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Case Study

The Added Value of Professional Development Programs: Insights from a Case Study

Lisa Wintersberg*, Anna Trikoili, Razin Abdullah, Daniel Pittich

Technical Education, TUM School of Social Sciences and Technology, Technical University of Munich, Munich, Germany
E-mail: lisa.wintersberg@tum.de

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Abstract: The effectiveness of lifelong learning programs designed for professionals relies on the transfer of the learnings to their workplaces. While the programs' quality is constantly evaluated, measuring whether the transfer takes place remains a significant challenge. With this study, we attempt to provide a triangulated measuring approach. We aim first to explore the factors that enhance or hinder learning transfer and second to describe instances when professionals applied newly acquired knowledge in their daily work life. In this mixed-methods study, twelve participants from a lifelong learning master's program completed the Learning Transfer System Inventory (LTSI) to identify factors influencing learning transfer. To triangulate the data, eight of them also provided open-ended reflections on specific transfer experiences, which were used as qualitative data. We found that psychological factors like motivation and peer support are strongly linked to learning transfer, while participants also felt that the program's content should be more relevant to their work. Moreover, our findings suggest that meeting the learning goals is not the key indicator of a lifelong learning program's success. Rather, the quality of these programs is defined by the extent of the participants' professional development. To approach the challenge of measuring transfer effectively and to achieve an in-depth evaluation, we call upon including a holistic approach combining qualitative and quantitative measurement methods as well as input from different stakeholders, instead of purely relying on self-report data.

***Keywords*:** learning transfer, lifelong learning, LTSI, mixed-method approach, professional development programs

1. Introduction

Lifelong Learning (LLL) has become increasingly important in today's rapidly evolving economic and technological landscape. In particular, in the German context, there has been an expansion of professional development opportunities (Käpplinger & Robak, 2014) in higher education, such as LLL Master's programs designed for working adults. In this context, professionals need to continuously develop their knowledge and skills in order to remain competitive in their respective fields (Billett, 2018; Schuller & Watson, 2009; Wintersberg & Pittich, 2025). Yet, despite the proliferation of such programs, one challenge remains persistent: the difficulty in translating what is learned during the training into actual workplace improvements. The effectiveness of Professional Development Programs (PDP) is, in fact, the balanced blend of academic knowledge with practical workplace applicability. However, studies have shown that a significant amount of what is learned during training does not translate into improved job performance (Fitzpatrick, 2001; Grossman & Salas, 2011). Research consistently shows that a large proportion of training content fails to result in

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behavioral change, a phenomenon commonly referred to as the "transfer problem" (Cheng & Hampson, 2008; Saks & Burke, 2012). In academic contexts, such as Master's programs tailored for adult learners, the complexity of learners' professional environments and the diversity of their prior experiences can further complicate the transfer process (Tynjälä, 2013). This persistent gap not only reduces the return on investment in professional development but also undermines the credibility and perceived value of LLL initiatives within higher education. To address this topic, this study focuses on identifying the factors influencing the transfer of acquired knowledge to everyday work life. In order to ensure the effectiveness of PDP, previous work focused on understanding these factors. The instruments that have been developed and applied are mainly of a quantitative nature. One prominent amongst them is the Learning Transfer System Inventory (LTSI) (Holton et al., 2000), which distinguishes three groups of factors: personal, training-related, and organizational. Despite its extensive usage in corporate environments, the instrument only explores participants' perceptions. As a result, there is a lack of paradigms that apply the LTSI in the context of academic LLL programs and in combination with qualitative methods to strengthen its findings.

The current study combines these key characteristics and seeks to address this gap by investigating learning transfer in a case study of a German LLL Master's program. It uniquely contributes to the literature by triangulating quantitative findings from the LTSI with qualitative data on actual instances of transfer at the workplace. This mixed-methods approach enables a more nuanced understanding of how and when learning transfer occurs, and under what conditions. In the next section, we present the models and frameworks previously used, the challenges associated with the assessment of transfer, and the LTSI. In the methods part, we explain how the two approaches function in a complementary manner and describe the specifics of the case study. After reporting the findings, in the discussion part we reflect on them and by reviewing the limitations we suggest how our approach can be implemented in future research and in practice.

2. Background

2.1 *Theoretical models and frameworks for learning transfer*

Understanding the factors that influence learning transfer is essential for evaluating the effectiveness of lifelong learning programs, particularly in higher education contexts targeting working professionals. Foundational theories have laid the groundwork for conceptualizing transfer. For example, Salomon and Perkins' (1989) distinction between *low-road* and *high-road* transfer emphasizes the role of context and cognitive effort, while Situated Learning Theory (Lave & Wenger, 1991) underscores the importance of authentic contexts and social participation. Baldwin and Ford's (1988) influential model identifies trainee characteristics, training design, and work environment as key determinants of transfer success.

While these models focus on cognitive processes and contextual similarity, newer models take a more comprehensive approach by integrating individual, training, and environmental factors. Recent research introduces innovative models that enhance our understanding of how knowledge moves from education to professional settings. The Learning Evaluation and Reflection Narrative (LEARN) framework facilitates structured reflection, enabling students to articulate and recognize their transferable skills more effectively, thus strengthening their employability (Simper et al., 2018). Complementing this, a learning transfer model identifies three key dimensions—knowledge, social interactions, and self-reflection—as fundamental to effective learning transfer, emphasizing the need for workplace experiences that actively engage these elements (Oliveira, 2017).

In response to globalization and diverse workplace environments, newer models have emphasized the influence of cultural and systemic factors. Recognizing the broader influences on learning, the Multidimensional Model of Learning Transfer highlights the critical role of local culture in shaping how adults apply new knowledge, suggesting that cultural alignment can significantly impact training outcomes (Brion, 2022). Meanwhile, a self-directed learning framework argues that autonomy in workplace learning fosters more effective knowledge application, reinforcing the idea that learning transfer is an active, ongoing process rather than a passive outcome (Hirv-Biene, 2023). Similarly, Loeng (2020) discusses factors influencing learners' autonomy, motivation, and the role of educators as facilitators, addressing debates about the innate versus learned nature of self-direction. Again, in this work, the importance of situational context is highlighted.

Expanding on these perspectives, a systems theory approach integrates structural and behavioral factors, offering a more holistic view of learning transfer by examining how different components interact within an organization (Cody & Beling, 2021). Mehner et al. (2025) also indicate that peer and supervisor support are key to training transfer and knowledge sharing, with social support influencing knowledge networks and sharing, and training transfer predicting changes in those networks. Collectively, these models suggest that learning transfer is not a singular process, but a complex, multidimensional phenomenon shaped by individual reflection, workplace dynamics, cultural context, and systemic interactions.

2.2 *Challenges and measurement of learning transfer*

The multifaceted nature of learning transfer poses a significant challenge in its measurement. The primary difficulty is capturing the complex interactions between trainee characteristics, training design, and the work environment (Baldwin & Ford, 1988). These factors are dynamic and can influence transfer outcomes in unpredictable ways. For instance, the same training program may yield different transfer results depending on the individual differences among trainees, such as their motivation and prior knowledge (Holton et al., 2000). This variability makes it challenging to design standardized measurement tools that can accurately capture the nuances of learning transfer across different settings.

The temporal aspect of learning transfer also poses a significant challenge. Transfer is a process that takes time and is not a one-time event (Saks & Belcourt, 2006). One significant challenge of learning transfer is that the retention and application of learned skills diminishes significantly over time without proper reinforcement strategies (Saks & Belcourt, 2006). Additionally, the effect of applying skills immediately after training may differ significantly from when used months or years later. However, it is resource-intensive and requires continuous engagement with participants to conduct longitudinal research, which can also be challenging to manage and sustain (Sullivan et al., 2019). Moreover, factors such as changes in the work environment or organizational restructuring can further complicate the assessment of long-term transfer.

Some of the aforementioned factors affecting transfer, such as training content validity, perceived support from supervisors, and the trainees' self-efficacy, are inherently subjective and can vary among individuals (Blume et al., 2010). While measurement methods like surveys and self-report can provide insights into these factors, they are susceptible to biases, such as social desirability and recall bias, and might undermine their reliability and validity (Holton, 2005).

Finally, the work environment also poses measurement challenges. The extent to which a workplace supports the application of new skills can vary significantly, as it is influenced by organizational culture, the availability of resources, and the nature of the professional tasks (Blume et al., 2010). Assessing these environmental factors requires comprehensive data collection from multiple sources, including supervisors, peers, and organizational records. This can be logistically complex and time-consuming (Tessmer & Richey, 1997).

2.3 *Learning transfer system inventory*

The LTSI is a tool that provides an initial assessment of factors perceived by trainees to impact transfer. Consequently, it is valuable for identifying potential barriers and facilitators of transfer. It is a tool designed to evaluate the multifaceted dimensions influencing the transfer of learning in PDP (Holton et al., 2000). It evaluates domains such as the characteristics of the learners, the design of the PDP, and the supportive nature of the work environment. The LTSI is supported by a substantial body of research that validates its use in various contexts (Holton et al., 1997). This research's backing increases its credibility and encourages its adoption by practitioners and researchers alike. The widespread use of the LTSI allows organizations to benchmark their results against industry standards or similar organizations (Velada et al., 2007). Compared to more comprehensive tools, the LTSI is relatively straightforward to administer and interpret. This ease of use makes it accessible to organizations without extensive resources or expertise in training evaluation (Seyler et al., 1998).

It is important to understand that the LTSI measures perceptions and not the actual transfer of learning. While the LTSI offers an initial evaluation of trainee-perceived factors affecting transfer and is helpful for planning in the post-training context, it does not directly measure transfer, thereby restricting conclusions about its relationship with transfer outcomes (Kirwan & Birchall, 2006). For instance, the LTSI can provide insights into how learners feel about PDP, but

cannot provide direct evidence of whether they use the newly acquired skills at their workplace.

2.4 *Aim and research questions*

Following up on previous research that highlights the need for evidence of learning transfer in PDP, we use an LLL Master's program at a German university as a case study. To measure the actual transfer of learning outcomes, in the current study, we address the LTSI's challenges by means of triangulation from a reflection activity.

Consequently, the aim of this paper is to examine participants' views on the extent of learning transfer and provide specific examples of its application in the workplace. Deriving from the above, we formulated the following research questions:

RQ 1: To what extent do participants in an LLL Master's program perceive that learning transfer has occurred, as measured by the LTSI?

RQ 2: How do participants describe their experiences and perceptions of training transfer in a reflection activity?

RQ 3.1: What are the results of triangulating the LTSI and the reflection activity?

RQ 3.2: Which conclusions can be drawn about the usefulness of combining the two data sources?

3. Methods

3.1 *Research design*

A mixed-method approach was used to investigate learning transfer in an LLL Master's program. First, a quantitative analysis, using the LTSI, served to identify factors influencing learning transfer (e.g., motivation, peer support, etc.). In turn, a qualitative analysis, based on open-ended reflections, explored participants' specific transfer experiences and provided insights into the relevance of the program's content.

3.2 *Participants*

The participating group was 12 professionals, studying in the lifelong learning master's program, who gave their informed consent after being briefed about the study's purpose, confidentiality and anonymity. They took the LTSI survey after the end of the first semester. Subsequently, eight of them answered the open-ended reflection task five months later. We employed convenient sampling for the recruitment process, and informed consent was obtained from each participant. The participation was not connected to students' performance, who were given the choice to participate in both the LTSI and the reflection activity. To encourage active participation, we gave detailed instructions regarding the purpose of the survey and the importance of their responses.

3.3 *Data collection and instrumentation*

3.3.1 *Adapted learning transfer system inventory*

Participants completed the LTSI, responding to 33 questions measuring subconstructs that included Learner Readiness, Performance Self-Efficacy, Motivation to Transfer, Transfer Effort- Performance Expectation, Peer Support, Resistance to Change, Personal Outcome Positive, Opportunity to Use Learning, Personal Capacity to Transfer, Perceived Content Validity, and Transfer Design. Scores for each subconstruct were collected, and mean scores were calculated for further analysis.

Fifteen questions measuring five constructs were omitted from the questionnaire. The subconstructs Performance Coaching, Supervisor Support, and Supervisor Sanction were excluded because they were deemed less relevant from a course evaluation perspective.

Challenges in obtaining detailed performance records from participants' workplaces led to the exclusion of the construct related to professional performance. This decision aimed to ensure the inclusion of only information that could be confirmed with some level of certainty.

Moreover, these constructs were considered less aligned with the study's primary objective. We omitted the subconstructs Performance Outcome Expectation and Personal Negative Outcome to avoid redundancy with other

similar subconstructs already included in the questionnaire. This exclusion also helped alleviate participant burden.

3.3.2 *Reflection task*

The qualitative reflection task comprised questions designed as an extension of the LTSI, aimed at obtaining examples of participants' application of learned concepts. All authors designed and formulated the reflection activity so that it aligns and corroborates with the LTSI, assessing key factors that influence training transfer, such as trainee perceptions, work environment support, and course design effectiveness. We agreed that the open-ended questions should look deeper into the concepts of personal application of learning, social support (e.g., recognition from colleagues), and training design (e.g., Information and Communication Technology (ICT) tools and course improvements). Participants were prompted to provide feedback on the course structure, support received, challenges encountered, and suggestions for improvement. The questions opted for real-world experiences and examples from the participants' work lives. As a result, the activity included the following four open-ended questions:

1. "Can you please give us an example of a time when you realized that you have applied something you learned in the program to your workplace? Include a short insight into what went well and what you perceive as challenging."

2. "Please describe an instance where your colleagues (from work) noticed or even appreciated your efforts to learn and apply new skills from the program in your work."

3. "Can you give an example of when you could apply a specific course design element to your job (e.g., ICT tools, applications, etc.)? Do you have any suggestions on how to improve the course design so that you can transfer more elements to your workplace?"

4. "Share an insight of a time when you realized that investing time in the program influenced your performance at the workplace in a positive way."

3.4 *Data analysis and triangulation*

Quantitative data from the LTSI were analyzed in SPSS by one researcher. The internal consistency of the scale was assessed using Cronbach's alpha, which was $\alpha = 0.81$, indicating good reliability (Nunnally & Bernstein, 1994). Descriptive statistics summarized participants' responses, including means, standard deviations, and frequency distributions. Six questions with negative phrasing were reverse-scored to ensure accuracy, precisely measuring subconstructs related to Resistance to Change and Personal Capacity to Transfer. No data was missing, and all responses were considered for analysis. We first assessed normality using the Shapiro-Wilk test for normality, as it is well-suited for small sample sizes. Since only one variable failed the normality test, we proceeded with Pearson correlation. To further ensure robustness, we also conducted a non-parametric correlation analysis using Spearman's rank-order correlation to create the correlation matrix and to compare the results. We conducted the Shapiro-Wilk test for normality in the variables of Qualitative and Quantitative Score, which suggested normal distribution, and then continued with a Pearson correlation analysis between the variables. The qualitative data analysis included a systematic examination of participants' responses to open-ended questions in the reflection task. Deductive thematic analysis was carried out by one researcher who conducted the initial qualitative analysis, while another researcher cross-checked the qualitative results to reduce potential bias involving coding transcripts according to an evaluation rubric (Table 1) to align with themes derived from the LTSI subconstructs. We applied event sampling for coding. Following this, each occurrence was individually scored according to the identified theme by the researcher. We created a coding scheme with low-, medium-, and high-inference codes, assigning one to five points based on how the participant met predefined criteria. Subsequently, the mean of each theme was calculated to compare with the results obtained from the LTSI analysis.

Combining qualitative methods such as focus groups, fieldwork, and interviews with quantitative methods enables researchers to triangulate data from an interpretive perspective and generate alternative sources for data and theory development (Burke & Hutchins, 2007). Triangulation, involving the use of multiple data sources and methods, is used to enhance the validity and reliability of the findings (Denzin, 1978). By integrating the quantitative data from tools like the LTSI with qualitative insights from participant interviews and reflection activities, researchers can uncover nuanced perspectives on training transfer and identify if there was an actual transfer.

Table 1. Excerpt of evaluation rubric based on the learning transfer system inventory

Code	1	2	3	4	5
Motivation to transfer	The participant had no confidence that the program would increase personal productivity.	The participant had slight expectations of personal productivity improvement after the program.	The participant moderately believed that the program would enhance personal productivity.	The participant fairly believed the program would boost personal productivity.	The participant strongly believed the program would significantly enhance personal productivity.
Opportunity to use learning	The participant did not get opportunities to apply learning on the job.	The participant received less opportunities to use learning on the job.	The participant moderately received adequate opportunities to use learning on the job.	The participant fairly received good opportunities to use learning on the job.	The participant received ample opportunities to use learning on the job.

4. Findings

4.1 *Perceived learning transfer among participants – quantitative results*

Descriptive statistics from the LTSI analysis (Table 2) showed a mean learning transfer score of 3.8 (*SD* = 0.3), indicating a moderate level of perceived learning transfer among participants. It was identified that motivation to transfer, performance self-efficacy, transfer effort, performance expectation, peer support, and openness to change were the factors that scored high (above 4.0) for means.

Table 2. Descriptive statistics of the learning transfer system inventory analysis

Subconstruct	Mean	*SD*
Learner readiness	3.44	0.6250
Performance self-efficacy	4.25	0.6216
Motivation to transfer	4.28	0.4889
Transfer effort performance expectation	4.06	0.4678
Peer support	4.08	0.5149
Openness to change	4.25	0.6051
Personal outcome +ve.	3.31	0.4371
Opportunity to use learning	3.94	0.5474
Personal capacity to transfer	3.86	0.8098
Perceived content validity	3.00	0.6513
Transfer design	3.75	0.5342
Learning transfer	3.84	0.3395

When conducting a Shapiro-Wilk test for normality (Table 3), it showed that from all constructs, only motivation to transfer was not normally distributed.

Table 3. Shapiro-Wilk test of normality

Variable	W	*p*-value	Normality
Learner readiness	0.904	0.181	Normal
Performance self-efficacy	0.911	0.223	Normal
Motivation to transfer	0.838	0.026	Not Normal
Transfer effort performance expectation	0.941	0.509	Normal
Peer support	0.895	0.137	Normal
Openness to change	0.910	0.211	Normal
Personal positive outcome	0.872	0.070	Normal
Opportunity to use learning	0.862	0.051	Normal
Personal capacity to transfer	0.931	0.391	Normal
Perceived content validity	0.941	0.508	Normal
Transfer design	0.898	0.151	Normal
Learning transfer	0.914	0.240	Normal

Note: A *p*-value less than 0.05 indicates a significant deviation from normality

Table 4. Pearsons correlation matrix

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. Learner readiness	-	0.39	0.21	0.49	-0.30	0.25	0.24	0.38	0.24	0.44	0.46	0.58*
2. Performance self efficacy	0.39	-	0.48	0.63*	0.15	0.77**	0.25	0.63*	0.64*	0.11	0.57	0.86**
3. Motivation to transfer	0.21	0.48	-	0.84**	0.44	0.50	0.12	0.49	0.36	-0.26	0.29	0.65*
4. Transfer effort perf. expectation	0.49	0.63*	0.84**	-	0.06	0.56	0.12	0.55	0.54	-0.20	0.67*	0.80**
5. Peer support	-0.30	0.15	0.44	0.06	-	0.44	-0.13	0.38	0.01	-0.06	-0.32	0.23
6. Openness to change	0.25	0.77**	0.50	0.56	0.44	-	0.02	0.72**	0.74**	-0.16	0.21	0.79**
7. Personal positive outcome	0.24	0.25	0.12	0.12	-0.13	0.02	-	-0.25	-0.12	0.47	0.43	0.33
8. Opportunity to use learning	0.38	0.63*	0.49	0.55	0.38	0.72**	-0.25	-	0.57	0.10	0.10	0.72**
9. Personal capacity to transfer	0.24	0.64*	0.36	0.54	0.01	0.74**	-0.12	0.57	-	-0.29	0.27	0.65*
10. Perceived content validity	0.44	0.11	-0.26	-0.20	-0.06	-0.16	0.47	0.10	-0.29	-	0.13	0.20
11. Transfer design	0.46	0.57	0.29	0.67*	-0.32	0.21	0.43	0.10	0.27	0.13	-	0.60*
12. Learning transfer	0.58*	0.86**	0.65*	0.80**	0.23	0.79**	0.33	0.72**	0.65*	0.20	0.60*	-

Note: $N = 12$. $p < 0.05$ (*), $p < 0.01$ (**). Pearson correlation coefficients are shown. A *p*-value less than 0.01 was considered a very strongly significant outcome, while a value less than 0.05 was considered strongly significant

Therefore, the Pearson correlation analysis showed (Table 4) a positive and very strong relationship between the subconstructs Performance self-efficacy ($r = 0.86$, $p < 0.01$), Transfer effort performance expectation ($r = 0.80$, $p < 0.01$), and Openness to change ($r = 0.79$, $p < 0.01$) with Overall learning transfer. While subconstructs Learner readiness ($r = 0.58$, $p < 0.05$), Motivation to transfer ($r = 0.65$, $p < 0.05$), Opportunity to use learning ($r = 0.72$, $p < 0.05$) and Personal capacity to transfer ($r = 0.65$, $p < 0.05$) are moderately correlated with Overall learning transfer. Therefore, the most influential factors on learning transfer in this analysis are Performance self-efficacy, Transfer effort performance expectation, Motivation to transfer, Opportunity to use learning, Personal capacity to transfer and Openness to change, as they not only scored high in mean values but also showed very strong positive correlations with overall learning transfer.

Consequently, in the non-parametric correlation analysis, using Spearman's rank-order correlation to create the correlation matrix (Table 5) some constructs – such as Learner readiness, Personal capacity to transfer, and Transfer design – which showed statistically significant relationships under Pearson's correlation (Table 4), became non-significant when analyzed using Spearman's correlation.

Table 5. Spearman rank correlations

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. Learner readiness	-	0.13	0.13	0.37	-0.39	-0.15	0.31	0.27	-0.2	0.51	0.35	0.35
2. Performance self efficacy	0.13	-	0.47	0.67*	0.15	0.76**	0.18	0.59*	0.49	0.04	0.44	0.86**
3. Motivation to transfer	0.13	0.47	-	0.86**	0.41	0.51	0.16	0.37	0.35	-0.29	0.24	0.70*
4. Transfer effort performance expectation	0.37	0.67*	0.86**	-	0.1	0.57	0.23	0.48	0.47	-0.06	0.61*	0.88**
5. Peer support	-0.39	0.15	0.41	0.1	-	0.42	-0.15	0.47	0.04	-0.11	-0.37	0.25
6. Openness to change	-0.15	0.76**	0.51	0.57	0.42	-	-0.08	0.56	0.64*	-0.27	0.13	0.70*
7. Personal positive outcome	0.31	0.18	0.16	0.23	-0.15	-0.08	-	-0.28	-0.18	0.43	0.56	0.38
8. Opportunity to use learning	0.27	0.59*	0.37	0.48	0.47	0.56	-0.28	-	0.27	0.29	-0.02	0.64*
9. Personal capacity to transfer	-0.2	0.49	0.35	0.47	0.04	0.64*	-0.18	0.27	-	-0.38	0.12	0.45
10. Perceived content validity	0.51	0.04	-0.29	-0.06	-0.11	-0.27	0.43	0.29	-0.38	-	0.21	0.17
11. Transfer design	0.35	0.44	0.24	0.61*	-0.37	0.13	0.56	-0.02	0.12	0.21	-	0.55
12. Learning transfer	0.35	0.86**	0.70*	0.88**	0.25	0.70*	0.38	0.64*	0.45	0.17	0.55	-

Note: $N = 12$. $p < 0.05$ (*), $p < 0.01$ (**)

4.2 *Narratives of training transfer – qualitative results*

In the qualitative analysis (Table 6), "Motivation to transfer" and "Peer support" received high mean scores of 4.20 and 4.17, respectively, indicating strong support mechanisms and motivation among participants for transferring learning into practice. This was evident from the answers of participants from the reflection activity. One of the learners noted: "I am trying to connect the course activities frequently. For instance, in the workplace learning discussion, I saw the opportunity to apply a project pilot about soft skills, the culture of observation, and feedback in a real work context." Another participant replied: "I found the peer mentoring process very encouraging during the [University name] course

and would like to replicate this."

Although the participants could find supportive peers in the course, it was hard for them to find the same level of support at their workplace. This was evident in a participant's response: "One challenge was that we are a small team, so finding a colleague in the office was not so simple. A solution was to reach out to our wider network to find other colleagues who would be interested in such a process."

"Perceived content validity" and "Opportunity to use learning" received a high-frequency count of 12 and 9, respectively, suggesting that participants recognize the significance of content validity and practical application in the learning process. However, their mean scores of 3.00 and 3.67 indicate room for improvement. "Transfer design" and "Transfer effort performance expectation" both received mean scores of 3.00 and 4.00, respectively. This was evident from a participant's response in which the participant was unsure about the application of learning: "The future application of the idea will depend on the decision of the management of the organization. This could be challenging because it could lead to some costs, as additional acknowledgement for mentors. One of the participants also opined that there was a gap between their learning in their course and application at their workplace: "In fairness, my work do not combine many approaches combined in the course.''

Table 6. Frequency and scoring of qualitative codes in the reflection task

Code	Frequency	Mean
Learning transfer	5	4.00
Motivation to transfer	5	4.20
Opportunity to use learning	9	3.67
Peer support	6	4.17
Perceived content validity	12	3.00
Performance self efficacy	4	2.50
Personal capacity to transfer	3	4.00
Personal positive outcome	3	3.33
Transfer design	6	3.00
Transfer effort performance expectation	7	4.00
Openness to change	1	4.00

4.3 *Triangulating quantitative and qualitative findings – mixed methods results*

As the scores of the quantitative and qualitative methods were normally distributed as measured with the Shapiro-Wilk test (Table 7), the Pearson correlation results (Table 8) indicated a non-significant medium positive relationship between qualitative and quantitative scores (r (8) = 0.34, p = 0.30). Therefore, there is no significant association between this study's qualitative and quantitative scores.

Table 7. Shapiro-Wilk test of normality

Variable	W	*p*-value	Normality
Qualitative score	0.894	0.154	Normal
Quantitative score	0.876	0.092	Normal

Note: A *p*-value less than 0.05 indicates a significant deviation from normality

Table 8. Mixed methods correlation analysis

		Quantitative score	Qualitative score
Quantitative score	Pearson correlation	1	0.34
	Sig. (2 tailed)		0.30
	N		11

Note: Correlation is not significant at the 0.05 level

5. Discussion

This research provided insights into the factors influencing the perceptions of learning transfer of participants who took part in an LLL Master's program in Germany. Psychological factors such as motivation to transfer, performance self-efficacy, personal capacity to transfer, transfer effort, performance expectation, and openness to change were found to significantly influence learning transfer. Studies that used LTSI have shown that psychological factors receive higher scores, which shows their significance in learning transfer. This aligns well with the Holton et al. (2003) study, which found that learners were more committed to applying new skills and knowledge in their work environments if they had high motivation to transfer. Considering the changes in significance in the quantitative results from Pearson's to Spearman's correlation analysis, our findings align with a review study by Edelsbrunner and Thurn's (2024), who reviewed 50 educational research articles and found that 48% of 528 hypothesis tests yielded non-significant results. This shows that getting non-significant results is a common challenge in the field rather than a methodological problem.

Nevertheless, the findings suggest that performance self-efficacy plays a critical role in learning transfer. Our sample consists of experienced professionals, which can result in higher confidence and self-efficacy. In fact, individuals who perceive their own abilities as exceptionally high may exhibit overconfidence, potentially impacting their engagement with learning opportunities and the application of newly acquired skills, as we see from the quantitative results on motivation. These levels of self-efficacy are also reflected in the discrepancy between how participants rated their own skills quantitatively and how those skills were reported in the reflection activity, pointing to the limitations of self-assessment (Fiore et al., 2018) in capturing socially embedded and dynamic environments. In previous work in the field of skills assessment, participants with elevated self-efficacy ratings tended to overestimate their competence (Trikoili et al., 2024). This could lead to a decreased motivation to seek further learning, but does not seem to influence the transfer of learning. These findings support the broader notion that self-perceptions often diverge from those of external observers when triangulating knowledge, skills, and abilities, according to Graesser et al. (2018).

Moreover, we have found that perceived content validity was not significantly related in both assessments. Especially in the qualitative assessment, a high-frequency count and a relatively low mean score for perceived content validity indicate that the learnings from the program were less relevant or useful for their jobs. Looking at the assessment time at the end of the first semester, which mainly focused on theoretical foundations, the scores could be attributed to criticism of individual modules with a more theoretical nature, instead of the learning of the whole master's program. With regards to this, the need for curating the program's content with participants' expectations and perceived relevance should not be overlooked. This conclusion underlines the importance of continuous improvement of PDP to maximize its practical relevance.

Lastly, although the correlation between the LTSI and the reflection activity was not statistically significant, there is a tendency for significant findings in both quantitative and qualitative data sources. This suggests that, despite the lack of strong statistical evidence, the qualitative insights provided by the reflection activity complement the LTSI results in meaningful ways. One potential explanation for the non-significant correlation is the small sample size, which may have limited the ability to detect significant relationships. However, the observed alignment between the two methods supports the usefulness of triangulation in learning transfer research.

5.1 *Study limitations and future research*

This study comes with limitations related mostly to the design due to the circumstantial characteristics of the case we used. Firstly, data collection occurred only at the end of the first semester and five months later and did not capture the long-term effects of the training on learning transfer and job performance. The study did not evaluate the impact of the training on participants' job performance and professional development after the completion of the program. Longitudinal and continuous evaluations are necessary to capture training interventions' effects on workplace performance (Blume et al., 2010). Also, although the sample size is sufficient for a case study, a bigger one would benefit the data analysis and generalizability of the findings. The quantitative analysis was carried out by a single researcher, introducing potential bias, which should be addressed in future studies. In addition, we did not acquire performance records or supervisor observation records in participants' workplaces, which limited the ability to evaluate the impact of training on other objective job performance indicators.

Future research can overcome these limitations by expanding the scope and duration of data collection. Researchers should incorporate objective performance records and observation data from participants' supervisors or colleagues to more accurately assess the training's impact on job performance. Additionally, adopting a longitudinal design that extends evaluations beyond the program would allow for a more comprehensive analysis of professional development. Finally, increasing the sample size would enhance the statistical power and generalizability of the findings.

5.2 *Practical implications*

Along with the considerations for future research, the practical implications build on the deficiencies in measuring learning transfer. As we have seen from the results of utilizing different assessment methods, triangulation offers a more holistic view of learning transfer. Quality assessment and evaluation in general aim to investigate educational programs' success and can be used to justify their continuity (Nickols, 2005; Schilling & Applegate, 2012). While measuring the learners' achievements is essential for the development of these programs, in LLL contexts, the impact of the learning on professionals' work environments and thus, the extent of professional development, remains a key indicator for program quality. For this reason, this study's practical implications build on the ideas of Kirkpatrick's model of evaluation, which views program quality through four levels—Reaction, Learning, Behaviour, and Results (Kirkpatrick & Kirkpatrick, 2006). The first level, Reaction, focuses on participants' immediate responses to the training by capturing their perceptions and satisfaction with the content and delivery. This feedback helps to fine-tune the course to better meet learners' needs and enhance their engagement. It further helps to include content that is relevant to the learners' application at their workplaces. The second level, Learning, assesses how participants have acquired the required knowledge and skills. This approach ensures continuous monitoring of learning outcomes. The third level, Behavior, evaluates the degree to which learners apply what they have learned when they return to their jobs. Assessments should focus on observable changes in behavior and performance, providing a clear picture of how well the training translates into practical application. This level can also be used to check back on the included content of the programs in order to review its relevance. Together with the first level about reaction, the actual behavior will support increasing perceived content validity. And lastly, the fourth level, Results, measures the final impact of the training on organizational outcomes, such as productivity, quality improvements, and financial gains (Alsalamah & Callinan, 2021; Kirkpatrick & Kirkpatrick, 2006).

With the triangulated approach in this study, our evaluation can be placed in the third level, Behavior, as it focuses on the observable changes in the behavior. Yet, the challenge of the LTSI evolves around not being an objective approach. While triangulation aims at tackling this problem, we further suggest considering the perspectives of different stakeholders, such as performance metrics and supervisor evaluations. This involves, but is not limited to, obtaining

feedback from supervisors through structured reports or direct communication (Nickols, 2005).

Overall, we obtained evidence that integrating each level of Kirkpatrick's model in the evaluation of PDP offers a holistic framework for measuring transfer and effectively addressing transfer-related problems. It further provides valuable quality metrics that go beyond self-perception statements (Bates, 2004; Kirkpatrick & Kirkpatrick, 2006). Furthermore, this approach not only facilitates the measurement of transfer, but the holistic evaluation framework can also serve as a foundation for developing guidelines or regulations. Yet, it must be adapted to the specific situations, contexts, and characteristics of the target group in order to be effective.

6. Conclusion

PDP often face transfer constraints, where the skills and knowledge acquired during training are not effectively applied in the workplace. This paper investigated the factors affecting learning transfer through a mixed-method approach. For this reason, we explored the perceptions of participants of an LLL Master's program in Germany regarding the extent to which they feel learning transfer had taken place and described specific instances of learning transfer to the workplace. We found significant positive relationships between psychological factors and learning transfer. When it comes to perceived content validity, we identified a need to strengthen the relevance of the program's content. Building on the limitations that mainly evolve around the timing and single occurrence of data collection, we propose a longitudinal design for future studies. For more targeted PDP, we suggest a holistic approach with evaluations carried out by different stakeholders to assess the extent of professional development.

Conflict of interest

The authors declare there is no conflict of interest at any point with reference to research findings.

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Appendix

Adapted Learning Transfer System Inventory (LTSI) Questionnaire

Q1	Prior to this training, I knew how the program was supposed to affect my performance.
Q2	Before this training, I had a good understanding of how it would fit my job-related development.
Q3	I knew what to expect from this training before it began.
Q4	I never doubt my ability to use newly learned skills on the job.
Q5	I am sure I can overcome obstacles on the job that hinder my use of new skills or knowledge.
Q6	At work, I feel very confident using what I learned in training even in the face of difficult or taxing situations.
Q7	This training will increase my personal productivity.
Q8	When I leave this training, I can't wait to get back to work to try what I learned.
Q9	I believe this training will help me do my current job better.
Q10	My job performance improves when I use new things that I have learned.
Q11	The harder I work at learning, the better I do my job.
Q12	The more training I apply on my job, the better I do my job.
Q13	My colleagues will appreciate my using the new skills I learned in this training.
Q14	My colleagues will encourage me to use the skills I have learned in this training.
Q15	At work, my colleagues will expect me to use what I learned in this training.
Q16	Experienced employees in my group ridicule others when they use techniques they learn in training.
Q17	People in my group are not willing to put in the effort to change the way things are done.
Q18	My workgroup is reluctant to try new ways of doing things.
Q19	Successfully using this training will help me get a salary increase.
Q20	If I use this training, I am more likely to be rewarded.
Q21	I am likely to receive some recognition if I use my newly learned skills on the job.
Q22	I will be able to try out this training on my job.
Q23	The resources needed to use what I learned in this training will be available to me.
Q24	I will get opportunities to use this training on my job.
Q25	I do not have time to try to use this training on my job.
Q26	Trying to use this training will take too much energy away from my other work.
Q27	There is too much happening at work right now for me to try to use this training.
Q28	The instructional aids (equipment, illustrations, etc.) used in this training are very similar to real things I use on the job.
Q29	The methods used in this training are very similar to how we do it on the job.
Q30	I like the way this training seems so much like my job.
Q31	It is clear to me that the people conducting this training understand how I will use what I learn.
Q32	The trainer(s) used lot of examples that showed me how I could use my learning on the job.
Q33	The way the trainer(s) taught the material made me feel more confident. I could apply it in my job.