make this process more transparent, the digital learning and knowledge transfer tool (LeWIT) can be used, which is described in more detail below.

The overarching aim of learning and knowledge transfer (LeWIT) is to optimize a training visit by increasing the transfer of learning, passing on knowledge to colleagues, linking formal and informal learning, evaluating

results and processes and involving members of the organization (Richter et al., 2020). At the same time, one requirement of the tool is that it requires little effort from everyone involved.

The process followed by the LeWIT tool can be seen in Figure 6 and can be divided into a total of four sub-steps: (1) planning, (2) use of the first questionnaire, (3) use of the second questionnaire and (4) evaluation results. With regard to the example described at the beginning, this would mean that Pia, Markus and Timo are sent the first questionnaire directly after the training programme. Among other things, they are asked what they would like to do with what they have learnt and what resources they need to do so. They also indicate which colleagues they would like to share their new knowledge with. For example, Timo plans to share his knowledge with his four direct colleagues. The three of them can also use the tool to rate how satisfied they were with the training event. Two months later, they automatically receive another questionnaire. They now indicate what they ultimately implemented, how well this was achieved and how much knowledge they actually shared with colleagues. They are also asked how well they supported their managers and whether there was enough material and time available for implementation. After each survey, Pia, Markus and Timo receive individual feedback, which the managers and Monika from the HR department also receive. In this way, everyone involved is optimally informed about the current status. Monika can also make strategic decisions based on the assessment of Pia, Markus and Timo.

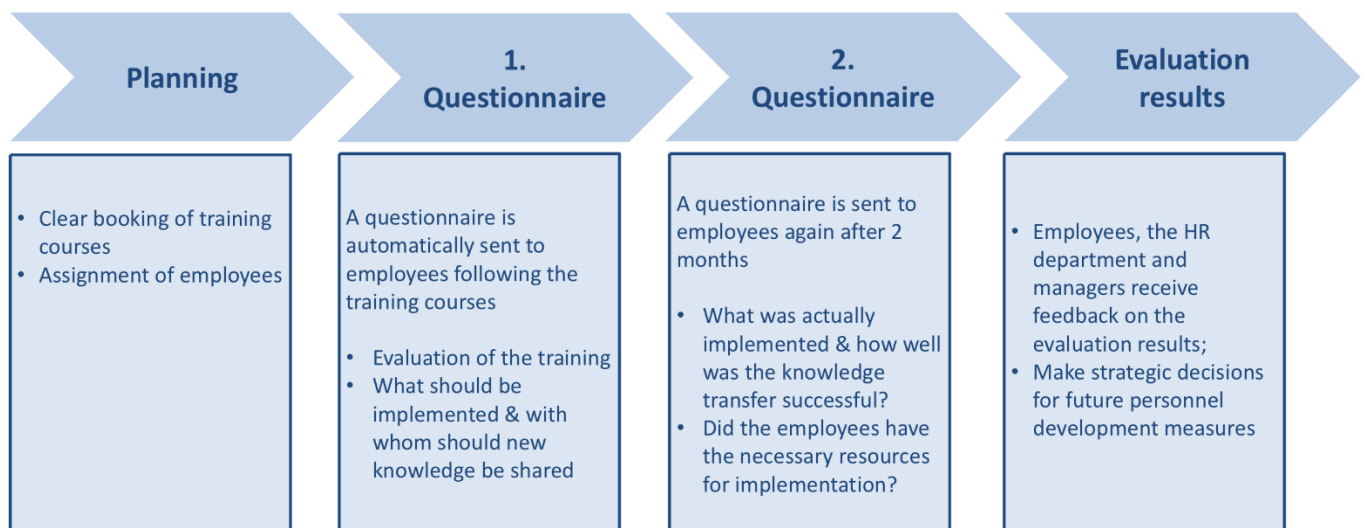


Figure 6: Overview of the LeWIT tool process

In summary, the LeWIT tool is intended to optimize processes. The process through the integration of the tool provides for information to be sent to the participant after the corresponding entry in the tool so that they can prepare for the training and take part in the next step. The process then provides for an evaluation



and reflection by the participant. As a result, the participant should not only apply what they have learnt themselves, but also pass on their knowledge to the HR department and transfer partners, for example. This should also be followed by an evaluation and reflection that results in a decision.

The LeWIT tool offers particular benefits for members of the organization, managers, the HR department, the organization itself and trainers. Employees benefit from the fact that the reflection step leads to increased implementation and emphasizes the importance of further training and transfer. On the other hand, the benefit for managers is that they receive performance feedback from employees and also have the opportunity to support employees where necessary. The HR department benefits from the tool on the one hand by evaluating external training courses and on the other hand by recognizing which departments are doing well or may still need improvement. Last but not least, the administration of training courses is also improved. The organization itself has the overriding advantage that the learning and knowledge transfer culture improves. The trainers also benefit from LeWIT, as they receive feedback on how the training is being implemented in day-to-day work and what can be improved in the training.

## 5.2. Current state of research and research gaps



### Key question

What is the state of scientific research on the problem of learning transfer?

Many scientific approaches to the problem of learning transfer attempt to work out the success factors for successful learning transfer (cf. Tonhäuser, 2017). At this point, reference can be made to the criticism of Nicolei & Kieser, 2002, who point out the unsuccessfulness of success factor research. As an alternative to the search for success factors, it makes sense to work out the respective resistances and potentials and to weight their significance in relation to the realization of learning transfer. This approach makes it possible to address the specific circumstances of each situation. For example, the problem of learning transfer in the context of the learning factory or teaching factory approaches is different from that of highly formalized further training courses. Based on the situation-specific weighting of the respective resistances and potentials, concrete options for action can then be worked out in the next step.

The next step would be to develop a questionnaire. The starting point could be these questions:

- **Learning transfer and dealing with resistance**

- What resistance is there to the transfer of learning, i.e. the use of skills acquired in the context of the learning factory or teaching factory approach, in your organization's working environment?
- If you had to prioritize these resistances, what would be the three to five most serious resistances? (If possible, give reasons for your answer.)
- What options do you see for dealing with this resistance?
- **Learning transfer and dealing with potential**
- What potentials do arise in the transfer of learning, i.e. the use of the skills acquired in the context of the learning factory or teaching factory approach, in the working environment in your organization?
- If you had to prioritize the potentials, what would be the three to five most important potentials? (If possible, give reasons for your answer). What options for action do you see to utilize the potential even better in the future?
- Further questions could build on previous empirical studies (Kauffeld et al. 2008, Kauffeld, 2016, Koch, 2023, Hinrichs, 2016, Weinbauer-Heidel, 2016). As the resistances and potentials related to the respective promotion of learning transfer are context-specific, the question arises for further research activities as to which contexts should be differentiated between. It would also need to be clarified how the respective context conditions can be quickly and accurately recorded.

With regard to the promotion of digital transformation, the scientific debate states that the challenges arising from the transformation cannot be solved with the help of top-down solutions alone (Kröll, 2020). Rather, there is a consensus that a reciprocal situation-specific top-down and bottom-up action strategy proves to be the most advantageous. Promoting the transfer of learning can help to empower organizational members to make suggestions or take initiatives in line with the bottom-up approach. It makes sense to rethink the solution to the problem and organize it accordingly. These solution approaches should therefore be combined with change management and organizational development approaches.

In order to promote the transfer of learning, it is crucial that the connection or link to the task fulfilment routines with which the learners are confronted in their workplace is successful. In order to familiarize oneself with the task fulfilment routines, it makes sense, for example, to carry out modelling of the central or decisive/relevant value creation processes. The corresponding reflection provides the opportunity to gradually improve these processes or task fulfilment routines in terms of quality management. In order for the reflection to be successful or to achieve a minimum level of quality, it is advantageous if the actors carrying out the reflection have the appropriate reflection skills.

## Summary



... The aim of the LeWIT tool is to optimize a training visit by increasing the transfer of learning, passing on knowledge to colleagues, linking formal and informal learning, evaluating results and processes and involving employees.

... It makes sense to analyze context-specific potential and resistance with regard to the transfer of learning.

## Exercises

1. What difficulties do you see in the survey of transfer determinants?
2. How could research into success factors be improved?

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## Appendix

### A. Solutions to the exercises

Individual solutions are required for the majority of the tasks, which may vary considerably. The following answers to the practical tasks within the self-study module are for guidance only and are intended to provide you with assistance and a means of checking.

#### Chapter 1:

##### Question 1: What could be inhibiting or promoting aspects of learning transfer in your organization?

Individual solutions are required here. These questions may help you to answer the question:

- What did you particularly like about a KE measure and where do you see potential for improvement?
- How do your team or superiors react to suggestions that you have learnt from a training course and would like to introduce into your everyday working life?
- Are further learning opportunities or an exchange on what has been learnt offered after a measure?

##### Question 2: How could you counteract the inhibiting aspects?

Individual solution, according to the inhibiting aspects from your organization. These could include the following aspects:

- During a measure, discuss how to deal with headwinds within the organization



- Ask for practical exercises to facilitate the transfer and application of what has been learnt in everyday working life
- Obtain support from the team or superiors before the CE measure

**Question 3: To what extent can learning factories be used as alternative approaches to teaching skills that are relevant to the digital transformation? What are the opportunities and where do you see challenges?**

- Opportunities:
  - Learners are actively involved and have to work together interactively
  - Formal and informal learning takes place close to the workplace
- Challenge: Not every company has access to learning factories, as these are often only to be found at large institutions (companies/universities).

## Chapter 2:

**Question 1: Name the three categories of transfer determinants and categorize 4 determinants that you know from your work context.**

- 3 categories: Influencing factors on the part of the learner, on the part of the training and on the part of the working environment

### Examples from working life:

- Influencing factors on the part of the learner: Motivation to learn something, self-efficacy, own effort, own job satisfaction
- Influencing factors on the part of the training: design of the training so that practical exercises are included, varied media and methodology, positive learning climate, pleasant learning environment, learning content tailored to the group of participants
- Influencing factors on the part of the working environment: support from superiors, targets & work requirements correspond to the learning content of the training, organisational culture is open to change, the team or colleagues are open to change and support it

**Question 2: In your opinion, which transfer determinants are easy or difficult to change? Give reasons for your answer.**

Various solutions are possible here. For example:

- The determinants relating to participants are often somewhat easier to change, for example by motivating learners (also extrinsically), encouraging personal initiative and increasing the expectation of success
- Determinants on the training side can also be optimized well on the basis of regular evaluations. However, the hurdle here is that external trainers often design the programme and therefore little adaptation can take place
- Determinants on the work environment side are rather more difficult to change depending on the respective organization, as this point often depends on many other people and aspects.

### **Question 3: To what extent are transfer determinants, learning and training transfer related?**

Participant characteristics, training design and working environment, which represent the transfer determinants, are the basis for learning and transfer success. If these three categories of transfer determinants are organized accordingly, learning and remembering can take place. Based on the learning success, what has been learned can then be generalized and applied to the work context so that transfer success can take place. Transfer determinants are therefore the basis for learning success and transfer success, and learning success in turn forms the basis for transfer success.

### **Question 4: Describe the transfer gap**

The transfer from the learning or training environment following a further training programme can be more or less strong in the working environment. This transfer often occurs in a so-called transfer gap, which describes the fact that participants in a training programme generate new knowledge, but the application and corresponding transfer to practical work is only partially successful. This results in a transfer gap between the actual and target state.

## **Chapter 3:**

### **Question 1: Name 4 ways to favour the transfer.**

Various solutions are possible here. Possible answers are

- Practice-orientated KE measure with many practical exercises
- Supervisors and colleagues are open to changes and suggestions that a learner transfers from a KE measure



- Creating an organizational culture that embraces and welcomes change
- Learners are motivated and sufficient time is scheduled for participation in training sessions

**Question 2: Which of these possibilities and how could you implement this within your organization?**

Various solutions are possible here. Possible answers are

- Enough time for training can be requested in advance so that participation can be guaranteed despite a high workload
- Agreement within the team that a CE measure or what has been learnt may change the way of working, so that openness to change can be supported
- A meeting with the team could be organized before or after a training session to pass on what has been learned or to discuss areas of application for what has been learned

**Question 3: What requirements would you place on skills development measures to ensure the transfer of learning?**

Various solutions are possible here. Possible answers are

- Sufficient time for training, exercises and questions
- Mix of methods and media to facilitate learning, especially transfer-oriented learning
- Opportunity to share what you have learnt even after the course
- Exchange on possible fields of application of what has been learnt in everyday working life

**Chapter 4:**

**Question 1: Thinking back to your last training programme, which aspects helped and which hindered the transfer of learning? To what extent were these aspects evaluated?**

Individual solutions are required here. These questions could help you with the task:

- Were you motivated to take part in the programme?
- What did you expect from the programme?
- How did your work environment react to the programme or what you learned?
- Was the KE measure designed in such a way that it came close to your everyday working life?



- What did you find particularly helpful about the programme? What did you take away from the programme and how has it changed your day-to-day work?

**Question 2: Create a checklist that can be used to determine the extent to which a training programme is transfer-oriented.**

Various solutions are possible here. All three categories of learning transfer determinants (participants, training design and working environment) should be included.

**Question 3: Describe the key differences between outcome- and process-based evaluation**

Results-based evaluation:

- Evaluation of the effectiveness of a KE measure
- "Justification" of a KE measure
- Basis for deciding whether the KE measure is (financially) worthwhile
- Results-based evaluation is also useful for comparing different KE measures to see which are the most effective or efficient

Process-related evaluation:

- Evaluation of the "adjusting screws in the process"
- Identification of factors influencing the efficiency of the KE measure
- Lends itself to gaining knowledge of favourable and unfavourable aspects of the learning transfer of a specific measure

**Chapter 5:**

**Question 1: What difficulties do you see in the survey of transfer determinants?**

- In practice, no evaluation is often carried out or evaluation is only carried out at the reaction level
- Evaluation that only looks at (financial) results and leaves out the levers in the process
- Looking at individual determinants without considering the interaction between them
- Some aspects cannot be surveyed or cannot be surveyed well (for example, the motivation of the participants if they respond in a socially desirable way)



## Question 2: How could research into success factors be improved?

- Use of process- and result-orientated evaluation to identify the transfer determinants of a measure that promote transfer in addition to its effectiveness
- Standardized evaluation at reaction, learning, behaviour and result level
- Surveys of specific transfer determinants before and after the training to make the effect measurable



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# Limits and possibilities of learning transfer effectiveness

Self-study module Limits and possibilities of learning transfer effectiveness

## Self-study module for the digital coach

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