

# Design of learning and team-building processes in remote onboarding

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**Abstract**— This full paper track proposal deals with the challenges of designing the onboarding of new employees in digital work settings. The increasing prevalence of home office workplaces due to the corona pandemic poses new challenges for managers in designing this phase given the physical separation of team members. In the context of this research project, the aim was to examine how managers experience digital onboarding in practice and which methods they use to trigger learning and teambuilding processes.

In particular, the initial period in a new company is accompanied by many learning and team-building processes at various levels: The newcomer must acquire new technical information, create social connections with other team members, and learn on a superordinate level which values are embodied in the organization. This introductory phase lays the foundation for the initiation of further learning processes as well as the learning climate and should therefore be designed with caution.

For this purpose, data was collected using guideline-based expert interviews with managers via digital video call platforms. Most managers reported a preference for hybrid onboarding. Overall, it appears that managers largely use adequate strategies for triggering learning and teambuilding processes in remote work. Nevertheless, not all potentials have yet been exhausted, so this paper describes implementation proposals for the conception of leadership development workshops regarding the design of a professional onboarding.

**Keywords**—team formatting, leadership, team-based learning

## I. INTRODUCTION

The career of a new employee in a company begins with the onboarding, which is considered the third element of personnel marketing [1]. In times of more frequent job changes and the war for talents especially concerning STEM occupations in the fields of mathematics, engineering, science and technology [2], a well-considered design of the onboarding contributes to the competitiveness and attractiveness of the company [3] and is more important than ever.

Moreover, the COVID-19 pandemic, which is characterized by uncertainties, forces companies to design the entry into an organization and the familiarization with a new position, which is accompanied by various learning processes, in such a way that security is conveyed [4], [5]. In this context, the digitization- and pandemic-related increase in home office workplaces which goes along with chances and risks for the health of employees [6] raises the question of how remote onboarding can be designed and what specifics need to be taken into account. Since the acclimatization is significantly

influenced by organizational efforts, it is particularly important for companies to know how they can support their new employees in the context of successful onboarding [7].

The crucial points in designing a digital onboarding process can also be applied to the university context in times of homeschooling due to the corona pandemic. Studies show that new engineering students are academically more successful and less likely to drop off their studies within the first year if they feel integrated into their college campus and that social integration goes along with increased motivation and higher academic achievement [8]–[11].

## II. THEORETICAL BACKGROUND

### A. Definition

Onboarding is part of the organizational socialization and describes the metamorphosis of a new employee from an organizational outsider to an organizational insider [7]. This goes along with learning the knowledge, skills, and behaviors which are essential for new employees to succeed in their new organizations [7].

Through this learning process, the goal is to activate performance and readiness as quickly as possible and maximize employee retention by reducing feelings of disorientation and clarifying expectations [12]–[14]. In this regard, socialization is considered a process from which productivity, commitment (in the sense of attachment to the organization), and lower turnover result after joining the organization [15]. Onboarding lays the foundations for establishing the psychological safety that leads new employees to work harmoniously as part of a team, feel comfortable and valued, and be willing to accept the risk of potential mistakes [16].

### B. Role of the leader

Leaders have a special role within onboarding, as they have a significant influence on the task area and work environment of the newcomer, act as a coach and disciplinary supervisor, set goals, track goal achievement, and monitor and promote development [12]. The leader-member exchange (LMX) theory, which addresses the effects of leadership behavior on the employee, focuses on the interface between supervisor and employee [17]. LMX centers on the individual dyadic relationships between the leader and each employee and their valence (low to high quality). The assumption is that effective leadership processes occur when a mature partnership between leader and employee is formed over time [18]. A distinction is made between in-group and out-group employees: Employees in the in-group are highly trusted, there is a high level of communication, and the turnover rate

is lower. Employees in the out-group, on the other hand, experience low levels of trust and formal interaction, experience dissatisfaction in this context, and consequently perform inferior work [18]. For this reason, it is important that new employees successfully become members of the in-group during onboarding. In this way, the supervisor can ensure the employee's high level of identification with the company, a perceived high level of fit with the company, and job satisfaction through social exchange and supervisory socialization tactics (e.g., counseling, guidance, and role modeling) [13]. At the same time, by instructing the workforce, managers can promote relationship building at the horizontal level [19]. Accordingly, managers have the responsibility to ensure good onboarding of new hires, thus shaping learning and socialization processes.

### *C. Levels of onboarding*

At the temporal level, the onboarding process can be divided into three successive phases, preceded by the preboarding. The generic term preboarding refers to all measures that take place in the period between the conclusion of the contract and the start of employment for the purpose of integration [12]. An early start of the onboarding can reduce uncertainties and fears of the newcomer and instead build security and commitment [12]. This early start is particularly important with regard to potential turnover before starting work, which was revealed in a survey [20] in Germany: 30.0% of the companies surveyed already received terminations before the first day of work. In practice, nevertheless, preboarding measures were established in only 80.0% of the companies surveyed [20]. The measures included regular contact with the HR department, supervisor, buddy or other contacts, help with organizational issues (e.g. relocation), welcome folders or welcome letters, invitations to events or access to onboarding software.

The preboarding is followed by the orientation phase, which covers the first few weeks at the company. The main aim for the new employee is here to internalize abbreviations, names, rules and processes. After approximately one month, the transition to the learning and integration phase takes place, in which the company can be perceived as a whole and the new employee can integrate into the existing structure. Approximately five to six months after joining the company, the employee is in the stability and acceptance phase and is considered an accepted, independent member of the organization [12].

With regard to the holistic onboarding process, a further differentiation can be made between three strategic levels: the specialist, social and value-oriented levels [12]. The specialist, content-related integration includes the acquisition of knowledge about the company as well as the organizational and process structures and relevant factual knowledge. Employees should learn how to apply their knowledge and skills in line with the company's goals and how to process corresponding tasks [12]. On the social level, the aim is to get to know the new working environment, to establish social contacts with superiors, colleagues and, if necessary, customers. The aim for the new employee is to be accepted as part of the team and to develop a "we-feeling" [12]. It was shown in this context that an increased level of positively perceived interaction increased socialization success [19]. Compared to these two levels, value-based integration is a more medium- and long-term process that relates to familiarizing new employees with the company's goals,

values, and principles and is mainly communicated through the values lived within the company [12].

Successful onboarding relies on addressing all three levels. Accordingly, social and value-based integration must not be disregarded so that the new hire is not emotionally isolated and quits internally [12]. Measures implemented in practice that address all three levels include introductory events, mentoring systems, regular feedback meetings, onboarding apps, networking support, and continuing education measures [20]. Apps offer the advantages that they can be used regardless of location and incorporate playful and multimedia elements (e.g., texts, videos) [21]. To communicate the corporate culture, it is recommended not to rely exclusively on written guides or presentations, but to make the culture tangible in virtual events with the entire workforce [22]. In order to make onboarding as goal-oriented and structured as possible, an individual onboarding plan should be used in which step-by-step goals are defined [23].

### *D. Importance of onboarding*

Successful onboarding is associated with numerous benefits: professionally competent, productive, motivated, and loyal employees contribute to the company's success, a low turnover rate saves costs and time, a good team climate promotes smooth cooperation, employees experience less stress, frustration, and excessive demands, and the company's image benefits from satisfied, integrated employees who recommend the company to others [3], [7], [12], [21], [24]. In this context, a study regarding company success showed that successfully integrated employees reached their full productivity two months earlier than employees whose onboarding did not proceed carefully [25]. Accordingly, there is an interest in successful onboarding on the part of both the employer and the employee.

From the employee's perspective, the self-determination theory [26] can be used to justify the extent to which successful onboarding has a positive influence on motivation and well-being. It is crucial to fulfill the three basic needs of autonomy (as a sense of control over one's own life), competence (as a sense of accomplishment), and relatedness (as a connection to others). Through specialist integration, the employee learns to work on tasks independently and, as qualification progresses, acquires greater scope for action and decision-making (fulfillment of the need for autonomy) [27]. In the course of successful specialist integration, the employee needs to ask fewer questions, experiences success, and learns routines (fulfillment of the need for competence) [27]. At the same time, social integration is associated with inclusion in the team and a sense of community (fulfillment of the need for relatedness) [27]. Complementing this, the uncertainty reduction theory [28] postulates that new employees experience strong uncertainties at their entry, which are reduced through information and interactions with peers and supervisors. Reducing uncertainty enables better task performance, higher job satisfaction, and a higher likelihood of remaining in the organization [28]. In this context, feedback during onboarding also plays an important role as it contributes to socialization success, lowers ambiguity as well as uncertainty, and is thus a relevant resource [29].

### *E. Features of remote onboarding*

When working remote, the special feature of onboarding new employees is that there is no personal contact, so the inclusion of digital measures seems indispensable. However,

a German survey [20] revealed that 78.0% of the HR managers surveyed did not implement any additional (digital) onboarding measures during the initial lockdown and the associated increase in remote work. However, over the course of the last few years, a general increase in the use of digital onboarding measures such as apps or software became apparent (2018: 7.0% of respondents, 2019: 12.0% of respondents, 2020: 23.0% of respondents), which benefits the implementation of onboarding measures for employees in the home office [20]. Other conceivable onboarding measures in the home office include greetings via video conference, welcome packages with welcome letters and corporate products, introduction videos, virtual coffee breaks, or digital onboarding events [12]. Compared to onboarding in the office, the density of contact is even more decisive for the success of remote onboarding [12]. If the opportunity exists, it is recommended not to onboard directly from the home office, but to start in a face-to-face format during the first few days or weeks [23]. In addition, when onboarding home office employees, managers should consider that more organization is needed (e.g., to get to know colleagues) and that the learning curve may be longer due to changes in opportunities for professional integration [22]. With a view to the changed conditions of working in a home office, the following research question was derived for the study:

How do managers shape the onboarding of new employees in the home office?

### III. METHOD

A qualitative research approach was followed, and data was collected using guideline-based expert interviews. This is due to the fact that qualitative research approaches are generally characterized by the ability to dynamically capture multidimensional contexts [30]. Accordingly, this form of qualitative data collection met the requirements of the research project in the form of the intended collection of individual reports of experiences and motives for action while at the same time preserving the comparability of the individual interviews [31]. Interviewing experts in the sense of an exposed group of people who have special knowledge regarding the research subject (in the present context: managers) comes with the advantage of collecting data that is as close to the real world as possible [32].

The SPSS method [33] was used for the construction of the interview guideline. The acronym "SPSS" symbolizes the parameters "collecting" (German: Sammeln), "checking" (German: Prüfen), "sorting" (German: Sortieren) and "subsuming" (German: Subsumieren). Within the first step "collecting", possible questions were generated based on theoretical knowledge, which were then critically evaluated with regard to their necessity and suitability in the second step "checking". Care was taken to ensure that all questions were precise, as comprehensible as possible, gender-neutral, and not suggestive or judgmental [34]. Subsequently, the questions were put into a stringent order in terms of content as part of the "sorting" and "subsuming" steps and arranged within the overall guide.

To test the comprehensibility, validate the content, and detect structural or content-related weaknesses of the guide in the next step, five pretest interviews were conducted under conditions that were as real as possible [34]. Thus, the pretests, which were excluded from the subsequent data analysis, ensured that the risk of losing valuable information due to

errors in question design within the actual survey phase was minimized [35]. During the pretest process, the questions were continuously adapted, their content sharpened in the sense of a formative evaluation approach [36], and the guideline was shortened.

The only inclusion criterion for participation in the study was an occupational position that included the management of employees who spend most of their working hours at home. The sample was deliberately not narrowed down further to obtain findings that could be generalized as far as possible and to collect heterogeneous reports. During the data collection, it was planned to flexibly terminate data gathering according to the principle of theoretical saturation as soon as the generation of new data would no longer have contributed significantly to the elaboration of new central categories [37]. Finally, 25 interviews were conducted via digital platforms such as zoom or Microsoft teams after participants gave informed consent. The average duration of the whole interview (covering a few more research questions in the field of health-promoting leadership) was 59.60 minutes, with heterogeneous individual interview lengths ( $SD = 12.73$  minutes, range = 37.00 - 76.00 minutes).

The interview transcripts were analysed using qualitative content analysis [38]. This procedure offered the advantage that it was simultaneously rule-guided, systematically reduced and summarized data without losing essential content, and built on everyday text comprehension [39]. For this purpose, categories were inductively derived on the basis of a prior interview material review in several passes. The category definitions (selection criterion) were made separately for each content-related question, which was taken up in the interview guide. With regard to the level of abstraction, it was intended to code all concrete statements in the interview with reference to the questions. An independent formative examination of the defined categories and material classifications took place, as well as a final plausibility check by another psychologist. For the final evaluation, the respective category frequencies were counted descriptively in terms of a frequency analysis. In general, multiple assignments of answers that addressed several aspects to different categories were possible for each interview partner, while multiple mentions of the same category in the course of an individual interview were not repeatedly included in the evaluation.

#### A. Sample

The sample consisted of 25 leaders with diverse professional backgrounds from various industries, including four female interviewees (16.0%) and 21 male interviewees (84.0%). This unequal gender distribution reflects the under-representativeness of women in management positions. On average, interviewees were 49.36 years old ( $SD = 8.19$  years, range = 28.00 - 63.00 years) and had an average of 14.56 years of leadership experience ( $SD = 7.71$  years, range = 2.50 - 29.00 years). The average manager-to-staff ratio numbered 13.72 ( $SD = 8.40$ , span = 4.00 - 32.00). In 44.0% ( $n = 11$ ) of the cases only parts of the team worked from home. For the most part, there was a part-time arrangement for remote work ( $n = 15$ , 60.0%), while in some teams remote work was exercised full-time ( $n = 6$ , 24) or in alternating systems ( $n = 4$ , 16.0%).

### IV. RESULTS

In 84.0% of the cases ( $n = 21$ ), the managers had actual experience with onboarding new employees in the home

office. Of these, 16 managers (64.0%) had onboarded external new hires and six (24.0%) had onboarded internal new hires (note: in one company, both internal and external new hires were onboarded). The remaining 16.0% ( $n = 4$ ) related their descriptions to a hypothetical scenario and indicated how they would theoretically train a new employee in the home office. The use of hybrid home office models appeared to be popular not only for the entire team, but especially for new employees: the majority of managers ( $n = 18$ , 72.0%) reported initially training new hires on-site before allowing for increased home office use. The initial time in the office varied from a few days ( $n = 5$ , 20%), to a few weeks ( $n = 4$ , 16.0%), to a few months ( $n = 1$ , 4.0%). Three times each (12.0% each), the reasons given for hybrid onboarding were easier handover and set-up of equipment and better opportunities for technical and social familiarization. In five cases (20.0%), onboarding took place entirely in the home office right from the start.

Preboarding measures were used by 19 managers (76.0%). In contrast, four managers (16.0%) did not have any contact with the new employee in the period between signing the contract and starting work (missing:  $n = 2$ , 8.0%). In corresponding contacts, mostly organizational matters (e.g., discussion of the start of work;  $n = 11$ , 44.0%) were discussed, the provision of equipment and access data (e.g., assignment of a telephone number;  $n = 9$ , 36.0%) was ensured, or getting to know the rest of the team (e.g., through team events;  $n = 9$ , 36.0%) was organized. Two managers (8.0%) reported contacts of professional motivation that served, for example, technical training. In addition, three interviewees (12.0%) globally stated that they made contact with new recruits in this phase, but did not specify this in more detail. With regard to the communication media used for preboarding, eight managers (32.0%) preferred video conferences. In addition, telephone calls, written contacts via mail or e-mail, and face-to-face meetings were used ( $n = 3$  each, 12.0%).

With regard to the communication of task-relevant information in terms of the professional level of onboarding, the managers relied on several strategies (Fig. 1). The most common ( $n = 16$ , 64.0%) was the networking of existing and new employees in the form of buddies or mentors. In addition, technical information was communicated within meetings (e.g., weekly *jour fixe*;  $n = 12$ , 48.0%) or using written documents (e.g., guides;  $n = 10$ , 40.0%). In addition, five managers (20.0%) used screen-sharing methods to transfer knowledge, and three interviewees (12.0%) reported that their team's technical onboarding took place on-the-job. The use of onboarding plans was realized by two managers (8.0%). One of these managers presented the corresponding plan in detail and named various components of the plan with regard to the specialist onboarding level. These included the definition of learning fields, the determination of a sequence for processing the content to be learned including prioritization, the

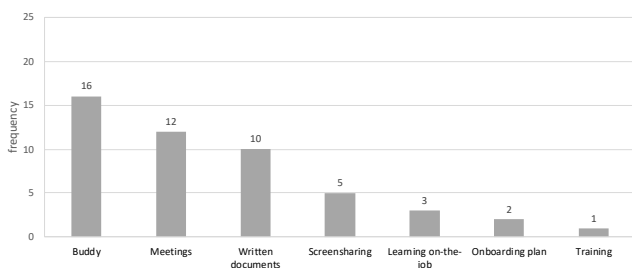


Fig 1. Overview of the mentions in relation to the specialist level of onboarding. Note:  $N = 24$ . Multiple answers possible.

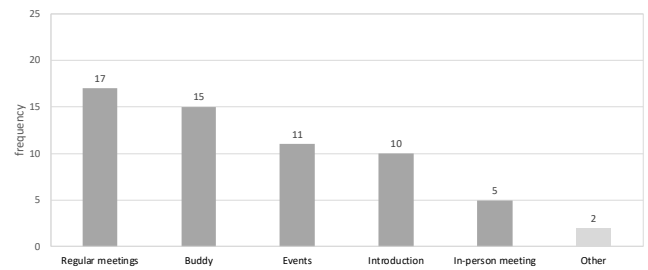


Fig. 2. Overview of the mentions in relation to the social level of onboarding. Note:  $N = 25$ . Multiple answers possible.

specification of respective contact persons and the anchoring of learning indicators, which served to check the learning progress. Furthermore, one manager (4.0%) stated that special training courses were used for the specialist induction of new employees (missing:  $n = 1$ ).

The social level of onboarding was also addressed using several approaches (Fig. 2). The most common approach ( $n = 17$ , 68.0%) was to integrate new employees into regular meetings (e.g., *jour fixe*) to establish contact with colleagues and superiors. In addition, 15 managers (60.0%) made use of buddy systems analogous to the specialist level. Digital events (e.g., coffee rounds) also were organized ( $n = 11$ , 44.0%). In addition, initial networking through introductions (e.g., in video conferences or emails) occurred in 10 cases (40.0%). Employees of five managers (20.0%) got to know their colleagues through face-to-face meetings. Two mentions (e.g., handbook; 8.0%) could not be assigned to any category.

Four managers (16.0%) indicated that they did not actively arrange the value-based level of onboarding (Fig. 3). The other managers arranged conversations with new hires (e.g., via video conference) in most cases ( $n = 10$ , 40.0%) to communicate the goals, values, and principles of the corporate culture. In nine cases (36.0%), written documents such as guides or publications on the intranet were used. Six managers (24.0%) reported that the culture was lived in everyday life, for example in the form of feedback behavior, and was thus communicated via this. In addition, four managers (16.0%) relied on workshops on this topic, in which, for example, particularly relevant situations requiring the living of the corporate values were addressed or potential for improvement with regard to the values lived were reflected upon. Two managers (8.0%) also benefited from the use of a mentoring system at the value-based level. Four further mentions (e.g. tour through the company, sending a goodie package; 16.0%) were assigned to an other-category.

In the final comparison of onboarding in the office and remote onboarding, a total of 37 disadvantageous aspects, seven neutral comments and two advantages were mentioned by 19 managers regarding onboarding on a distance. From the

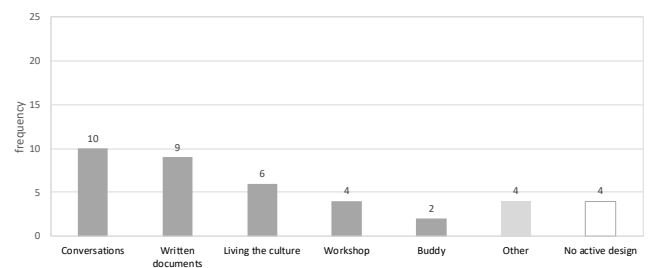


Fig. 3. Overview of the mentions in relation to the value-oriented level of onboarding. Note:  $N = 22$ . Multiple answers possible.

perspective of some managers ( $n = 13$ , 52.0%), the disadvantages included above all the elimination of unplanned contacts (e.g., in the hallway). This was accompanied by the comments of seven managers (28.0%) who criticized the more difficult social integration of new hires due to the greater distance and the elimination of shared activities. The onboarding process for employees in the home office was characterized by seven managers (28.0%) as more complex and demanding overall. In addition, six interviewees (24.0%) pointed to a lack of rich communication, as facial expressions and gestures were not conveyed in many digital contacts and video conferencing was not perceived as a fully adequate substitute for face-to-face contact. In the view of two managers (8.0%), the distance was accompanied by greater inhibition thresholds for those entering the process, for example, when a colleague at the next table cannot simply be approached at a low threshold for a question, but a separate call has to be made. Two further mentions (8.0%) referred to other disadvantages. One interviewee expressed concerns about the transfer of culture in the home office: "In my opinion, culture is actually transferred through personal contact, through experience. I am very concerned that this will go down the drain." The neutral mentions addressed value-free changes (e.g., increase in the number of telephone calls) or descriptions that existing onboarding mechanisms were also successfully implemented digitally. Two managers (8.0%) identified advantageous aspects of onboarding employees in the home office and emphasized the benefits of screen-sharing options and the possibility of simultaneous task completion during video conferences.

## V. DISCUSSION

### A. Summary and implications

The answers of the managers show that the implementation of onboarding in the context of the home office is experienced as a challenge by most managers. Accordingly, measures for dealing with these new types of competence requirements are derived. Overall, the offering of a seminar on the learning and health-promoting design of onboarding for employees in the home office is recommended. A mixture of face-to-face formats and digital events can be used for this purpose. The ongoing evaluation of existing and newly introduced offerings is recommended in order to ensure the satisfaction of participants and to provide an incentive for participation through participatory design options.

It clearly stands out that hybrid onboarding models are preferred. This preference seems understandable and is in line with forecasts and recommendations from the literature, which point out that hybrid work location models have the potential to combine the advantages of home office and face-to-face work [23], [40]. A key advantage of these hybrid models - especially for new entrants - is the facilitated opportunity to establish and maintain social contacts in the workplace, so that the risk of a lack of connection and loneliness can be minimized [40]. Such positive encounters are enormously important, especially in the early days, to bind new employees to the company [41]. In addition to the benefits on a social level, managers also see a facilitation in the transmission of technical information. It can also be stated with regard to the transfer of culture that it is favored in hybrid formats, since it is not necessary to fall back on theoretically conveyed building blocks, but culture can be experienced in interaction [41]. The disadvantages expressed by the

executives with regard to familiarization in the home office (e.g., with regard to a lack of personal contacts or a lack of communication richness) can largely be compensated for by implementing a hybrid strategy. Accordingly, the approach taken by the majority of managers in choosing the form of induction for new hires can be judged as positive.

Contacting new hires before they start work in the sense of preboarding occurs about as frequently among the executives in this study as in a comparable survey in Germany [20]. Nevertheless, the frequency of use of 76.0% shows that just under a quarter of the companies do not make any contact with new employees in the period between the commitment and the first working day. This is critical in light of the fact that a lack of preboarding means that the opportunity to reduce uncertainties and fears remains unused and that it is not possible to build up security and commitment [12]. Especially in the pandemic situation, which is characterized by uncertainties, onboarders and companies could benefit from prior contact, a high contact density, and the resulting reduction of uncertainty [12]. Those executives who use preboarding measures resort to information exchanges in video conferences, telephone calls, written contacts, and face-to-face formats as part of this process. Depending on the goal and content of the exchange, these formats are considered useful according to media richness theory [42], [43]. In terms of content, the contacts aim at exchanging organizational as well as professional information, getting to know each other, and equipping the entrant with working materials and access data. Particularly in the case of full-time home office entry, clarifying the required equipment, setting up access points and installing the necessary programs before the first day of work are useful to enable entry at the technical level in the first place [21]. In individual cases, events such as training courses or team events are organized. The methods mentioned are fundamentally in line with recommendations from the literature [21]. Accordingly, a superficial knowledge of possibilities for shaping the digital preboarding phase seems to be available. Nevertheless, greater use should be made of goodie packages, digital events, welcome folders or videos in the future. By defining specific contacts early on, the social level of onboarding can also be addressed at an early stage and the subsequent actual induction can be facilitated. Expanding the portfolio of measures compiled by managers through the use of onboarding software or digital apps also is recommended in view of the developments in the labor market due to digitization [21].

With regard to the three strategic onboarding levels, the interview results indicate that suitable approaches exist for implementing the specialist and social onboarding, while the approach at the value-based level could be expanded. An indication of this assessment is both the comparatively smaller number of mentions of possible strategies for teaching the value-based level and the content of the existing mentions. With regard to the professional level, measures such as sponsorships, regular meetings, training and written documents coincide with advice from the literature [12], [20], [21]. Some managers find the use of screen-sharing tools in particular to be profitable and even see this as an advantage of onboarding in the home office. When providing information, care should be taken to balance on-the-job (e.g., on-the-job training) and off-the-job (e.g., external training) measures and to avoid over- or under-challenging the onboarding employee [1], [12]. A gradual induction, which incorporates ongoing goals based on Brenner's (2020) phase model, supports the

acquisition of competencies and the growth of independence at an appropriate pace [44]. Depending on skill level, one of the following learning strategies can be used to practice work tasks: Shadowing, assisting, taking on partial tasks independently, performing tasks with latitude, to sharing overall responsibility [45].

Some measures do not address only one of the levels separately, but are accompanied by positive effects on several levels. For example, buddy programs and *jour fixes* can also contribute to building social inclusion. Digital team events (e.g., virtual coffee rounds, online gin tastings) can also be used. If several new employees are hired simultaneously, it is worthwhile to hold a joint introductory event on the first day of work [1]. Analogous to the specialist level, managers also apply a number of useful strategies on the social level, which are in line with literature-based recommendations [12], [20], [21]. However, since a balanced consideration of all levels is highly relevant for the success of onboarding [12], managers should primarily be made aware of the importance of the value-based level and be provided with possible strategies. At the same time, existing knowledge regarding the professional and social levels can be expanded to make onboarding as varied and appealing as possible. With regard to the value-based level, the statements of those managers who state that they do not take any measures at all to communicate the values and goals of the corporate culture are to be regarded as critical. In addition, the repeatedly mentioned communication of culture via written documents is also considered to be comparatively unpromising [41]. Instead, companies should increasingly be encouraged to visualize the culture in the form of videos or to discuss it in personal conversations and implement interactive workshops. In this context, one manager reports the implementation of a virtual workshop in which relevant situations in which the corporate culture is particularly evident are discussed and team members jointly reflect on which values are already actually lived in everyday life and where behavior can still be improved. The implementation of such an interactive event is also recommended by the literature [22] and helps to anchor the corporate values sustainably.

Onboarding plans are used in some cases, which help to structure the onboarding process, maintain an overview and keep track of the flood of new information. Guidebooks also recommend the use of an onboarding plan in which contact persons, familiarization dates, tasks, goals and required competencies are recorded [23], [46], [47]. Especially against the theoretical background of goal setting theory [48], the advantages of clearly defining goals are underlined. An induction plan offers the possibility to note the learning progress, which can be reviewed, for example, in interim meetings with the manager or mentor [44]. In addition to a jointly accessible plan for onboarders and the responsible internal employee, it is advisable to develop an internal company guideline for the responsible manager. This standardizes the onboarding process and ensures that plans running in the background, such as assigning a telephone number, determining sponsors, providing welcome gifts as a token of appreciation, or organizing and inviting employees to a welcome event, are not forgotten [47], [49]. Appropriate induction and process plans should be established across the board in companies in order to meet the increased demands on the organization of remote onboarding [22]. The early definition of a mentor within these plans also enables the preparation of the responsible person for his or her task as

mentor, which includes, for example, the introduction of the environment or the technical briefing on tasks [1]. Nevertheless, as a sign of appreciation for the new hire, the manager should not delegate all induction tasks to the mentor, but should devote himself to the new employee himself, especially on the first day of work [1].

Given the crucial role that the manager plays in the success of the onboarding of a new employee, efforts should be made to raise awareness of the issue. Managers should not only have appropriate strategies for creating a conducive relationship with the onboarding person themselves, but should also be aware that they can significantly influence relationship building at the horizontal level between employees by initiating familiarization processes [17], [19]. For this reason, managers at the organizational level should receive support in implementing a promising onboarding process. For example, a company's HR department can be centrally tasked with developing an onboarding app, higher-level onboarding plans, or guides that managers from different departments can refer to. Sometimes, corresponding tools can additionally be adapted to the respective work content of the onboarding employee in line with requirements. In addition, as part of the recommended series of seminars, workshops can be offered for the purpose of management development that address either onboarding in general or, ideally, the specifics of onboarding employees in the home office. In this context, it would also make sense to offer an exchange of managers within their peer group so that mutual coaching can take place and on-the-job experiences regarding onboarding in the company can be shared. As a starting point for such a seminar, managers could first reflect on their own past onboarding and thus put themselves in the role of the onboarding employee in order to be able to empathize with his or her needs as realistically as possible [50]. On the advice of a manager, it is also advisable for the manager to obtain regular feedback on the new hire's satisfaction with the onboarding process so that the process can be continuously improved and poor onboarding can be prevented. This approach can be used to optimize onboarding and promote the development of the manager. A long-term evaluation of onboarding is additionally advisable by including objective key figures (e.g., early turnover rate, quality of hire, time to fully operational) [20].

### *B. Relevance for engineering education*

Since successful onboarding has the potential to increase employer attractiveness and thus draw the attention of qualified employees to the company and retain them, the measures and processes should be optimized and applied specifically as a personnel marketing strategy [47], [51]. This has an enormous relevance for STEM occupations facing the war for talents in the fields of mathematics, engineering, science and technology [2].

Moreover, the results of the study can be contextualized in the Student Experience Transitions Model for Practitioners [52] which provides a framework for the student's journey at the university and should help practitioners to manage their student's aspirations and expectations and their academic and social integration. It includes six phases, beginning with the first contact and admissions, continuing with pre-arrival, arrival and orientation, introduction to study and including reorientation and reinduction as well as outduction. Depending on the phase, students should be provided with

information, advice, and support by the university staff. The contents of the phases are reminiscent of the differentiation between preboarding and onboarding and in addition to that, the three levels of onboarding are reflected in the phases.

A study by Kline and colleagues [53] showed that the number of Bachelor of Science graduates in STEM subjects could be increased by improving the retention of first-year students using learning community cohorts including tutoring services. This also underlines the relevance of an adequate onboarding at university with regard to the specialist and social level. Just as the adjustment to a new environment and new processes within the framework of a new job can be made health-promoting and performance-enhancing through reasonable measures, the start of the studies could also be facilitated for students and thus ensure well-being and performance in the long term.

### C. Limitations and outlook

One limitation of the study is the self-selection of interviewees resulting from the voluntary nature of participation. It is possible that only those managers who consider their own leadership behavior concerning the onboarding of new employees to be successful and are therefore willing to report on it will agree to participate in the interview. On the one hand, this can limit the generalizability of the results, but on the other hand, the possible participation of particularly qualified managers also opens up the possibility of deriving a large number of recommendations for action for other managers.

It must also be critically questioned whether managers realistically assess the influence of their leadership behavior on employees or whether there is a discrepancy between the employees' perception and the managers' self-assessment. This phenomenon could be addressed in future studies by planning a tandem survey of managers and subordinates who belong to each other. The managers' self-assessment would thus be supplemented by a third-party assessment, allowing for a more precise assessment.

As a possible further perspective, the organizational level can be included in future studies, since it is becoming apparent in some places that managers are dependent on support from the organization (e.g. through the organization of workshops) in order to organize a well-structured onboarding. Furthermore, future studies should strive for triangulation in order to further expand the qualitative data and supplement it with quantitative data. In addition, it should be a top priority to examine the presumed transferability of the results into the university context and to explicitly ask new students about their onboarding at the university.

### D. Conclusion

The increasing prevalence of home office workplaces and hybrid work models makes it essential to deal intensively with the design of this form of work. The managers interviewed have basic skills in designing successful onboarding. This knowledge and experience can be built on as part of management development measures to consolidate and further expand management skills and thus create the best possible learning and working conditions for newcomers to the home office. The observance of such work design measures is indispensable in order to retain new hires from the STEM-subjects in the company and thus prevent a shortage of skilled workers

## REFERENCES

- [1] M. Poser and M. Meyer, 'Personalmarketing', in *Lehrbuch Stationsleitung: Pflegemanagement für die mittlere Führungsebene im Krankenhaus*, 1. Aufl., M. Poser, Ed. Bern: Huber, 2012, pp. 291–324.
- [2] F. Steinke and V. Heumann, 'Die Rolle des Recruitings im War for Talent 2.0', *HR Consulting Review*, vol. 9, no. 1, pp. 10–13, 2018.
- [3] T. N. Bauer and B. Erdogan, 'Organizational socialization: The effective onboarding of new employees.', in *APA handbook of industrial and organizational psychology, Vol 3: Maintaining, expanding, and contracting the organization.*, S. Zedeck, Ed. Washington: American Psychological Association, 2011, pp. 51–64. doi: 10.1037/12171-002.
- [4] J. Simson, *Der Einfluss individueller und struktureller Merkmale auf die 'Stabilität' von Beschäftigung: Eine Untersuchung von Übergängen im Beschäftigungssystem in Ost- und Westdeutschland*. Hamburg: Diplomica, 2002. Accessed: Nov. 06, 2021. [Online]. Available: <https://nbn-resolving.org/urn:nbn:de:101:1-2019043008210399521562>
- [5] D. Stocker, J. Jäggi, L. Liechti, D. Schläpfer, P. Németh, and K. Künzi, *Der Einfluss der COVID-19-Pandemie auf die psychische Gesundheit der Schweizer Bevölkerung und die psychiatrisch-psychotherapeutische Versorgung in der Schweiz (Kurzfassung erster Teilbericht)*. Bern: Bundesamt für Gesundheit, 2020.
- [6] O.-R. Stüncel, A. Niță, and M. Oravițan, 'The impact of home office setup due to COVID-19 pandemic on IT professionals' physical health: a systematic review', *Timisoara Physical Education and Rehabilitation Journal*, vol. 14, no. 26, pp. 7–16, Jun. 2021, doi: 10.2478/tperj-2021-0001.
- [7] T. N. Bauer, E. W. Morrison, and R. R. Callister, 'Organizational socialization: a review and directions for future research', in *Research in Personnel and Human Resources Management*, G. R. Ferris, Ed. JAI Press, 1998, pp. 149–214.
- [8] C. Clark, 'Diversity initiatives in higher education: Intergroup dialogue as pedagogy across the curriculum', *Multicultural Education*, vol. 12, no. 3, p. 51, 2005.
- [9] A. B. Dessel and N. Rodenburg, 'An Evaluation of Intergroup Dialogue Pedagogy: Addressing Segregation and Developing Cultural Competency', *Journal of Social Work Education*, vol. 53, no. 2, pp. 222–239, Apr. 2017, doi: 10.1080/10437797.2016.1246269.
- [10] R. G. Jabaji, S. H. Buenaflor, B. F. Dillehay, R. Z. Kenemuth, E. Kurban, and P. E. Smith, 'The Role of [Onboarding Program] in Fostering a Sense of Belonging and Sociocultural Competence in New Engineering Students', presented at the ASEE Virtual Annual Conference Content Access, Virtual Conference, Jul. 2021. [Online]. Available: <https://peer.asee.org/38102>
- [11] B. A. Nagda *et al.*, 'Intergroup Dialogues: An Innovative Approach to Teaching About Diversity and Justice in Social Work Programs', *Journal of Social Work Education*, vol. 35, no. 3, pp. 433–449, Oct. 1999, doi: 10.1080/10437797.1999.10778980.
- [12] D. Brenner, *Onboarding: als Führungskraft neue Mitarbeiter erfolgreich einarbeiten und integrieren*, 2. Auflage. Wiesbaden [Heidelberg]: Springer Gabler, 2020. doi: 10.1007/978-3-658-30674-8.
- [13] D. M. Sluss and B. S. Thompson, 'Socializing the newcomer: the mediating role of leader-member exchange', *Organizational Behavior and Human Decision Processes*, vol. 119, no. 1, pp. 114–125, 2012, doi: 10.1016/j.obhdp.2012.05.005.
- [14] J. P. Wanous, *Organizational entry: recruitment, selection, orientation and socialization of newcomers*. Addison-Wesley Publishing, 1992.
- [15] J. van Maanen and E. H. Schein, 'Career Development', in *Improving life at work*, J. R. Hackman and J. L. Suttle, Eds. Goodyear, 1977, pp. 58–62.
- [16] C. Birmele, J. Böhmers, A. Merklin-Wendle, and F. Pohl, *Crashkurs: Mitarbeiter-Onboarding*. Haufe, 2020.
- [17] G. B. Graen and J. Cashman, 'A role-making model of leadership in formal organizations: A developmental approach', in *Leadership Frontiers*, J. G. Hunt and L. L. Larson, Eds. Kent, OH: Kent State University Press, 1975, pp. 143–166.
- [18] G. B. Graen and M. Uhl-Bien, 'Relationship-based approach to leadership: development of Leader-Member Exchange (LMX) Theory of Leadership over 25 years: applying a multi-level multi-domain perspective', *Leadership Quarterly*, vol. 6, no. 2, pp. 219–247, 1995.

- [19] R. F. Korte, 'The socialization of newcomers into organizations: integrating learning and social exchange processes', presented at the International Research Conference, Indianapolis, 2007.
- [20] Haufe, '4. Onboarding Umfrage 2020 – Onboarding im Wandel'. 2020. [Online]. Available: <https://www.myonboarding.de/c/danke-t-onboarding-studie-2020?purl=AnnikaFrankenL83VB9&med=https%3A%2F%2Fapp.aktuell.haufe.com&akttyp=direkt&aktnr=84834&wnr=04393689>
- [21] Haufe, 'Remote Onboarding: Tipps für das virtuelle Onboarding'. Aug. 24, 2020. [Online]. Available: [https://www.haufe.de/personal/hr-management/digitales-onboarding/onboarding-im-zeitalter-der-digitalisierung\\_80\\_329564.html](https://www.haufe.de/personal/hr-management/digitales-onboarding/onboarding-im-zeitalter-der-digitalisierung_80_329564.html)
- [22] R. Abel, 'Auf stürmischer See an Bord gehen: 6 Tipps für ein gelungenes Einarbeiten und Einweisen neuer Mitarbeiter in Corona-Zeiten', *CITplus*, vol. 24, no. 3, pp. 6–7, Mar. 2021, doi: 10.1002/citp.202100304.
- [23] M. Landes, E. Steiner, R. Wittmann, and T. Utz, *Führung von Mitarbeitenden im Home Office: Umgang mit dem Heim Arbeitsplatz aus psychologischer und ökonomischer Perspektive*. Wiesbaden [Heidelberg]: Springer Gabler, 2020. doi: 10.1007/978-3-658-30053-1.
- [24] O. Schiffer, *Onboarding - optimale Einarbeitung für neue Mitarbeiter. Mit einem Unternehmensbeispiel und einer empirischen Untersuchung des Einarbeitungsprozesses*. epubli, 2020.
- [25] R. Ganzel, 'Putting out the welcome mat - When good employees are hard to find, and harder to keep, orientation- how you welcome newcomers into the fold - becomes more crucial than ever. Five fast-growing firms explain how they do it.', *Training : The Magazine of Manpower and Management Development*, vol. 35, no. 3, pp. 54–63, 1998.
- [26] R. M. Ryan and E. L. Deci, 'Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being', *American Psychologist*, vol. 55, no. 1, pp. 68–78, 2000, doi: 10.1037/0003-066X.55.1.68.
- [27] J. Schörger, A. Rausch, and J. Neubauer, 'Onboarding von Auszubildenden – Welche Maßnahmen erleichtern den Ausbildungsbeginn?', *Zeitschrift des Bundesinstituts für Berufsbildung*, vol. 2, no. 1, pp. 42–45, 2013.
- [28] A. M. Saks and B. E. Ashforth, 'Organizational socialization: making sense of the past and present as a prologue for the future', *Journal of Vocational Behavior*, vol. 51, no. 2, pp. 234–279, 1997.
- [29] S. J. Ashford and L. L. Cummings, 'Proactive feedback seeking: the instrumental use of the information environment', *Journal of Occupational Psychology*, vol. 58, no. 1, pp. 67–79, 1985.
- [30] J. Li and J. Earnest, 'Das Beste aus zwei Welten: Vorteile einer Kombination von quantitativen und qualitativen Forschungsmethoden', *WZB Mitteilungen*, vol. 150, no. 1, pp. 30–33, 2015.
- [31] W. Loosen, 'Das Leitfadentinterview – eine unterschätzte Methode', in *Handbuch nicht standardisierte Methoden in der Kommunikationswissenschaft*, S. Averbek-Lietz and M. Meyen, Eds. Wiesbaden: Springer Fachmedien, 2016, pp. 139–155. doi: 10.1007/978-3-658-01656-2\_9.
- [32] R. Liebold and R. Trinczek, 'Experteninterview', in *Handbuch Methoden der Organisationsforschung*, S. Kühl, P. Strodtholz, and A. Taffertshofer, Eds. Wiesbaden: Verlag für Sozialwissenschaften, 2009, pp. 32–56. doi: 10.1007/978-3-531-91570-8\_3.
- [33] C. Helfferich, *Die Qualität qualitativer Daten*. Wiesbaden: Verlag für Sozialwissenschaften, 2011. doi: 10.1007/978-3-531-92076-4.
- [34] R. Schnell, P. B. Hill, and E. Esser, *Methoden der empirischen Sozialforschung*, 9., Aktualisierte Aufl. München: Oldenbourg, 2011.
- [35] K. Bähring, S. Hauff, M. Sossdorf, and K. Thommes, 'Methodologische Grundlagen und Besonderheiten der qualitativen Befragung von Experten in Unternehmen: ein Leitfaden', *Die Unternehmung*, vol. 62, no. 1, pp. 89–111, 2008.
- [36] W. Mittag and W. Hager, 'Ein Rahmenkonzept zur Evaluation psychologischer Interventionsmaßnahmen', in *Evaluation psychologischer Interventionsmaßnahmen, Standards und Kriterien: Ein Handbuch*, W. Hager, J.-L. Patry, and H. Brezing, Eds. Bern: Huber, 2000, pp. 102–128.
- [37] B. G. Glaser and A. L. Strauss, *The discovery of grounded theory: strategies for qualitative research*. Aldine, 1967.
- [38] P. Mayring, *Qualitative Inhaltsanalyse: Grundlagen und Techniken*, 12., Überarbeitete Auflage. Weinheim Basel: Beltz Verlag, 2015.
- [39] P. Mayring and T. Fenzl, 'Qualitative Inhaltsanalyse', in *Handbuch Methoden der empirischen Sozialforschung*, N. Baur and J. Blasius, Eds. Wiesbaden: Springer Fachmedien, 2019, pp. 633–648. doi: 10.1007/978-3-658-21308-4\_42.
- [40] C. Bogenstahl and R. Peters, 'Perspektiven eines hybriden Arbeitens im Homeoffice und im Büro', Büro für Technikfolgen-Abschätzung beim Deutschen Bundestag (TAB), 2021. doi: 10.5445/IR/1000131774.
- [41] M. Camphausen, 'Kma Entscheider Blog: Was bei der Einarbeitung neuer Mitarbeiter zu beachten ist', *Klinik Management aktuell*, vol. 11, no. 1, p. 10, 2020.
- [42] R. L. Daft and R. H. Lengel, 'Information richness: a new approach to managerial behavior and organization design', in *Research in Organizational Behavior*, B. Staw and L. L. Cummings, Eds. Greenwich: JAI, 1984, pp. 191–233.
- [43] R. L. Daft and R. H. Lengel, 'Organizational information requirements, media richness and structural design', *Management Science*, vol. 32, no. 1, pp. 554–571, 1986.
- [44] P. Blietschau, 'Checklisten erleichtern die Einarbeitung', *CNE.fortbildung*, vol. 4, no. 1, pp. 14–16, 2011.
- [45] C. Lummer, *Praxisanleitung und Einarbeitung in der Altenpflege: Pflegequalität sichern - Berufszufriedenheit verstärken*, 3., Aktualisierte Aufl. Hannover: Schlüter, 2015.
- [46] Haufe, 'Mitarbeiter Onboarding – 10 Erfolgsfaktoren für einen strukturierten und begeisternden Onboardingprozess'. 2021. [Online]. Available: [https://images.aktuell.haufe.com/Web/HaufeLexwareGmbHCoKG/%7B3758b40d-abbf-49a8-aebd-4936f6f8f700%7D\\_ROM\\_Checkliste\\_Onboarding\\_-\\_Erfolgsfaktoren.pdf](https://images.aktuell.haufe.com/Web/HaufeLexwareGmbHCoKG/%7B3758b40d-abbf-49a8-aebd-4936f6f8f700%7D_ROM_Checkliste_Onboarding_-_Erfolgsfaktoren.pdf)
- [47] C. Liebhart, 'Neueinstellung – Professionelle Einarbeitung als Erfolgsfaktor', *physiopraxis*, vol. 10, no. S 01, pp. E6–E8, Jan. 2012, doi: 10.1055/s-0031-1301053.
- [48] E. Locke and G. Latham, *A theory of goal setting and task performance*. Perntice Hall, 1990.
- [49] Haufe, 'Onboarding – Einarbeitungsplan für neue Mitarbeiter:innen'. 2021. [Online]. Available: [https://images.aktuell.haufe.com/Web/HaufeLexwareGmbHCoKG/%7B8f95f2d8-cfa3-4fd8-b41e-fe513c652869%7D\\_ROM\\_Arbeitshilfe\\_Onboarding\\_-\\_Einarbeitungsplan.pdf](https://images.aktuell.haufe.com/Web/HaufeLexwareGmbHCoKG/%7B8f95f2d8-cfa3-4fd8-b41e-fe513c652869%7D_ROM_Arbeitshilfe_Onboarding_-_Einarbeitungsplan.pdf)
- [50] C. Lummer, 'Einarbeitung als geplanter Prozess', *CNE.fortbildung*, vol. 4, no. 1, pp. 2–5, 2011.
- [51] A. Fust, M. Mahler, A. Graf, T. Zügler, N. Bolliger, and C. Brunner, 'KMU-Leitfaden zur Steigerung der Arbeitgeberattraktivität - Mit effektivem Employer Branding und geeigneten Massnahmen den Fachkräftemangel angehen'. 2021. [Online]. Available: <https://www.alexandria.unisg.ch/264451/1/KMU-Leitfaden%20zur%20Steigerung%20der%20Arbeitgeberattraktivitaet%202021.pdf>
- [52] M. Morgan, *Improving the student experience*, Abingdon, Oxon: Routledge, 2012.
- [53] A. Kline, B. Aller, and E. Tsang, 'Improving student retention in STEM disciplines: A model that has worked,' *ASEE Annual Conference & Exposition Proceedings*, 2011.