

Turning Mentoring Around – A Case-based Analysis of the Outcomes of Digital Reverse Mentoring

Completed Research

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Abstract

Firms have recently employed digital reverse mentoring programs in which young and digitally affine employees are paired as mentors with mentees from senior management to foster their digital mindset. This paper sheds light into the outcomes and success factors of such reverse mentoring relationships by conducting a qualitative analysis of nine reverse mentoring pairs in four different organizations. Using an exploratory approach, we identified 31 different outcomes which are clustered along themes (e.g., technologies/trends or corporate culture), behavior (ranging from just creating awareness to sustainably changed behavior), and scope (ranging from personal to organization-wide impact). Moreover, we extracted success factors that showed to be important preconditions for making digital reverse mentoring successful.

Keywords

Reverse mentoring, digital mentoring, digital mindset, case study, exploratory analysis.

Introduction

Every day, senior managers have to ask themselves how they want to position and sustain their company in an environment that is turned upside down by digitalization. However, for many of them, digitalization is a phenomenon that entails unknown and new aspects. Particularly for older generations, digital trends are often alien or at least ‘not natural’ (Nelissen and Van den Bulck 2018). Too little digital competence or ‘digital mindset’ at the senior management level can lead to companies missing out innovation and falling behind competition. Especially when it comes to the potential of digital technologies and solutions, there is a group of people who knows about them like no other does: Digital Natives, members of the generations Y and Z (Prensky 2001a). They grew up in a world with ubiquitous Internet access, mobile communication, and social media. While growing up, they develop a natural approach to using digital technologies. This results in, compared to older generations, different behavioral patterns and perspectives (Prensky 2001b). In this research, we want to shed light on the question whether and how Digital Natives, as the young generation of employees, can share their experiences and mindset with senior managers. Firms have recently set up so called reverse mentoring programs in order to institutionalize digital spill-over from ‘young to old’ as they pair senior managers with younger employees (Chaudhuri and Ghosh 2012; Harvey et al. 2009; Lytle 2017). So far, there have only been few and conceptual works on the outcomes and challenges of such partnerships. The implications for executives who participate in reverse mentoring have yet to be addressed in research – this becomes even more essential as firms put increasingly resources into such programs. Therefore, this paper addresses the following questions: #1: *What effects does reverse mentoring have on the digital mindset of executives?* #2: *What are important factors that enable achieving the intended effects?*

These questions are intended to examine whether digital reverse mentoring is a useful format and what kind of outcomes the implementing firms can expect.

To answer them, we conducted a series of case studies with mentor/mentee pairs of reverse mentoring programs in various firms. We apply an exploratory approach to discover the various effects that executives experience through their participation in reverse mentoring. Based on this empirical work, we develop a categorization of reverse mentoring effects. At the end, we discuss limitations and implications of our research, together with an outlook into future directions for reverse mentoring research.

Background and Related Research

Reverse Mentoring vs. Traditional Mentoring

Reverse mentoring is a unique form of mentoring, “pairing of a younger, junior employee acting as mentor to share expertise with an older, senior colleague as the mentee” (Marcinkus Murphy 2012:549). This rather new mentoring approach supports executives to better understand trends and technologies through the expertise and help of younger employees as mentoring partners (Allen et al. 1999; Mirvis 1996).

Traditionally, within the business context, a mentor is an individual with sophisticated knowledge and experience (often a senior manager), dedicated to providing promotional support and mobility to his or her mentee’s career (Kram 1985). In most cases, this support can be categorized into *career support* (enhancing the mentee’s career within the organization) and *psychological support* (helping the mentee to grow personally and professionally). The mentor encourages the mentee to gain self-recognition and endorsement, gives advice to help solve problems, grants respect and friendship, and has a role model function. Mentors and mentees usually prefer to maintain rather informal relationships to gain more favorable outcomes (Noe 1988). Evidence shows that mentoring often results in career advancement for the mentees (e.g., higher compensation, higher satisfaction with own job and career (Harvey et al. 2009)). Especially in internationally operating firms, the mentee can get global information and the provision of contacts and networks (Harvey et al. 2009). Thus, mentoring is a powerful tool for companies to support the development of young employees.

Reverse mentoring has several characteristics in common with traditional mentoring. Both concepts are conducive to vocational development, they do not only bring benefits for mentees but also for mentors, and often create strong relationships between the participants. But, obviously, both approaches also show contradictory patterns: first, in reverse mentoring it is the younger counterpart, not the senior manager, who is responsible for teaching and transferring knowledge to the counterpart (Meister and Willyerd 2010). Second, while traditional mentoring comprises the sharing of organizational, internal knowledge, reverse mentoring is about transferring domain knowledge which is often stemming from outside the organization (Harvey et al. 2009). Third, the unequal status of the reverse mentoring partners challenges the senior mentee because this kind of mentoring program can only work if the senior mentee accepts giving up control and to learn from the junior mentor (Marcinkus Murphy 2012). Fourth, the mentors learn through observation, i.e., personal, implicit learning (‘implicit’, because they do not get direct instructions from the senior). As a result, both parties must actively engage in the common aim of mutual learning and support. This factor is indispensable, given the generational differences (Chaudhuri and Ghosh 2012).

Digital Reverse Mentoring, Digital Natives, and Digital Immigrants

In our study, we focus on reverse mentoring with regard to digital expertise or a ‘digital mindset’. In this ‘digital reverse mentoring’, usually ‘Digital Natives’, employees who grew up with digital technology (Prensky 2001a), will mentor ‘Digital Immigrants’, i.e., members from older generations. Having grown up and consistently interacted with digital technologies (Internet, instant messaging, social media, mobile devices etc.), younger generations have a fundamentally different approach to thinking and processing information (Prensky 2001a). For them, it is usual to have instant access to contents and to receive information very fast. They like to work in a parallel or multi-task process way and they have little patience. Neurobiological and socio-psychological experiments show that even their brain structure and thus thinking patterns might have changed (Prensky 2001b). By contrast, the older ‘Digital Immigrants’ were not born into a digital environment, but may have adopted aspects of the technologies; like learning a new language, they learn to assimilate to their environment but keep their ‘accent’ to some extent, like printing out documents to read or edit them (Prensky 2001a)¹. Digital reverse mentoring aims at creating a spill-over of a ‘digital mindset’ from a digital native to a digital immigrant.

¹ Obviously, neither Digital Natives nor Digital Immigrants are homogeneous groups. Kennedy et al. (2010) showed that Digital Natives can be grouped into four categories, ranging from power users to basic users. Further, according to Brown and Czerniewicz (2010), we note that using the terms “native” vs. “immigrant” might be perceived as offensive because it ‘labels’ people. Nevertheless, the two groups are so distinct that we, in a simplifying manner, treat them as the two sources for reverse mentors vs. mentees.

Related Research

Research on reverse mentoring is scarce. The few available works can be categorized into two groups: those approaching reverse mentoring conceptually (e.g. Marcinkus Murphy 2012) and those demonstrating reverse mentoring through practical cases (Chen 2013; DeAngelis 2013). Marcinkus Murphy (2012) focuses on the generation of Millennials and their potential for sharing technological expertise with the older generation through reverse mentoring. Harrison (2017) additionally considers reverse mentoring as an opportunity to prepare young employees for leadership positions and, as a consequence, to enable innovation in the organization. Chaudhuri and Ghosh (2012) see reverse mentoring as a social exchange tool for HR development; they explain how an organization can effectively manage its demographically diverse workforce through increasing the Millennial's engagement and the Baby Boomer's commitment by means of reverse mentoring. Harvey et al. (2009) consider reverse mentoring as an advanced mentoring format that emerged from the traditional mentoring format in the context of supporting female managers.

Chen (2013) did a qualitative field study to explore the effects of reverse mentoring on traditional-mentoring functions (career development, psychological support etc.) and found that reverse mentoring has quite similar benefits as traditional mentoring. The most managerial (single) case study was done by DeAngelis (2013) who describes why and how The Hartford Company implemented reverse mentoring.

Overall, those first studies have argued for positive effects such as transferring knowledge to and learning on the mentee's side (Harvey et al. 2009). The objects of transfer do vary, but mostly it is about new and emerging topics, e.g., the use of social media, technology trends, or generational views on various subjects (Chaudhuri and Ghosh 2012; Meister and Willyerd 2010). Especially for employees who lack technical skills, reverse mentoring can be a practical solution (Harvey et al. 2009). Sensitizing the mentees for increasing diversification of work environments, work-life balance, or innovation drivers are further effects of such programs (Chaudhuri and Ghosh 2012; Marcinkus Murphy 2012). However, reverse mentoring is not only about gaining knowledge, but also about getting a new perspective, obtaining an understanding about the younger generation, otherwise difficult to achieve. Thus, theoretically, executives become more engaged in communicating with other generations (Chaudhuri and Ghosh 2012; Marcinkus Murphy 2012). Further, more indirect effects of reverse mentoring are a positive impact for HR (recruiting, retention rate), enhancing 'vertical social networks', creating social equity, bridging technology gaps, understanding trends and customers, and driving innovation and org. learning (Marcinkus Murphy 2012).

While no negative effects of reverse mentoring have been identified, yet, researchers argue that, to achieve the intended effects, certain conditions must be fulfilled. For example, a reverse mentoring program needs to carefully consider the characteristics of mentors and mentees in terms of gender, ethnicity, and personality in order to create effective pairs; accordingly, a thorough and data-driven matching process is an important success factor (Marcinkus Murphy 2012). Further, some awareness training is required up-front as both parties usually do not have experiences with these unusual roles. Then, the participants need to dedicate the necessary time for creating an effective and trustful relationship (Marcinkus Murphy 2012). As with all forms of mentoring programs, success requires well-thought planning and leadership support (Allen et al. 2006); particularly, an active executive endorsement proves the importance and value of the program to participants and the whole organization (DeAngelis 2013; Marcinkus Murphy 2012). Finally, researchers highlight the supporting role of communication technologies (DeAngelis 2013; Marcinkus Murphy 2012) and clear *a priori* setting of goals, agendas, timelines for a reverse mentoring initiative (DeAngelis 2013).

In summary, the above mentioned studies offer first impressions about the mechanisms of reverse mentoring. However, all cited works look at reverse mentoring and its outcomes exclusively either from a conceptual and not empirically informed perspective or they use a small number (often only one) of use cases and do not relate the outcomes to the digital progress of the involved organization organizations. None of them question the resulting impact on managers who come into contact with digital issues in a new way by participating in a reverse mentoring program. In our study, we do, unlike most previous works, explicitly elaborate on reverse mentoring in the context of digitalization. In the following, we outline our approach.

Methodology

We chose an exploratory case study approach for our study. Our aim was to investigate the effects of reverse mentoring in a digital context and their underlying root causes. We collected data in four German firms by talking to the leaders of those programs, conducting interviews with the members of nine reverse mentoring

pairs, and screening internal files such as profile cards, which were used for the pair matching. All interviews were conducted in 2018 and followed a semi-structured guideline. Questions focused on pair relationships, the organization of the mentoring activities, relevant topics that were discussed among the mentor and mentee, and resulting outcomes of the mentoring. For analysis, we followed Bryman's proposed four-stage concept of general analysis, detailed analysis, systematic coding, and theoretical relation (Bryman 2016). Open coding was applied to identify all relevant statements in a first step. As the study was conducted as an explorative study, the result categories were then formed in a 'bottom-up' aggregation of the identified codings. Moreover, they were screened for relationships to underlying root causes. Table 1 gives an overview about the mentoring pairs included in our study.

Pairs (Mentee/mentor)	Gender	Year of birth	Company	Duration of mentoring
P1E/P1R	Female/Male	1970/1992	Bank	4 months
P2E/P2R	Male/Male	1963/1988	Bank	6 months
P3E/P3R	Female/Female	1964/1991	Bank	6 months
P4E/P4R	Female/Male	1972/1989	Bank	6 months
P5E/P5R	Male/Male	1968/1988	Bank	6 months
P6E/P6R	Male/Male	1972/1990	Investment firm	6 months
P7E/P7R	Female/Male	1972/1991	Investment firm	6 months
P8E/P8R	Male/Male	1956/1996	Insurance firm	6 months
P9E/P9R	Male/Female	1963/1989	Consumer goods firm	6 months

Table 1: Participants' background and mentoring program's period

To give the reader a better idea about the context of reverse mentoring, we give some descriptive information about *Bank*, where we collected more than half of our interviews. *Bank* is a large bank which is currently undergoing a holistic digital transformation initiative. Within this initiative, *Bank* wanted their senior managers to get a deeper understanding of the different aspects and implications of digitalization. Part of this was to implement a reverse mentoring program; this program was led by a team of four employees from the digital transformation team and HR. This team invited executives to participate in the program and asked junior employees (working students and trainees) whether they would be interested in being the executives' reverse mentors. Afterwards, the matching process started: all applicants had to fill out a profile card to provide relevant personal information (their use of social channels etc.). Further, all participants had to choose different topics they wanted to learn about (executives, mentees) or where they perceived themselves to have a high level of expertise (junior employees, mentors), respectively. This information was used to match the pairs, thereby also ensuring that members of a pair did *not* belong to the same business unit. The mentoring phase started with a joint kick-off event where all pairs were announced and met for the first time. Further, the organizers of the program provided some guidelines, rules, and suggestions, such as informal addressment within pairs, discreetness, commitment, meeting at least one hour per month, or suggesting joint visits of events and to conduct reciprocal job shadowing for one day. The opening event was also used to introduce the "Reverse Mentoring Challenge": on a voluntary basis, pairs were asked to work on a particular innovation idea that relates to the digitalization of a specific field of banking operations. The pairs were asked to present their ideas at the closing event of the mentoring phase and to vote for the best idea to be rewarded. The organization team also awarded a pair with the "Best Match Award", which honored the pair that showed to have had the highest interaction intensity. Initially designed for three months, the first trial was extended to six months because of the unanimously positive feedback of the participants. The organizers did also support exchange among mentors by setting up monthly calls, where mentors shared their experiences and received advice from an HR expert.

Results

Effects of Reverse Mentoring

As answer to our first research question, the analysis revealed a total of 31 effects of reverse mentoring on the digital mindset of the mentee. Table 2 (left part) lists them and categorizes them along topics, affected behavior and scope. All categories and selected exemplary effects will be explained in the following.

Outcomes of Digital Reverse Mentoring

Effect	Categories of effects of reverse mentoring (research question #1)							Categories of causal factors (research question #2)						
	Topics	Behavior			Scope			Relationship		Mentor's approaches			Mentee's approaches	Org. facilitating conditions
		Aware-ness	Adop-tion	Usage	Per-sonal	Busi-ness	Organi-zation	Communi-cation/ team-work	Atmos-phere	Show-ing/ sharing	Effort/ passion	Passing on employees' views		
Working with new work equipment	Tools/ programs			x		x				x				
Founding a non-profit organisation	Tools/ programs			x			x				x			x
Planning introduction of serious games within firm	Tools/ programs			x			x		x		x			
Getting a new attitude to paper consumption	Tools/ programs		x			x					x			
Being more opened for digital solutions	Tools/ programs		x		x					x				
Using new services within the company	Tools/ programs			x			x			x				
Planning explanation videos for employees	Tools/ programs			x			x				x			
Testing programming tools	Tools/ programs		x		x				x	x	x			
Using new social media functions	Tools/ programs			x	x					x				
Testing video editing programmes	Tools/ programs		x		x					x	x			
Starting a different approach of time management	Tools/ programs			x	x								x	
Using new apps	Tools/ programs			x	x					x	x		x	
Loosing fear of programmes and tools	Tools/ programs		x		x	x				x				
Gaining knowledge about university WiFi networks	Technologies/ trends	x			x						x			
Planning introduction of sensor technology within firm	Technologies/ trends			x			x	x			x			
Understanding a robo-advisor	Technologies/ trends	x				x				x	x			
Changing the company's IT	Technologies/ trends			x		x	x	x	x	x	x			
Examining possible transfer of open source to firm	Technologies/ trends		x				x	x			x			
Launching a digitalisation information fair for employees	Corporate culture			x			x				x		x	x
Launching a digital challenge for employees	Corporate culture			x			x	x			x			x
Allowing informal addressing of the company's executives	Corporate culture			x			x		x		x			
Launching new leadership principles	Corporate culture			x			x	x			x			
Launching a Millennial Board	Corporate culture			x			x	x						
Publishing an interview for employees	Corporate culture			x			x					x		
Starting to have business meetings at different floors	Corporate culture			x		x	x					x		
Considering the Digital Native's think approaches	Digital Natives		x			x				x				
Gaining insights into the life of Digital Natives	Digital Natives	x			x				x	x			x	
Gaining knowledge about the firm's Digital Natives	Digital Natives	x				x		x		x	x	x	x	
Having new smartphone habits	Digital Natives			x	x			x		x	x	x		
Gain insights about other segments and businesses	Businesses	x				x		x			x			
Having new think approaches about digital bus. models	Businesses		x			x		x						

Table 2. Impacts of Reverse Mentoring and their Categorization

Topics

The effects mentioned by the interviewees can be structured along five topics that were dealt with and influenced by the reverse mentoring programs: tools and programs, technologies and trends, corporate culture, Digital Natives, and businesses.

Reverse mentoring led to a more profound understanding and access to new **tools and programs**, such as smartphone apps, thereby fostering a shared knowledge domain of mentees and their related mentors. To a certain extent, every pair talked about various tools and programs. Above all, the presentation and application of smartphone apps was actively addressed by both, the mentors and their mentees (P1-P9). This can be as beneficial for the private use as for the entire firm: *“The influence of the [reverse mentoring] program is also reflected in the fact that in my segment we are now using the services of a new start-up, through which we, for example, can clearly display cost reports”* (P4E). Another pair searched for a gamification tool that presents internal online training courses in an entertaining and playful way. After finding one, they now anticipate that the employees prospectively *“will use this approach in the bank”* (P2E). However, one executive criticizes that the only digital topics that most potential mentors in his company are aware of are social media apps and smartphones, which is not perceived as very helpful (P8E).

Digital **technologies and trends** were discussed to a similar extent as tools and programs. Grown up in a technology-laden world, many mentors shared their technological experience and know-how with the executives. P4R, for instance, introduced his mentee to a start-up that built a robo-advisor. The executive got the opportunity to gain personal experience in this technology (P4E). For some pairs, however, getting to know technologies and trends was only the fundament to work on practical application of the technologies within the organization. Pair 2 worked on finding *“something that is applicable for the bank”* (P2E).

The third category of reverse mentoring effects relates to the **corporate culture** as outcomes of reverse mentoring are beginning to trigger cultural changes. Dealing with digital topics in a structured way and discussing ideas with her mentor, the executive of pair 3, for instance, started an information fair for all employees of her segment to increase their awareness of digital topics. Further, most interviewed participants addressed each other informally when talking to each other, reflecting another cultural change (P1-P7, P9). One interviewed CEO even introduced informal addressing for the entire organization (P6E).

Another highly relevant topic for the executives is to gain insights into the habits, characteristics, and the life of **Digital Natives**. One mentee states that through participating in the mentoring program she got a *“deeper and better understanding of the generation of Digital Natives”* (P7E). This even resulted in copying her mentor’s habits in the daily use of her smartphone. Further, two executives argue they have learned approaches from their mentors for how to solve problems or receive information (P1E, P4E). Reverse mentoring also gives the executives insights into the group of their firm’s Digital Natives: *“What I as HR manager learned from the junior staff obviously brought insights that I otherwise might not have received”* (P8E). Executives can put themselves in the position of young employees and change perspective (P6E).

The last category of topics is **businesses**. By discussing business models with their mentors and looking at other segments and companies, the executives gain insights into areas they would not get by own initiative. This has an impact on the executives’ perception and understanding of digital businesses, in particular. One pair discussed digital business models of the future. The executive states: *“I better understand under what conditions digital business models can be successful”* (P7E). The mentor of pair 5 organized one whole day in Berlin for his mentor, visiting several teams and start-ups. The executive confirmed that this has broadened his range of perspectives and that he has got to know new areas and businesses (P5E). However, this does not mean that the executive actually needs the gained knowledge for his everyday tasks: *“Did this [knowledge] help me in my daily work? No, I don't think so”* (P5E). This shows how differently topics are received and that the range and intensity of impacts can vary according to each individual pair.

It is important to mention that some interviews also revealed that a reverse mentor is not always able to introduce new topics and impart knowledge to his or her mentee (P5E, P7R). Whether unknown aspects can be conveyed, depends on the executive’s thematic affinity and the previous level of knowledge.

Behavior

The effects of reverse mentoring can also be categorized by the executives’ associated behavior. The associated subcategories are awareness, adoption, and usage (cf. Table 2). Among them, **awareness** is the least

far-reaching level in terms of executives' behavior. Through reverse mentoring, mentees get insights into certain topics and develop a certain basic knowledge and understanding of them. For example, executives stated insights into the life of Digital Natives as an impact of their reverse mentoring program. In this regard, one executive states: *"I was always fascinated by what my mentor told me about how he lived and what digital components he took for granted in his life. As a result, ideas arose again and again, which was personally and professionally exciting for me"* (P4E).

The second behavior category is **adoption**, relating to an actual change of the executives' attitude, making them considering, examining, or testing new things. Adopting new digital aspects and thoughts leads to a more pronounced digital mindset than simply creating awareness. Overall, acquiring new capabilities is one of the main initial reasons for executives participating in these programs. In one pair, for instance, the executive discussed and tested programming tools with his mentor in order to develop and improve coding skills (P6E). For another executive the experience of his mentor working with a tablet was new. He states: *"My mentor is really clearly digitalized in the sense of low paper consumption. [...] I've changed my attitude about paper consumption. I want to print less for meetings"* (P2E). Participating in a reverse mentoring program changed the executive's analogue mindset to a digital one.

Several executives stated impacts that also, one step further than initial adoption only, changed their behavior sustainably. **Usage** is this third level of the behavior category. One executive and her mentor built a concept for a non-profit organization to help more girls getting to learn programming skills (P1E). Another executive states: *"I would say that throughout my professional career, nothing has influenced me and broadened my horizons as much as this mentoring program"* (P6E). Inspired by the reverse mentoring program, he developed a "Millennial Board", an association of the respective reverse mentors of the Management Board members that serves as Advisory Board for the Management Board. It represents the Digital Natives' opinions on digitalization and future issues (P6).

Scope

The stated effects can also be categorized along different scopes. It makes a difference whether executives learn something for their personal life, for their business life, or whether their entire organization benefits.

The first considered area is the **personal area**. Because of the informal mentoring relationship, many pairs also discussed matters of private life (P2-P4, P6-P9), which, in most cases, are not necessarily related to their professional life or organization. One executive states that she got a *"better understanding of communication tools such as social media"* (P7E). Another executive states that the reverse mentoring program influenced his personal time management: *"Time alone can be enough to make progress [...]. If I want to learn something, I also have to plan time for it and give it a higher priority so that I actually do it"* (P9E). A third impact regarding the personal area is the change in the individual general view of digitalization and the everyday life solutions thus possible. One executive cites as an example: *"The reverse mentoring has given me personally more openness towards the whole digitalized world"* (P2E).

Of course, reverse mentoring has also impacts on the executives' **business area**. One pair, for example, only met virtually via Google Hangouts because they faced the difficulty of not being in the same country during the program's period). The executive states: *"[Reverse mentoring] always makes me try something out and take responsibility"* (P1E). Reverse mentoring can also relieve anxiety and break down barriers regarding new aids and technologies that some executives face (P6E, P9E). One executive, for instance, had problems using work-related business software. After the reverse mentoring sessions, he now says: *"It was a kind of fear that I had – will I find it, will this work out? [...] By today, I am on my way without any fear – that was a change of mindset. [...] Don't give up and be patient! That's something I learned"* (P9E).

The area with the highest potential reach, or widest scope, is the **organization area**. Reverse mentoring programs have their greatest possible impact if the participating executives experience or initiate impacts not only in their private or own work environment but create impact for the large organization. Transferring knowledge, for instance, is not only an important principle for the reverse mentoring program but can also be applied to the entire organization. One pair, for example, developed the idea to explain digital keywords that appear in the corporate Intranet's articles in short videos. Those scribbled video clips that enhance the understanding of terms like *API* or *Blockchain* will be implemented now (P4E). The executive of pair 3 asked all employees of her segment to describe daily problems they face. The received problem descriptions where

then prioritized by a special task force, some submissions selected, and the respective employees were invited to take part in small innovation projects running over multiple weeks. The proposed solutions were presented to a jury comprising of experienced executives (P3E). Another organization-wide effect of reverse mentoring we observed is its impact on staffing. The executive of pair 6 states: *“My view on our IT has changed. [...] In the last years [...] I always stayed away from IT. Every executive somehow says that he has no idea about IT. At the same time, IT is the highest budget position and a real f***-up! [...] Starting the mentoring program, I therefore said that I didn't want this to be the case anymore and that I would start to work my way into our IT architecture. [...] In order to really be able to intervene as a manager, basic knowledge is required. That was my main objective, and I have come critically close to it. I already replaced my IT boss, which I wouldn't have dared to do six months [starting point of the reverse mentoring program, authors note] ago. The reverse mentoring [program] has led to understanding where things don't work well and that this could work differently”* (P6E).

Causal Factors

In the second step, we looked for causal factors that help explain which reverse mentoring outcomes to expect under which circumstances and thus answer our second research question. These factors can be divided into four categories: the relationship within a pair, that done by the Digital Natives as mentors, that done by the executives as mentees, and the support provided by the organization. The causal foundations of the stated impacts are listed in the right half of Table 2 above and are examined below in detail.

Relationship

Two types of **communication and teamwork** were mentioned by many executives: mutual exchange (P2, P5R, P6, P7E, P8) and doing various activities with each other, such as reading a book or coding (P3E, P6). Here, the **atmosphere** in the pairs plays an important role regarding the resulting impacts. Facilitating factors in this respect are uncomplicated interaction and open communication, exchange on personal topics, informal addressing, and ignoring of hierarchical formalities (P2R, P6R).

Mentors' Approaches

An important aspect for the mentors to transfer knowledge to their mentees is **showing and sharing** – on the one side practically showing the executives how software, tools, or devices work according to the learning-by-doing principle and, on the other side, sharing insights about their life as Digital Natives, such as usage of apps and social media (P2, P4, P6-P9), but also how they deal with challenges (P1) and what their personal views on certain issues are (P4E, P6R). Even more important is the **effort and passion** shown by the mentors. They include, for instance, searching for and selecting interesting events or topics (P2R, P3, P4E, P6E, P9R), creative preparation of the mentoring sessions (P2R, P4E, P6R, P7R, P8R, P9R), creating documents for summary (P3, P6R), working out topics that could be of the executive's interest (P5R, P6R), or analyzing business models (P4E). Some mentors are also used as the voice of the staff as they are **passing on employees' views** (P6R, P7R, P8E). Having a close relationship with an executive, the mentors become potentially valuable contacts for their colleagues.

Mentees' Approaches

Of course, the executives as mentees are also responsible for making the reverse mentoring successful. Here, asking questions very actively is the most frequently mentioned factor for an effective mentoring relationship (P3R, P4R, P6E). Other aspects are the willingness to regularly spend time on mentoring sessions (P9E), or the disposition to address own problems openly to the mentor (P9E).

Organizational factors

The last category of causal factors is the organization itself. According to the interviews, the support of the company makes the success of the reverse mentoring program more likely. In *Bank's* program, two support factors are explicitly mentioned: a challenge set up by the organization team for the six-month program duration and the support material provided by the supporting program team (P1E, P3).

Discussion

The present work has *implications for research*, in particular by creating more transparency on the subject of reverse mentoring. In particular, the focus on the possibilities of acquainting executives with the various aspects of digitalization through reverse mentoring is a contribution that closes previous research gaps by breaking down and analyzing various impacts on digital mindsets. The contents of this work also offer *managerial implications*. Lifelong learning is the basis for successful development within the professional life. Reverse mentoring can be an important mean to bridge cross-generational gaps in knowledge about uprising technologies and digital change. It can also be introduced in companies to promote exchange among employees, to focus on specific topics, or to enable more focused knowledge transfer. The implementation of a reverse mentoring program is relatively simple, easy to scale, and enjoyable for both parties involved (P1-P9). To achieve the best results, the participants should develop a mutual relationship of trust and, therefore, participation must be voluntary. A high participation rate can be achieved through executives exemplifying participation as a role model for other potential participants. Attitude of executives is also of great importance – the willingness to communicate at eye level with the young mentor, to accept the role reversal, and to allow potential subsequent changes requires courage. Given the busy schedule of executives, they should reserve sufficient time for joint sessions to ensure continuous discussion of the covered topics and to build a trustful relationship. The organization can assist in matching mentoring pairs. Ultimately, the organization also benefits from junior employees who show a high level of commitment. The support of the executives and the simultaneous acceptance of the program by the junior employees are important for its implementation into an organization.

Our research has of course some *limitations*. First, data collection and analysis was done by the first author only; however, the codings were validated by the second author. Second, the interviewer himself has been participant in a reverse mentoring program before. This experience ensures a certain affinity to the topic and closer insights into practical implementations, however, a general bias regarding the topic is unavoidable. A third limitation refers to the digital affinity of the interviewed executives. In all companies that agreed to participate in our case studies, the reverse mentoring program was the first of its kind. The number and type of influences of reverse mentoring on the mindset of participating executives could be relatively higher and more intensive than for executives who are not early adopters and therefore did not participate in the first round of the digital reverse mentoring programs.

The results of the present work offer various *future research possibilities*. In order to obtain empirical results that are statistically meaningful, quantitative investigations of a larger sample size should be conducted. Also, a more diverse sample would give broader and deeper insights into criteria such as cultural, social or ethnical dimensions of the pairs or the participants' duration of affiliation with their companies. Further, a longitudinal study of the impacts of reverse mentoring could also provide information on whether the introduction of reverse mentoring also has an impact on actual corporate results. Long-term studies could also provide new insights regarding the reverse mentors and their role within the company such as whether their reverse mentoring participation at that time was conducive to their careers. Another exciting topic that could be examined is the future potential of the reverse mentoring concept against the background of demographic change. In the coming years, many executives and managers who are members of the Baby Boomer generation will drop out of the workforce due to their age while digital natives will take over. This ongoing development also means that knowledge and understanding of digital topics from the younger generation are increasingly gaining ground in companies. By contrast, continuous technological progress at exponential rate will bring new digital technologies and new generations might again develop expertise that today's digital natives will not have. Do companies therefore still need reverse mentoring in the future? How should a sustainable reverse mentoring approach be framed and structured?

Conclusion

Digitalization, with all its facets, is still a poorly understood phenomenon for many executives. However, future requires to deal with the manifold aspects of digitalization. Digital reverse mentoring is a concept that provides various contributions to the development of executives' digital mindset. Our research is among the first that shed light into the outcomes and success factors of such mentoring programs. Transforming senior managers' mindset creates opportunities to help companies keep pace and stay ahead of the competition.

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