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Managing the Pre-Training Phase: Lecturer-Learner Dynamics in the Digital Age

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Background / Purpose: This study examines the significance of the pre-training phase and its impact on subsequent learning outcomes. It investigates the critical role of contemporary digital technologies in employee development, specifically during the initial pre-training stage. The research aims to provide a deeper understanding of how these technologies support, rather than diminish, lecturer–learner interaction.
Methods: To achieve this objective, the paper utilized a mixed-methods approach. First, four semi-structured interviews were conducted to capture the organizational perspective. Subsequently, the authors surveyed participants to gather learner perspectives, allowing for the analysis of the training environment.
Results: The findings confirm that interaction between the lecturers and learners is pivotal to the employee development process, particularly during the pre-training phase. Additionally, the results indicate that digital solutions positively influence both parties in achieving primary learning goals.
Conclusion: The findings of this study offer significant theoretical and practical implications. The research highlights that pre-training activities function as a catalyst for effective employee development and subsequent organizational implementation. Furthermore, by integrating organizational and employee perspectives within a European context, this study provides a holistic view of modern training complexities.

Keywords: Digital, Training, Development, Learning, Interaction, Lecturer, Learner

1 Introduction

The contemporary business environment places a significant emphasis on the outcomes of employee learning and development (Ahadi & Jacobs, 2017). Organizations increasingly seek to determine practical and goal-oriented strategies to improve learning and development processes within their organizations (Lee & Tan, 2023). Consequently, aligning learning objectives with business goals has become critical. Nevertheless, the field of employee development is evolving rapidly (Melnychenko et al., 2021). These shifts are driven by various factors that influence instructional methods, pedagogical approaches, and interaction between learners and lecturers (Addae et al., 2022; MacLean et al., 2014; Melnychenko et al., 2021).

For those reasons, the authors concentrated within this research on employee training, lecturer-learner interaction presence, and digital technology usage. This research paper investigates how digital technologies play a critical role in employee development processes within contemporary businesses. The focus is predominantly on the initial stage of employee learning - the pre-training phase. Furthermore, the study examines how current technologies support, rather than diminish, the interaction between lecturers and learners.

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2 Systematic Literature Review Approach

Employee learning and development have become key pillars for achieving organizational goals and success. Various authors have identified several beneficial outcomes stemming from a corporate focus on employee learning (Trávníčková et al., 2024). Consequently, current businesses and human resources specialists are striving to identify methods to enhance the effectiveness of learning and development processes (Park et al., 2021; Su & Li, 2023). Nevertheless, these approaches are influenced by global, political, and economic challenges. One of the most significant recent influences was the global epidemiological crisis, which prompted businesses to rapidly reconsider their approach to employee learning (Estévez et al., 2023; Park et al., 2021). These circumstances resulted in outcomes that revamped company perceptions toward employee development and strengthened them further.

Employee development is a long-term process incorporating various steps and dependencies (Trávníčková et al., 2024). At the same time, this long-term perspective can be divided into distinct phases to better comprehend the respective measures (Alipour & Ghsemi, 2023; Memon et al., 2023). The phases of the employee learning and development process can be categorized into pre-training, training, and post-training phases (Jaidev & Chirayath, 2012). This approach is essential to effectively enhance employee skills, knowledge, and performance within the business landscape.

The initial pre-training phase incorporates relevant starting particulars that shape format the subsequent employee development processes, including other phases (Celestin & Yufen, 2018). This phase focuses on the necessary knowledge to meet predefined objectives, address the skills gap, and fulfil the company strategy. Following this phase, the fundamental delivery of knowledge and skills continues via the training session. This phase incorporates various forms of knowledge transfer by utilizing different methods and techniques (Muduli et al., 2020). This step can be characterized as the execution of objectives established during the pre-training phase. Once this training phase is successfully completed, the post-training stage evaluates executed activities, provides relevant feedback for both parties, assesses the return on investment, and implements specific measures for upcoming employee development agendas (Zia et al., 2020).

For the purpose of this research, the authors concentrate predominantly on the initial pre-training phase. The main reason for this emphasis is the critical importance of the pre-training phase for subsequent employee learning and development steps. Pre-training activities have a significant relationship with and influence on the transfer of training (Jaidev & Chirayath, 2012). Moreover, pre-training activities provide learners with the basic skills necessary for successful training execution (Fabian et al., 2024). The primary objective of pre-training phase is to provide both lecturer and learner with fundamental knowledge that can be used during the actual training activity (Celestin & Yufen, 2018). This ensures that the training program meets expected outcomes and fulfils company goals. Due to these reasons, a special focus on this phase is vital to understand its broader implications. Howard and Lee (2020) explored pre-training interventions and the utilization of current technologies to support this phase. The authors identified several pre-training interventions that have a powerful impact on digital training program execution. It is also essential to note that pre-training has long been a core topic for businesses, as confirmed by the study of Cohen (1990). The author emphasized the positive impact of a deeper focus on the pre-training phase, noting that introducing upcoming training programs impacts motivation, engagement, and the overall learning experience (Cohen, 1990).

Nevertheless, the digital era and the development of information technologies present new challenges for companies regarding the effectiveness of employee learning (Hubschmid-Vierheilig et al., 2020; Melnychenko et al., 2021). Current trends in organizational processes have influenced the pre-training phase (Howard & Lee, 2020; Jaidev & Chirayath, 2012). Digital trends provide opportunities for cost reductions, and the digitalization of all training phases (Hašková & Zatkalík, 2018; Kuczyńska, 2022; Melnychenko et al., 2021; Ostin, 2023). Current organizations are exploring new techniques that positively impact the cost efficiency of training activities and enhance the pre-training effectiveness (Celestin & Yufen, 2018; Chen et al., 2022; Howard & Lee, 2020). Integrating digital tools into training phases offers various benefits while simultaneously fulfilling company objectives (Männistö et al., 2020). Furthermore, new forms of pre-training approaches and digital tools utilization enable lecturers to express their creativity, engage participants and understand their needs better (Ceh et al., 2024; Cohen, 1990; Karakas & Manisaligil, 2012).

Various authors have explored the impact of digitalized and hybrid forms of training, emphasizing the necessity of a personal approach (Antoun et al., 2023; Fortuna et al., 2020; MacLean et al., 2014). Alipour and Ghsemi (2023) stated that this technique should significantly improve following training effectiveness, as the pre-training element should be a central part of these advancements.

To address the importance of this topic, the authors analysed factors such as peer interaction within the learning and development process. For the purpose of this study, peer interaction is defined broadly to encompass lecturer-learner dynamics where the instructor acts as a facilitator. This approach aligns with the concept of instructional peerage, where digital tools bridge the hierarchical gap,

allowing for the collaborative exchanges traditionally associated with peer-to-peer learning to occur between the lecturer and the learner.

The authors utilized a systematic literature review (SLR) approach via the Web of Science, obtaining data up to June 1, 2024. This method was employed to trace the development of the key terms and identify potential outcomes and the research gap.

The search utilized the terms "peer interaction and learning" to capture the broadest possible range of collaborative dynamics in digital environments. This initial search in the Web of Science database yielded 2,174 publications. The authors subsequently applied meticulous inclusion and exclusion criteria to ensure the dataset's relevance and comprehensibility. Specifically, papers published before 2005 and non-English language manuscripts were excluded. After removing duplicate publications to prevent redundancy, a systematic review of titles and abstracts was conducted on the remaining 1,492 records.

During this screening phase, 1,433 records were excluded primarily due to a focus on K-12 education, a lack of relevance to corporate or adult learning, or the absence of digital learning environments. The subsequent phase involved a full-text exploration of the remaining 59 records. During this stage, the authors specifically filtered for studies where peer-style collaborative interactions occurred between lecturers and learners. Consequently, 42 records were excluded because they strictly examined student-to-student dynamics (horizontal interaction) without facilitator involvement. This was a critical step, as the focus of this research is specifically on the facilitated lecturer–learner dynamic (vertical interaction) during the pre-training phase.

Table 1: Key Findings: Facilitated Lecturer-Learner Interaction

Author(s)	Key Findings in employee – lecturer peer interaction
Alshammari and Alshammari, 2024	Emotional engagement and interaction positively influence intention to use digital solutions.
Carson et al., 2024	Lecturer assisted learning supports a more effective approach at higher task complexity.
Chung and Huang, 2022	Lecturer assistance positively impacts the learning motivation, achievements, and peer interaction.
Nisar et al., 2021	Identified significant challenges for participants in online skills training solutions.
Schafer et al., 2021	Confirmed a successful incorporation of lecturer-lecturer learning interect in practice.
Sippel, 2024	Enhanced effectiveness with form-focused instruction and peer feedback.
Tenenbaum et al., 2020	Confirmed that interaction between the learner and lecturer significantly facilitates learning.
Youde, 2020	Effective tutoring despite the lack of lecturer support. The author underlined the importance of lecturer's proactive involvement.
Chen et al., 2022	Enhanced positive interaction and learning performance
Peeters, 2020	Emphasized learners' online conversations and their positive outcome to their learning path progress.
Lai et al., 2019	Highlighted positive effects on learning engagement and achievement via online solutions and lecturer interaction presence.
Lin et al., 2017	Confirmed significant effects on learning achievement through interaction involvement.
Du and Durrington, 2013	Enhanced cognition process and interaction in collaborative tasks to gain learning effectivness.
Jeon and Kim, 2012	Identified key factors influencing informal learning in the workplace and emphasized the role of lecturers in this process.
Ma and Yuen, 2011	Confirmed, that interpersonal relationships significantly influence online knowledge sharing.
Guldberg, 2008	Highlighted the role of an effective learning and professional development in networked communities.

Source: Own elaboration based on data from Web of Science

This rigorous selection process and strict adherence to the research objectives yielded a final sample of 16 records. By synthesizing the findings from these 16 studies, the authors were able to formulate a comprehensive definition of interpersonal interaction within the learning and development context. Furthermore, these literature-based insights enabled a more precise formulation of the foundational aspects of lecturer–learner interaction as they pertain to the pre-training phase.

Table 1 summarizes the outcomes of the SLR. While the majority of identified studies explore students' interaction among participants, existing literature lacks a profound focus on the vertical interaction between lecturers and learners during the pre-training phase. This gap highlights a significant opportunity for further exploration, specifically regarding the lecturer–learner dynamic within the context of digitalization. It is crucial to emphasize the interplay between the lecturer's interaction with learners and the efficacy of the subsequent training activity (Guldberg, 2008; Tenenbaum et al., 2020).

Current research necessitates a specific investigation into how lecturer–learner interaction can be effectively conducted during the pre-training phase. While existing literature confirms the overarching value of instructional involvement, there remains a critical need to examine the lecturer–learner dynamic during the preliminary stages of development. At this stage, the lecturer's role extends beyond mere content delivery; it involves building initial rapport, clarifying learning objectives, and establishing familiarity with digital tools before the cognitive load of the main training begins. Applying the established benefits of digital interaction - such as enhanced engagement and preliminary problem-solving - directly to the pre-training phase suggests that early, digitally facilitated support from a lecturer can pre-emptively close knowledge gaps. Therefore, exploring this specific pre-training interaction is crucial for understanding how to maximize the subsequent transfer of knowledge. Interaction with lecturers is one of the most essential elements in completing the company's objectives during employee learning and development (Stone et al., 2013). Chiaburu and Marinova (2005) highlighted that interaction during training provides multiple benefits for both lecturers and learners. Pietrantoni et al. (2024) positively confirmed the interconnection between managerial support, direct interaction with learners, and the related dependency of these factors on employee performance. Based on the stated outcomes, it is possible to identify the potential of stated interaction, thus its vitality for the effectiveness of pre-training activity (Fortuna et al., 2020; MacLean et al., 2014). According to various authors, digitalized tools offer diverse learning solutions such as case consultations, research tools, and lecturer-learner interaction procedures, where real-time support is critical given the specific field of research and learning paths (Youde, 2020). For the purpose of conceptual clarity, this study defines lecturer-learner interaction during the pre-training phase as a dynamic process wherein employees engage with a lecturer through collaborative exchanges, facilitated via face-to-face approaches and digital platforms (Alshammari & Alshammari, 2024; Carson et al., 2024; Schafer et al., 2021). This stage includes structured learning and feedback interchange (Du & Durrington, 2013; Lai et al., 2019; Sippel, 2024; Tenenbaum et al., 2020). This interaction significantly expands pre-training effectiveness and improves overall performance of the lecturer's collaborative interaction with learners (Carson et al., 2024; Celestin & Yufen, 2018; Chen et al., 2022; Guldberg, 2008; Jaidev & Chirayath, 2012; Jeon & Kim, 2012; Lin et al., 2017).

3 Research Methodology

As the research investigates lecturer-learner interaction and its effect on the pre-training phase, a mixed-methods approach was employed to achieve the study's objectives. This technique integrated semi-structured interviews with a survey.

This mixed-methods approach was specifically designed to address a critical gap identified during the initial stages of this research. The literature review confirmed that lecturer–learner interaction is a pivotal determinant of success in pre-training phases. Furthermore, while digital tools are known to enhance training effectiveness and engagement, the SLR revealed a significant research deficit: only 1.1% of identified publications specifically examined the intersection of digitalization and the pre-training phase within management and business disciplines. This gap demonstrates a significant opportunity for contributions that bridge theoretical approaches with empirical evidence, offering actionable insights for managers and HR specialists. By focusing on these disciplines, the research seeks to design approaches that enhance the training process and, consequently, organizational performance.

Firstly, the authors conducted four semi-structured interviews in total. Their primary objective was to gain several outputs regarding the current trends and barriers within organizations in employee learning and development. The interview selection mainly consisted of Central European companies' human resources (HR) and learning and development (L&D) managers. These interviews were performed from June to October 2023 in two large and two medium sized enterprises. The interview participants were selected using purposive sampling. This non-probability sampling technique allowed the authors to specifically target key informants - L&D and HR managers - who possess specialised knowledge and decision-making power regarding the implementation of digital tools and training structures within the automotive industry. The detailed specifications of the participating companies are provided

in Table 2. The decision to begin with a qualitative phase was motivated by the need to acquire precise, context-specific insights before proceeding to the broader quantitative phase.

To ensure methodological rigor, the authors executed a systematic thematic analysis of the qualitative data. An open coding approach was utilized to identify initial concepts related to pre-training digital tools, learning structures, and lecturer-learner interactions. These initial codes were then grouped into broader categories, such as "Learning Educational Structure", "Social Learning Dynamics", "Training Methods" and others (see Table 2.), allowing for cross-case comparison among the four enterprises. The semi-structured interview protocol consisted of open-ended questions targeting three core areas: (1) current digital tool utilization, (2) the structure of training delivery, and (3) employee attitudes toward digital versus face-to-face lecturer-learner interaction.

Secondly, following the insights gained from the interviews, the authors decided to dilate their standpoint and delve more in-depth into comprehending the learner's feedback. To effectively collect this feedback, the authors utilized a quantitative data method in the form of a survey. The authors conducted an anonymous format questionnaire. The questionnaire included 13 questions and was constructed by utilizing the Computer-Assisted Web Interviewing (CAWI) method. The full questionnaire instrument is provided in Appendix A. The closed questions with an optional "other" alternative were predominantly used, authorizing participants to express their direct feedback. The closed questions included single and multiple-choice answers. Moreover, several questions used Likert scales to apprehend the nuances of participants' attitudes and points of view. According to Korkut Altuna and Arslan, (2016), selecting a 7-point Likert scale for questionnaires is more effective than other alternatives. Additionally, Menold (2020) proves that utilizing fully verbalized seven varieties is effective for online surveys as well. Thus, the Likert scale enables respondents demonstrate their agreement or disagreement with specific statements within the questionnaire.

To ensure high-quality data and improve response rates, one of the authors took part in one of the company trainings in May 2024. This action was necessary to ensure respondents comprehended the critical role of their feedback in the research, thereby promoting higher response rates and more competent answers. After the training, the questionnaire was distributed to all respondents. The survey gained a 62% response rate with a total sample of 108 responses. The approached respondents performed their occupation in one of the service providers within the automotive industry in the Czech Republic region. The outcomes were subsequently analysed using a descriptive statistic. Pearson's chi-square test was also used to underline the relationships between two chosen variables using the R-Studio tool. To facilitate the Pearson's chi-square analysis, the quantitative data were categorized based on the themes identified during the qualitative open coding process. This allowed for the testing of statistical dependencies between the organizational strategies identified in the interviews and the actual experiences reported by the participants.

4 Qualitative Research Results

The research provides an analysis of the current employee development landscape by identifying several key trends and practices. The participating companies are referred to as Enterprise 1, 2, 3, and 4 to ensure organizational anonymity. This procedure was necessary to maintain confidentiality and encourage open, honest feedback from the interviewees.

The following Table 2. reveals several pivotal results from the semi-structured interviews related to the digitalization in companies´ training. The documented outcomes were coded and categorized to reflect themes related to pre-training and interaction. It should be noted that only data relevant to the scope of this paper are presented, as some interview responses pertained to broader areas of HR management.

The results listed above provided a foundational basis for the subsequent quantitative survey. All four enterprises utilize various Learning Management Systems (LMS) for employee qualification. Despite variations in company size, digital and systematic solutions are consistently present across the organizations, highlighting the central role of digital approaches in modern development processes.

The existence of LMS systems is highly interconnected with a training evaluation process, which is essential for nowadays businesses. Enterprise 1 and Enterprise 2, regularly evaluate training activities via pre- and post-testing. Those steps emphasize a systematic approach for the whole training process, starting from self-learning and finishing with training outcomes. In contrast, Enterprise 3 and Enterprise 4 do not evaluate training activities or participants self-study learning. This illustrates a visible disparity compared to the structured evaluation practices of the first two companies.

Nevertheless, the most valuable results for confirming the research objective are stated within the training method and digitalization sections of Table 2. The results of all four interviews revealed that enterprises primarily utilize digital methods for employee learning. Besides, several company representatives (Enterprise 2, Enterprise 3, and Enterprise 4) noted that they are increasingly concentrating on employee self-learning.

Table 2: Semi-structured interviews outcomes

Category	Enterprise 1	Enterprise 2	Enterprise 3	Enterprise 4
Interviewer	L&D Manager	L&D Manager	HR Manager	L&D Manager
Number of employees	8 000	2 000	70	60
Field	Manufacturing	Manufacturing	Marketing	L&D
LMS System	Qualification Portal	Internal LMS	Internal LMS	Research Centrum
Learning educational structure	Blended system (predominantly virtual with structured Face-to-Face)	Decentralized digital ecosystem (self-paced tools & online academies)	Peer-led knowledge sharing (internal courses & communities)	Traditional apprenticeship model (on-the-job, in-person coaching)
Social Learning Dynamic	Highly collaborative and interactive	Community-driven online networking	Team-oriented and collective	Individualized and isolated
Role of Lecturer	Virtual facilitator and expert guide	Knowledge community moderator	Peer / Team member	Direct personal coach / Mentor
Training methods	Online (80%): Webinars, expert talks, interactive sessions.	Online: Expert talks, webinars, online academies	Internal Courses: Focus on experience sharing	On-the-Job: Individual coaching.
	Face-to-Face (20%): Train-the-trainer sessions, workshops, lectures.	Self-Learning Tools: Videos, presentations, eLearning, home tasks due to capacity constraints.	Self-Learning Tools: IT tools, conference participation, expert communities within the company.	Educational Platforms: Platforms such as Red Button.
	Human Approach: Emphasizing personal interaction even during virtual sessions.	Expert Communities: Knowledge sharing through online expert communities.		Team Presentations: Team members training the team using digital tools.
Digital tools usage	Special Tools: Development tools for skills enhancement.	High Demand: Digital training tools and topics are highly demanded by employees and supported by employers as well.	Digital Solutions: Utilization of AI, VR, eLearning. The problem is consisting of real time lecturer presence during online tools utilization.	Limited Popularity: Digitalization is not highly demanded but critical for specific contexts.
	Support: Employees require lecturer support and expert sessions even online.			

Source: Own elaboration

However, in contrast to this trend of total autonomy, Enterprise 1 and Enterprise 2 consistently support their learners by facilitating lecturer-learner interactions and discussions. These enterprises have adopted a blended technique where participants complete preliminary learning independently but receive digital support from a lecturer. This model includes specialized expert sessions that address frequent questions following the self-learning stage. To illustrate this balance, the L&D Manager of Enterprise 1 stated: "Even though the vast majority of our training is now conducted online through webinars and interactive sessions, we cannot eliminate the human element. Our employees explicitly require lecturer support and expert sessions even in virtual environments to truly feel engaged." According to representatives from Enterprises 1 and 2, this practice allows companies to organize employee learning more effectively and cost-efficiently. The interviewed companies also confirmed that lecturer support is available throughout the training process, including the pre-training phase.

Furthermore, three enterprises (excluding Enterprise 4) emphasized the essential role of digitalization during the employee learning process. These companies are persevering in utilizing of various digital solutions

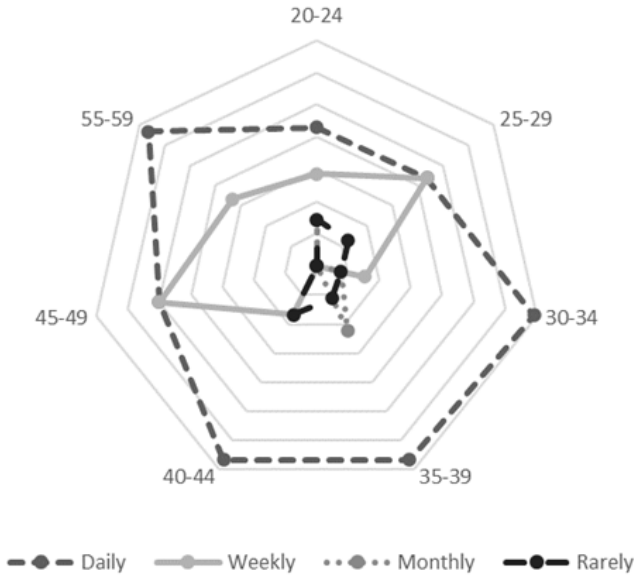

Figure 1: Age groups and digital technology usage for learning purposes
Source: Own elaboration

to integrate them into the business environment, including the employee learning landscape. The representative from Enterprise 2 underlined the mutual force from both sides. In that company, employees are regularly requesting company support for digital tool implementation, and the employer is supporting its employees with that. Highlighting this dynamic, the representative noted: "The push for digitalization isn't just coming from management; these digital training tools are actually highly demanded by the employees themselves. By focusing on knowledge sharing through online expert communities, we've created a culture where people actively want to engage with the digital LMS."

When reviewing the educational structures of these four enterprises, as stated within the Table 2, a clear pattern emerges that contextualizes their differing levels of enthusiasm for new digital tools. Enterprises 1, 2, and 3 utilize highly structured, collaborative learning environments. For instance, Enterprise 1 conducts 80% of its training online through interactive sessions and webinars. Enterprise 2 leans heavily on online academies and expert communities for knowledge sharing, which directly correlates with their employees exhibiting a "High Demand" for digital training tools. Similarly, Enterprise 3 integrates experience sharing and team presentations alongside advanced digital solutions like AI and VR.

In contrast, Enterprise 4, an L&D firm with 60 employees, relies on a fundamentally different education structure. Their primary training method is based on "On-the-Job: Individual coaching" rather than collaborative online ecosystems. While they do utilize educational platforms such as Red Button, digitalization overall has "Limited Popularity" and is not highly demanded by their workforce. As the L&D Manager of Enterprise 4 explained: "Because our core training method has always been on-the-job, individual coaching, our staff is accustomed to direct, face-to-face mentorship. Consequently, while we do offer educational platforms like Red Button, pure digitalization just isn't highly demanded or popular among our team right now." This suggests that because Enterprise 4's core learning structure is rooted in individual, in-person mentorship, employees are less enthusiastic about adopting independent digital tools. Ultimately, comparing these structures demonstrates how the underlying framework—collaborative online networks versus individualized coaching—directly influences the acceptance of digital transformation in employee development.

The qualitative findings gathered through these interviews provide a practical context for the research. This approach ensures that the study captures a comprehensive view of how digital technologies shape lecturer-learner interaction and training effectiveness within contemporary organizations.

5 Quantitative Research Results

The importance of lecturer-learner interaction in the pre- training phase in context of digital technologies was analysed on the data described above. As noted in the pre-

vious parts, collecting feedback from learners regarding their point of view toward the importance of the pre-training phase was crucial. Moreover, it was necessary to highlight and emphasize their interaction with lecturers before the actual training took place. The survey was distributed following the training activity to guarantee that participants had a precise familiarity with the primary purpose of the research. Firstly, it was essential to clarify the usage of digital technologies for self-learning among respondents. Besides, it was necessary to categorize all respondents by age group. This step was necessary to understand the approaches of diverse age groups, regarding the self-development outside of their work environment. The authors divided the participants into ten separate age groups to understand related data. Figure 1. summarizes the data. It includes the age groups of respondents represented as percentages and the frequency of digital technology usage.

The radar chart (Figure 1.) provides a unique perspective on the analysed data regarding the comparison of the frequency distribution across all age groups simultaneously. Each spoke of the chart demonstrates an age group, and the distance from the centre represents the percentage for each frequency category (daily, weekly, monthly, rarely). Daily use represented the largest area across all researched groups, prominent for the 30-34 years old (69%), 35-39 (67%), 40-44 (67%) and 55-59 (67%). The second most prominent results were observed in the age categories 25–29 (44%) and 45–49 (50%), which demonstrated a more balanced distribution of usage. The 'Monthly' and 'Rarely' categories generally showed lower frequencies, with data points plotted closer to the origin of the radar chart across most age groups.

Based on Figure 1, it is evident that daily use was the most frequent pattern across several age groups. This suggests that age did not appear to be a major barrier to digital self-learning within this sample. Consequently, we can infer that learners across various generations are actively engaging with digital tools for their self-development processes. This trend is reflected in the data presented in the figure. This trend aligns with the findings of Ceh et al. (2024) and Stone et al. (2013), who state that individuals within modern organizations seek to improve their skills on a daily basis. As no significant age barriers regarding digital technology usage were recognized, the authors proceeded to analyze the relationship between interaction variables utilizing the Pearson's chi-square test.

The first variable examined was the respondents' comfort level with utilizing digital technologies for pre-training activities. This investigation evaluated participants' readiness to incorporate digital tools into their learning processes prior to the formal training session. The second variable focused on participants' interest in pre-training support activities facilitated by lecturers.

For the purpose of this research, the following hypotheses were formulated:

- *H0: There is no association between participants' comfort with utilizing digital technologies for pre-training and their interest in participating in pre-training support facilitated by lecturers*
- *H1: There is a significant association between participants' comfort with utilizing digital technologies for pre-training and their interest in participating in pre-training support facilitated by lecturers.*

The Pearson's chi-square test was chosen for its suitability in exploring categorical variables and evaluating associations between specific items. This analysis provides a statistical framework to investigate the relationship between technological comfort and the desire for lecturer-led digital support. By doing so, the authors aim to provide empirical evidence for designing effective training strategies that align learner's preferences with organizational technological readiness. The authors aim to contribute empirical proof to propose the effective training strategies design, that adjust learner's preferences and the technological readiness of the organizations. The below Table 3 demonstrates the results of the following statistical analysis. As the p-value equal to less than 0.01, which is much lower than a 5 % level of significance, it is possible to determine, that between selected valuable there is a high association. The results of the researched variables indicate a statistically significant association between participants' comfort with digital technologies and their interest in lecturer-facilitated pre-training support ($X^2=18.48$, $p < .001$). To address the strength of this association, an effect size measure was applied. The calculation of Cramer's V yielded a value of 0.52, which represents a large effect size. Therefore, a statistically significant relationship exists between learners' comfort with utilizing digital technologies for pre-training and their interest in participating in pre-training support facilitated by lecturers. These findings suggest that as learners become more comfortable with digital tools, their interest in lecturer-led digital interventions during the pre-training phase also increases.

The data indicate that learners who are comfortable with digital technologies are significantly more likely to express interest in proactive interactions with lecturers. Conversely, respondents who are neutral toward digital tools are more likely to be uninterested in such interactions. Among the participants who expressed a clear interest in lecturer-led support, 37% reported being comfortable with digital technologies, while only 3% remained neutral. Furthermore, among respondents who indicated interest "depending on the format," 43% were comfortable with technology usage, whereas only 9% were neutral. These findings suggest that technological readiness acts as a facilitator for lecturer–learner engagement during the pre-training phase.

Table 3: Pearson's chi-square test results

Pre-training support facilitated by lecturer	Comfort with use of digital technology		
Observed Frequencies	**Neutral, N (%)**	**Comfortable, N (%)**	**Total, N (%)**
Yes	2 (3%)	25 (37%)	27 (40%)
Maybe	6 (9%)	29 (43%)	35 (51%)
No	5 (7%)	1 (1%)	6 (9%)
Total	13 (19%)	55 (81%)	68 (100%)
Pre-training support facilitated by lecturer	Comfort with use of digital technology		
Expected Frequencies	**Neutral**	**Comfortable**	**Total**
Yes	5.2	21.8	27
Maybe	6.7	28.3	35
No	1	5	6
Total	13	55	68

Source: Own elaboration

Additionally, based on the questionnaire results, the authors identified, that lecturer's support via digital tools positively impacts training comfort and subsequent participants' engagement. Acquired outputs from participants demonstrate, that 77 % of all respondents noted that lecturer-learner interaction during the pre-training phase is significant to varying degrees. Results emphasized, that only 18 % of respondents stated, that this interaction is moderately important, which can be adopted as a neutral answer. The 5 % of respondents impressed their slightly negative approach towards the peer interaction with lecturers. Moreover, according to the questionnaire results, most helpful training element was interpreted as lecturer support before the actual training activity, which provides understanding and clarification of the most complex issues related to the trained composition (32% of respondents in total). Following that, 25% of respondents positively emphasized the additional lecturer's recommendation of supplementary resources and training guidance. Additionally, 22% confirmed that peer interaction with lecturers before the actual training activity positively motivates and encourages learners about the subsequent learning and development process. Last is personalized feedback towards individuals, which helps to achieve practical outcomes. To fully capture the participants' viewpoints, it was crucial to define the type of lecturer support activities they requested further. According to the results, 67% of all participants favoured synchronous support, also known as real-time, provided by the lecturer. The remaining 33% of participants selected asynchronous or on-demand lecturer support. These discoveries can be theoretically grounded in Social Presence Theory and Cognitive Load Theory. The strong preference for synchronous support (67%) aligns with Social Presence Theory, which posits that real-time communication provides a richer medium that enhances the sense of human connection, thereby reducing ambiguity and allowing for immediate, dynamic peer feedback from the lecturer (Richardson et al., 2017). Conversely, the 33% preference for asynchronous, on-demand support can be understood through Cognitive Load Theory; asynchronous digital support mechanisms allow learners to pace their own information processing and review complex pre-training materials without the pressure of real-time performance (Sweller, 1988; Sweller et al., 2019). Both formats highlight the necessity of targeted lecturer guidance to properly prime employees for successful training transfer.

6 Discussion and Limitations

This study investigates how digital technologies are impacting peer interaction between lecturer and learners during the pre-training phase of the employee development process. The literature review emphasizes the importance of lecturer-learner interaction, even in the digital era (Ceh et al., 2024; Chung & Huang, 2022; Lai et al., 2019). According to various authors cited in the literature review part of this paper, training activities concern various systematic aspects that influence the development of employees' knowledge and skills, with a significant focus on interaction. Especially in the pre-training phase, interaction with the lecturer is not often considered as so important. However, the literature review, e.g. Velada (2007) confirm the positive effect of pre-training activities on training transfer knowledge into employee practice (Velada et al., 2007). Using primary qualitative and quantitative data, the paper shows that the attitude of learners and companies

confirm the openness to use digital technologies in training and support the interaction of learners and lecturers in the pre-training phase using digital technologies. The lecturers' approaches and direct interaction with learners contribute to positive outcomes of current businesses. The direction toward interactive learning no longer dismisses effectiveness but positively affects systematic employee development activities in current businesses. Nowadays, digital technologies play a crucial role in this interaction. Our research showed openness to using digital technologies and unveils a consistency of employees' demand for lecturer-learner interaction through real-time (synchronous) support.

Similarly, Rudy (2022) highlights the necessity for integrating learning into employees' daily workflows. This approach demonstrates a certain focus on interaction between company representatives and employees. Our research confirms those findings by indicating that lecturer-learner peer interaction facilitates the immediate application of knowledge and encourages a collaborative learning environment.

Key findings regarding the effective utilization of digital technologies during the pre-training phase simultaneously corroborate with the work of Brassey et al. (2019). These authors underscore the significance of a mixed-methods technique, combining digital and in-person training to gain learning preferences and support strategic business objectives (Brassey et al., 2019). Our research underscores the role of digital tools during the pre-training phase to demonstrate the cooperative conception of digital and human approaches. Furthermore, Deloitte (2020) is proposing a wide look on the employee development, concerning with the strategic alignment of employee training programs with more comprehensive business goals. Deloitte (2020) highlights the importance of continuous employee development via adapting new trends for the learning process. The focus on continuous learning in Deloitte's study agrees with our findings, which emphasize the necessity of constant engagement, participants' motivation, and involvement during all training processes. Comparing our research results with other authors outcomes, it is evident that there is a strong concurrence on the importance of lecturer-learner interaction and the strategic use of digital technologies in employee learning experience, especially during the pre-training phase. This dual procedure of technology integration and maintaining human interaction is crucial for effective employee development to achieve business objectives.

The human approach to digital technology solutions is also essential for their effective utilization. This research mainly focused on the pre-training phase, as this part plays a critical role in the effectiveness of employee learning and development processes. The pre-training phase covers self-study materials preparation, goal orientation approaches, and pre-learning milestones creation. Nonetheless, the presence of a human approach is still crucial for the employee learning success, as was presented in this research earlier.

Although the findings from the primary qualitative and quantitative data yield valuable insights, their interpretation is subject to several limitations. First, the qualitative phase relies on a restricted, purposive sample of managers from four companies, meaning these perspectives cannot be broadly generalized. Second, the quantitative survey presents primary data from a non-random sample of participants from a single organization within the automotive sector. Consequently, the generalizability of these findings to other industries or regions is limited. Finally, it is necessary to acknowledge potential researcher bias; because one of the authors was present during the training to distribute the questionnaire, participants may have been susceptible to social desirability bias. Nevertheless, the integrated qualitative and quantitative data offer significant insights into the evolving nature of lecturer-learner interaction in the digital era. As this area remains under-researched, it provides a strong foundation for future study. The authors intend to expand the scope of factors influencing the pre-training phase, increase the sample size, and incorporate the perspectives of lecturers to provide a more holistic view of training transfer.

7 Conclusion

In the current competitive market environment, businesses continually strive for sustainable success. Their primary pillar for such achievement is the workforce, which represents their most significant capital. Consequently, a proficient and strategic approach to employee learning and development is essential for modern enterprises.

This research highlights the critical importance of interpersonal interaction and digital integration within employee development processes. Current organizations should not dismiss either of these elements; instead, they must adopt a synergistic approach that balances lecturer-learner interaction with digital technology. By integrating human guidance with digital tools, businesses can improve the effectiveness of learning objectives. Furthermore, such a balanced framework ensures that employees remain well-equipped with the necessary skills to succeed in a rapidly evolving business landscape. Ultimately, effective pre-training support in digital contexts depends on combining technological solutions with meaningful human guidance, ensuring that digitalization serves as a facilitator rather than a replacement for expert instruction.

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Appendix A

Socio-demographic part

1. To which gender identity do you most identify?

- Male
- Female
- Other

2. What is your age?

- 19 or younger
- 20-24
- 25-29
- 30-34
- 35-39
- 40-44
- 45-49
- 50-54
- 55-59
- 60 or older

3. Which of the following best describes the setting of your primary residence?

- Eastern Europe
- Western Europe
- Central Europe
- Southern Europe
- Northern Europe
- Asia
- North America
- South America
- Africa
- Oceania

4. Which of the following best describes the setting of your current professional discipline?

- Manufacturing
- Sales
- Service/Repair
- Customer Service
- Marketing/Advertising
- Management

Utilization of Digital Technologies and Pre-Training Support

5. How frequently do you use digital technologies for self-learning purposes outside of work?

- Daily
- Weekly

- Monthly
- Rarely
- Never

6. How comfortable are you with utilizing digital technologies for pre-training activities?

- Extremely comfortable
- Very comfortable
- Slightly comfortable
- Neutral
- Slightly uncomfortable
- Very uncomfortable
- Extremely uncomfortable

7. How much do you associate each of the following benefits with microlearning?

(On a scale of 1 to 7, where 1 is “Not at all” and 7 is “Extremely”)

- Flexibility to learn anytime, anywhere: [1 ... 7]
- Ability to focus on specific topics or skills: [1 ... 7]
- Higher retention of information due to shorter learning sessions: [1 ... 7]
- Increased engagement through interactive content: [1 ... 7]
- Facilitation of just-in-time learning needs: [1 ... 7]

8. Would you be interested in participating in pre-training support activities facilitated by peers (lecturer)?

- Yes, definitely
- Maybe, depending on the format
- No, not interested

9. How important do you think peer (lecturer-learner) interaction is during the pre-training phase?

- Extremely important
- Very strongly important
- Very important
- Moderately important
- Somewhat important
- Slightly important
- Extremely not important

10. Would you prefer synchronous (real-time) or asynchronous (on-demand) support from trainers (lecturers) during the pre-training phase?

- Synchronous
- Asynchronous

11. What aspects of a trainer (lecturer) support do you consider as the most valuable during the pre-training phase? (Select all that apply)

- Clarifying complex concepts
- Providing personalized feedback

- Motivating and encouraging learners
- Offering additional resources and guidance
- Self-Study Materials

12. Which types of self-study materials do you think would be most helpful in preparing for training? (Select all that apply)

- Video tutorials
- Expert interviews
- Gamification elements (e.g., quizzes, challenges)
- Interactive documents, e-books
- Podcasts and audio resources
- Interactive assessments with immediate feedback
- Discussion forums and social media groups for peer interaction

13. How much does each of the following factors motivate you to engage with self-study materials? (On a scale of 1 to 7)

- Clear learning objectives and goals: [1 ... 7]
- Interactive and engaging content: [1 ... 7]
- Opportunities for self-assessment and feedback: [1 ... 7]
- Variety of content formats (videos, quizzes, etc.): [1 ... 7]