

ESSAYS ON THE USE OF COMPUTER-BASED TOOLS
FOR HUMAN RESOURCE DEVELOPMENT

PhD Thesis submitted to the Faculty of Economics and Business

Institute of Work and Organizational Psychology

University of Neuchâtel

For the degree of PhD in Psychology

by

Sebastian OTTE

Accepted by the dissertation committee:

Prof Adrian Bangerter, University of Neuchâtel, thesis director

Prof Marianne Schmid Mast, University of Neuchâtel

Prof Andreas Hirschi, University of Bern

Prof Petra Klumb, University of Fribourg

Defended on July 3rd, 2014

IMPRIMATUR POUR LA THÈSE

Essays on the use of Computer-Based Tools for
Human Resource Development

Sebastian OTTE

UNIVERSITÉ DE NEUCHÂTEL
FACULTÉ DES SCIENCES ÉCONOMIQUES

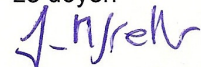
La Faculté des sciences économiques,
sur le rapport des membres du jury

Prof. Adrian Bangerter (directeur de thèse, Université de Neuchâtel)
Prof. Marianne Schmid Mast (présidente du jury, Université de Neuchâtel)
Prof. Petra Klumb (Université de Fribourg)
Prof. Andreas Hirschi (Université de Berne)

Autorise l'impression de la présente thèse.

Neuchâtel, le 25 septembre 2014

Le doyen



Jean-Marie Grether

Publication List

Study 1

Otte, S., Bangerter, A., Britsch, M., & Wüthrich, U. (2014). Attitudes of coaches towards the use of computer-based technology in coaching. *Consulting Psychology Journal: Practice and Research*, 66, 38-52. doi: 10.1037/a0035592

Study 2

Otte, S., & Bangerter, A. (unpublished manuscript). Computer use for competency development: The example of a Web-based tool.

Study 3

Otte, S., Bangerter, A., Britsch, M., & Wüthrich, U. (unpublished manuscript). Linguistische Eigenschaften von Verhaltensbeschreibungen aus Assessment Centern.

Contact:

Sebastian Otte

University of Neuchâtel

Institute of Work and Organizational Psychology

Rue Emile-Argand 11

2009 Neuchâtel, Switzerland

sebastian.otte@unine.ch

Für meine Eltern.

Danksagung

Prof. Adrian Bangerter danke ich sehr für seine Betreuung. Ich habe unter seiner Führung viel lernen können und bin sehr dankbar für die Zeit, die ich am Institut für Arbeits- und Organisationspsychologie der Universität Neuenburg verbringen durfte.

Prof. Marianne Schmid Mast, Prof. Petra Klumb und Prof. Andreas Hirschi danke ich für die freundliche und rasche Bereitschaft, diese Dissertation zu begutachten.

Ich danke der papilio ag und der Kommission für Technologie und Innovation (KTI) des Eidgenössischen Departements für Wirtschaft, Bildung und Forschung (WBF) für die Finanzierung des KTI-Projekts „Förderung kompetenzbezogener Personalentwicklungsprozesse in Organisationen durch die internetbasierte Plattform enTalent“.

Besonders möchte ich Dr. Urs Wüthrich für seine Initiative und seine Unterstützung danken. Diese Dissertation wäre ohne die von ihm lancierte Zusammenarbeit zwischen der papilio ag und der Universität Neuenburg wohl nicht zustande gekommen. Ebenso danke ich seiner langjährigen Geschäftspartnerin Dr. Mirjam Britsch sehr herzlich, dass sie das KTI-Projekt stets mitgetragen und unterstützt hat.

Dr. Ioana Latu, Dr. Eric Mayor, Dr. Véronique Eicher, Dr. Sarah Seyr, Dr. Michael Burtscher, Prof. Franziska Tschan, Dr. Denise Frauendorfer, Martin Niemann und Dr. Johann Weichbrodt danke ich für ihre Hilfe bei methodischen oder inhaltlichen Fragen.

Michaela Schär von der papilio ag danke ich für ihre Unterstützung bezüglich der webbasierten Plattformen „enAC“ und „enTalent“.

Chantal Cornaz, Leiterin Personalentwicklung bei PostMail, danke ich für ihre Rücksichtnahme in der Endphase meiner Promotion. Besonders danke ich ihr für das in mich gesetzte Vertrauen und für meine neue berufliche „Heimat“.

Silvia Jeronimo, Sara Pereira, Sophie Nidegger, Sijian Wong und Charlotte Hart danke ich für die gute Zusammenarbeit bei der Datenerhebung für die in dieser Dissertation beschriebenen Studien.

Meinen Kollegen und den Professoren des IPTO danke ich für eine tolle gemeinsame Zeit. Besonders danke ich Ioana, Dario, Françoise, Denise, Valérie, Elena, Annick, Sandra, Julia sowie dem gesamten „Team Bangerter“ (Adrian, Eric, Nicolas, die zwei Véroniques, Mathieu, Paloma und Julie).

Meiner Familie und meinen Freunden danke ich ebenfalls sehr für ihre Unterstützung.

Abstract

In human resource development, information and communication technology (ICT) has gained widespread use. For example, organizations use ICT to test cognitive and practical abilities via e-assessment or to improve the knowledge and skills of employees via e-learning. This dissertation examines different aspects of computer use in human resource development that are rather related to soft skills (i.e., personal and social skills) than hard skills (i.e., specific technical skills). The first study examines the attitudes of coaches toward computer use in coaching. Coaches with higher Internet self-efficacy and a higher preference for systematic coaching have more positive attitudes toward computer use. The second study experimentally investigates the effectiveness of a Web-based application for competency development. The treatment group used the application to define development objectives and plans, ask others for feedback and make self-evaluations. The control group could only ask for feedback and make self-evaluations. However, the competency development of both groups was not significant. Furthermore, there were no significant differences between the two groups. I discuss possible explanations for these findings. The third study analyzes linguistic characteristics of written evaluations of assessment center candidates. These evaluations were written using a Web-based application. I show that assessors describe candidates' behavior rather abstract than concrete and that they prefer descriptions with more adjectives. ICT could help assessors to describe candidates' behavior more concrete by giving them automatic feedback on linguistic characteristics of their writings. Overall, these studies add to the understanding of the prerequisites, possibilities and limitations of ICT utilization in human resource development.

Keywords: human resource development, ICT, Web-based application, coaching, assessment center

Mots-clés: développement des ressources humaines, TIC, application web, coaching,
assessment center

Table of Contents

Introduction	1
The Use of Information and Communication Technology in Human Resource Development	4
Technology Acceptance.....	8
Soft Skills Development with Information and Communication Technology .	12
Supporting Assessors with Information and Communication Technology	18
Study 1: Attitudes of Coaches Towards the Use of Computer-Based Technology in Coaching.....	23
Abstract	26
Computer-Based Technology in Coaching	28
Attitudes Toward Computer-Based Technologies	31
Method	37
Results	43
Discussion	47
References	53
Study 2: Computer Use for Competency Development: The Example of a Web-Based Tool.....	61
Abstract	64
Competency Development	66
Computer Use in Competency Development.....	70
The Example of a Web-Based Tool for Competency Development.....	72
Method	79
Results	84

Discussion	88
References	95
Appendix 1	103
Appendix 2	106
Appendix 3	107
 Study 3: Linguistische Eigenschaften von Verhaltensbeschreibungen aus Assessment	
Centern	109
Zusammenfassung	112
Assessment Center	115
Beschreibung des Kandidatenverhaltens durch Assessoren	115
Diese Studie	118
Methode	121
Ergebnisse	129
Diskussion	138
Literatur	143
General Discussion	149
Contribution	152
Limitations	156
Implications for Research	159
Implications for Practice	162
Conclusion	165
References	167

Introduction

Introduction

Progress in information and communication technology (ICT) has profoundly changed working life and therefore the experience and behavior of employees (Hoogervorst, Koopman, & Flier, 2002). Just as other areas of organizational activity, human resource management uses ICT to improve and accelerate its processes (Fisher & Howell, 2004; Hils & Bahner, 2005). In human resource development (HRD), ICT is used for a variety of purposes. For example, organizations use e-learning to develop the skills of employees and e-assessment to assess the competencies of employees or job candidates (Chen, 2010; Konradt & Sarges, 2003; Laumer, von Stetten, & Eckhardt, 2009; Park & Wentling, 2007; Tynjälä & Häkkinen, 2005). A more recent use of ICT is for the mentoring and coaching of employees (Averweg, 2010; Headlam-Wells, Gosland, & Craig, 2006; Knatz, 2012; Ziemons, 2012). The present dissertation examines different aspects of ICT utilization in HRD. More precisely, the attitudes of coaches towards e-coaching are analyzed (Study 1), the effectiveness of a Web-based application for competency development is tested (Study 2) and linguistic characteristics of written evaluations from a Web-based assessment center tool are examined (Study 3). As these topics differ so do their psychological processes. The first study deals with technology acceptance in a process that is usually based on direct personal contact. In the second study, the focus is on learning and competency development via ICT. The third study looks at how observers describe others' performance in an ICT-based tool. A common ground of these studies is the focus on ICT utilization in assessment or development processes that are rather related to so-called soft skills (i.e., social and personal skills) than hard skills (i.e., technical skills related to a specific topic).

This dissertation empirically investigates three important aspects of ICT utilization in HRD, namely technology acceptance, ICT utilization for competency development and the support of assessment and development centers by ICT. The studies on technology

acceptance and competency development were part of the project “Enabling of competency-based personnel development processes in organizations via the Web-based platform enTalent”. This project was funded by papilio Ltd. and the Commission for Technology and Innovation (CTI) of the Swiss Confederation. The study on assessment and development centers was supported by papilio Ltd. by giving us access to real-life assessment center data. The results of the three studies contribute to an understanding of the potentials and limitations of present-day ICT utilization in HRD.

The Use of Information and Communication Technology in Human Resource Development

There are many different definitions of HRD and its scope is debated (Gold, Holden, Stewart, Iles, & Beardwell, 2013; Hamlin & Stewart, 2011). At its core, HRD is “a set of systematic and planned activities designed by an organization to provide its members with the opportunities to learn necessary skills to meet current and future job demands” (Werner & DeSimone, 2011, p. 4). In a broader sense, HRD “encompasses planned activities, processes and/or interventions designed to have impact upon and enhance organisational and individual learning, to develop human potential, to improve or maximise effectiveness and performance” (Hamlin & Stewart, 2011, p. 213). Other terms for HRD are “training and development”, “personnel development” and “learning and development” (Gold et al., 2013; Luoma, 2000). HRD deals with learning, training, career development, talent development, organization development, diversity and change (Gold et al., 2013; Riggio, 2002; Werner & DeSimone, 2011). Many processes in HRD are supported by ICT. For example, organizations often use learning management systems in order to manage the training activities of employees (Keist & Gissler, 2013; Watson & Watson, 2007). Typically, a learning management system is an integrated system that supports the preparation of course schedules and the setting of curricula, and it allows users to register

for courses, to download files and to participate in e-learning courses (Dalsgaard, 2006; Hils & Bahner, 2005; Watson & Watson, 2007).

E-learning (i.e., learning activities supported by ICT) enables organizations to offer standardized trainings for a large number of employees with flexibility regarding time and location (L. Brown, Murphy, & Wade, 2006; Chen, 2010; Macpherson, Elliot, Harris, & Homan, 2004). One type of e-learning are Web-based trainings (WBTs) (L. Brown et al., 2006; Hils & Bahner, 2005). From teaching basic IT skills to increasing optimism and resiliency, WBTs are used for a variety of purposes (Luthans, Avey, & Patera, 2008; Piccoli, Ahmad, & Ives, 2001). The main advantage of using the Internet for HRD activities is the increased ease of accessing content and communicating with others (L. Brown et al., 2006; Fahy, 2004; Headlam-Wells, Gosland, & Craig, 2005).

Further examples of Internet utilization in HRD can be found in e-coaching, e-mentoring and e-assessment (Averweg, 2010; Headlam-Wells et al., 2006; Hils & Bahner, 2005; Konradt & Sarges, 2003; Laumer et al., 2009; Ziemons, 2012). In e-coaching and e-mentoring, part or all of the communication between coaches or mentors and their clients is based on ICT (e.g., e-mail, online chats, video conferencing) (Headlam-Wells et al., 2006; Knatz, 2012; Ubben, 2005). E-assessment (i.e., assessment of knowledge, skills, attitudes and other characteristics via ICT) is not only used for personnel selection but also for HRD, as the information gained by e-assessments is used for the planning of development activities and career steps of employees (Konradt & Sarges, 2003).

Given that many HRD processes interact with each other, it would be reasonable to use integrated ICT-based platforms for several processes (Hils & Bahner, 2005; Konradt & Sarges, 2003). An example of an integrated Web-based platform that supports different HRD processes is the platform “enablingSolutions” of the consultancy papilio Ltd.

(www.papilio.ch/assessment-Web-based-solutions.htm). This integrated platform consists of three different tools that are based on the same content management system.

The tool “enRecruit” structures and standardizes recruitment processes. Recruiters are guided through the recruitment process by the tool and they evaluate job applicants by filling in evaluation sheets. These sheets include rating scales with statements that describe positive and negative behavior of the assessed competency. Furthermore, enRecruit offers access to a large data base of competency-based interview questions and it can integrate the results of online tests (e.g., language tests, personality questionnaires, ability tests). At the end of the process, enRecruit consolidates the evaluations of different recruiters and the results of different tests for every candidate.

The tool “enTalent” supports the competency development of its users. One part of this dissertation deals with testing and evaluating enTalent (Study 2). In enTalent, the users define development objectives and development plans for the competencies they want to develop. Furthermore, enTalent allows to collect and consolidate feedback of others and self-evaluations for the selected competencies. In addition, mentors or supervisors can be given access to the development plans and evaluation results of individual talents. enTalent is used in connection with development centers, performance appraisals and development processes such as talent development programs. For example, a large Swiss manufacturing company uses enTalent as part of a talent development program. Every year, this company conducts a development center with approximately 25 high potential employees. As a result, these employees receive a detailed assessment report with identified strengths and development needs. Afterwards, they get access to enTalent and define development objectives and plans in the tool together with their supervisors. Then they make a self-evaluation and are evaluated by their supervisors in the competencies they want to develop by using evaluation sheets in enTalent. Subsequently, the employees conduct the defined

development activities during several months. At the end, they evaluate themselves and get evaluated by their supervisors for a second time. The differences between the first and the second round of evaluations serve as indicator for competency development.

The tool “enAC” helps with the design and planning of assessment and development centers as well as with evaluating candidates and writing assessment reports. In this dissertation, the linguistic characteristics of observations written in enAC are analyzed and implications are discussed (Study 3). Just as the other tools of the platform enablingSolutions, enAC has access to the competency model of papilio Ltd. consisting of competencies, behavioral indicators, interview questions and development recommendations. The competencies of other organizations (e.g., clients of papilio Ltd.) can be linked to these indicators, questions and recommendations. At the beginning, assessors define in the criteria-exercise matrix which competencies are assessed in which exercises. enAC supports the planning and organization of assessment and development centers by automatically generating time schedules and observation sheets. These electronic observation sheets in enAC are filled in by assessors either during the exercises or afterwards. In these sheets, the assessors give the candidates a rating for the assessed competencies and they describe the candidates’ behavior in text entry fields. At the end, the ratings of all assessors can be consolidated for each participant. Furthermore, all entries in the observation sheets for one candidate can be submitted to the assessment report form in order to write the final assessment report. papilio Ltd. uses enAC to conduct assessments for their clients such as banks, audit and consultancy services, manufacturing companies, public transportation services and government agencies. Furthermore, enAC is used by clients who conduct assessments on their own or by other consultancies. Currently, enAC is the most widely used and commercially most successful tool of the platform enablingSolutions.

Technology Acceptance

The introduction of new ICT often requires of the users to learn new skills (Marler & Liang, 2012). In addition, users react emotionally to new ICT systems and they make assumptions about its user-friendliness and how it might influence their work (Dillon & Morris, 1996; Klein & Sorra, 1996). Many implementations of new ICT in organizations fail due to negative reactions of users (Aiman-Smith & Green, 2002; Davis, 1989).

Negative reactions toward deficient technologies are understandable and can be constructive. However, negative attitudes toward ICT in general jeopardize the implementation of all kinds of ICT, potentially helpful and effective ICT included. Therefore, technology acceptance is an important success factor for ICT utilization.

There are several models and theories related to technology acceptance, with the technology acceptance model (TAM) being one of the most influential (Davis, 1986; Venkatesh, Morris, Davis, & Davis, 2003). The TAM describes “the motivational processes that mediate between system characteristics and user behavior” (Davis, 1986, p. 10). More specifically, the TAM states that perceived usefulness and the perceived ease of use of a system predict the intention to use it (Davis, 1989). Perceived usefulness is “the degree to which a person believes that using a particular system would enhance his or her job performance” while perceived ease of use is “the degree to which a person believes that using a particular system would be free of effort” (Davis, 1989, p. 320). Later, the TAM was extended with subjective norm as another predictor for the intention to use a system (Venkatesh & Davis, 2000). The subjective norm of users was adapted from the theory of reasoned action of Fishbein and Ajzen (1975) and is defined as a “person’s perception that most people who are important to him think he should or should not perform the behavior in question” (p. 302). Thus, the TAM states that the subjective norm of a person and the perceived ease of use influence the perceived usefulness of a

technology, and all three influence the intention to use this technology (Venkatesh & Davis, 2000). The intention to use then predicts the actual usage behavior. For instance, if users believe that important others think they should use the technology and that the technology will be easy to use, they will also more probably believe that the technology is useful and their intention to use it will also increase.

Other theories and models of technology acceptance are for example the model of personal computer (PC) utilization, the innovation diffusion theory and the unified theory of acceptance and use of technology (Venkatesh et al., 2003). The model of PC utilization suggests several predictors of computer utilization, such as the belief in the capability of the technology to enhance the user's performance, the belief in positive long-term consequences of using the technology, the perceived difficulty of using it, positive feelings toward its use and social factors such as the reference group's subjective culture (Thompson & Higgins, 1991). While the model of PC utilization was formulated to predict personal computer utilization, it is also "suited to predict individual acceptance and use of a range of information technologies" (Venkatesh et al., 2003, p. 430).

The innovation diffusion theory in the extended version of Moore and Benbasat (1991) states that individual technology acceptance is predicted by factors such as the relative advantage of an innovation compared to its predecessors, its perceived ease of use, and the perceived voluntariness of using it. Additional predictors of technology acceptance are the perceived compatibility of the technology with the values, needs and experiences of potential users, and its perceived influence on one's image or social status when using it (Moore & Benbasat, 1991).

In the unified theory of acceptance and use of technology, Venkatesh et al. (2003) aimed at unifying already existing theories and models of technology acceptance and they proposed four determinants of user acceptance and behavior. One determinant is

performance expectancy, defined as the belief that using the technology will increase one's job performance. Other determinants are effort expectancy (i.e., the perceived ease of use), social influence (i.e., the perceived opinion of important others that the technology should be used) and facilitating conditions (i.e., the belief in a supportive organizational and technical infrastructure) (Venkatesh et al., 2003).

In summary, all these models propose attitudes toward the potential benefit and the ease of use of a technology as predictors for the intention to use it. If these attitudes are negative, users will probably show more resistance against the use of a certain technology. For assessment processes, research indicates that candidates increasingly accept the use of ICT (Jones & Dages, 2003). In e-learning, technology acceptance depends highly on the learning material and the perceived usefulness of the e-learning system (Lee, Yoon, & Lee, 2009; Selim, 2003). Further predictors of technology acceptance in e-learning are factors such as playfulness (the degree to which the user finds a system interesting and enjoyable) and perceived ease of use (Lee et al., 2009; Selim, 2003). However, in development processes that usually rely on direct personal contact (e.g., coaching, mentoring, psychotherapy), the use of ICT could cause resistance among its potential users. For instance in psychotherapy, the use of ICT is sometimes criticized as potentially harmful for the therapist-client relationship, despite empirical findings in support of the effectiveness of computer-based psychotherapy (Berger & Andersson, 2009). In coaching, the coach-client relationship is also seen as an important success factor (Kemp, 2005). Therefore, critics of ICT utilization in coaching raise the concern that the coach-client relationship might be impaired because of a decrease of face-to-face communication (McKenna & Davis, 2009; Ubben, 2005).

As technology acceptance is a prerequisite for the successful use of ICT, this dissertation looks at technology acceptance in coaching. We examine attitudes of coaches

toward possible benefits of ICT use in coaching (Study 1). A sample of 161 coaches filled in an online questionnaire about the coaching process in general and about computer use in coaching. The results show that the coaches' Internet self-efficacy and their preference for a systematic coaching approach are significant predictors of positive attitudes toward computer use in coaching. Internet self-efficacy is "the belief in one's capabilities to organize and execute courses of Internet actions required to produce given attainments" (Eastin & LaRose, 2000, p. 1). Hence, coaches who are confident that they can use Internet-related tools and services effectively and with ease are more likely to have positive attitudes toward computer use in coaching. This result is in line with the TAM, which states that the perceived ease of use influences the perceived usefulness of technology (Davis, 1986; Venkatesh et al., 2003).

In addition, coaches with a preference for a systematic coaching approach are also more likely to have positive attitudes toward computer use. According to Joo (2005), coaching should be a structured process that "provides systematic approaches" (p. 475). And according to Grant (2005), coaching "needs to be evidence based" (p. 2) and it should be goal-directed and systematic. We asked the participants if coaches should have a clear method, provide a clear schedule and a measure for effectiveness for their intervention, use scientifically validated methods, and define clear and measurable coaching objectives. Coaches who agree with these principles are also more likely to have positive attitudes toward computer use in coaching.

We also examined the technology acceptance of participants in a validation study for the Web-based tool enTalent (Study 2). At the end of the study, the participants were asked how they perceived the usefulness and the ease of use of the tool. The participants perceived the tool as easy to use and the workload reasonable. The answers regarding the perceived usefulness of enTalent were more ambiguous. The participants showed a neutral

attitude toward the question if they had progressed thanks to enTalent and they indicated the tendency to be more motivated by conventional forms of learning (e.g., learning in groups). Furthermore, most of the participant indicated to have used the tool less than once per week.

Soft Skills Development with Information and Communication Technology

This dissertation looks at technology acceptance in e-coaching, investigates the effectiveness of a Web-based tool for competency development and examines the characteristics of written observations from assessment centers. All these processes deal with competencies that are rather soft skills than hard skills. Soft skills are comprehensive personal and social skills (e.g., communication skills, leadership, creativity, time-management skills) while hard skills are technical skills related to specific topics, sometimes referred to as specialist knowledge (Andrews & Higson, 2008; Heckman & Kautz, 2012; Morgan & Adams, 2009; Salvisberg, 2010). Soft skills are important factors of individual performance and career advancement (Heckman & Kautz, 2012; Salvisberg, 2010). Given their importance, the assessment and development of soft skills is of vital interest for organizations. For example, assessment centers usually assess competencies of candidates that are rather soft skills than hard skills (Arthur, Day, McNelly, & Edens, 2003; Kleinmann, 2003). And coaching and mentoring often aim at developing competencies (e.g., leadership, communication, stress management) that also belong to the category of soft skills (Bono, Purvanova, Towler, & Peterson, 2009; Brotman, Liberi, & Wasylyshyn, 1998). But soft skills are often harder to measure than hard skills and their transfer of training is usually more challenging, because training of soft skills can mostly only teach general principles (Blume, Ford, Baldwin, & Huang, 2010; Heckman & Kautz, 2012). Nonetheless, soft skills are already assessed and developed via ICT. Examples of e-assessment for soft skills are computer-based psychometric tests, questionnaires and

simulations (Hertel & Konradt, 2004; Laumer et al., 2009). Computer-based simulations assess social skills as well as cognitive skills and they often have the edge over paper and pencil testing in terms of realism, interactivity and administrative effort (Callinan & Robertson, 2000; Kleinmann, 2003; Kleinmann & Strauß, 1998). Furthermore, computer-based simulations are also used for the training of employees, with encouraging results (Salas, Tannenbaum, Kraiger, & Smith-Jentsch, 2012). As Callinan and Robertson (2000) put it: “Video and computer-based situational testing offers the potential for creating more realistic simulations of work contexts than afforded by written tests, but with more practical convenience than live simulations” (p. 7).

Like face-to-face coaching and mentoring, e-coaching and e-mentoring usually deal with the development of soft skills and less with the development of hard skills. In e-coaching and e-mentoring, ICT is used for the communication between coaches or mentors and their clients (e.g., e-mail, chat, video conferencing) or for accessing content (e.g., articles, videos, text files) (Headlam-Wells et al., 2006; Ubben, 2005; Ziemons, 2012). Furthermore, soft skills are also developed via e-learning (Adams et al., 2009; Bruns, Keith, & Müller, 2013; Park & Wentling, 2007). While e-learning for hard skills usually supports the memorization of facts, e-learning for soft skills supports the effective interpretation and application of information and behaviors depending on the context (Morgan & Adams, 2009; Sitzmann, Kraiger, Stewart, & Wisher, 2006). The latter requires from the learner to develop an understanding of the situation and the kind of behavior that would be most effective. Part of this dissertation is the evaluation of the Web-based tool enTalent that supports learners in developing competencies in their daily routine, so that they can practice their behavior in different everyday situations (Study 2). Although this Web-based tool could also be used for the development of hard skills, it is usually used for the development of competencies that can be defined as soft skills.

In order to be effective, e-learning has to “incorporate the right learning principles (...) into the design of the program” (Salas et al., 2012, p. 87). In HRD, the participants in e-learning processes are usually employees of organizations and therefore adult learners. Hence, the theoretical background of e-learning in HRD are adult learning theories. There are many different adult learning theories, models and principles. Among the most influential models are the andragogy model and models of self-directed learning (SDL) (Ellinger, 2004; Merriam, 2001).

SDL can be defined as “self-learning in which learners have the primary responsibility for planning, carrying out, and evaluating their own learning experiences” (Ellinger, 2004, p. 159). The early models of SDL state that adults are proactive learners who feel responsible for their own development and that educators should foster the self-directedness of adult learners (Knowles, 1975; Tough, 1971). Later models of SDL also include contextual factors of learning processes, for instance the learners’ interactions with others (Merriam, 2001).

The andragogy model by Malcolm Knowles (1973) states that adults are more self-directed learners than children and need less guidance and control in the learning process. The model also states that adults are more interested in the reasons why they should learn something and that they want to learn things that are relevant for their personal or work lives. In addition, adults have more experience of life, which can be a resource in the learning process. Furthermore, the andragogy model underlines the importance of reflecting on learning experiences, as this can help with structuring and integrating new information (Knowles, 1973).

Other adult learning theories also state that reflection on learning experiences is an important success factor of learning, since the reflection on experiences can lead to transformation of knowledge (Kolb, 1984; Schön, 1987; Tynjälä & Häkkinen, 2005). As

stated above, e-learning for soft skills should support the effective interpretation and application of information in specific contexts (Morgan & Adams, 2009). Reflecting on experiences could help to improve the interpretation and application of information and should therefore be supported by e-learning processes for soft skills.

One possibility to help learners to reflect on learning experiences is to ask them for self-evaluation. The second study of this dissertation experimentally investigates the effectiveness of the Web-based tool enTalent. This tool aims at supporting the competency development of its users and is used in connection with development centers, talent development programs and performance appraisals. enTalent supports the self-evaluation of the competencies the users try to develop. By evaluating themselves on scales that describe behaviors that are typical for the particular competency, the users of enTalent reflect on their own behavior. This reflection process might already lead to competency development. However, self-ratings often lack accuracy and might therefore lead to self-reflection that is not very effective for learning (Carless & Roberts-Thompson, 2001). enTalent also offers the possibility to be evaluated by others on the same scales, thereby including an e-assessment of the competencies the users try to develop. Discrepancies between the self-evaluations and the evaluations by others might lead to a more effective self-reflection, as the users get a feedback on how others perceive them and can compare this feedback with their self-evaluation (Carless & Roberts-Thompson, 2001).

Knowles also proposed a process model of HRD based on his andragogy model (Knowles, 1973). This process model of HRD suggests that successful learning processes of employees involve seven steps, namely (1) establishing a learning climate, (2) involving the learners in the planning of the process, (3) diagnosing learning needs, (4) formulating learning objectives, (5) designing learning experiences, (6) conducting these learning experiences and (7) evaluating learning outcomes. With regard to this process model of

HRD, the Web-based tool enTalent (Study 2) especially supports the involvement of learners in the process (step 2 of the process model of HRD), the formulating of objectives (step 4), the conducting of learning experiences (step 6) and outcome evaluation (step 7). What is more, the tool gives its users a lot of autonomy in planning and conducting their learning experiences, thereby being in accordance with basic assumptions of the andragogy model of Knowles (1973) and of SDL models (Ellinger, 2004; Merriam, 2001).

Another important aspect of enTalent is the support for users in defining development objectives and development plans. Users are instructed to write down one to three development objectives that are achievable and measurable and they are shown competency-specific development recommendations that they can use to formulate their development objectives. This complies with recommendations that development objectives should be clear, behavioral and measurable and that learners should focus on one to three development objectives (Bracken, Timmreck, & Church, 2001; Byham, 2005; Grote, 1996).

After having defined their development objectives, the users define specific development activities including a deadline and they are asked to write down how they could deal with possible difficulties. This is in accordance with recommendations that development objectives and plans should be written down and that possible obstacles and ways how to overcome them should be thought of at the beginning of a development process (Bracken et al., 2001; Byham, 2005; Grote, 1996).

Moreover, as learners differ in their personality and their learning styles, e-learning for soft skills should allow learners to choose learning activities on their own, conduct those activities in their everyday work life and make pre- and posttests to evaluate the outcome of their learning activities (Adams et al., 2009). The tool enTalent complies with these recommendations too.

The effectiveness of enTalent was tested with a pretest-posttest experimental design in a randomized controlled trial (Study 2). Seventy-one employed persons were randomly allocated to either the treatment group ($n = 36$) or the control group ($n = 35$). The treatment group used the regular version of enTalent that allows to define development objectives and plans, ask others for feedback and make self-evaluations. The control group used a reduced version of enTalent that only allows to ask others for feedback and to make self-evaluations. But the participants of the control group were asked via e-mail to define development objectives for themselves and to plan how to realize these objectives. Thereby, the main difference between the two conditions was the fact that the treatment group used enTalent to define development objectives and to plan their development. All participants were asked to select one competency and to develop this competency for the next two months. The three offered competencies were “Acting under pressure”, “Generating solutions” and “Structuring tasks and projects” which can all be defined as soft skills. Furthermore, all participants asked colleagues at work for evaluations and made self-evaluations, once at the beginning of the two months and once afterwards. These evaluations were conducted with rating scales in enTalent and they served as pretest and posttest measures of competency development.

The differences between pretest and posttest measures were not significant for both groups and there were no significant differences between the two groups. These results suggest that complying with all the recommendations for adult learning and competency development mentioned above is not enough for a development process to be effective, at least after two months. Hence, either two months are not enough to significantly develop the offered competencies, or learners need more guidance and control by others (e.g., supervisors, mentors or coaches). In development processes where the learners have a lot of autonomy, the guidance and control of others might be helpful in order to make sure that

learning activities are actually realized (Salas et al., 2012). As already mentioned, e-learning for soft skills is less about memorizing facts and more about learning to effectively apply general principles in different contexts and situations (Morgan & Adams, 2009). This is a complex endeavor, so learners might feel overwhelmed and the guidance of an experienced mentor might be necessary.

This dissertation contributes to the research on assessment and development of competencies by exploring the use of ICT in this domain. After having discussed the use of ICT for competency development, I will now discuss how ICT could support the assessment of competencies.

Supporting Assessors with Information and Communication Technology

Since decades, organizations use ICT to assess the competencies of job applicants and employees by means of computer-based tests, questionnaires and simulations (Hertel & Konradt, 2004; Laumer et al., 2009). Research indicates that applicants and employees accept e-assessment methods (Jones & Dages, 2003). Future use of ICT in e-assessment could include innovative approaches such as automatic sensing of applicants' nonverbal behavior or computer-based simulations in virtual reality environments (Aguinis, Henle, & Beaty Jr, 2001; Frauendorfer, Schmid Mast, Nguyen, & Gatica-Perez, 2014). In assessment centers (ACs) and development centers (DCs), computer-based tests, questionnaires, in-basket exercises and simulations are commonly used (Kleinmann, 2003).

ICT could also directly support the assessors in carrying out their tasks of observing and evaluating the competencies of candidates, for example by giving automatic feedback on their evaluations. For computer-based feedback to be effective, the software must be able to identify the correctness of the users' input (Azevedo & Bernard, 1995). In ACs and DCs, assessors evaluate candidates by giving them a rating for observed competencies (Ballantyne & Povah, 2004; Bowler & Woehr, 2006; Lievens, Dilchert, & Ones, 2009).

When assessors receive automatic feedback about how their ratings differ from averaged ratings of other assessors, the accuracy of their ratings can increase over time (Grüterich, 2006). However, empirical findings are still ambiguous, also because the averaged ratings of other assessors are not per se more accurate than ratings of single assessors (Biedermann, 2008; Grüterich, 2006).

Assessors do not only evaluate the competencies of candidates via rating scales, they also describe the behaviors of candidates in observation sheets and assessment reports (Ballantyne & Povah, 2004; Hennessy, Mabey, & Warr, 1998; Thornton & Rupp, 2006). These descriptions serve as evidence for the ratings in the competencies. Moreover, assessment reports are used to give feedback on the candidate's performance to the HR managers, supervisors, or to the candidates themselves. Computer-based feedback could help assessors to improve their descriptions of candidates' behavior. A computer-based tool could automatically analyze the linguistic characteristics of these descriptions and give feedback instantly. The analysis of linguistic characteristics without the use of computers is laborious and time-consuming, but a computer-based tool could give feedback on linguistic characteristics in an efficient way. Such a tool could analyze texts quickly and report the linguistic characteristics of these texts. Furthermore, such a tool could also give feedback on how the assessors could improve their descriptions of candidates' behavior.

For this kind of feedback to be effective, those linguistic characteristics that distinguish better descriptions from worse have to be known. For example, the degree of abstraction could serve as quality criterion for descriptions of other people's behavior. The use of concrete language has many advantages when describing behavior, for example it "elicits generally deeper levels of processing and encoding than abstract language" (Ter Doest, Semin, & Sherman, 2002, p. 199). Furthermore, abstract descriptions of behavior are more likely to cause the fundamental attribution error than concrete descriptions

(Semin & Fiedler, 1991). The fundamental attribution error is the tendency of observers to underestimate the influence of external factors and to overestimate the influence of personality traits on the behavior of others (Harvey, Town, & Yarkin, 1981). In addition, more concrete descriptions could also reduce the halo effect, which is the tendency to be influenced by known characteristics (e.g., attractiveness) of others when judging less obvious characteristics (e.g., personality traits) (Bernardin, 1978; Lance, Foster, Gentry, & Thoresen, 2004; Sagie & Magnezy, 1997). And concrete descriptions are easier to remember and describe behavior more precisely than abstract descriptions (Semin & Fiedler, 1991; Ter Doest & Semin, 2005). Aside from the degree of abstraction, there could also be other linguistic quality criteria. For example, the number of adjectives or the kind of nouns used in the descriptions of candidates' behavior could also play a role. But to my knowledge, the linguistic quality criteria of assessors' descriptions of AC and DC candidates have not yet been empirically investigated.

The third study in this dissertation examines linguistic criteria of assessors' entries in the Web-based tool enAC. Assessors use this tool for planning ACs and DCs, noting candidates' behavior in observation sheets, rating their performance on rating scales, and for writing the assessment report. We had access to observation sheets of 11 ACs with entries of 21 assessors describing the behavior of overall 33 candidates. The linguistic characteristics were analyzed using the linguistic category model (LCM) and the Web-based tool Coh-Metrix (Graesser, McNamara, Louwerse, & Cai, 2004; Semin & Fiedler, 1991). The LCM categorizes verbs and adjectives according to their abstraction/concreteness (Semin & Fiedler, 1991). The Web-based tool Coh-Metrix automatically analyzes different linguistic characteristics of English texts (Graesser et al., 2004). Results indicated that assessors describe candidates' behavior rather abstract than concrete.

In order to evaluate the quality of the entries in the observation sheets, 20 assessors filled in an online questionnaire. In this questionnaire, every assessor evaluated 40 descriptions of candidates' behavior with regard to their clarity, concreteness, and their usefulness for rating the competency, writing the assessment report and giving a feedback. Altogether, 160 descriptions of candidates' behavior were evaluated, each by three different assessors. Results showed that assessors evaluated descriptions with many adjectives as better than descriptions with fewer adjectives.

Computer-based tools such as Coh-Metrix are able to quickly analyze texts concerning their abstraction/concreteness or their number of adjectives. Tools for assessors could make use of these algorithms and analyze the entries of assessors and give them automatic feedback. For example, if assessors use abstract language, such a tool could give the hint to use more descriptive action verbs when describing candidates' behavior. This is technically possible, but to my knowledge it is has not yet been implemented in computer-based tools for assessors.

Study 1

Attitudes of Coaches Towards the Use of Computer-Based Technology in Coaching

Sebastian Otte and Adrian Bangerter

University of Neuchâtel

Mirjam Britsch and Urs Wüthrich

Papilio Ltd, Zurich, Switzerland

Author Note

Sebastian Otte and Adrian Bangerter, Institute of Work and Organizational Psychology, University of Neuchâtel, Neuchâtel, Switzerland; Mirjam Britsch and Urs Wüthrich, Papilio Ltd, Zurich, Switzerland.

This study was supported in part by a grant from the Commission for Technology and Innovation (CTI) of the Swiss Confederation. We acknowledge the help of Sijian Wong and Sylvie Cajot with the data collection for this study.

Abstract

Coaching has become a widespread development practice. From executives to private individuals, people seek for help from professional coaches to achieve their goals. Computer technology might make coaching practice more efficient and more accessible. Parts of the coaching process could be automated and face-to-face sessions replaced by Web-based communication. However, coaches and clients might take a skeptical view toward the use of computer technology in coaching. For example, they might fear that it undermines the relationship between coach and client. We explored attitudes of coaches toward the use of computer technology. A sample of coaches ($N = 161$) responded to an online questionnaire about their opinions on the coaching process in general and about computer use in coaching. Internet self-efficacy and the preference for a systematic coaching approach were correlated with positive attitudes toward computer use in coaching. No age or gender effects were found. Implications for further research are discussed, for example, the need to investigate the attitudes of clients toward computer use in coaching as well. Practical implications include increasing the Internet self-efficacy of coaches to foster more positive attitudes toward computer-based coaching tools. Furthermore, such tools should aim to support a systematic coaching approach.

Keywords: coaching, computer-based coaching, attitudes toward computer use, technology acceptance

Attitudes of Coaches Towards the Use of Computer-Based Technology in Coaching

Coaching has become a widespread development practice with different methods and approaches (Bono, Purvanova, Towler, & Peterson, 2009). Three major approaches are executive coaching for managers, life coaching for personal issues and workplace coaching by mentors (Grant, 2005). While mentors help less experienced employees within their own organization, coaches are usually external professionals (Joo, 2005). Coaching is becoming increasingly popular and commercialized, which will lead to more demand for high-quality services and pressure to cut costs (Maher & Pomerantz, 2003). As coaching becomes more popular, clients and their organizations will become more sensitive to quality-related aspects while an increase in the number of coaches will lead to more price competition. These trends could favor an increase in the use of computer technology in coaching. Such technology could help to standardize and evaluate coaching processes to improve quality control. Furthermore, coaching services could be offered at a lower price, for example, if some face-to-face coaching sessions were replaced by computer-mediated communication.

Computer-based technology could also make coaching practice more efficient and more accessible for a broader target group (Ubben, 2005). Through the use of e-mail, videoconferencing, dedicated software, and the like, coaches and their clients could gain more flexibility and would not be restricted with regard to time and place. Furthermore, information, exercises and tasks could be organized, linked, and transmitted between coach and client. However, in many fields of organizational activity, the advent of new technology can be met with resistance (e.g., Dillon & Morris, 1996; Fisher & Howell, 2004). Thus, it is important to understand the attitudes of coaches toward the use of computer technology in coaching.

This study explored the attitudes of Swiss coaches about the use of computer-based technology in coaching as well as correlates of those attitudes. A sample of coaches responded to an online questionnaire about their opinions on the coaching process in general and about their attitudes toward computer technology. The results contribute to an understanding of individual differences in coaches that may affect the adoption of computer technology in coaching.

Computer-Based Technology in Coaching

There are many definitions of coaching (e.g., Grant, 2005; Joo, 2005). They share the idea that coaching is a collaborative relation between a coach and client aimed at improving the client's ability to attain goals in a self-directed manner. For example, Stober and Parry (2005) define coaching as "a collaborative process of facilitating a client's ability to self-direct learning and growth, as evidenced by sustained changes in self-understanding, self-concept and behavior" (p. 14). In his literature review, Joo (2005) defines executive coaching as "a process of a one-on-one relationship between a professional coach and an executive (coachee) for the purpose of enhancing coachee's behavioral change through self-awareness and learning, and thus ultimately for the success of individual and organization" (p. 468). More generally, coaching tries to attain sustained behavior change in targeted behaviors (e.g., Brotman, Liberi, & Wasylshyn, 1998).

How could such a process benefit from computer technology? Computer technology could enhance counseling efficiency (Knatz, 2012; Ubben, 2005). For example, computer-based coaching processes may be more accessible and flexible. For their interactions, coaches and clients could use e-mails, Internet telephony (e.g., Voice over IP), text messages, online chats, or video-conferencing instead of accomplishing all the sessions face-to-face. Coaching sessions could thereby be conducted from different locations. Coaches and clients could exchange videos, documents, links and texts to inform each

other about the next steps, recent developments, useful information, thoughts, ideas and progress so far. In addition, computer technology could also be used to automate some parts of the coaching process. For example, information and tasks such as homework assignments could be predetermined and automatically presented to the client via computer. Furthermore, progress could be recorded by computer technology, for example, through evaluations by others or self-evaluations. Through such innovations, computer-based coaching would become less cost-intensive and more accessible for a wider range of clients than the traditional face-to-face approach that is often reserved for executives. However, coaching processes could either use many or only a few innovations of computer-based coaching. Just as blended learning combines e-learning with classroom learning, coaching processes could combine face-to-face sessions with computer-based coaching in order to maximize advantages.

To realize such potential, however, evidence is needed on both the efficacy of computer-based coaching and users' (i.e., coaches and clients') attitudes. Currently, there are too few theoretical models and published studies about computer-based coaching to derive general conclusions about these issues. In a study about coaches' perceptions of their relationship with their clients, coaches filled in an online questionnaire about their coaching practice and the working alliance with clients (Berry, Ashby, Gnilka, & Matheny, 2011). The coaches' perceptions did not differ significantly between face-to-face and distance coaching practices (e.g., coaching by phone or e-mail). Therefore, from the coaches' perspective, distance coaching practices do not necessarily harm the working alliance. One study evaluated a computer-based coaching program designed to help junior scientists improve self-management competencies and work-life balance (Cornelius, Schumann, & Boos, 2009). Participants used a computer program to define career and work-life balance goals and to set priorities. Then they discussed these goals with their

coaches in a chat room. Three months after using the program for 2 weeks, participants reported significant improvements in self-management and work-life balance.

Furthermore, acceptance of the program was high. In another study about e-mentoring for women, the participants used a computer program to conduct online meetings with their mentors and participate in discussions and group mentoring. The communication between mentors and participants was either synchronous in online meetings or asynchronous (e.g., via e-mail). The majority of participants were satisfied with electronic communication with their mentors (Headlam-Wells, Gosland, & Craig, 2005).

Indirect evidence for the potential benefits of computer-based coaching comes from related fields like psychological assessment and psychotherapy, where computer technology has been increasingly implemented and evaluated (Peñate, 2012). Both coaching and psychotherapy comprise a goal-oriented change process (Kilburg, 1996) that is mediated by the collaboration between the therapist or coach and the client. Computer-based psychotherapy is diverse, but often based on cognitive-behavioral therapies (Peñate, 2012). For a variety of symptoms related to mental health problems, computer-based psychotherapy can be as effective as traditional face-to-face therapy in helping patients to deal with symptoms (Barak, Hen, Boniel-Nissim, & Shapira, 2008; Berger & Andersson, 2009; Cuijpers et al., 2009; Kessler et al., 2009). Sloan, Gallagher, Feinstein, Lee, and Pruneau (2011) conducted a meta-analysis on the effectiveness of treatments via communication technology (e.g., telephone or Internet) for posttraumatic stress disorder (PTSD) symptoms, including a total of 13 studies with 725 participants. These telehealth treatments led to significant reduction of PTSD symptoms, but less so than face-to-face treatments. For the reduction of depression symptoms, the authors reported comparable outcome effects between telehealth and face-to-face treatments. In another meta-analysis on the effectiveness of computer-based psychotherapy for anxiety disorders, no significant

differences between face-to-face and computer-based treatments were found (Cuijpers et al., 2009). These studies show that patients with serious mental health problems can benefit from computer-based psychotherapy, so in turn it seems plausible that coaching clients could benefit from similar processes as well. The use of technology has also been tested and implemented in the related field of telemedicine. For example, in a systematic review of the research literature, Hersh et al. (2001) showed that telemedicine is used in a variety of health care areas and can be effective. We now turn to the issue of attitudes toward the use of computer technology in coaching and factors that might influence these attitudes.

Attitudes Toward Computer-Based Technologies

People differ in their overall willingness to use computer-based technology. The Technology Acceptance Model (TAM) (Davis, 1986) describes antecedents of computer acceptance and related behaviors. It states that perceived usefulness and perceived ease of use influence the user's attitude toward the technology (Davis, Bagozzi, & Warshaw, 1989). Therefore, if people think a technology is easy to use and useful, their attitudes toward it will be positive and they will intend to use it. However, people often have ambiguous attitudes toward new technology and worry about possible negative aspects, for example, technical defects or lack of user-friendliness (Dillon & Morris, 1996; Fisher & Howell, 2004).

The goal of this study is to explore the attitudes of coaches toward the use of computer technology in coaching, for example, to facilitate administrative tasks (e.g., invoicing), data collection and analysis, the planning of the process, and the interaction between coach and client. Especially the latter aspect could provoke resistance, because the use of computer technology can also be seen as a threat to the interaction process and not as a facilitator. For example, critics of computer-based psychotherapy emphasize the

importance of the therapist-client relationship for success, suggesting that computer-based methods could have severe disadvantages compared with traditional face-to-face therapy (Berger & Andersson, 2009). Similarly, coaches and clients often consider their relationship as an important success factor of the coaching process (Kemp, 2005). For example, Kilburg (1996) defines executive coaching as “a helping relationship formed between a client (...) and a consultant who uses a wide variety of behavioral techniques and methods to help the client achieve a mutually identified set of goals” (p. 142). Some people could view computer technology as a threat to the coaching process because they believe it might impair the relationship between coach and client. As face-to-face interaction offers often more cues (e.g., nonverbal expressions) compared with computer-mediated communication, some people might fear that information that is vital for relationship building would not be exchanged and the relationship therefore flawed. Referring to research on psychotherapy, McKenna and Davis (2009) argue that the relationship or alliance between coach and client might account for 30% of coaching success and is therefore an important success factor in executive coaching. They further point out that there is a trend in executive coaching to use e-mails, text messages and video conference calls as means of communication and raise the question how a relationship with the client can be built and sustained when there is less face-to-face interaction.

On the other hand, computer-mediated communication such as video conferences via Internet could enable coaches and their clients to interact with higher flexibility relating to location. Furthermore, face-to-face interaction is not necessarily per se the best approach for all clients. In some cases, it could also have a negative influence on the coaching process, for example, if the facial expressions of the coach disturb the client (Ziemons, 2012). Communication via e-mail could reduce the inhibition threshold for some people to contact a coach and to discuss their problems (Knatz, 2012; Ubben, 2005). It also allows

the client to spend time thinking about the input of the coach instead of feeling obliged to come up with an elaborate answer right away. Therefore, it seems premature to assume that computer-mediated communication leads to an overall impairment of the relationship between coach and client. In addition, the aforementioned study of Berry et al. (2011) showed that the working alliance between coaches and their clients is not necessarily different in distant coaching practices compared to face-to-face coaching.

In the next sections, we discuss two individual factors that might influence coaches' attitudes toward computer technology in coaching: (1) Internet self-efficacy and (2) preference for measurable goals, empirically supported methods and outcome evaluation. We will argue why we think these factors are significantly related to general attitudes toward computer technology in coaching.

Internet self-efficacy. The use of computer technology in coaching will involve Internet-based applications, just like in computer-based psychotherapy. To feel confident using these Internet-based applications, coaches and clients need to possess a minimal amount of Internet self-efficacy.

Self-efficacy is the self-appraisal of one's capabilities to deal with certain situations or to achieve certain goals, so it is "concerned with judgments of how well one can execute courses of action required to deal with prospective situations" (Bandura, 1982, p. 122). These judgments influence people's motivation and behavior. People whose belief in their capabilities in a certain domain is low tend to avoid related behaviors or to invest little effort in trying to achieve related goals when faced with difficulties. Conversely, people with high self-efficacy beliefs for certain goals or tasks are convinced that they can master difficulties and succeed. Therefore, they are more likely to invest effort in order to reach their goals.

Internet self-efficacy is “the belief in one's capabilities to organize and execute courses of Internet actions required to produce given attainments” (Eastin & LaRose, 2000, p. 1). In other words, if this belief is high, people think that they are able to use Internet applications in a successful way. As mentioned above, the TAM states that the perceived ease of use of an application has an influence on the attitude toward this application. For example, people with higher Internet self-efficacy have more positive attitudes toward computers than people with lower Internet self-efficacy (Torkzadeh & van Dyke, 2002). Furthermore, higher Internet self-efficacy has a positive impact on attitude toward using a Web-based tax-filing service (Hsu & Chiu, 2004). Hence, coaches with high Internet self-efficacy should have a positive attitude toward the use of computer-based technology in the coaching process. We therefore propose:

Hypothesis 1: Coaches with higher Internet self-efficacy have more positive attitudes toward the use of computer-based technology in the coaching process than coaches with lower Internet self-efficacy.

Preference for systematic approach. Coaching is a recent field of activity with an ongoing debate about the right quality standards (e.g., Bono et al., 2009). For example, the International Coach Federation (ICF) has defined 11 coaching core competencies. These competencies reflect the necessary skills a professional coach should demonstrate (International Coach Federation, 1999). However, the development of these core competencies was not based on empirical findings from research studies (Griffiths & Campbell, 2008). To ensure a satisfactory level of quality, Grant (2005) suggests that “coaching needs to be evidence-based” (p. 2), and “the coaching process should be systematic and goal-directed” (p. 4). Joo (2009) describes executive coaching as a structured process that “provides systematic approaches” (p. 475). Computer-based technology could be a helpful tool to ensure that coaching processes are structured, goal-

directed and systematic. More precisely, the use of such technology could help to ensure a minimum standard of quality by helping to structure the coaching process and measure its progress and outcome. For example, the specific goals and the sequence of tasks, actions and meetings could be determined. This would allow for transparency in the planning of the process, and a clear method could be established right from the beginning of the process. Furthermore, the task fulfillment of the client could be monitored. Even the dialogue between coach and client could be guided or simulated by computer technology, as it is done in some Web-based psychotherapy programs (e.g., Meyer et al., 2009). In addition, outcome evaluation could be facilitated by computer technology: Feedback of others or self-evaluations could be collected via the Internet and relevant data such as the communication between coach and client could be stored (Ubben, 2005). This feedback and data could then be analyzed and the coaching process adapted according to the results.

Given the many possible benefits of computer use in coaching, it is likely that coaches with higher preferences for a systematic approach in coaching (measurable goals, clear and scientifically validated coaching methods, and outcome evaluation) have a positive attitude toward the use of computers. Therefore, we propose:

Hypothesis 2: Coaches with a higher preference for a systematic approach in coaching processes will have more positive attitudes toward the use of computer technology in coaching than coaches with a lower preference for a systematic approach.

We also measure factors such as gender, age, coaching experience or the type of coaching to obtain more comprehensive data about the participants of this study. We now discuss gender and age as factors that might influence attitudes toward computer use because of the stereotype of the typical computer user being young (Czaja & Sharit, 1998) and masculine (Ware & Stuck, 1985).

Gender. In the past, girls and boys were socialized differently with regards to computer technology (Whitley, 1997). Mass media often conveyed a masculine image of computer technology and the typical computer user (Ware & Stuck, 1985). Some researchers have found gender differences in general attitudes toward computers. For example, Shashaani (1997) found that female college students had less interest in computers and less confidence in using them compared with male college students. However, in a meta-analysis, Whitley (1997) reported zero gender differences in beliefs about computers and only very small gender differences in computer-related behaviors. Given today's vast diffusion of computer-based technology in almost every field of professional or leisure activities, it is unlikely that a significant number of women still regard computer technology use more as a masculine activity than an everyday matter of course. Therefore, we do not expect significant gender differences in the participants' attitudes toward the use of computers in the coaching process. However, in the aforementioned study of Cornelius et al. (2009) on the effectiveness of an online coaching program, "female participants reported less media competencies than males" (p. 54). Therefore, we will control for the influence of gender in the data analysis.

Age. We will also control for the influence of age in the data analysis, because some studies showed that younger and older adults differ in their attitudes toward computers (e.g., Marquie, Thon, & Baracat, 1994). Older adults sometimes feel less comfortable when dealing with computers than younger adults. This may partly reflect a cohort effect: Older adults may have less experience with computers (Czaja & Sharit, 1998). In a study with older adults, Jay and Willis (1992) showed that feelings of comfort and competence when using computers could be increased via direct experience with computers. Younger adults often have more experience with computers and this since a younger age, so it is possible that younger coaches will have more positive attitudes toward the use of computer

technology in coaching than older coaches. However, the aforementioned studies about the effect of age on attitudes toward computers are older and may be outdated. Furthermore, as we said before, the use of computer-based technology is nowadays an everyday matter of course. It is therefore possible that older coaches already have become accustomed to computer use in general and do not differ significantly in their attitudes toward computer use from younger coaches. In the current study, we measured the attitudes of Swiss coaches toward the use of computer technology, their Internet self-efficacy and their preferences for measurable goals, scientifically supported coaching methods and outcome evaluation via an online questionnaire.

Method

Participants

We conducted an Internet search for e-mail addresses of coaches in Switzerland on Google using a combination of the terms *coach* or *coaching* and *Switzerland* in French, German and English. This procedure led us to the Web sites of professional associations, where we found most of the e-mail-addresses we used in contacting potential participants. For example, 1079 e-mail addresses were listed on the Web site of the professional association *Berufsverband für Coaching, Supervision und Organisationsberatung* (BSO). The BSO is the largest association of coaches in Switzerland. Active members must have formal training that is accredited by the BSO. Another 102 e-mail addresses were listed on the Web site of the Swiss Charter Chapter of the ICF. The ICF is an international association that trains and certifies professional coaches. It refers to itself as “the world’s largest non-profit coaching association” (International Coach Federation, 2013). Members must have completed 60 hr of training in coaching according to ICF requirements. Both associations promote professional codes of standards and ethics and its members are bound by these codes. We found additional e-mail addresses via Google on Web sites of

individual coaches or coaching firms. The Internet search on Google was stopped when it led to 10 coaches who had already been found before. This approach led to a total of 1,372 e-mail addresses of coaches in Switzerland. These 1,372 coaches were contacted via an e-mail message containing a link to the questionnaire. The contact message also asked them to forward the link to other coaches.

In total, of 310 participants started the online questionnaire (response rate: 22.6%), but 149 data sets were excluded from final analysis. Eighty-two participants only started the questionnaire and answered less than 10% of all items. Another 41 had over 60% missing values on the rating scales, and 26 participants had less missing values but did not answer the key questions on new technology. Therefore, the final sample consisted of responses from 161 coaches. The mean age of these participants was 49.6 ($SD = 8.2$) with a range of 27 to 71 years of age. Eighty-three were female and 78 male. Most of the respondents of the final sample were Swiss citizens (90.7%) and possessed a degree from a university or university of applied sciences (88.8%). Fifty-eight of these 161 participants possessed a graduate degree (e.g., Master), while nine possessed a doctoral degree. The participants had majored in many subjects, with psychology (16.2%) and economics (11.8%) being the most frequent. Only six participants had practiced for less than 1 year as coach, while 58 had practiced as coaches between 1 to 5 years, 42 between 6 to 10 years, 32 were coaches between 11 to 15 years, 11 between 16 to 20 years and 12 coaches since more than 20 years. One hundred respondents practiced alone, while 30 worked in small organizations between two to nine people. Only 31 coaches worked in larger organizations. Sixty-eight respondents offered both executive coaching as well as life coaching, 42 respondents offered only executive coaching, 27 respondents offered only life coaching, while the rest offered other types of coaching, such as career coaching or business coaching. Both individual as well as group coaching was offered by 118 respondents,

while 43 respondents offered only individual coaching. The vast majority of respondents (155) had completed training or certification in coaching and were members of a coaching association (141). When asked to rate the importance of several theoretical orientations on a 7-point Likert scale, participants rated the importance of the systemic approach to coaching the highest ($M = 6.30$, $SD = 0.96$). Other theoretical orientations with rather high ratings were the humanistic approach ($M = 5.80$, $SD = 1.10$) and social constructivism ($M = 5.08$, $SD = 1.40$).

Procedure

We conducted preliminary expert interviews with three Swiss coaches as well as with three Swiss HR professionals to get a detailed understanding of their views of the coaching process, its typical problems and first opinions on the use of computer-based technology in coaching. Interviews were transcribed verbatim and analyzed for main themes. The results of these analyses informed the topics covered and the questions asked in the survey. For example, interviewees said that having a clear method from the start of the process or evaluating the outcome are important quality aspects of coaching. Consequently, we asked related questions in the survey. The online questionnaire was created using the Web-based Qualtrics survey software (<http://www.qualtrics.com>; Qualtrics Labs, Inc., 2011). We carefully selected the questions to make sure that the participants needed at most 15 to 20 min to complete the questionnaire. Participants were contacted by e-mail. In the invitation mail, the participants received the link to the questionnaire and were then guided through the response process by information and instructions in the survey. Furthermore, they were provided with an e-mail address in case they would have had further questions or problems. Participants could choose to complete the survey in either German or French, which are the two most widely spoken national languages of Switzerland. After 1 month, a reminder mail was sent to coaches who had not

yet responded. By creating the questionnaire in both languages, sending a reminder mail and limiting the estimated completion time to 20 minutes, we tried to apply survey design best practices to maximize the sample size and response rate (Baruch & Holtom, 2008). After the time period for responding to the survey expired, the results were downloaded from Qualtrics and then analyzed using SPSS software.

Measures

For all scales, participants indicated their degree of approval of each item on a 7-point Likert scale. The scale anchors ranged from 1 = *strongly disagree* to 7 = *strongly agree*, with 4 = *neutral*.

Attitudes toward the use of computer-based technology in coaching. We created a 6-item scale to measure participants' attitudes toward using computer-based technology in coaching. Table 1 depicts the English translation of the items of this dependent variable as well as their means and *SDs*. The six items were prefaced with the following wording: *A computer system integrated in the coaching process could...* The participants then indicated their endorsement of six possible facilitations via the use of computer technology (e.g., *facilitate interactions between coach and client*, or *facilitate the planning of the intervention*). Internal consistency of the scale was $\alpha = .77$.

Internet self-efficacy. Six items were used to measure Internet self-efficacy of participants. Table 2 lists the English version of these items. Five items were drawn from the general Internet self-efficacy scale (GISE) of Hsu and Chiu (2004). These five items reflect general and widespread Internet-related activities that do not need specific training (e.g., *I feel confident finding information by using a search engine*, or *I feel confident sending e-mail messages*). We added a sixth item to measure if the participants also feel confident to use Web-based applications to plan and coordinate meetings, *I feel confident planning events or meetings on-line (e.g., Doodle, Google Calendar, etc...)*. This item was

not part of the original scale of Hsu and Chiu (2004), but the use of such applications reflects the activity of coaches in scheduling meetings with or activities for their clients. We chose these two examples because both Web-based applications allow users to plan and coordinate meetings and activities with others and need only Internet access and a Web browser. Furthermore, because of recent media coverage about Doodle in Switzerland (Doodle, 2012) and the general popularity of the Google platform we believed that many participants know at least one of the two applications. The items were translated into French and German by two native speakers of each language. Cronbach's alpha for this scale was $\alpha = .93$. When omitting the sixth item in the reliability analysis, Cronbach's alpha for this scale was $\alpha = .95$.

Table 1

Means and SDs for Items of Attitudes Toward the Use of Computer-Based Technology in Coaching

Item	<i>M</i>	<i>SD</i>
A computer system integrated in the coaching process could...		
...facilitate administrative tasks.	5.87	1.05
...facilitate data collection.	5.65	1.16
...facilitate systematic data gathering for every client.	4.87	1.45
...facilitate data analysis and retrieval.	4.49	1.58
...facilitate the planning of the intervention.	4.06	1.62
...facilitate interactions between coach and client.	4.05	1.52

Note. $N = 161$

Table 2

List of Items of Internet Self-Efficacy Scale

Item
I feel confident finding information by using a search engine.
I feel confident receiving e-mail messages.
I feel confident sending e-mail messages.
I feel confident saving files attached to e-mail.
I feel confident attaching files to e-mail.
I feel confident planning events or meetings on-line (e.g., Doodle, Google Calendar, etc...).

Preference for systematic approach. A 6-item scale was created to assess the preference for a systematic approach in coaching with measurable goals, scientifically supported methods, and outcome evaluation. Table 3 depicts the English translation of these six items, which were loosely based on (1) Grant’s (2005) suggestion that coaching processes should be evidence-based and goal-directed, (2) Joo’s (2009) notion of executive coaching as a structured process with systematic approaches, and (3) considerations of the PRACTICE model of coaching of Palmer (2008), a problem solving and solution-focused model. However, the wording of these items was deliberately very general to ensure that all coaches had the same understanding, independent of their preferred approach or school of thought. Four items referred to the professional practices of coaches (e.g., *Coaches should use scientifically validated methods* or *A coach should be able to provide a precise schedule for his/her intervention*). The other two items assessed the extent to which the coaching objectives should be clear (*The objectives should be clear from the beginning*) and measurable (*The coaching objectives should be measurable*). The Cronbach’s alpha coefficient for this scale was $\alpha = .77$.

Table 3

List of Items of Preference for Systematic Approach in Coaching Scale

Item
A coach should have a clear method right from the beginning of the intervention.
A coach should be able to provide a precise schedule for his/her intervention.
A coach should be able to provide a measure for the effectiveness of his/her intervention.
Coaches should use scientifically validated methods.
Objectives should be clear from the beginning.
Coaching objectives should be measurable.

Results

Table 1 lists descriptive statistics for the six items composing the dependent variable of interest, namely attitudes toward the use of computer-based technology in coaching. We conducted a *t*-test for every item against the test value 4, which represents the midpoint of the 7-point Likert scale, and thus a neutral attitude. Participants had significantly positive opinions of the statements that a computer system could facilitate administrative tasks ($t(160) = 22.60, p < .001$), data collection in general ($t(160) = 18.02, p < .001$), systematic data gathering for every client ($t(160) = 7.59, p < .001$), and data analysis and retrieval ($t(160) = 3.95, p < .001$). Participants showed a neutral attitude concerning the statements that a computer system could facilitate interactions between coach and client $t(160) = 0.42, p = .68$ and the planning of coaching interventions $t(160) = 0.49, p = .63$. Table 4 depicts the means, *SDs* and intercorrelations for all variables.

Table 4

Means, SDs, and Correlations Between Main Study Variables

Variables	<i>M</i>	<i>SD</i>	1	2	3	4
1. Gender	0.48	0.50				
2. Age	49.61	8.22	.19*			
3. Internet self-efficacy	6.38	0.84	-.13	-.06		
4. Preference for systematic approach	4.52	1.04	-.02	.07	.10	
5. Attitudes towards computer-based technology	4.83	0.96	-.03	-.08	.19*	.29**

Note. $N = 161$. Values for gender are expressed in 0 = *Women* and 1 = *Men*. Values for age are expressed in years.

* $p < .05$; ** $p < .01$

Hierarchical multiple regression analysis was used to investigate the influence of age, Internet self-efficacy, and preferences for a systematic approach on attitudes toward the use of computer-based technology. The results are reported in Table 5. The R^2 change (ΔR^2) at each step shows the contribution of the newly included predictor to explaining variance in the outcome after having controlled for the already included predictors. The amount of variation in the outcome explained by all predictors is $R^2 = .12$ (Adjusted $R^2 = .10$).

In a first step, we entered the gender of the participants in the regression. This was done in order to control for gender as a possible covariate. The results confirmed that there are no significant gender differences in attitudes toward the use of computer-based technology in coaching ($\beta = -.03, p = .68$).

The age of participants was entered into the regression in the second step. The results confirmed that age has no significant effect on attitudes toward the use of computer-based technology in coaching ($\beta = -.07, p = .37$).

In a third step, we entered Internet self-efficacy as a predictor. The results confirmed Hypothesis 1: Coaches with higher Internet self-efficacy had significantly more positive attitudes toward the use of computer-based technology in the coaching process than coaches with lower Internet self-efficacy ($\beta = .18, p < .05$).

In a fourth step, attitudes about a systematic approach in coaching were entered into the regression equation as predictor. The results support Hypothesis 2: Coaches with higher preference for a systematic approach in coaching with measurable goals, scientifically supported methods and outcome evaluation have significantly more positive attitudes toward the use of computers in coaching ($\beta = .29, p < .001$).

Table 5

Hierarchical Regression Analysis With Gender, Age, Internet Self-Efficacy and Preference for Systematic Approach Predicting Attitudes Towards Computer-Based Technology in Coaching

Attitudes towards computer-based technology in coaching			
Predictors:	ΔR^2	<i>B</i> (<i>SE B</i>)	β
Step 1:	.00		
Gender		-0.06 (0.15)	-.03
Step 2:	.01		
Gender		-0.04 (0.16)	-.02
Age		-0.01 (0.01)	-.07
Step 3:	.03*		
Gender		0.01 (0.15)	.00
Age		-0.01 (0.01)	-.07
Internet self-efficacy		0.21 (0.09)	.18*
Step 4:	.08**		
Gender		0.02 (0.15)	.01
Age		-0.01 (0.01)	-.09
Internet self-efficacy		0.18 (0.09)	.16*
Preference for systematic approach		0.26 (0.07)	.29**

Note. *N* = 161

* $p < .05$, ** $p < .001$

Discussion

The aim of this study was to investigate the attitudes of coaches toward computer use in coaching. We expected that Internet self-efficacy and preference for a systematic approach in coaching influence coaches' attitudes.

Attitudes Toward Computer-Based Technology in Coaching

Coaches see computer technology as a helpful means to facilitate administrative tasks, data collection and data analysis. When it comes to computer technology as a way to facilitate the interaction between coach and client, coaches have a neutral attitude. We do not believe that the participants indicated a neutral attitude for this aspect only because they did not really understand the meaning of the item. As preface for the items on attitudes toward computer use in coaching, we described briefly how technology is already used in psychotherapy. For example, we said that some therapists sometimes interact with their patients via phone or e-mail. Therefore, the participants should have understood what we mean with this item on computer technology as a facilitator of interaction. Their overall neutral attitude could stem from a lack of experience with computer-based interaction in coaching, which might lead to uncertainty about whether it has more positive or more negative effects.

Coaches also have an overall neutral attitude toward computer technology as a means to facilitate the planning of coaching interventions. This is surprising because computer technology offers a variety of possibilities to plan processes, exchange these plans between the persons involved and update plans in a flexible way. A possible explanation could be that there are too few computer-based coaching approaches and tools that could serve as positive examples.

We did not find a significant relationship between positive attitudes toward computer use and gender or age. Therefore, older and younger coaches or female and male coaches

do not differ significantly in their positive attitudes toward computer use in coaching. This finding is in line with our notion that computer technology is nowadays an everyday matter of course and gender or age differences in attitudes toward computer technology are most likely a phenomenon of the past.

Internet self-efficacy. Consistent with our predictions, there was a significant association between considering oneself as being competent in basic Internet-related activities, like using a search engine or sending e-mails, and the belief that computer technology could facilitate and ameliorate the coaching process. This finding converges with other research showing that Internet self-efficacy predicts actual use of Web-based applications (e.g., Hsu & Chiu, 2004, Yi & Hwang, 2003). In the TAM (Davis, 1986), Internet self-efficacy could be seen an indicator for the perceived ease of use of Web-based applications. So coaches with higher Internet self-efficacy are likely to have higher intentions to use Web-based coaching tools. In addition, because the use of computer technology in coaching will most certainly imply Web-based communication and applications, Internet self-efficacy is an important predictor of attitudes toward computer-based coaching in general. For example in the related field of computer-based psychotherapy, many procedures include Web-based applications (e.g., Berger & Andersson, 2009, Kessler et al., 2009, Meyer et al., 2009). Web-based applications often have an edge over traditional installed software (e.g., Lee, Saha, Yusufi, Park, & Karimi, 2009). For example, Web-based applications run on different platforms and operating systems because only Internet access and a Web browser are needed. In addition, communication between coaches and clients could be a vital part of Web-based applications by including e-mail exchange, chats or voice over IP procedures (Ubben, 2005). However, computer-based coaching also implies certain risks. Because coaching produces sensitive data about the client, data protection is crucial (Knatz, 2012). Therefore,

concerning this matter, computer-based coaching should apply best practices of other fields and contexts where these problems have already been tackled. For example, the American Medical Association has included ethical principles and guidelines concerning telemedicine in their Ethics Code to guide physicians about best practices in telemedicine (Lovejoy, Demireva, Grayson, & McNamara, 2009). The American Psychological Association (2013) and the Canadian Psychological Association (2006) have developed guidelines that recommend best practices for the use of communication technology for rendering psychological services. Computer-based coaching could benefit from similar rules of conduct.

Preference for systematic approach. We now turn to preference for a systematic approach as a predictor for attitudes toward computer use in coaching. We found a positive relationship between favoring measurable goals, clear and scientifically validated coaching methods, and outcome evaluation on the one hand, and the belief that computer technology can facilitate and improve coaching processes on the other hand. It is likely that coaches with a high preference for a systematic approach in coaching see computer technology as an expedient of structuring or even standardizing the coaching process. Computer technology could determine the sequence of steps in the coaching process (e.g., topics to discuss and tasks for the client) and allows for monitoring the interaction between coach and client, the fulfillment of tasks and goal attainment. Furthermore, coaches who like to collect and analyze data for outcome evaluation may consider computer technology as a useful tool concerning this matter. In summary, computer technology can serve as a means for coaches with high preferences for systematic coaching processes to realize these preferences. This could be the reason why they have more positive attitudes toward computer use in coaching than coaches with lower preferences of this kind.

Limitations

This study has three main limitations. First, because we tested attitudes toward computer technology via an online questionnaire and not with a paper-pencil method, the results could be biased. Therefore, mainly coaches who already had positive attitudes toward computer use in general could have answered the questionnaire. The fact that the mean of the Internet self-efficacy scale was high might reflect sample bias due to the use of an online questionnaire. However, the level of computer-related skills required to answer the questionnaire was low. All that was needed to participate was an e-mail address and a Web browser. The participants only needed to click on a hyperlink in the e-mail they received and then click on response options or type in answers to complete the questionnaire.

A second limitation is the rather low response rate. The results could have been biased by the fact that many of the coaches we contacted via e-mail did not fill in the questionnaire. However, low response rate is not an automatic indicator of bias. We note that the demographic characteristics of the coaches in our sample closely resemble those of another sample of a recent survey of the Swiss coaching market (Seiger & Künzli, 2012), for example, characteristics such as age, gender, professional experience, educational background, membership in professional associations and approach to coaching.

The third limitation stems from the fact that our sample is – like in many other surveys – only from one country. Therefore, it remains to be tested if our results generalize to coaches outside of Switzerland. However, the coaching market in Switzerland is very diverse. Coaching services are offered in different languages such as German, French, Italian and English. Coaches use different coaching styles and methods and their theoretical and educational backgrounds vary as well (Seiger & Künzli, 2012). Moreover, business practice in the various linguistic regions of Switzerland is similar to practice in

respective neighboring countries. For example, the French-speaking Swiss coaching market is closely related to the French coaching market. Therefore, we do not expect our results to change much in other Western European contexts.

Implications

Two important research gaps on computer-based coaching are (1) testing its effectiveness with randomized controlled trials and (2) measuring the attitudes of the persons involved toward computer use in coaching. We made a contribution toward the latter issue, but only concerning the attitudes of coaches. One avenue for future research is to assess the attitude of clients toward computer use in coaching as well. Because coaching aims to achieve a sustained change of the clients' behavior, their approval of computer use would be essential. Furthermore, the attitudes of clients' supervisors and HR managers could also be important. Often, coaching processes are not initiated and ordered by the clients themselves, but by their supervisors or by HR managers in their organizations. Therefore, their attitudes could be of practical importance. Another implication for future research is to collect further data about the current use of computer technology in coaching processes and its advantages and disadvantages. The use of computer technology in coaching is growing (e.g., Web-based communication), but more systematic research on this phenomenon is needed (e.g., Geißler & Metz, 2012).

Future research should also seek to further validate our results. The relationship between preferences for measurable goals, clear methods and outcome evaluation on one side and technology acceptance on the other has not been tested before, neither for computer-based coaching nor other contexts, for example, computer-based psychotherapy. However, it is highly possible that such a relationship exists in other contexts as well. To establish generalizability, our study should be replicated, for example, with coaches from other countries, or in other contexts (e.g., psychotherapy).

A practical implication of our finding is that coaches should be trained in the use of Web-based technology. This is because of the fact that such training most likely increases their Internet self-efficacy, which in turn might improve their attitudes toward the use of Web-based technology in coaching.

Practical implications for developers and suppliers of computer-based coaching tools come from the relationship we found between preference for a systematic coaching approach and computer-related attitudes. Given this relationship, computer-based coaching tools should help to establish measurable coaching goals, structure the coaching process and improve outcome evaluation (e.g., via systematic data collection and analysis). In other words, computer-based coaching tools that reflect this preference for a systematic approach can probably be sold more successfully than tools that solely focus on other valuable features, e.g., Web-based videoconferencing.

The use of computer-based technology in coaching will most likely increase in the future. The present study extends research on coaching practice by exploring correlates of attitudes toward this important future change.

References

- American Psychological Association (2013). Guidelines for the practice of telepsychology. Retrieved from: <http://www.apapracticecentral.org/ce/guidelines/telepsychology-guidelines.pdf>.
- Bandura, A. (1982). Self-efficacy mechanisms in human agency. *American Psychologist*, *37*, 122-147. doi: 10.1037/0003-066X.37.2.122
- Barak, A., Hen, L., Boniel-Nissim, M., & Shapira, N. (2008). A comprehensive review and a meta-analysis of the effectiveness of Internet-based psychotherapeutic interventions. *Journal of Technology in Human Services*, *26*, 109-160. doi: 10.1080/15228830802094429
- Baruch, Y., & Holtom, B. C. (2008). Survey response rate levels and trends in organizational research. *Human Relations*, *61*, 1139-1160. doi: 10.1177/0018726708094863
- Berger, T., & Andersson, G. (2009). Internetbasierte Psychotherapien: Besonderheiten und empirische Evidenz [Internet-based psychotherapies: Characteristics and empirical evidence]. *Psychotherapie, Psychosomatik, Medizinische Psychologie*, *59*, 159-170. doi: 10.1055/s-0028-1090162
- Berry, R. M., Ashby, J. S., Gnilka, P. B., & Matheny, K. B. (2011). A comparison of face-to-face and distance coaching practices: Coaches' perceptions of the role of the working alliance in problem resolution. *Consulting Psychology Journal: Practice and Research*, *63*, 243-253. doi: 10.1037/a0026735
- Bono, J. E., Purvanova, R. K., Towler, A. J., & Peterson, D. B. (2009). A survey of executive coaching practices. *Personnel Psychology*, *62*, 361-404. doi: 10.1111/J.1744-6570.2009.01142.X

- Brotman, L. E., Liberi, W., & Wasylyshyn, K. M. (1998). Executive coaching: The need for standards of competence. *Consulting Psychology Journal: Practice and Research*, 50, 40-46. doi: 10.1037/1061-4087.50.1.40
- Canadian Psychological Association (2006). Ethical guidelines for psychologists providing psychological services via electronic media. Retrieved from:
<http://www.cpa.ca/aboutcpa/committees/ethics/psychserviceselectronically/>
- Cornelius, C., Schumann, G., & Boos, M. (2009). Zeit- und Ziele-Management für Nachwuchswissenschaftler/innen [Time- and goal-management for junior researchers – evaluation of an online-coaching]. *Organisationsberatung, Supervision, Coaching*, 16, 54-65. doi: 10.1007/s11613-009-0110-3
- Cuijpers, P., Marks, I. M., van Straten, A., Cavanagh, K., Gega, L., & Andersson, G. (2009). Computer-aided psychotherapy for anxiety disorders: A meta-analytic review. *Cognitive Behaviour Therapy*, 38, 66-82. doi:
10.1080/16506070802694776
- Czaja, S. J., & Sharit, J. (1998). Age differences in attitudes toward computers. *Journal of Gerontology: Psychological Sciences*, 53, 329-340. doi:
10.1093/geronb/53B.5.P329
- Davis, F. D. (1986). A technology acceptance model for empirically testing new end-user information systems: Theory and results. Unpublished doctoral dissertation, Massachusetts Institute of Technology. Retrieved from:
<http://hdl.handle.net/1721.1/15192>
- Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science*, 35, 982-1003. doi: 10.1287/mnsc.35.8.982

- Dillon, A., & Morris, M. G. (1996). User acceptance of information technology: Theories and models. *Annual Review of Information Science and Technology*, *31*, 3-32.
Retrieved from: <http://www.asis.org/publications/arist/>
- Doodle AG (2012). Doodle in den Medien [Doodle in the media]. *Doodle.com*. Retrieved June 7th, 2013, from: <http://de.blog.doodle.com/doodle-in-den-medien/>
- Eastin, M. S., & LaRose, R. (2000). Internet self-efficacy and the psychology of the digital divide. *Journal of Computer-Mediated Communication*, *6*. doi: 10.1111/j.1083-6101.2000.tb00110.x
- Fisher, S. L., & Howell, A. W. (2004). Beyond user acceptance: An examination of employee reactions to information technology systems. *Human Resource Management*, *43*, 243-258. doi: 10.1002/Hrm.20018
- Geißler, H., & Metz, M. (Eds.) (2012). *E-Coaching und Online-Beratung: Formate, Konzepte, Diskussionen [E-coaching and online-consulting: Formats, concepts, discussions]*. Wiesbaden, Germany: Springer VS. doi: 10.1007/978-3-531-19155-3
- Grant, A. M. (2005). What is evidence-based executive, workplace and life coaching? In M. Cavanagh, A. M. Grant, & T. Kemp (Eds.), *Evidence-based coaching* (Vol. 1, pp. 1-12). Bowen Hills, Australia: Australian Academic Press.
- Griffiths, K. E., & Campbell, M. A. (2008). Regulating the regulators: Paving the way for international, evidence-based coaching standards. *International Journal of Evidence Based Coaching and Mentoring*, *6*, 19-31. Retrieved from: <http://eprints.qut.edu.au/13388/>
- Headlam-Wells, J., Gosland, J., & Craig, J. (2005). "There's magic in the web": E-mentoring for women's career development. *Career Development International*, *10*, 444-459. doi: 10.1108/13620430510620548

- Hersh, W. R., Helfand, M., Wallace, J., Kraemer, D., Patterson, P., Shapiro, S., & Greenlick, M. (2001). Clinical outcomes resulting from telemedicine interventions: A systematic review. *BMC Medical Informatics and Decision Making*, 1, 5. doi: 10.1186/1472-6947-1-5
- Hsu, M. H., & Chiu, C. M. (2004). Internet self-efficacy and electronic service acceptance. *Decision Support Systems*, 38, 369-381. doi: 10.1016/J.Dss.2003.08.001
- International Coach Federation (2013). Members. *ICF – International Coach Federation*. Retrieved September 19, 2013, from: <http://www.coachfederation.org/members/landing.cfm?ItemNumber=687&navItemNumber=504>
- International Coach Federation (1999). ICF core competencies. *ICF – International Coach Federation*. Retrieved September 21, 2013, from: <http://www.coachfederation.org/credential/landing.cfm?ItemNumber=2206&navItemNumber=576>
- Jay, G. M., & Willis, S. L. (1992). Influence of direct computer experience on older adults' attitudes toward computers. *Journals of Gerontology*, 47, 250-257. doi: 10.1093/geronj/47.4.P250
- Joo, B.-K. (2005). Executive coaching: A conceptual framework from an integrative review of practice and research. *Human Resource Development Review*, 4, 462-488. doi: 10.1177/1534484305280866
- Kemp, T. J. (2005). Psychology's unique contribution to solution-focused coaching: Exploring clients' past to inform their present and design their future. In M. Cavanagh, A. M. Grant & T. Kemp (Eds.), *Evidence-based coaching* (Vol. 1, pp. 37-47). Bowen Hills, Australia: Australian Academic Press.

- Kessler, D., Lewis, G., Kaur, S., Wiles, N., King, M., Weich, S., Peters, T. J. (2009). Therapist-delivered Internet psychotherapy for depression in primary care: A randomised controlled trial. *Lancet*, *374*, 628-634. doi: 10.1016/S0140-6736(09)61257-5
- Kilburg, R. R. (1996). Toward a conceptual understanding and definition of executive coaching. *Consulting Psychology Journal: Practice and Research*, *48*, 134-144. doi: 10.1037/1061-4087.48.2.134
- Knatz, B. (2012). Coaching per Internet - wie es geht und wie es wirkt [Coaching via Internet – how to do it and how it works]. In H. Geißler & M. Metz (Eds.), *E-Coaching und Online-Beratung [E-coaching and online-consulting]*. Wiesbaden, Germany: Springer VS. doi: 10.1007/978-3-531-19155-3
- Lee, D. Y., Saha, R., Yusufi, F. N., Park, W., & Karimi, I. A. (2009). Web-based applications for building, managing and analysing kinetic models of biological systems. *Briefings in Bioinformatics*, *10*, 65-74. doi: 10.1093/bib/bbn039
- Lovejoy, T. I., Demireva, P. D., Grayson, J. L., & McNamara, J. R. (2009). Advancing the practice of online psychotherapy: An application of Rogers' diffusion of innovations theory. *Psychotherapy*, *46*, 112-124. doi: 10.1037/a0015153
- Maher, S., & Pomerantz, S. (2003). The future of executive coaching: Analysis from a market life cycle approach. *International Journal of Coaching in Organizations*, *1*, 3-11. Retrieved from: <http://www.ijco.info/pdfs/artmkctcy.pdf>
- Marquié, J. C., Thon, B., & Baracat, B. (1994). Age influence on attitudes of office workers faced with new computerized technology. *Applied Ergonomics*, *25*, 130-142. doi:10.1016/0003-6870(94)90011-6

- McKenna, D. D., & Davis, S. L. (2009). Hidden in plain sight: The active ingredients of executive coaching. *Industrial and Organizational Psychology, 2*, 244-260. doi: 10.1111/j.1754-9434.2009.01143.x
- Meyer, B., Berger, T., Caspar, F., Beevers, C. G., Andersson, G., & Weiss, M. (2009). Effectiveness of a novel integrative online treatment for depression (Deprexis): Randomized controlled trial. *Journal of Medical Internet Research, 11*. doi: 10.2196/jmir.1151
- Palmer, S. (2008). The PRACTICE model of coaching: Towards a solution-focused approach. *Coaching Psychology International, 1*, 4-6. Retrieved from: http://ac.somcom.co.uk/media/uploads/papers/The_PRACTICE_model_of_coaching_towards_a_solution-focused_approach-2.pdf
- Peñate, W. (2012). About the effectiveness of telehealth procedures in psychological treatments. *International Journal of Clinical and Health Psychology, 12*, 475-487. Retrieved from: http://www.aepc.es/ijchp/articulos_pdf/ijchp-423.pdf
- Qualtrics Labs, Inc. (2011). Qualtrics Survey Research Suite (version 34512). Provo, UT: Qualtrics Labs, Inc.
- Seiger, C., & Künzli, H. (2012). *Der Schweizerische Coachingmarkt 2011 aus der Sicht von Coachs [The Swiss coaching market 2011 from the perspective of coaches]*. Retrieved from: http://www.psychologie.zhaw.ch/fileadmin/user_upload/psychologie/Downloads/Forschung/SeigerK%C3%BCnzli12_Schweizerischer_Coachingmarkt11_Korr.pdf
- Shashaani, L. (1997). Gender differences in computer attitudes and use among college students. *Journal of Educational Computing Research, 16*, 37-51. doi: 10.2190/Y8U7-AMMA-WQUT-R512

- Sloan, D. M., Gallagher, M. W., Feinstein, B. A., Lee, D. J., & Pruneau, G. M. (2011). Efficacy of telehealth treatments for posttraumatic stress-related symptoms: A meta-analysis. *Cognitive Behaviour Therapy, 40*, 111-125. doi: 10.1080/16506073.2010.550058
- Stober, D. R., & Parry, C. (2005). Current challenges and future directions in coaching research. In M. Cavanagh, A. M. Grant & T. Kemp (Eds.), *Evidence-based coaching* (Vol. 1, pp. 13-19). Bowen Hills, Australia: Australian Academic Press.
- Torkzadeh, G., & Van Dyke, T. P. (2002). Effects of training on Internet self-efficacy and computer user attitudes. *Computers in Human Behavior, 18*, 479-494. doi:10.1016/S0747-5632(02)00010-9
- Ubben, C. (2005). Coaching und Internet? Chancen und Grenzen des Internets für Coaches und Klienten [Coaching and Internet? Chances and limitations of the Internet to coaches and clients]. *Organisationsberatung, Supervision, Coaching, 12*, 75-87. doi: 10.1007/s11613-005-0092-8
- Ware, M. C., & Stuck, M. F. (1985). Sex-role messages vis-à-vis microcomputer use: A look at the pictures. *Sex Roles, 13*, 205-214. doi: 10.1007/BF00287911
- Whitley, B. E. (1997). Gender differences in computer-related attitudes and behavior: A meta-analysis. *Computers in Human Behavior, 13*, 1-22.
- Yi, M. Y., & Hwang, Y. (2003). Predicting the use of Web-based information systems: Self-efficacy, enjoyment, learning goal orientation, and the technology acceptance model. *International Journal of Human-Computer Studies, 59*, 431-449. doi: 10.1016/S1071-5819(03)00114-9

Ziemons, M. (2012). Blended Business Coaching - Internet-unterstütztes Transfer-Coaching [Blended business coaching: Internet based transfer coaching]. *Organisationsberatung, Supervision, Coaching*, 19, 217-225. doi: 10.1007/s11613-012-0281-1

Study 2

Computer Use for Competency Development:

The Example of a Web-Based Tool

Sebastian Otte and Adrian Bangerter

University of Neuchâtel

Author Note

Sebastian Otte and Adrian Bangerter, Institute of Work and Organizational Psychology, University of Neuchâtel, Neuchâtel, Switzerland

This study was supported in part by a grant from the Commission for Technology and Innovation (CTI) of the Swiss Confederation. We acknowledge the help of Silvia Jeronimo and Sara Pereira with the data collection for this study.

Abstract

Organizations need a competent workforce to reach their goals. Employees with the right knowledge, skills and attitudes perform well and thereby help their organizations to achieve good results. Hard skills (i.e., technical skills related to a specific topic) and soft skills (i.e., wider social and personal skills) are both important for overall job performance. Training and development of both types of skills is therefore of vital interest for organizations as well as for their employees. Successful training and development processes ensure transfer of the trained competencies to the daily working routine. In this context, Web-based applications might help to plan, standardize and evaluate competency development, e.g. by providing tools that allow users to plan their training of competencies and to ask others for feedback. We tested the effectiveness of the Web-based tool “enTalent”. A sample of employed persons was randomly allocated to either the treatment group ($n = 36$) or the control group ($n = 35$). Both groups were asked to develop one competency for two months. The treatment group used the regular version of enTalent with the possibilities to formulate development objectives, fill in a development plan, ask others for evaluations, and make self-evaluations. The control group used a reduced version of enTalent with only the possibilities to ask others for evaluations and make self-evaluations. The participants of both groups received a better evaluation of the trained competencies after the two months than in the beginning, but this improvement was not significant. Furthermore, there were no significant differences between the two groups. We discuss several factors that might have affected the results, e.g. the similarity of tasks between the treatment group and the control group or the difference between our study and real-life development processes.

Keywords: competency development, soft skills, ICT, Web-based application, Web-based tool

Computer Use for Competency Development:

The Example of a Web-Based Tool

Organizations need a competent workforce that is able to adapt to change and new challenges. For this reason, employees need to constantly learn and develop their competencies (Bergmann & Pietrzyk, 2000; Illeris, 2003). Computer-based technology can increase the efficiency of competency development. Trainings could be delivered via videoconferencing, in virtual classrooms, or the learning content could be conveyed via websites or dedicated software (Islas et al., 2007). Thereby no attendance in classrooms is needed and both trainers as well as trainees are flexible in terms of schedules (Ally, 2004). Computer technology can also help to standardize learning content and training processes. It can not only deliver the same content and the same process more reliably than trainers, computer technology can also help with the evaluation of training progress by recording activities and test results.

Computer-aided training in the working environment has already been studied, both for the so-called “soft skills” (e.g., leadership, persuasion skills, self-discipline) and for technical skills (J. Adams et al., 2009; Bruns, Keith, & Müller, 2013; Park & Wentling, 2007). However, soft skills are often developed through practical experience in real life, as the effectiveness of the behavior depends on the particular context (Morgan & Adams, 2009). So when the learning itself mostly takes place in real life, learners need support with setting the right development goals, planning the learning process and getting feedback on their progress.

This study tested the effectiveness of a Web-based application for competency development that supports the development planning and helps with evaluating development progress. Seventy-one employed persons used this application for two

months in order to develop one competency. Thirty-six participants used the regular version of this application, while 35 participants used a reduced version. Neither the increase in the evaluations after the two months nor the differences between the two groups were significant. The results challenge the common assumption that competency development is more effective with detailed and structured development plans.

Competency Development

There are numerous definitions of the term “competency” (Hoffmann, 1999; Sampson & Fytros, 2008). Spencer, McClellan and Spencer (1994, as cited in Shippmann et al., 2000, p. 706) define competency as “a combination of motives, traits, self-concepts, attitudes or values, content knowledge or cognitive behavior skills; any individual characteristic that can be reliably measured or counted and that can be shown to differentiate superior from average performers”. The International Board of Standards for Training, Performance and Instruction (2006) defines competency as “an integrated set of skills, knowledge, and attitudes that enables one to effectively perform the activities of a given occupation or function to the standards expected in employment”. Given these definitions, both hard skills and soft skills can be called “competency”. While hard skills are technical skills related to specific topics (e.g., specialist knowledge), soft skills are comprehensive social and methodological skills (e.g., communication skills, reliability, creativity, time-management skills) and often harder to measure than hard skills (Andrews & Higson, 2008; Heckman & Kautz, 2012; Morgan & Adams, 2009; Salvisberg, 2010). Furthermore, training transfer is often more difficult for soft skills than for hard skills, because soft skills training can often only teach general principles (Blume, Ford, Baldwin, & Huang, 2010).

Organizations use competency models (i.e., sets of competencies) as tools in human resource management. Lucia and Lepsinger (1999) characterize these competency models as follows: “A competency model describes the particular combination of knowledge,

skills, and characteristics needed to effectively perform a role in an organization and is used as a human resource tool for selection, training and development, appraisal, and succession planning” (p. 5). So organizations use competency models as a tool for training and development, because competencies describe effective behavior and can thereby serve as a frame of reference for goal setting and progress evaluation in development processes.

We define competency development as the improvement of knowledge, skills, and attitudes that leads to more effective behavior (e.g., better performance in specific contexts). There is the assumption that humans are intrinsically motivated to develop their competence in order to increase the feeling of being capable (Huitt, 2011; White, 1959). For example, self-determination theory states that humans have three psychological needs: The need to feel competent, the need of autonomy as a sense of having control and being free, and the need of relatedness as a sense of being connected to others (Ryan & Deci, 2000). Given the fact that employees are adult learners (teenage employees, apprentices and trainees excepted), the theoretical background for competency development of employees comes from adult learning theories. One influential adult learning theory is the andragogy model by Malcolm Knowles (Knowles, 1973; Merriam, 2001). Knowles defined andragogy as the art and science of teaching adults, in contrast to pedagogy as the art and science of teaching children. The andragogy model emphasizes that adults are self-directed learners with life experience that can be utilized as a resource in learning processes. Furthermore, it underlines the importance of reflecting on learning experiences and of having direct experience with the learning content in real life settings. As Tynjälä and Häkkinen (2005) put it: “Common to all of the most influential adult learning theories is the emphasis on personal reflection on the learner’s experiences” (p. 320). For example in the learning theories of Schön (1987) and Kolb (1984), an important part of the learning process is the reflection of the learners on their actions and experiences (Tynjälä &

Häkkinen, 2005). As competencies are integrated sets of skills, knowledge, and attitudes, reflecting on learning experiences helps to integrate learning progress on all these dimensions and facilitates transfer to new situations. Self-evaluations of the learners could foster the reflection on learning experiences. In order to self-evaluate their competence, learners have to reflect on their experiences and performance in specific situations. This reflection process can then lead to the transformation of knowledge (Tynjälä & Häkkinen, 2005).

Competency development processes in organizations often start with a training needs analysis, a performance appraisal, or a development center. Riggio (2002) distinguishes between four levels of training needs analysis: On the organizational level the goals of the organization and their implications for training and development are analyzed. On the task level the competencies necessary for effective job performance are analyzed. On the person level the actual abilities and skills of the employees are analyzed in order to identify the training needs of the current staff. On the demographical level, the specific training needs of different demographic groups (e.g., age groups, ethnical groups, women vs. men) are analyzed. After a training needs analysis, an organization can define training objectives and plan the development process for all employees, specific groups of employees or for individual employees.

Performance appraisals are often the starting point of competency development processes for individual employees (Wilson & Western, 2000). Performance appraisals are (mostly regular) reviews of the employees' performance (Murphy & Cleveland, 1995). In appraisal interviews, supervisors or mentors discuss with employees the performance of the latter and their further development (Cederblom, 1982). During an appraisal interview, development goals and often a development plan are defined (Wilson & Western, 2000).

Another frequent starting point for individual competency development is a development center. Development centers are assessment centers with the purpose to diagnose development needs and thereby to set the starting point for competency development (Appelbaum, Harel, & Shapiro, 1998; Ballantyne & Povah, 2004). Development centers are not only used as diagnostic tools, but also as interventions for competency development (Engelbrecht & Fischer, 1995; Jones & Whitmore, 1995). That means development centers can also be training events in which the participants practice effective behaviors and receive instructive feedback. After a development center, the results are “used to initiate developmental planning and follow-up training and development activities” (Thornton & Krause, 2009, p. 479).

Irrespective of whether a development process begins with a training needs analysis, a performance appraisal, a development center or any other method, a sound development process needs sound planning. A written development plan that defines development objectives and activities increases the chance that the employee will actually try to achieve these objectives (Byham, 2005; Grote, 1996). There should be no more than three development objectives and they should be clear, behavioral and measurable (Bracken, Timmreck, & Church, 2001; Byham, 2005; Grote, 1996). It is also helpful to identify possible obstacles and difficulties in pursuing the development activities and to list possible ways how they could be overcome (Bracken et al., 2001; Byham, 2005). In addition, it might be useful to identify persons who could help to achieve the development objectives, for example by giving information or feedback or by helping to overcome possible obstacles. The learning activities can either be trainings (e.g., classroom trainings, computer-aided trainings) or on-the-job learning activities, in which the employees practice new behaviors in the actual contexts. In general, training transfer is enhanced if

the learners have opportunities to perform newly learned behaviors in the real work environment (Salas, Tannenbaum, Kraiger, & Smith-Jentsch, 2012).

We now discuss how computer technology can support competency development processes and describe the features of a Web-based tool that aims to support the competency development of its users.

Computer Use in Competency Development

Computer-aided learning is known by many synonyms, e.g. e-learning, distance learning, tele-learning, or Web-based learning (Ally, 2004). More and more organizations use e-learning or blended learning (i.e., the combination of e-learning with classroom learning) for employee training (Chen, 2010). The main benefits of e-learning for organizations are its cost effectiveness and for the learners its flexibility concerning time and location, especially in the case of Web-based tools. A study of Chen (2010) on the relationship between e-learning and job outcomes indicated that employees do not only perceive e-learning systems as useful, but also “that employees’ e-learning system use is significantly associated with their overall job outcomes” (p. 1634). According to Tynjälä and Häkkinen (2005), e-learning systems are often only used as means to simply deliver learning content. They emphasize that e-learning systems should rather support workplace learning, for example by combining face-to-face meetings with online tasks in order to facilitate collaborative knowledge building.

More and more, e-learning courses are not only designed and conducted for hard skills, but also for soft skills (J. Adams et al., 2009; Park & Wentling, 2007). While e-learning for hard skills development tries to facilitate the memorization of facts and rules, e-learning for soft skills development needs to support the effective interpretation and application of information and behaviors, depending on the specific context (Morgan & Adams, 2009). For example, Bruns et al. (2013) tested the effectiveness of a Web-based

training for social skills that simulated social situations at work. This training helped to develop the trained social skills such as networking or assertiveness. A Canadian study on soft skills development via blended learning tested different strategies of computer-supported soft skills development (J. Adams et al., 2009). Results indicate that the success of workplace learning of soft skills depends highly on individual characteristics of the learners. Therefore, soft skill development processes should allow the learners to self-select learning contents and schedule learning activities in the daily routine. Furthermore, the authors stress the importance of pre- and posttests for outcome evaluation (J. Adams et al., 2009). If this includes self-evaluations, the learners might be animated to reflect on their learning experiences and progress. In addition, soft skill development processes should also tie in with the reality and practice of human resource development in organizations. As mentioned above, competency development processes often start with training needs analyses, individual performance appraisals, or development centers. The outcomes of this are development objectives for the employees that ideally lead to the planning of development activities. Referring to the quality aspects of development plans mentioned above, a computer-based tool could help with the actual realization of development plans by giving the learners the tasks: (1) to formulate clear, behavioral and measurable development objectives (Bracken et al., 2001; Byham, 2005; Grote, 1996), (2) to schedule learning activities (Byham, 2005; Grote, 1996), (3) to identify and write down possible difficulties and ways how to deal with them (Bracken et al., 2001; Byham, 2005), and (4) to list persons that could help with achieving the development objectives. In addition, mentors or supervisors of the learners could control and give feedback on how the learners performed these tasks. This would most likely increase the learners motivation to fulfill these tasks in a thorough way.

The Example of a Web-Based Tool for Competency Development

We now describe the Web-based tool “enTalent”. We used two different versions of this tool in this study. The purpose was to test the effectiveness of the regular version of enTalent with a comprehensive development plan and the possibility to do self-evaluations and ask others for feedback. The control group used a reduced version of enTalent with only the possibility to do self-evaluations and ask others for feedback.

enTalent

The Web-based tool enTalent was developed by the Swiss consultancy papilio Ltd. and aims to support the competency development of its users. enTalent is already used by some of papilio’s client organizations as part of their internal development processes, e.g. talent development programs. The tool mostly comes into play after performance appraisals and development centers. Although enTalent can be used for hard skills development, usually it supports the development of competencies that can be categorized as soft skills. The main users are the learners themselves and they are called “talents” in the denotation of enTalent. A second user group is called “mentors” (i.e., the learners’ supervisors, trainers, coaches or mentors). This user group can be given access to the development plans of specific learners, so that they can control and comment on the learners’ entries and download the development plans and feedback results.

The activities of the learners in enTalent are the following: At the beginning they choose the competencies they would like to develop. A system administrator has set up a list of competencies beforehand. Then they define development objectives for the selected competencies. The learners are instructed to define specific, measurable, achievable, relevant and time-bound development objectives. At this stage, the learners can read development recommendations for the selected competencies. These recommendations are intended as an inspiration for the verbalization of the development objectives. The third

step is then to fill in one development plan per competency. The learners have to define learning activities, including their deadline and their status (defined, started, good progress, completed). The learners are asked to update the status of each learning activity when there is a change, so the mentors can see the progress of the learning activities in the development plan. In addition, the learners are instructed to list names of persons they could ask for support, write down possible difficulties in developing this competency and how they could deal with these difficulties. The last step in filling in the development plan is to list possible measures for progress in developing this competency. In order to receive evaluations of others and do their self-evaluations, the learners use the feedback tool in enTalent. The first step in this feedback tool is to choose pairs of statements that describe positive and negative behavior of the particular competency. Then the learners can send a link to an online-questionnaire to their feedback providers and themselves. This online-questionnaire contains the chosen pairs of statements and a 5-point Likert scale to evaluate the accuracy of the behaviors described by the pairs of statements.

E-learning tools have to “incorporate the right learning principles (...) into the design of the program” (p. 87) in order to be effective (Salas et al., 2012). enTalent contains the aforementioned quality aspects of development plans: enTalent instructs the learners (1) to write down development objectives and plans (Byham, 2005; Grote, 1996), (2) to define objectives that are clear, behavioral and measurable (Bracken et al., 2001; Byham, 2005; Grote, 1996), (3) to list possible difficulties and ways to deal with them (Bracken et al., 2001; Byham, 2005) and (4) it encourages the learners to perform new behavior in the work environment (Salas et al., 2012). Furthermore, enTalent contains a tool for pre- and post-evaluation (J. Adams et al., 2009) and gives mentors the possibility to monitor the learners’ activities. Pre- and post-evaluation in enTalent includes self-evaluation of the learners, which leads to self-reflection on learning experiences and can thereby support

learning progress (Tynjälä & Häkkinen, 2005). Given all these features, we believe that the use of enTalent will lead to competency development. We therefore propose:

Hypothesis 1: After having used enTalent for at least two months, the self-evaluations and evaluations by others will have improved significantly.

In order to test the effectiveness of using development plans such as those offered by enTalent, a reduced version of enTalent with only the feedback tool will serve as comparison. The users of the latter version have to come up with development objectives and development plans on their own without the instructions and the structure provided by enTalent. In other words, the users of the reduced version will not profit from the instructions and detailed development plans in enTalent, but only from the feedback tool. This gives the learners using the regular version of enTalent an advantage for their competency development. In order to make sure that the difference between the two groups is not simply caused by the fact that the treatment group defines development objectives and plans, we asked the participants of the control group via e-mail to define 1-3 development objectives that are realistic, attainable and measurable. Furthermore we asked them to plan how they want to attain these objectives. Thereby the difference between the two groups is reduced to defining objectives and planning the development with or without enTalent's detailed instructions and development plans. As these instructions and development plans contain many of the quality aspects mentioned above, we believe that using the regular version of enTalent leads to greater competency development than using the reduced version. Therefore, we propose:

Hypothesis 2: The users of the regular version of enTalent will have a greater improvement of their self-evaluations and evaluations by others than the users of the reduced version of enTalent.

In order to gain comprehensive information about the participants, we will also collect sociodemographic data such as gender, age group, education level, and years of experience with computers and the Internet. Furthermore, we measure the personality traits, the time management behavior and the Internet self-efficacy of the participants in order to control for their possible effect on the competency development. In the following, we will discuss how these factors could influence competency development and the use of enTalent.

Five-factor model of personality. There are many definitions for the concept of personality (Amelang & Bartussek, 2001). One example is the definition of Ryckman (2004) that personality is a “dynamic and organized set of characteristics possessed by a person that uniquely influences his or her cognitions, motivations, and behaviours in various situations” (p. 4). So personality is a set of characteristics or traits, that is relatively enduring and varies among individuals (Bilsky & Schwartz, 1994; McCrae & Costa Jr, 1997). One of the most widespread models of personality traits is the five-factor model, whose factors are also called “Big Five” (Digman, 1990; McCrae & Costa Jr, 1997). The five factors are (1) agreeableness (i.e., the tendency to act in a cooperative and helpful way), (2) conscientiousness (i.e., the tendency to be reliable, organized and ambitious), (3) extraversion (i.e., the tendency to like feeling excitement and being with others), (4) neuroticism (i.e., the tendency to have negative feelings), and (5) openness to experience (i.e., the tendency to be curious and imaginative). The first published questionnaire measuring the Big Five factors is the NEO personality inventory (Costa & McCrae, 1985).

Since its publication, this questionnaire and its shorter version NEO-FFI have several times been revised and validated (Digman, 1990). In this study, we will use the NEO-FFI 30 inventory to measure the Big Five factors (Körner et al., 2008).

The personality traits of learners can influence learning processes in manifold ways. For instance, the motivation to learn is linked to learner characteristics such as conscientiousness, extraversion, openness to experience and proactive personality (Major, Turner, & Fletcher, 2006). Conscientiousness, extraversion and openness to experience are also predictors of training proficiency, as Barrick and Mount (1991) showed in their meta-analysis on the relationship between personality traits and job performance. A more recent meta-analysis also found that conscientiousness and openness to experience are valid predictors of training proficiency (Salgado & Táuriz, 2012). Conscientiousness is also positively correlated with training success in trainings that demand individual responsibility from the learners (Boyce, Zaccaro, & Wisecarver, 2010; Major et al., 2006; Maurer, Lippstreu, & Judge, 2008). In e-learning, extraversion and openness to experience can be moderators of the correlation between learner control and training performance (Orvis, Brusso, Wasserman, & Fisher, 2011). As regards the two factors neuroticism and agreeableness, we did not find references in the cited meta-analyses that they have a significant impact on learning processes. Both Salgado and Táuriz (2012) and Barrick and Mount (1991) did not find that agreeableness and neuroticism are valid predictors for training proficiency. We believe that the personality traits conscientiousness, extraversion and openness to experience can have an effect on competency development, but not agreeableness and neuroticism. However, we will include all of the Big Five factors as covariates in the analysis to control for their influence on competency development.

Time management behavior. Self-regulatory actions such as time management are necessary for achieving long-term goals (Gerhardt, 2007; van Eerde, 2003). For example in

order to achieve career goals, employees have to engage in career self-management behaviors and regulate their actions (Raabe, Frese, & Beehr, 2007). In a study with Dutch employees, time management training increased the time management abilities of the participants and reduced procrastination (van Eerde, 2003). The advice literature contains popular time management books that aim to help their readers to become more productive and efficient (Allen, 2001; Lakein, 1973). Macan (1994) developed a process model of time management that consists of four factors: (1) the setting of goals and priorities, (2) the mechanics of time management (e.g., making lists and scheduling), (3) the preference for organization (i.e., an organized and methodical working style), and (4) the perceived control of time (i.e., the sense of mastery over one's own time). These factors can be measured by the Time Management Behavior Scale (TMBS) of Macan, Shahani, Dipboye, and Phillips (1990). The factorial structure of the scale was supported by a confirmatory factor analysis (G. A. Adams & Jex, 1997) and the scale has been used in different studies (e.g., Jex & Elacqua, 1999; König & Kleinmann, 2006).

In competency development processes, the learners try to achieve medium or long term development objectives. Time management is especially important in development processes where the learners have to schedule and prioritize their learning activities on their own initiative. In these processes, learners have to set goals and priorities, work in an organized way, and know the mechanics of time management. So learners with a more effective time management might have an advantage over learners with less effective time management behavior. Therefore we will measure the time management behavior of our participants in order to control for its influence on the competency development.

Internet self-efficacy. As enTalent is a Web-based tool, the participants' Internet self-efficacy can have an influence on its use. Self-efficacy is a judgment of one's capabilities to achieve certain goals in prospective situations (Bandura, 1982). High self-

efficacy means that persons are convinced that they can master specific situations or tasks and therefore will reach their goals. So these persons will probably invest more effort when faced with difficulties than persons with low self-efficacy. The latter will probably invest only little effort to overcome obstacles and maybe avoid certain situations altogether, because they are convinced that they will not reach their goals. Internet self-efficacy is then “the belief in one's capabilities to organize and execute courses of Internet actions required to produce given attainments” (Eastin & LaRose, 2000, p. 1). So if the Internet self-efficacy of users is high, they are convinced that they are able to use Internet-based applications and services successfully. For example, Torkzadeh and van Dyke (2002) found that higher Internet self-efficacy is related to more positive attitudes towards computers. And Hsu and Chiu (2004) found a positive relationship between Internet self-efficacy and attitudes towards the use of a Web-based service. In a study about the influence of Internet self-efficacy on Web-based learning, the students with higher Internet self-efficacy showed better information seeking strategies and better learning results (Tsai & Tsai, 2003).

If the participants of this study do not feel confident enough to perform basic Internet-related activities, they might not use enTalent in the expected way. For example, they might avoid to fill in the development plans or to select the statement pairs for the evaluation. Therefore we will measure the Internet self-efficacy of the participants in order to control for the influence of this factor on the competency development.

In the current study, we tested the Web-based tool enTalent with two groups of participants in order to test two different versions of this tool. Furthermore, we measured the possible covariates Big Five personality dimensions, time management behavior, and Internet self-efficacy via an online questionnaire.

Method

Participants

We sent e-mails to employed persons in French-speaking Switzerland asking for their participation in our study. In this e-mail, we described the purpose and process of the study and included a link to a video about the platform enTalent. The participants needed to be either working or doing an internship and willing to ask a colleague or supervisor for an evaluation. We offered a gift voucher with a value of 20 Swiss francs from the retail chains “Fnac” or “Payot” to all persons who would participate in our study. Furthermore, we wrote that every participant would take part in the drawing of one “Smartbox” with a value of 200 Swiss francs. A “Smartbox” is a gift voucher for restaurants, hotels, activities, or events.

Ninety persons indicated their willingness to participate in our study, while 71 finished it. So the final sample consisted of 71 participants, which were randomly allocated to either the treatment group ($n = 36$) or the control group ($n = 35$). Fifty-three participants of our final sample were female and 18 male. Table 1 depicts the age groups of the treatment and the control group. There were no significant age differences between male and female participants, $X^2(9, N = 71) = 12.08, p = .20$.

Forty participants held a degree from a university or university of applied sciences and 48 were Swiss nationals. Among the non-Swiss participants, the majority were French nationals (twelve participants), while five were Italian, four were Spanish, one was Portuguese and one was from Benin. Forty-six participants had a degree of employment from 90% to 100%, eight from 70% to 80%, six from 50% to 60%, while eleven participants indicated a degree of employment under 50%. Fourteen participants indicated that they had used computers since five to ten years, 35 participants had used computers since eleven to 15 years and the remaining 22 participants had used computers even longer.

Twenty-six participants used the Internet since five to ten years and 35 participants since eleven to 15 years. There were no significant differences between the treatment and the control group regarding the demographical variables discussed above.

Table 1.

Age Groups of Participants

Age Group	Treatment Group (<i>n</i> = 36)		Control Group (<i>n</i> = 35)	
	<i>Frequency</i>	<i>Percent</i>	<i>Frequency</i>	<i>Percent</i>
15-20	2	5.6	2	5.7
21-25	11	30.6	17	48.6
26-30	8	22.2	5	14.3
31-35	3	8.3	2	5.7
36-40	3	8.3	2	5.7
41-45	2	5.6	1	2.9
46-50	5	13.9	3	8.6
51-55	1	2.8	1	2.9
56-60	0	0.0	2	5.7
61-65	1	2.8	0	0.0

Note. Values for age are expressed in years.

Procedure

First we sent an e-mail to all participants with the link to an online questionnaire measuring demographical variables, the Big 5 personality dimensions, time management behavior, and Internet self-efficacy. In order to answer all questions, the participants needed at most 15 to 20 minutes. After having clicked on the link in the e-mail, the

participants were guided through the process by instructions in the survey. Furthermore, there were already instructions in the e-mail and an e-mail address in case the participants had any questions or problems.

After this questionnaire had been completed, the participants received an e-mail with their access data for enTalent. They also received a user guide either for the treatment group or for the control group, depending on their particular experimental condition. The participants were asked to choose one competency in enTalent and to try to develop this competency for the next two months. They could choose one of three different soft skills from the competency model of papilio Ltd. Table 2 depicts these three competencies and their definitions as they were shown in enTalent. Most participants (31) chose the competency “Acting under pressure” for development during two months. Twenty-two chose “Structuring tasks and projects” and 18 chose “Generating solutions”. We offered only three competencies in order to reduce variation between participants, but we did not offer only one competency because we still wanted the participants to have a choice. And we deliberately offered these specific competencies because we thought that all our participants probably need them in order to be successful in their professional life. So we thought that these three competencies are relevant for all participants and not just to some.

After the participants of the treatment group had chosen the competency they wanted to develop, they defined their development objectives in enTalent and filled in the development plan. The participants of the control group did not have the possibility to write down their objectives in enTalent or the development plan. But in our e-mail we asked them to write down 1-3 development objectives that are realistic, attainable and measurable. Furthermore, we asked them to make a plan how they want to reach these goals during the upcoming two months. Thereby we made sure that the difference between the two experimental conditions was mainly based upon the fact that the treatment group

used enTalent to define development objectives and fill in a development plan, while the control group did not have these options in enTalent.

Table 2.

Competencies with Definitions

Competency	Definition
Acting under pressure	Remains cool under pressure and does not become discouraged by work volume, complications or setbacks.
Generating solutions	Produces imaginative ideas and solutions; thinks 'out of the box'; promotes change and novelty. Uses common sense.
Structuring tasks and projects	Uses a structured approach; plans ahead, defines priorities, identifies milestones and allocates resources effectively.

Note. Adapted from the competency model of papilio Ltd., Zurich, Switzerland.

Regardless of their experimental conditions, all participants had to choose three to six pairs of statements for their self-evaluation and for the evaluation by others. The statement pairs described either positive or negative behavior of the particular competency. The participants could choose among a list of six statement pairs in enTalent. Tables 3a to 3c in Appendix 1 depict these pairs of statements. Afterwards the participants sent a link to an online questionnaire with these statements to their feedback providers and themselves. They only had to fill in the name and e-mail address of their feedback provider in enTalent. And they had to tick the box „self-evaluation“, so that they received a link as well. In this study, the feedback providers were mainly colleagues from their work. At the end of the study, all participants had to ask their feedback provider for a second feedback and fill in the self-evaluation again. Thereby we obtained two evaluations and self-evaluations per participant with the same statement pairs. During the study, we sent several e-mails to the

participants in order to remind them of filling in the development plan, asking others for feedback and to fill in their self-evaluations. As the final step of the study, we sent a link for another online questionnaire to all participants. In this questionnaire we asked the participants to indicate their general opinion about enTalent, e.g. how much they thought that enTalent had helped them developing the selected competency. Furthermore, we asked how often they had used enTalent and how appropriate they found the three competencies we asked them to choose among.

Measures

Competency development. We measured the competency development of the participants via the two self-evaluations and the two evaluations by others, which were all carried out with the feedback tool in enTalent. The participants and their feedback providers rated the statement pairs on a 5-point Likert scale ranging from 1 = *requires significant development* to 5 = *very strong*, with 3 = *meets expectations*.

Five-factor model of personality (Big Five). In order to measure the personality traits of our participants according to the five-factor model, we let the participants fill in the NEO-FFI 30 personality inventory (Körner et al., 2008). The 5-point Likert scale ranged from 1 = *strongly disagree* to 5 = *strongly agree*, with 3 = *neutral*. Internal consistencies of the factors were (1) $\alpha = .62$ for the factor Agreeableness, (2) $\alpha = .76$ for the factor Conscientiousness, (3) $\alpha = .68$ for Extraversion, (4) $\alpha = .82$ for Neuroticism, (5) and $\alpha = .79$ for the factor Openness to experience.

Time management behavior. We used the Time Management Behavior Scale (TMBS) of Macan, Shahani, Dipboye, and Phillips (1990) to measure the participants' ability to manage their own time. The 5-point Likert scale ranged from 1 = *seldom true* to 5 = *very often true*, with 3 = *true about as often as not*. The Cronbach's alpha coefficients for the factors of this scale were (1) $\alpha = .73$ for Setting goals and priorities, (2) $\alpha = .77$ for

Mechanics of time management, (3) $\alpha = .40$ for Preference for organization, (4) and $\alpha = .65$ for Perceived control of time. As the internal consistency of the factor “Preference for organization” was very low, we omitted this factor from further analyses.

Internet self-efficacy. We used the general Internet self-efficacy scale (GISE) of Hsu and Chiu (2004) to measure the participants’ self-efficacy of Internet actions. The 19 items of this scale start with “I feel confident...” and then describe an Internet-related activity (e.g., *I feel confident finding information by using a search engine, or I feel confident downloading files and software*). The participants rated their level of agreement on a 7-point Likert scale from 1 = *strongly disagree* to 7 = *strongly agree*, with 4 = *neutral*. Cronbach’s alpha for this scale was $\alpha = .91$.

Opinion on enTalent. We created a scale measuring the participants’ opinion on enTalent. Table 4 depicts the English translation of the eight items of this scale as well as their means and standard deviations (see Appendix 2). The participants indicated their degree of approval on a 5-point Likert scale. The scale anchors ranged from 1 = *strongly disagree* to 5 = *strongly agree*, with 3 = *indifferent*. The Cronbach’s alpha coefficient for this scale was $\alpha = .77$.

Further questions in this online questionnaire were (1) how often the participants had used enTalent (*several times per week, once per week or less than two times per month*), and (2) how relevant the offered competencies were for them (5-point Likert scale from 1 = *very inappropriate* to 5 = *very appropriate*, with 3 = *neutral*).

Results

Tables 5 and 6 list means and standard deviations for the evaluations and self-evaluations of the participants. Table 5 lists the descriptive statistics for the treatment group for the first (time 1) and the second round of evaluations (time 2). Table 6 lists these descriptive statistics for the control group. Both for time 1 as well as for time 2 we calculated the mean

of the self-evaluations and the evaluations by others to have an overall evaluation. The fact that both evaluations correlated significantly with each other ($r = .51, p < .001$ at time 1; $r = .57, p < .001$ at time 2) indicates that the mean of self-evaluations and evaluations by others is a valid measure for the overall evaluation, both for time 1 as well as for time 2.

Table 7 lists the mean and standard deviations for the NEO-FFI 30, the TMBS and the GSIE. Table 8 in Appendix 3 depicts the intercorrelations for the main study variables. We conducted a 2x2 analysis of variance (ANOVA) with repeated measures to test the differences of the overall evaluations (self + others) between time 1 and time 2, and the differences of the overall evaluations between the treatment and the control group. So time was the within-subjects factor and the experimental condition was the between-subjects factor. We included the following variables in the analysis in order to control for their influence on the relationship between time, experimental condition and the overall evaluations: (1) two dummy variables for the selected competency, (2) sociodemographic variables (gender, age group, nationality, education level, degree of employment, years of computer use, years of Internet use), (3) the five factors of the NEO-FFI 30 scale, (4) the subscales of the Time Management Behavior Scale (TMBS) without the subscale “Preference for organization” as its internal consistency was low, and (5) the General Internet self-efficacy scale. The results did neither confirm Hypothesis 1 nor Hypothesis 2: Neither the difference between time 1 and time 2 ($F(1, 51) = 0.32, p = .58$) nor the difference between the treatment and the control group ($F(1, 51) = 0.66, p = .42$) were significant. Furthermore, only the control variable perceived control of time had a significant effect on the within-subjects factor time ($F(1, 51) = 6.81, p = .01$). The other control variables had no significant effect.

Table 5.

Means and Standard Deviations for Competency Development of the Treatment Group

Evaluation by	t1		t2	
	<i>M (SD)</i>	95% CI	<i>M (SD)</i>	95% CI
Self	3.13 (0.69)	[2.89, 3.36]	3.63 (0.54)	[3.44, 3.81]
Others	3.72 (0.78)	[3.46, 3.98]	3.87 (0.77)	[3.61, 4.13]
Combined	3.42 (0.65)	[3.20, 3.64]	3.75 (0.60)	[3.55, 3.95]

Note. $N = 36$; t1 = time 1; t2 = time 2; CI = confidence interval

Table 6.

Means and Standard Deviations for Competency Development of the Control Group

Evaluation by	t1		t2	
	<i>M (SD)</i>	95% CI	<i>M (SD)</i>	95% CI
Self	3.20 (0.72)	[2.95, 3.45]	3.77 (0.74)	[3.52, 4.03]
Others	3.64 (0.80)	[3.36, 3.91]	3.82 (0.67)	[3.59, 4.05]
Combined	3.42 (0.65)	[3.19, 3.64]	3.80 (0.61)	[3.59, 4.01]

Note. $N = 35$; t1 = time 1; t2 = time 2; CI = confidence interval

We then repeated this 2x2 repeated measures ANOVA, once with self-evaluations as the dependent variable and once with evaluations by others as the dependent variable. The difference between time 1 and time 2 was neither significant for the self-evaluations ($F(1, 51) = 0.55, p = .46$) nor for the evaluation by others ($F(1, 51) = 0.01, p = .91$). We found the same for the difference between the two experimental conditions: Neither the difference in the self-evaluations ($F(1, 51) = 2.00, p = .16$) nor in the evaluations by others ($F(1, 51) = 0.02, p = .88$) were significant. For the control variables, only two had a significant effect. With evaluation by others as dependent variable, the control variable perceived control of time had a significant effect on the within-subject factor time ($F(1, 51) = 7.95, p = .01$). With self-evaluation as dependent variable, the effect of degree of employment on the within-subjects factor time was significant ($F(1, 51) = 3.90, p = .05$).

Forty-five participants filled in the last online questionnaire about their opinion and their use of enTalent. Concerning the eight items in Table 4 (see Appendix 2), overall the participants had a neutral opinion about enTalent ($M = 3.24, SD = 0.71$). In tendency, the participants found enTalent rather easy to use, the workload reasonable and the instructions understandable. However, 38 participants indicated that they had used enTalent “less than once per week”. Seven participants indicated that they had used enTalent “once per week” and no participant indicated “several times per week”. Two participants found the three offered competencies inappropriate, six indicated a neutral attitude towards the offered competencies, 31 found them appropriate and six very appropriate.

Table 7.

Means and Standard Deviations for NEO-FFI 30, TMBS and GISE

Variables	<i>M</i>	<i>SD</i>
NEO-FFI 30 (Five-factor model of personality)		
Agreeableness	4.10	0.51
Conscientiousness	4.18	0.51
Extraversion	3.88	0.52
Neuroticism	2.45	0.75
Openness to experience	3.25	0.76
Time management behavior scale		
Setting goals and priorities	3.45	0.56
Mechanics of time management	3.13	0.75
Perceived control of time	3.54	0.72
General Internet self-efficacy scale		
	24.07	0.77

Note. N = 71.

Discussion

We studied the effectiveness of a Web-based tool for competency development that offers structured and comprehensive development plans and a feedback tool for (self-) evaluations. We expected that the use of this tool for two months would lead to significant competency development. Secondly, we expected that the use of this tool would lead to better competency development than only using the feedback tool.

Competency development

The use of enTalent did not lead to significant competency development. There was an increase in the evaluations and self-evaluations from time 1 to time 2 for both groups, but this increase was not significant. In the following, we will discuss three possible reasons why this increase was not significant: a possible lack of motivation, the difficulty to define development objectives and activities for oneself, and the length of the learning period.

Motivation of the participants. Very likely, the participants in this study did not have the same motivation as participants of real development processes in organizations. The participants of this study asked colleagues for evaluations and not supervisors, we controlled their activities in enTalent and send the reminder mails and not real-life mentors, and progress was not rewarded. All this might have reduced their motivation to develop the selected competency compared to real development processes in organizations.

Defining development objectives and activities for oneself. Beyond that, it could also be that learners who try to develop the competencies offered in this study need more help with defining development objectives and development activities. These competencies are soft skills and it might be difficult for many participants to come up with ideas on their own how to develop these competencies. As support, there are development recommendations for each competency at the first step in enTalent where participants define their development objectives. But it might be that many participants did not read these development recommendations, or that they were not suitable for many participants. So one reason why the competency development was not significant might be the fact that participants were unable to come up with appropriate development objectives and development activities.

Length of the learning period. Another possible reason might be that the learning period was too short. Maybe the competency development would have been significant if the process would have been longer than two months. But then again, there are no indications that two months are not long enough. In other studies on computer-aided soft skills development, the time period was even shorter (J. Adams et al., 2009; Bruns et al., 2013).

Of the control variables, two interactions were significant. We will now turn to the discussion of these interactions.

Control variables. Perceived control of time had a significant effect on the increase of the evaluations by others. So participants with a higher sense of mastery over their time were evaluated better by others in the selected competencies than participants with a lower perceived control of time. This was not hypothesized by us and comes as a surprise. People who feel in control of their time are more confident to accomplish their tasks in due time, which might in turn lead others to believe that they are also more competent. So our participants with a higher perceived control of time were probably less stressed. This might have led their colleagues who evaluated them to believe that they are also capable.

The other significant relationship was between degree of employment and the increase in self-evaluations. So participants who work more seemed to feel more competent and gave themselves better evaluations. The competencies the participants could choose among were “Generating solutions”, “Structuring tasks and projects”, and “Acting under pressure”. It is likely that people who work more have also more opportunities to develop these competencies and therefore feel more capable in this regard than people who work less.

Experimental conditions

There was no significant difference between the treatment group that used the regular version of enTalent and the control group that only used the feedback tool in enTalent. This contradicts the assumption that competency development is more effective with written development objectives that are specific, measurable and achievable and development plans that incorporate certain quality aspects (e.g., scheduled development activities, or the possibility to make a list of potential obstacles and ways to deal with them). However, this result might be due to the fact that the tasks of the treatment and the control group were very similar. It is true that the control group neither had access to the development objectives part in enTalent with instructions and development recommendations, nor to the development plans. But we asked this group via e-mail to formulate development objectives that are realistic, attainable and measurable. And we told them to plan how to reach these objectives during the next two months. So while they were not using enTalent for this, they still were informed how to define development objectives and that they should make a plan. So it might be that this instruction was sufficient to create too much similarity between the two conditions.

Having said that, the fact remains that there were no significant differences between the two groups. So having the opportunity to use enTalent and therefore be guided through the process of defining development objectives and using comprehensive development plans is not enough to stimulate significant competency development. Neither is asking others for evaluations and doing self-evaluations, as both groups did. But this does not mean that these aspects do not have a positive influence on competency development. It could just be possible that other aspects are more important for competency development, for example the motivation of participants. So when these other aspects are given, a structured competency development process as the one embodied by enTalent is most

likely more effective than a less structured process with no detailed development plans and no (self-) evaluations. Thus, we still think that the following recommendations are helpful and valuable for supporting competency development: Development objectives should be clear, behavioral and measurable and not more than three (Bracken et al., 2001; Byham, 2005; Grote, 1996), development objectives and plans should be written down (Byham, 2005; Grote, 1996), and potential difficulties and ways to deal with them should be listed beforehand (Bracken et al., 2001; Byham, 2005). We also consider the notions of J. Adams et al. (2009) as helpful and right that in soft skill development the learners should self-select learning contents, plan learning activities in the workday life and make pre- and posttests for outcome evaluation. But maybe other factors have a stronger positive influence on competency development, for example motivation or extrinsic pressure. So some of the assumptions of adult learning theories, such as the idea that adults are self-directed learners (Knowles, 1973), might be too optimistic. Or the assumptions of self-determination theory that people have the need to feel competent and autonomous (Ryan & Deci, 2000) might not fit to competency development processes where progress is sometimes slow and often hard to measure. It could be that people need more guidance and direct help with defining development objectives and activities. Furthermore, in order to motivate learners to actually do what they have planned, clear directions and control might be necessary (Salas et al., 2012). Otherwise the learners might need a lot of self-discipline to actually do the development activities in the every-day working time besides their other tasks.

Limitations

The main limitation of this study is that its findings can only be generalized to a certain extent. In real-life development processes in organizations, the learners are often asked by their supervisors or by internal mentors to participate and to develop specific

competencies. Often, the development objectives are defined together with the supervisor or a mentor. In the real-life use of enTalent, the feedback providers are usually the supervisors and not colleagues. In our study, the feedback providers were colleagues and it was us who asked the participants to participate and develop a competency. Furthermore, it was us who send reminder mails when some participants did not fulfill a task in enTalent. And there was no extrinsic reward for the participants for good progress: No career move could be made, no bonus was at stake, and no supervisor who could be impressed was directly involved in the process. So the participants' motivation might have been reduced by all of this. In addition, we had no control over the activities of the participants other than their activity in enTalent. So whatever they did or not did as learning activities, the environments they work in, and many other things that can have a strong influence on the learning process were not seen or controlled by us.

Another limitation is the fact that the sample was very diverse. The participants were very different with regards to age, degree of employment, education, job, or nationality. However, enTalent was not developed for a specific user group and should be beneficial for the competency development of all kinds of users. And there were no significant differences between the two experimental conditions concerning the demographical variables. So the random allocation of participants to experimental conditions was successful.

Implications

Research on computer-aided soft skills development should investigate its key success factors. This includes research on the effectiveness of tools and methods, as it was already done in some studies (J. Adams et al., 2009; Bruns et al., 2013; Park & Wentling, 2007), including the present one. Future research should further test tools and methods, but also investigate the prerequisites of effective soft skills development with computer

technology. Especially the motivation of participants and how their motivation could be increased would be important avenues of future research. Processes in which the learners are not controlled and in which they self-select learning contents and activities correspond to the notions of self-determination theory (Ryan & Deci, 2000) and andragogy (Knowles, 1973). But future research should also test the effectiveness of processes in which the learners have clear and specific instructions, receive support from mentors, and in which their activities and their progress is monitored by supervisors. It might be that the latter type of development processes is more effective for competency development of employees.

A practical implication of our results is that participants of computer-aided soft skills development processes might have to be guided through the process by mentors. This includes the setting of development objectives, the planning of development activities, and the support and control of the realization of development activities. Without such support and mentoring, it might be too much to ask of participants to define learning objectives and activities, deal with motivation gaps and evaluate the progress all by themselves. So the proper support of mentors could improve the quality and effectiveness of competency development processes.

The training and development of employees often involves the setting of individual development objectives and the use of development plans. In the future, probably more and more computer-based applications will be used for this. This study extends research on the use of Web-based tools for competency development. Furthermore, it emphasizes the need for mentoring and guidance in competency development processes, as using detailed development plans for self-directed learning is not sufficient.

References

- Adams, G. A., & Jex, S. M. (1997). Confirmatory factor analysis of the time management behavior scale. *Psychological Reports, 80*, 225-226. doi: 10.2466/pr0.1997.80.1.225
- Adams, J., Hanesiak, R., Morgan, G., Owston, R., Lupshenyuk, D., & Mills, L. (2009). *Blended learning for soft skills development (2009-5)*. York, Canada: York University, Institute for Research on Learning Technologies. Retrieved from: <http://irlt.yorku.ca/reports/TechReport2009-5.pdf>
- Allen, D. (2001). *Getting things done: The art of stress-free productivity*. New York, NY: Viking.
- Ally, M. (2004). Foundations of educational theory for online learning. In T. A. Anderson & F. Elloumi (Eds.), *Theory and Practice of Online Learning* (pp. 3-31). Athabasca, Canada: Athabasca University.
- Amelang, M., & Bartussek, D. (2001). *Differentielle Psychologie und Persönlichkeitsforschung [Differential psychology and personality research]* (5 ed.). Stuttgart, Germany: Kohlhammer.
- Andrews, J., & Higson, H. (2008). Graduate employability, 'soft skills' versus 'hard' business knowledge: A European study. *Higher Education in Europe, 33*, 411-422. doi: 10.1080/03797720802522627
- Appelbaum, S. H., Harel, V., & Shapiro, B. (1998). The developmental assessment centre: The next generation. *Career Development International, 3*, 5-12. doi: 10.1108/13620439810368574
- Ballantyne, I., & Povah, N. (2004). *Assessment and development centres* (Second ed.). Aldershot, England: Gower.

- Bandura, A. (1982). Self-efficacy mechanisms in human agency. *American Psychologist*, *37*, 122-147. doi: 10.1037/0003-066X.37.2.122
- Barrick, M. R., & Mount, M. K. (1991). The Big Five personality dimensions and job performance: A meta-analysis. *Personnel Psychology*, *44*, 1-26. doi: 10.1111/j.1744-6570.1991.tb00688.x
- Bergmann, B., & Pietrzyk, U. (2000). Lernanforderungen von Arbeitsaufgaben und Kompetenzentwicklung [Competence development in the work process]. *Arbeit*, *9*, 40-53.
- Bilsky, W., & Schwartz, S. H. (1994). Values and personality. *European Journal of Personality*, *8*, 163-181. doi: 10.1002/per.2410080303
- Blume, B. D., Ford, J. K., Baldwin, T. T., & Huang, J. L. (2010). Transfer of training: A meta-analytic review. *Journal of Management*, *36*, 1065-1105. doi: 10.1177/0149206309352880
- Boyce, L. A., Zaccaro, S. J., & Wisecarver, M. Z. (2010). Propensity for self-development of leadership attributes: Understanding, predicting, and supporting performance of leader self-development. *Leadership Quarterly*, *21*, 159-178. doi: 10.1016/J.Leaqua.2009.10.012
- Bracken, D. W., Timmreck, C. W., & Church, A. H. (2001). *The handbook of multisource feedback*. San Francisco, CA: John Wiley & Sons.
- Bruns, A. K., Keith, N., & Müller, S. C. (2013). *Self-regulated performance improvement through deliberate practice in organizations: The case of female employees and skills to career advancement*. Paper presented at the Sixteenth Congress of the European Association of Work and Organizational Psychology, Münster, Germany.

- Byham, T. (2005). *Factors affecting the acceptance and application of developmental feedback from an executive assessment program*. (Electronic Thesis or Dissertation), University of Akron, OhioLINK Electronic Theses and Dissertations Center. Retrieved March 17th, 2014, from: <https://etd.ohiolink.edu/>
- Cederblom, D. (1982). The performance appraisal interview: A review, implications, and suggestions. *The Academy of Management Review*, 7, 219-227. doi: 10.2307/257300
- Chen, H.-J. (2010). Linking employees' e-learning system use to their overall job outcomes: An empirical study based on the IS success model. *Computers & Education*, 55, 1628-1639. doi: 10.1016/j.compedu.2010.07.005
- Costa, P. T., & McCrae, R. R. (1985). *The NEO personality inventory manual*. Odessa, FL: Psychological Assessment Resources.
- Digman, J. M. (1990). Personality structure: Emergence of the five-factor model. *Annual Review of Psychology*, 41, 417-440. doi: 10.1146/annurev.ps.41.020190.002221
- Engelbrecht, A. S., & Fischer, A. H. (1995). The managerial performance implications of a developmental assessment center process. *Human Relations*, 48, 387-404. doi: 10.1177/001872679504800405
- Gerhardt, M. (2007). Teaching self-management: The design and implementation of self-management tutorials. *Journal of Education for Business*, 83, 11-18. doi: 10.3200/JOEB.83.1.11-18
- Grote, R. C. (1996). *The complete guide to performance appraisal*. New York City, NY: AMACOM Div American Mgmt Assn.
- Heckman, J. J., & Kautz, T. (2012). Hard evidence on soft skills. *Labour Economics*, 19, 451-464. doi: 10.1016/j.labeco.2012.05.014

- Hoffmann, T. (1999). The meanings of competency. *Journal of European Industrial Training, 23*, 275-286. doi: 10.1108/03090599910284650
- Hsu, M. H., & Chiu, C. M. (2004). Internet self-efficacy and electronic service acceptance. *Decision Support Systems, 38*, 369-381. doi: 10.1016/J.Dss.2003.08.001
- Huitt, W. (2011). Motivation to learn: An overview. *Educational Psychology Interactive*. Retrieved March 17th, 2014, from: <http://www.edpsycinteractive.org/topics/motivation/motivate.html>
- Illeris, K. (2003). Workplace learning and learning theory. *Journal of Workplace Learning, 15*, 167-178. doi: 10.1108/13665620310474615
- International Board of Standards for Training, P. a. I. (2006). Competencies. Retrieved October 28th, 2011, from: <http://www.ibstpi.org/competencies.htm>
- Islas, E., Pérez, M., Rodriguez, G., Paredes, I., Ávila, I., & Mendoza, M. (2007). E-learning tools evaluation and roadmap development for an electrical utility. *Journal of Theoretical and Applied Electronic Commerce Research, 2*, 63-75. Retrieved from: <http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.145.2798>
- Jex, S. M., & Elacqua, T. C. (1999). Time management as a moderator of relations between stressors and employee strain. *Work and Stress, 13*, 182-191. doi: 10.1080/026783799296138
- Jones, R. G., & Whitmore, M. D. (1995). Evaluating developmental assessment centers as interventions. *Personnel Psychology, 48*, 377-388. doi: 10.1111/j.1744-6570.1995.tb01762.x
- Knowles, M. (1973). *The adult learner: A neglected species*. Houston, TX: Gulf Publishing Company.
- Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development* (Vol. 1). Englewood Cliffs, NJ: Prentice-Hall.

- König, C. J., & Kleinmann, M. (2006). Individual differences in the use of time management mechanics and in time discounting. *Individual Differences Research, 4*, 194-207. Retrieved March 17th, 2014, from: <http://psycnet.apa.org/psycinfo/2006-12834-005>
- Körner, A., Geyer, M., Roth, M., Drapeau, M., Schmutzer, G., Albani, C., . . . Brähler, E. (2008). Personality assessment with the NEO-five-factor inventory: The 30-item-short-version (NEO-FFI-30). *Psychotherapie, Psychosomatik, Medizinische Psychologie, 58*, 238-245. doi: 10.1055/s-2007-986199
- Lakein, A. (1973). *How to get control of your time and your life*. New York City, NY: P. H. Wyden.
- Lucia, A. D., & Lepsinger, R. (1999). *The art and science of competency models: Pinpointing critical success factors in organizations*. San Francisco, CA: Jossey-Bass/Pfeiffer.
- Macan, T. H. (1994). Time management: Test of a process model. *Journal of Applied Psychology, 79*, 381-391. doi: 10.1037/0021-9010.79.3.381
- Macan, T. H., Shahani, C., Dipboye, R. L., & Phillips, A. P. (1990). College students' time management: Correlations with academic performance and stress. *Journal of Educational Psychology, 82*, 760-768. doi: 10.1037/0022-0663.82.4.760
- Major, D. A., Turner, J. E., & Fletcher, T. D. (2006). Linking proactive personality and the Big Five to motivation to learn and development activity. *Journal of Applied Psychology, 91*, 927-935. doi: 10.1037/0021-9010.91.4.927
- Maurer, T. J., Lippstreu, M., & Judge, T. A. (2008). Structural model of employee involvement in skill development activity: The role of individual differences. *Journal of Vocational Behavior, 72*, 336-350. doi: 10.1016/J.Jvb.2007.10.010

- McCrae, R. R., & Costa Jr, P. T. (1997). Personality trait structure as a human universal. *American Psychologist*, *52*, 509-516. doi: 10.1037/0003-066X.52.5.509
- Morgan, G., & Adams, J. (2009). Pedagogy first: Making web-technologies work for soft skills development in leadership and management education. *Journal of Interactive Learning Research*, *20*, 129-155. Retrieved from: <http://www.editlib.org/p/25256>
- Murphy, K. R., & Cleveland, J. (1995). *Understanding performance appraisal: Social, organizational, and goal-based perspectives*. Thousand Oaks, CA: Sage Publications.
- Orvis, K. A., Brusso, R. C., Wasserman, M. E., & Fisher, S. L. (2011). E-nabled for e-learning? The moderating role of personality in determining the optimal degree of learner control in an e-learning environment. *Human Performance*, *24*, 60-78. doi: 10.1080/08959285.2010.530633
- Park, J.-H., & Wentling, T. (2007). Factors associated with transfer of training in workplace e-learning. *Journal of Workplace Learning*, *19*, 311-329. doi: 10.1108/13665620710757860
- Raabe, B., Frese, M., & Beehr, T. A. (2007). Action regulation theory and career self-management. *Journal of Vocational Behavior*, *70*, 297-311. doi: 10.1016/J.Jvb.2006.10.005
- Riggio, R. (2002). Employee training and development. *Introduction to industrial/organizational psychology* (4th ed.). Upper Saddle River, NJ: Prentice-Hall.
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, *55*, 68. doi: 10.1037/0003-066X.55.1.68
- Ryckman, R. M. (2004). *Theories of personality* (8th ed.). Belmont, CA: Thomson/Wadsworth.

- Salas, E., Tannenbaum, S. I., Kraiger, K., & Smith-Jentsch, K. A. (2012). The science of training and development in organizations: What matters in practice. *Psychological Science in the Public Interest*, *13*, 74-101. doi: 10.1177/1529100612436661
- Salgado, J. F., & Táuriz, G. (2012). The five-factor model, forced-choice personality inventories and performance: A comprehensive meta-analysis of academic and occupational validity studies. *European Journal of Work and Organizational Psychology*, *23*, 3-30. doi: 10.1080/1359432X.2012.716198
- Salvisberg, A. (2010). *Soft Skills auf dem Arbeitsmarkt: Bedeutung und Wandel [Soft skills for the labor market: importance and change]*. Zürich, Switzerland: Seismo.
- Sampson, D., & Fytros, D. (2008). Competence models in technology-enhanced competence-based learning. In H. H. Adelsberger, K. Kinshuk, J. M. Pawlowski & D. G. Sampson (Eds.), *Handbook on Information Technologies for Education and Training* (pp. 155-177). Berlin, Germany: Springer.
- Schön, D. A. (1987). *Educating the reflective practitioner*. San Francisco, CA: Jossey-Bass.
- Shippmann, J. S., Ash, R. A., Battista, M., Carr, L., Eyde, L. D., Hesketh, B., . . . Prien, E. (2000). The practice of competency modeling. *Personnel Psychology*, *53*, 703-740. doi: 10.1111/j.1744-6570.2000.tb00220.x
- Thornton, G. C., & Krause, D. E. (2009). Selection versus development assessment centers: An international survey of design, execution, and evaluation. *The International Journal of Human Resource Management*, *20*, 478-498. doi: 10.1080/09585190802673536
- Torkzadeh, G., & Van Dyke, T. P. (2002). Effects of training on Internet self-efficacy and computer user attitudes. *Computers in Human Behavior*, *18*, 479-494. doi: 10.1016/j.dss.2003.08.001

- Tsai, M.-J., & Tsai, C.-C. (2003). Information searching strategies in Web-based science learning: The role of Internet self-efficacy. *Innovations in Education and Teaching International, 40*, 43-50. doi: 10.1080/1355800032000038822
- Tynjälä, P., & Häkkinen, P. (2005). E-learning at work: Theoretical underpinnings and pedagogical challenges. *The Journal of Workplace Learning, 17*, 318-336. doi: 10.1108/13665620510606742
- van Eerde, W. (2003). Procrastination at work and time management training. *Journal of Psychology, 137*, 421-434. doi: 10.1080/00223980309600625
- White, R. W. (1959). Motivation reconsidered: The concept of competence. *Psychological Review, 66*, 297. doi: 10.1037/h0040934
- Wilson, J. P., & Western, S. (2000). Performance appraisal: An obstacle to training and development? *Journal of European Industrial Training, 24*, 384 - 391. doi: 10.1108/03090590010377754

Appendix 1

Table 3a.

Pairs of Statements for the Competency “Generating solutions” for the Evaluation Form

Competency “Generating solutions”	
Positive Statement	Negative Statement
is open for radical solutions	stays away from radical solutions
adds fresh and unconventional insights	comes up with nothing new or recycled ideas
discovers/sees potential in a situation and it's chances / opportunities	discovers few available opportunities
produces lots of ideas and suggestions	comes up with few ideas and suggestions
uses common sense when dealing with tasks/problems	ignores risks and obstacles; acts without thinking
identifies available ideas for solutions	overlooks available solutions

Note. Adapted from the competency model of papilio Ltd., Zurich, Switzerland.

Table 3b.

Pairs of Statements for the Competency “Structuring tasks and projects” for the Evaluation Form

Competency “Structuring tasks and projects”	
Positive Statement	Negative Statement
structures own activities	gives little structure to own activities
checks progress of task fulfilment regularly	does not check on progress of own tasks
allocates resources effectively	neglects the allocation of resources
compiles long term and focused plans	works without plans and only with short term goals
designs exact plans as to what is to be done and when	does not plan in advance
knows how to concentrate on core problems	treats every task as being of equal importance

Note. Adapted from the competency model of papilio Ltd., Zurich, Switzerland.

Table 3c.

Pairs of Statements for the Competency “Acting under pressure” for the Evaluation Form

Competency “Acting under pressure”	
Positive Statement	Negative Statement
tolerates stressful situations	loses head in stressful situations
deals well with pressure	works ineffectively in times of stress
finds ways to balance stressful work phases	shows a tendency to get immersed in situations of heavy work loads and forgets to recharge own batteries
does not get evasive in difficult situations but tackles the resulting challenges	walks away from difficult or unpleasant situations
recovers from setbacks and is able to draw something positive from them	gets thrown off track by setbacks easily
stays calm in difficult situations	loses composure in difficult situations

Note. Adapted from the competency model of papilio Ltd., Zurich, Switzerland.

Appendix 2

Table 4.

List of Items of Questionnaire about Opinion on enTalent

Item	<i>M</i>	<i>SD</i>
I found the platform enTalent easy to use	3.56	1.12
I found enTalent useful for developing my competency	3.18	1.09
I found the number of process steps in enTalent sufficient for structuring my development	3.31	1.06
I think I have progressed thanks to enTalent	2.98	1.01
I was motivated by this form of e-learning	2.89	1.19
I am more motivated by conventional forms of learning, such as learning in groups, etc. (<i>R</i>)	3.40	1.18
I found the workload reasonable	3.64	1.11
I could easily apply the instructions that I received by email on the platform	3.80	1.06

Note. *N* = 45; (*R*) = reverse coded item

Appendix 3

Table 8. Correlations between Main Study Variables

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Evaluation scores																					
1. Self-Evaluation t1																					
2. Self-Evaluation t2	.66**																				
3. Evaluation by others t1	.51**	.54**																			
4. Evaluation by others t2	.44**	.57**	.71**																		
5. Combined t1	.85**	.69**	.88**	.67**																	
6. Combined t2	.62**	.87**	.71**	.90**	.77**																
Sociodemographic variables																					
7. Gender	-.05	.09	.03	-.04	-.00	.02															
8. Age group	-.11	-.15	-.00	.07	-.06	-.04	-.02														
9. Nationality	-.12	-.19	-.12	-.16	-.14	-.20	.01	.03													
10. Education level	.11	.08	.18	.27*	.17	.21	.05	.38**	.08												
11. Degree of employment	.14	-.05	.03	.08	.10	.02	.24*	.19	-.10	.23											
12. Computer use in years	-.12	-.04	.02	.12	-.06	.05	.12	.57**	-.13	.24*	.17										
13. Internet use in years	-.05	.02	.00	.03	-.03	.03	.13	.33**	-.11	.07	.08	.66**									
NEO-FFI 30																					
14. Agreeableness	.00	-.01	.07	.21	.04	.12	-.30*	.08	-.06	.02	.11	.14	.22								
15. Conscientiousness	.25*	.10	.07	.08	.18	.10	-.16	.07	.15	.07	.20	.08	.05	.19							
16. Extraversion	.01	.03	.04	.01	-.02	.02	.16	-.30*	-.05	-.23*	.01	.12	.07	.11	.01						
17. Neuroticism	-.14	-.13	-.07	-.09	-.11	-.12	-.30**	.24*	.08	.10	-.21	.12	-.03	-.20	-.06	-.37**					
18. Openness for experience	-.19	-.03	-.14	.00	-.18	-.02	-.17	-.00	-.12	-.16	-.18	.20	.19	.25*	-.22	.10	.09				
TMBS																					
19. Setting goals and priorities	.33**	.15	.23	.18	.32**	.19	-.25*	.19	.04	.01	.20	.04	.05	.23	.48**	.01	-.01	-.07			
20. Mechanics of time management	.21	.29*	.17	.04	.22	.18	-.07	-.01	-.16	-.07	-.06	.11	.06	-.02	-.00	.11	.06	.17	.38**		
21. Perceived control of time	.36**	.18	.36**	.24*	.41**	.24*	-.33**	.12	-.15	.13	.16	.19	.22	.34**	.42**	.02	-.12	-.03	.43**	-.02	
22. General Internet self-efficacy	.13	.23	.15	.09	.17	.18	.25*	-.27*	-.07	-.09	.07	-.08	.03	-.13	.00	.05	-.20	-.01	.22	.12	.02

Note. N = 71. * $p < .05$; ** $p < .01$

Study 3

Linguistische Eigenschaften von Verhaltensbeschreibungen aus Assessment Centern

Sebastian Otte und Adrian Bangerter

Université de Neuchâtel

Mirjam Britsch und Urs Wüthrich

papilio ag, Zürich

Anmerkung des Autors

Sebastian Otte und Adrian Bangerter, Institut de Psychologie du Travail et des Organisations, Université de Neuchâtel, Neuchâtel, Schweiz; Mirjam Britsch und Urs Wüthrich, papilio ag, Zürich, Schweiz.

Wir danken Sophie Nidegger und Charlotte Hart für ihre Unterstützung bei der Datenerhebung für diese Studie.

Zusammenfassung

Diese Studie untersucht sprachliche Eigenschaften schriftlicher Beschreibungen von Kandidatenverhalten in Assessment Centern. Es werden Zusammenhänge zwischen Bewertungen dieser Beschreibungen durch Assessoren und ihren linguistischen Eigenschaften aufgezeigt. Dafür wurden 515 Einträge in Beobachtungsbögen aus englischsprachigen Assessment Centern mit Hilfe des linguistischen Kategorienmodells und des webbasierten Tools „Coh-Metrix“ ausgewertet. Ein besonderer Fokus lag dabei auf der Abstraktheit/Konkretheit der Texte. Die Ergebnisse zeigen, dass Assessoren das Verhalten von Kandidaten eher abstrakt als konkret beschreiben. Außerdem werden Beschreibungen mit vielen Adjektiven von Assessoren besser bewertet als Beschreibungen mit weniger Adjektiven. Einschränkungen der Ergebnisse sowie Implikationen für Forschung und Praxis werden diskutiert.

Schlüsselwörter: Assessment Center (AC), linguistisches Kategorienmodell (LCM), Coh-Metrix

Linguistic characteristics of behavior descriptions of Assessment Center candidates

Abstract

This study examines linguistic characteristics of written descriptions of candidates' behavior in assessment centers. Correlations between assessors' evaluations of these descriptions and their linguistic characteristics are identified. A sample of 515 descriptions from assessment centers in English were analyzed by using the Linguistic Category Model and the Web-based tool Coh-Metrix, with a special focus on the abstraction/concreteness of these texts. Results show that assessors describe the behavior of candidates rather abstract than concrete. Furthermore, assessors evaluated descriptions with a lot of adjectives as better than descriptions with fewer adjectives. Limitations of the results as well as implications for research and practice are discussed.

Keywords: Assessment Center (AC), Linguistic category model (LCM), Coh-Metrix

Linguistische Eigenschaften von Verhaltensbeschreibungen aus Assessment Centern

Die Methode des Assessment Centers (AC) ist ein weit verbreitetes Verfahren zur Kompetenzbeurteilung (Ballantyne & Povah, 2004; Howard, 1997; Kleinmann, 2003). Organisationen setzen ACs in der Personalauswahl und –entwicklung ein, um zukünftige Stelleninhaber auszuwählen oder um Entwicklungsbedarf zu identifizieren und Entwicklungsziele abzuleiten (Lievens, Tett, & Schleicher, 2009; Thornton & Krause, 2009). Die Validität der AC-Methode wurde bereits mehrfach empirisch untersucht (Lievens, 2009; Lievens, Dilchert, & Ones, 2009; Schmidt & Hunter, 1998; Shore, Thornton, & McFarlane Shore, 1990). Diese Studien fokussierten auf die Kriteriumsvalidität oder die Konstruktvalidität der Ratings, welche die Assessoren den Kandidaten für die zu beurteilenden Kompetenzen geben. Zusätzlich zu diesen Ratings in den Kompetenzen werden die Leistungen der Kandidaten in der Regel auch schriftlich auf Beobachtungsbögen festgehalten (Ballantyne & Povah, 2004; Hennessy, Mabey, & Warr, 1998; Thornton & Rupp, 2006). Diese schriftlichen Beschreibungen der Assessoren dienen beispielsweise dazu, in der Beobachterkonferenz bestimmte Beurteilungen rechtfertigen zu können oder als Grundlage zum Verfassen des Assessmentberichts (Ballantyne & Povah, 2004; Grüterich, 2006; Hennessy et al., 1998). Entsprechend haben sie eine wichtige Bedeutung im AC-Prozess. Nach unserem Wissensstand wurden die sprachlichen Eigenschaften und Qualitätsmerkmale schriftlicher Beschreibungen von Kandidatenleistungen bisher nicht empirisch untersucht. Die vorliegende Studie ermittelt linguistische Eigenschaften von Einträgen in Beobachtungsbögen mit Fokus auf der Abstraktheit/Konkretheit der Beschreibung des Kandidatenverhaltens. Es werden Zusammenhänge zwischen den Urteilen von Assessoren über diese

Verhaltensbeschreibungen und den linguistischen Eigenschaften untersucht. Die Ergebnisse der Untersuchung sollen Aufschluss darüber geben, welche linguistischen Eigenschaften die Verhaltensbeschreibungen aufweisen sollten und welche eher nicht. Wenn diese Eigenschaften bekannt sind, kann Assessoren entsprechendes Feedback gegeben werden, wie sie ihre Beschreibungen von Kandidatenverhalten verbessern könnten. Da diese Beschreibungen dazu dienen, Ratings in Kompetenzen rechtfertigen zu können und den Assessmentbericht zu schreiben, kann eine der Beschreibungen wiederum zu valideren Beurteilungen und Assessmentberichten führen.

Assessment Center

Ein AC ist eine Methode zur systematischen Beobachtung und Bewertung des Verhaltens mehrerer oder einzelner Kandidaten, bei der verschiedene diagnostische Verfahren bzw. Übungen eingesetzt werden (Ballantyne & Povah, 2004; Howard, 1997; Kanning, Pöttker, & Gelléri, 2007; Thornton & Rupp, 2006). Beispiele für AC-Übungen sind Gruppendiskussionen, Postkorbaufgaben, Fallstudien, Persönlichkeitsfragebögen, kognitive Fähigkeitstests und Rollenspiele (Ballantyne & Povah, 2004; Kanning et al., 2007; Kleinmann, 2003; Lievens, Tett, et al., 2009; Thornton & Rupp, 2006). Typische Rollenspiele in ACs sind herausfordernde Führungssituationen, Kundengespräche oder Gespräche mit Kollegen, wobei die Kandidaten entsprechend entweder die Rolle von Vorgesetzten, Kundenbetreuern oder Kollegen einnehmen (Kleinmann, 2003; Thornton & Cleveland, 1990).

Beschreibung des Kandidatenverhaltens durch Assessoren

Den Assessoren kommt in ACs eine Schlüsselrolle zu. Sie beobachten und beurteilen das Verhalten der Kandidaten und diskutieren zum Schluss in der Beobachterkonferenz gemeinsam ihre Beobachtungen, um eine abschließende Beurteilung der einzelnen Kandidaten vorzunehmen (Kleinmann, 2003). In der Regel schreiben die Assessoren auch

den Schlussbericht über die einzelnen Kandidaten (Ballantyne & Povah, 2004). Während der AC-Übungen notieren Assessoren ihre Beobachtungen. Anschließend ordnen sie in der Regel ihre Beobachtungen in Beobachtungsbögen den einzelnen Kompetenzen zu und geben den Kandidaten für ihre gezeigte Leistung ein Rating (Ballantyne & Povah, 2004; Hennessy et al., 1998; Thornton & Rupp, 2006). So findet das Beobachten der Kandidaten und das Kategorisieren und Beurteilen ihrer Leistung bezüglich der definierten Kompetenzen getrennt voneinander statt.

Um ihrer wichtigen Rolle gerecht zu werden, benötigen Assessoren ein Beobachtertraining. In einem Beobachtertraining werden den Assessoren die zu beurteilenden Kompetenzen und Übungen vermittelt und typische Beobachterfehler sowie deren Vermeidung besprochen (Kleinmann, 2003; Schneider & Schmitt, 1992). Ein typischer Beobachterfehler ist der Halo-Effekt, bei dem von einzelnen bekannten Eigenschaften der Kandidaten übermäßig auf andere unbekanntere Eigenschaften geschlossen wird (Bernardin, 1978; Lance, Foster, Gentry, & Thoresen, 2004; Sagie & Magnezy, 1997). Weitere Beobachterfehler sind bspw. die Tendenz von Assessoren, nur die mittleren Werte der Ratingskalen zu nutzen (Tendenz zur Mitte) und der Mildefehler, der dazu führt, dass diejenigen Kandidaten besser beurteilt werden, die den Assessoren sympathisch sind (Bernardin, 1978; Kleinmann, 2003; Schneider & Schmitt, 1992). Der fundamentale Attributionsfehler ist die Tendenz von Beobachtern, den Einfluss der Situation auf das Verhalten anderer zu unterschätzen und den Einfluss von Persönlichkeitseigenschaften zu überschätzen (Harvey, Town, & Yarkin, 1981).

Die Validität eines AC ist höher, je weniger Kompetenzen die Assessoren beurteilen müssen (Lievens, 2002; Schneider & Schmitt, 1992), wenn die Assessoren erfahren sind (Lievens, 2001, 2002), wenn Psychologen als Assessoren eingesetzt werden (Sagie & Magnezy, 1997) und wenn die Assessoren nur wenige Kandidaten beobachten müssen

(Kanning et al., 2007). Die Vorhersagevalidität der AC-Methode kann bei qualitativ hochwertiger Durchführung als zufriedenstellend angesehen werden (Arthur, Day, McNelly, & Edens, 2003; Lance et al., 2004; Lievens, Dilchert, et al., 2009). Allerdings wurde in mehreren Studien gezeigt, dass die Konstruktvalidität von ACs oft gering ist, da Übungseffekte stärker auftreten als Kompetenzeffekte (Bowler & Woehr, 2006; Lance, 2008; Lievens, 2009; Schneider & Schmitt, 1992). Assessoren bewerten Kandidatenleistungen also für alle Kompetenzen einer Übung ähnlicher als für eine Kompetenz bei verschiedenen Übungen. Als eine mögliche Ursache dafür wurde Überforderung der Assessoren genannt, z.B. wenn Assessoren nicht ausreichend trainiert wurden oder zu viele Kompetenzen pro Übung beurteilen müssen (Lievens, 2009).

Computergestütztes Feedback an die Assessoren könnte helfen, die Beurteilungsgenauigkeit zu verbessern. In zwei Studien wurde Assessoren die von ihnen vergebenen Ratings im Vergleich zu den Ratings anderer Assessoren angezeigt (Biedermann, 2008; Grüterich, 2006). Allerdings führt solches computergestütztes Feedback nur teilweise zu präziseren Ratings (Biedermann, 2008; Grüterich, 2006). Computergestütztes Feedback ist dann effektiv, wenn die eingesetzte Software eindeutig feststellen kann, ob die Eingaben des Nutzers korrekt sind (Azevedo & Bernard, 1995). Entsprechend müsste die Software die Validität der Ratings der Assessoren kennen. Hingegen könnte die Qualität der schriftlichen Beurteilungen durch computergestütztes Feedback verbessert werden, wenn Qualitätskriterien schriftlicher AC-Beurteilungen bekannt wären. Die Texte von Assessoren könnten direkt nach der Eingabe durch Software auf ihre linguistischen Eigenschaften hin analysiert werden. Computergestütztes Feedback könnte dann den Assessoren anzeigen, welche Eigenschaften ihre Texte aufweisen und ob sie den Qualitätskriterien entsprechen. Dazu müssen aber zuerst die Zusammenhänge zwischen linguistischen Eigenschaften und der Qualität von schriftlichen Beurteilungen

des Kandidatenverhaltens untersucht werden. Die vorliegende Studie leistet einen Beitrag dazu, indem die sprachlichen Eigenschaften von Einträgen in Beobachtungsbögen analysiert und der Zusammenhang zu Qualitätsbewertungen von Assessoren untersucht wird. Die Kenntnis darüber, welche Eigenschaften gut bewertete Texte aufweisen, ermöglicht es den Assessoren entsprechendes Feedback geben zu können, damit sich ihre Beschreibungen von Kandidatenleistungen verbessern.

Diese Studie

Diese Studie untersucht die linguistischen Eigenschaften der Texte, die von den Assessoren über die Kandidatenleistungen in Beobachtungsbögen geschrieben werden. Diese Einträge in Beobachtungsbögen dienen u.a. der Begründung der jeweiligen Ratings in den Kompetenzen und sind Grundlage für das Verfassen der Assessmentberichte (Ballantyne & Povah, 2004; Grüterich, 2006; Hennessy et al., 1998). Die Forschungsfrage, die wir in dieser Studie versuchen zu beantworten, lautet: Welche linguistischen Eigenschaften von Einträgen in Beobachtungsbögen hängen mit den Qualitätsbeurteilungen durch Assessoren zusammen? Eine Identifizierung dieser linguistischen Eigenschaften würde es ermöglichen, Assessoren hilfreiches Feedback geben zu können, damit sich die Qualität ihrer schriftlichen Beurteilungen verbessert.

In dieser Studie werden Einträge in Beobachtungsbögen von Rollenspielen auf ihre Eigenschaften hin untersucht. Rollenspiele kommen als AC-Übung häufig zum Einsatz (Kanning et al., 2007; Schneider & Schmitt, 1992). In Rollenspielen interagieren die Kandidaten direkt mit Schauspielern und es werden in der Regel besonders interpersonale Kompetenzen (z.B. mündliche Kommunikationsfähigkeit oder Führungsfähigkeit) der Kandidaten beurteilt (Lievens, Tett, et al., 2009; Thornton & Cleveland, 1990). Kandidaten müssen in Rollenspielen aber oft auch Kompetenzen wie bspw. Planungsverhalten, Initiative, Stresstoleranz und Problemlösefähigkeit an den Tag legen (Bycio, Alvares, &

Hahn, 1987; Kleinmann, 2003; Schneider & Schmitt, 1992; Schollaert & Lievens, 2011). Aufgrund der großen Bandbreite an Kompetenzen, die in Rollenspielen beobachtet werden können, kann vielfältiges Kandidatenverhalten in Beobachtungsbögen beschrieben werden. In dieser Studie werden ausschließlich Beobachtungsbögen aus Rollenspielen als Datenbasis herangezogen. So können vergleichbare Beschreibungen von Kandidatenverhalten untersucht werden.

Bei der Untersuchung der linguistischen Eigenschaften fokussieren wir auf die Abstraktheit/Konkretheit der Beschreibungen des Kandidatenverhaltens. Konkrete Beschreibungen des Verhaltens anderer führen zu einer weniger oberflächlichen Verarbeitung der Informationen im Vergleich zu abstrakten Beschreibungen (Ter Doest, Semin, & Sherman, 2002). Konkrete Begriffe werden auch besser erinnert als abstrakte (Ter Doest & Semin, 2005). Darüber hinaus führt eine abstrakte Beschreibung anderer eher zum fundamentalen Attributionsfehler als eine konkrete Beschreibung (Semin & Fiedler, 1991). Auch der Halo-Effekt könnte durch konkrete Verhaltensbeschreibungen reduziert werden. Die konkrete Beschreibung von Verhalten anderer gibt genauere Informationen darüber, was die Person tatsächlich getan hat und macht weniger Aussagen über allgemeine Eigenschaften der Person (Semin & Fiedler, 1991). Somit sind konkretere Beschreibungen präziser.

Um die Abstraktheit/Konkretheit der Beschreibungen zu messen, nutzen wir das linguistische Kategorienmodell und einzelne Variablen des Coh-Matrix-Tools. Das linguistische Kategorienmodell (LCM) wurde von Semin und Fiedler (1991) entwickelt und dient dazu, Verben und Adjektive die zur Beschreibung von Personen genutzt werden gemäß ihrer Abstraktheit/Konkretheit zu kategorisieren. Das LCM wurde bereits in mehreren Untersuchungen zum Einfluss von Sprache auf soziale Kognitionen eingesetzt, auch bezüglich anwendungsbezogener Themen wie bspw. der Personalauswahl (Rubini &

Menegatti, 2008). Deskriptive Handlungsverben (descriptive action verbs; DAV) bilden die konkreteste der fünf LCM-Kategorien und beinhalten alle Verben, die sich auf eine spezifische Aktion mit klarer Zeitbegrenzung und gleichbleibender physischer Eigenschaft beziehen (z.B. sprechen, laufen, sitzen). Interpretative Handlungsverben (interpretative action verbs; IAV) beziehen sich ebenfalls auf Aktionen mit klarem Anfang und Ende, allerdings sind diese Aktionen weniger „objektiv“ und beinhalten nicht notwendigerweise immer eine bestimmte physische Eigenschaft (z.B. helfen, imitieren, betrügen).

Zustandsbezogene Handlungsverben (state action verbs; SAV) haben ebenfalls eine klare Zeitbegrenzung und beschreiben emotionale Konsequenzen als Folge von Handlungen (z.B. überraschen, verärgern, erfreuen). Zustandsverben (state verbs; SV) beschreiben mentale und emotionale Zustände ohne klaren Anfang und Ende (z.B. mögen, hassen, bewundern). Adjektive (ADJ) bilden im LCM die abstrakteste der fünf Wortkategorien, denn sie bieten relativ großen Interpretationsspielraum und sind stark personen- und weniger situationsbezogen (z.B. ehrlich, hilfsbereit, impulsiv). Je nach Kategorie haben Verben und Adjektive unterschiedliche Effekte auf die Kognitionen der Leser bzw. Zuhörer und beeinflussen deren Wahrnehmung der beschriebenen Personen (Coenen, Hedeboom, & Semin, 2006; Semin, 1994; Semin & Fiedler, 1988). Das webbasierte Tool Coh-Matrix wurde von der Universität Memphis (USA) entwickelt und analysiert englischsprachige Texte per Mausklick auf verschiedene linguistische Eigenschaften (Graesser, McNamara, Louwerse, & Cai, 2004). Es existiert bereits in der Version 3.0 und ermittelt Ergebnisse zu 106 linguistischen Maßen (McNamara, Louwerse, Cai, & Graesser, 2012). Von diesen Variablen haben wir neun für unsere Studie ausgewählt.

Zur Ermittlung der Qualität der untersuchten Beschreibungen haben Assessoren diese Beschreibungen auf ihre Klarheit, Konkretheit und Nützlichkeit hin beurteilt. Anschließend wurden Zusammenhänge zwischen diesen Qualitätsbeurteilungen und den

linguistischen Eigenschaften untersucht. Die Kenntnis solcher Zusammenhänge ermöglicht es, Assessoren dabei zu unterstützen, Kandidatenverhalten besser zu beschreiben und somit die Qualität von Assessmentberichten zu erhöhen.

Methode

AC-Beobachtungsbögen

Die Schweizerische Unternehmensberatung papilio AG hat die webbasierte Plattform „enAC“ entwickelt, um ACs zu planen und durchzuführen. Assessoren tragen in enAC ihre Beobachtungen ein, geben den Kandidaten Ratings in den zu beurteilenden Kompetenzen und schreiben die Assessmentberichte. Die Beobachtungsbögen werden für jede beobachtete Kompetenz pro AC-Übung ausgefüllt. Wenn also in einer AC-Übung bspw. vier Kompetenzen beobachtet werden, füllen die Assessoren anschließend vier Beobachtungsbögen für diese AC-Übung aus. Die Beobachtungsbögen in enAC bestehen aus zwei Teilen. Im oberen Teil werden die Kandidaten anhand von Ratingskalen und Verhaltensbeispielen in der jeweiligen Kompetenz eingeschätzt. Im unteren Teil gibt es zwei Textfelder (s. Abbildung 1). Im linken Textfeld mit grünem Hintergrund tragen die Assessoren positive Verhaltensweisen der Kandidaten zu einer bestimmten Kompetenz ein. Im rechten Textfeld mit rotem Hintergrund werden negative Verhaltensweisen der Kandidaten eingetragen, die auf einen Entwicklungsbedarf in dieser Kompetenz hinweisen.

Die papilio AG hat uns Zugriff auf anonymisierte Beobachtungsbögen von Rollenspielen aus englischsprachigen ACs ermöglicht. Es wurden englischsprachige AC-Beobachtungen gewählt, da diese bereits in großer Zahl vorhanden waren und sich die zur linguistischen Analyse verwendeten Modelle auf englische Texte beziehen. Die anonymisierten Beobachtungsbögen stammen aus elf ACs von acht verschiedenen Organisationen und wurden von 21 verschiedenen Assessoren verfasst. Insgesamt wurde das Verhalten von 33 verschiedenen Kandidaten beschrieben. Sowohl der Name der

jeweiligen Organisation als auch die Namen aller Assessoren und Kandidaten wurden anonymisiert.

Einträge in einem grünen oder in einem roten Textfeld wurden jeweils als eine Beobachtung definiert. Es standen 283 Beobachtungen mit positiven Verhaltensbeschreibungen aus grünen Textfeldern und 232 Beobachtungen mit negativen Beschreibungen aus den roten Textfeldern zur Verfügung. Insgesamt wurden 515 englischsprachige Beobachtungen aus Rollenspielen anhand des linguistischen Kategorienmodells (Linguistic Category Model; Semin & Fiedler, 1991) und des Coh-Matrix-Tools (Graesser et al., 2004) analysiert.

Führung übernehmen

B
3.50

Kandidat Susan Sommer
 Übung Competency-based Interview
 Kompetenz Führung übernehmen ⓘ
 Komplettierung 50%

Positiv	A	B	C	D	E	X	Negativ
trifft Entscheidungen - auch mit unvollständigen Informationen und unter Termindruck oder anderen Belastungen	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	verhält sich zögerlich und sucht nach möglichst vielen Informationen, um Unsicherheiten zu verringern und Risiken zu vermeiden
definiert die Aufgaben, Ziele und Rahmenbedingungen klar und eindeutig	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	delegiert, ohne den Kompetenz- und Verantwortungsbereich klar klar zu definieren
kontrolliert regelmässig den Fortschritt der delegierten Aufgaben	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	kontrolliert den Fortschritt der delegierten Aufgaben nicht
gibt Feedback, inwieweit die Ergebnisse den Erwartungen und Ansprüchen entsprechen	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	gibt keine Rückmeldung, wie die delegierten Aufgaben erledigt wurden
sorgt dafür, dass das Team auf die Aufgaben und Zielsetzungen konzentriert bleibt	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	stellt nicht immer sicher, dass das Team auf die Aufgaben und Zielsetzungen konzentriert bleibt
nutzt die unterschiedlichen Fähigkeiten und Kenntnisse der Teammitglieder effektiv	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	nutzt die unterschiedlichen Fähigkeiten und Kenntnisse der Teammitglieder nicht effektiv
spricht andere auf ihr unerwünschtes oder nicht akzeptables Verhalten auf eine respektvolle Art und Weise an	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	konfrontiert andere mit ihrem unerwünschten Verhalten auf eine aggressive und respektlose Art
macht anderen vorhandene Erwartungen und Standards deutlich	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	vermittelt anderen nicht seine/ihre Erwartungen und die gegebenen Standards

A = klar übertroffen; B = leicht übertroffen; C = erfüllt; D = teilweise erfüllt; E = nicht erfüllt; X = keine Evidenzen

Positive Verhaltensevidenzen

Negative Verhaltensevidenzen

Manuelles Rating

▼

Speichern und weiter

Speichern erfolgreich - 14:00

Abbildung 1. Beobachtungsbogen in enAC (Beispiel)

Das linguistische Kategorienmodell

Die Verben und Adjektive der 515 AC-Beobachtungen wurden gemäß den fünf Kategorien des LCM kategorisiert. Als Kodierungsmanual diente das LCM Manual von Coenen, Hedeboom und Semin (2006). Als erstes kategorisierten drei Rater 99 Beobachtungen gemäß den LCM-Kategorien, um die Interrater-Reliabilität zu ermitteln. Insgesamt wurde eine Interrater-Reliabilität von *Fleiss Kappa* = .73 erreicht, was einer substantiellen Übereinstimmung entspricht (Landis & Koch, 1977). Bei diesen 99 Beobachtungen wurde kein SAV gefunden, aber bei drei der restlichen vier LCM-Kategorien wurde ebenfalls eine substantielle Übereinstimmung erreicht (DAV: *Fleiss Kappa* = .62; IAV: *Fleiss Kappa* = .70; ADJ: *Fleiss Kappa* = .85). Bei SVs ergab sich eine moderate Übereinstimmung (*Fleiss Kappa* = .59). Als nächster Schritt wurden unterschiedliche Kodierungen besprochen, um ein einheitliches Verständnis der fünf LCM-Kategorien zu gewährleisten. Besonders die Kategorien SAV und SV wurden diskutiert. Zwei der drei Rater führten die weitere Kodierung der 515 Beobachtungen für diese Studie durch. Anschließend wurde der LCM-Score für jede Beobachtung ermittelt (Semin & Fiedler, 1991). Dazu wurde pro Beobachtung ausgezählt, wie viel Verben der verschiedenen Kategorien und wie viel Adjektive darin vorkommen. Jede Kategorie wird unterschiedlich gewichtet. Die Anzahl DAVs wird mit 1 multipliziert, IAVs und SAVs mit 2, SVs mit 3 und die Anzahl Adjektive wird mit 4 multipliziert. Der Gesamtwert wird durch die Anzahl der kodierten Wörter dividiert. Der daraus resultierende LCM-Score liegt zwischen 1 und 4 und gibt an, wie abstrakt ein Text gemäß dem LCM ist. Je höher der LCM-Score, desto abstrakter der Text.

Coh-Matrix

Fünf dieser Variablen wurden gewählt, weil sie die Abstraktheit/Konkretheit eines Textes angeben. Die Variable „Konkretheit für lexikalische Wörter“ (Concreteness for

content words) gibt auf einer Skala von 100 bis 700 an, wie konkret ein Text ist. Je konkreter die verwendeten lexikalischen Wörter sind, desto höher ist der Wert dieser Variablen. Ab einem Wert von 500 wird ein Text als sehr konkret und unter 300 als sehr abstrakt bezeichnet (Coltheart, 1981).

Drei Variablen geben die Hyperonymie verwendeter Wörter an. Ein Hyperonym ist der Oberbegriff anderer Begriffe. „Säugetier“ ist beispielsweise das Hyperonym der Begriffe „Hund“, „Katze“ und „Maus“. Die Variable „Hyperonymie für Verben“ (Hypernymy for verbs) gibt an, wie konkret die im Text verwendeten Verben sind. Je höher der Wert, desto mehr Hierarchiestufen von Oberbegriffen gibt es für die verwendeten Verben, das heißt desto konkreter sind diese Verben (Graesser et al., 2004). Die Variable „Hyperonymie für Nomen“ (Hypernymy for nouns) gibt das selbe für Nomen an. Die Variable „Hyperonymie für Nomen und Verben“ (Hypernymy for nouns and verbs) ist die Kombination beider Variablen.

Eine weitere Variable, die sich auf Abstraktheit/Konkretheit bezieht, ist die Variable „Wortkonkretheit“ (Word Concreteness). Sie ist eine der Hauptkomponenten aus einer Hauptkomponentenanalyse zu den Coh-Matrix-Variablen und gibt die Konkretheit, Aussagekraft und Bildhaftigkeit der verwendeten Wörter an (Graesser, McNamara, & Kulikowich, 2011).

Um die linguistische Analyse der 515 AC-Beobachtungen über den Aspekt Abstraktheit/Konkretheit hinaus zu erweitern, wurden diese Beobachtungen auch bezüglich weiterer Hauptkomponenten aus der Hauptkomponentenanalyse von Graesser et al. (2011) analysiert.

Die Hauptkomponente „Narrativität“ (Narrativity) ist ein Maß dafür, inwieweit ein Text eine Sequenz von Handlungen und Ereignissen wiedergibt. Ein höherer Wert gibt eine stärkere Narrativität an, das heißt der Textinhalt beschreibt stärker eine Geschichte,

einen Prozess oder eine Sequenz von Handlungen oder Ereignissen als ein Text mit einem niedrigeren Wert (Graesser et al., 2011).

Drei Hauptkomponenten geben die Kohäsion eines Textes an. „Referenzielle Kohäsion“ (Referential cohesion) gibt an, wie sehr die lexikalischen Wörter eines Textes miteinander verbunden sind. Je höher der Wert, desto mehr Wörter vorheriger Sätze wurden in den nachfolgenden Sätzen verwendet (Graesser et al., 2011).

„Kausale Kohäsion“ (Deep cohesion) ist das Ausmaß, indem Absätze und Sätze eines Textes durch Bindewörter miteinander verknüpft sind. Höhere Werte bedeuten, dass der jeweilige Text mehr solcher Bindewörter aufweist als Texte mit niedrigeren Werten (Graesser et al., 2011).

„Verbkohäsion“ (Verb cohesion) gibt an, inwieweit sich die im Text verwendeten Verben wiederholen (McNamara, Graesser, & Louwerse, 2012).

Qualitätsbeurteilung durch Experten

Um die Qualität der Beobachtungen zu beurteilen, konnten 20 Assessoren als Experten rekrutiert werden. Es wurde eine E-Mail an Assessoren gesendet, in der sich ein Link zum Online-Fragebogen befand. Die Empfänger wurden durch Instruktionen in der E-Mail und im Fragebogen durch den Prozess geleitet und konnten sich bei Fragen jederzeit an zwei am Anfang des Fragebogens genannte E-Mailadressen wenden. Aus den 515 Beobachtungen wurden 80 positive und 80 negative Beobachtungen durch Zufall ausgewählt, die im Online-Fragebogen den Assessoren zur Bewertung gezeigt wurden. Drei dieser 160 Beobachtungen wurden durch andere ersetzt, da sie aus nur zwei bis drei Wörtern bestanden und nur Angaben beinhalteten, dass keine Beobachtungen zu dieser Kompetenz gemacht wurden (z.B. „No observations“). Dadurch, dass die Assessoren nur 160 statt 515 Beobachtungen beurteilen mussten, wurde die benötigte Anzahl von Teilnehmern des Fragebogens verringert. Der Online-Fragebogen war so aufgebaut, dass

jedem Experten 40 Beobachtungen zur Beurteilung gezeigt wurden. Bei jeder zu beurteilenden Beobachtung wurde auch jeweils angegeben, ob es sich um ein Kunden- oder Führungsgespräch handelte und welche Kompetenz beurteilt werden sollte. Um die Anonymität der jeweiligen Organisation zu wahren wurden nicht die eigentlichen Kompetenzbezeichnungen und –definitionen angezeigt, sondern Kompetenzen und Definitionen, die stark an Kompetenzen aus dem Kompetenzmodell der papilio AG angelehnt sind. Diese Bezeichnungen und Definitionen entsprechen in ihrer Bedeutung den jeweiligen verwendeten Kompetenzen, sind aber anders formuliert.

Achtzehn der 160 Beobachtungen wurden von drei verschiedenen Experten beurteilt, die restlichen 142 Beobachtungen von vier verschiedenen Experten. Die Experten wurden anhand von fünf Items gefragt, ob die jeweilige Beobachtung klar ($M = 3.33$, $SD = 0.91$), konkret ($M = 3.34$, $SD = 0.91$) und nützlich zur Vergabe eines Ratings ($M = 2.83$, $SD = 1.01$), zum Schreiben des Assessmentberichts ($M = 2.97$, $SD = 1.01$) und zum Geben eines Feedbacks ist ($M = 3.17$, $SD = 0.98$). Da die Expertenurteile hoch signifikant positiv miteinander korrelieren haben wir ein zusammengefasstes Maß für die Expertenurteile gebildet, indem wir für jede Beobachtung den Mittelwert über die fünf verschiedenen Urteile berechnet haben. Der Reliabilitätskoeffizient für die Qualitätsurteile der Assessoren beträgt $\alpha = .93$. Die Interrater-Reliabilität der Expertenurteile war gut (klar: $ICC = .65$; konkret: $ICC = .60$; nützlich für Rating: $ICC = .71$; nützlich für Assessmentbericht: $ICC = .72$; nützlich für Feedback: $ICC = .69$).

Die von uns angeschriebenen Assessoren waren nicht an der Erstellung der begutachteten Beobachtungen beteiligt gewesen, manche waren aber für die papilio AG als Angestellte oder Partner tätig. Andere Assessoren kamen von anderen Beratungsfirmen aus der Schweiz, aus der kanadischen Provinz Québec und aus Deutschland. Dreizehn dieser 20 Experten waren Frauen. Elf waren französischer und neun deutscher Muttersprache.

Das Durchschnittsalter betrug 38.35 ($SD = 8.83$, $Range = 26 - 57$). Elf Experten waren Schweizerischer Nationalität, acht waren kanadischer und eine/r deutscher Nationalität. Gefragt nach dem höchsten Bildungsabschluss gaben fünfzehn Experten an, einen Mastertitel oder vergleichbaren Abschluss an einer Universität oder Fachhochschule erworben zu haben. Ein/e Expert/in hatte einen Bachelorabschluss erworben, zwei hatten einen Dokortitel und zwei weitere gaben den Eidgenössischen Fähigkeitsausweis zur HR-Fachfrau bzw. zum HR-Fachmann als höchsten erworbenen Abschluss an. Fünfzehn Experten nannten Psychologie als eigenen Fachbereich, zwei Wirtschaftswissenschaften, eine/r Theologie, eine/r Management und eine/r Industrial relations. Als Beruf gaben neun Experten HR-Berater oder Unternehmensberater an. Weitere genannte Berufe waren HR-Verantwortlicher (3), Arbeits- und Organisationspsychologe (2), Assessor (1), Unternehmer (1), Professor (1), Managementdiagnostiker (1), Recruiter (1), und Spezialist Gesundheitsmanagement (1). Elf Assessoren arbeiteten in einem Unternehmen mit 11-50 Mitarbeitenden, die anderen arbeiteten in Unternehmen mit 1-10 (1 Assessor/in), 50-150 (3 Assessoren), 150-500 (2 Assessoren) oder mit über 1,000 Mitarbeitenden (2 Assessoren). Da die Beobachtungen in Englisch verfasst waren, baten wir die Assessoren im Fragebogen um eine Selbsteinschätzung ihrer Englischkenntnisse gemäß dem Gemeinsamen europäischen Referenzrahmen für Sprachen (GeR) des Europarats (Cedefop, 2014). Fünf Experten gaben ein Englischniveau von C2 (exzellente Kenntnisse) an, fünf weitere C1 (fortgeschrittene Kenntnisse), neun B2 (gutes Mittelmaß) und ein/e Assessor/in gab B1 (Mittelmaß) als eigenes Englischniveau an. Daher gehen wir davon aus, dass die Experten über ausreichende Englischkenntnisse verfügten, um die Qualität der in Englisch geschriebenen Beobachtungen beurteilen zu können.

Ergebnisse

Deskriptive Ergebnisse zu linguistischen Eigenschaften

Von den 20,181 Wörtern der 515 AC-Beobachtungen sind 399 DAVs, 3,032 IAVs, 41 SAVs, 239 SVs und 2,517 Adjektive (s. Tabelle 1).

Tabelle 1.

Anzahl Wörter, Anzahl Sätze und LCM-Kategorien

	<i>N</i>	<i>M (SD)</i>	Range
Anzahl Wörter	20,181	39.19 (31.10)	2 – 253
Anzahl Sätze	1,278	2.48 (1.67)	1 – 14
DAV	399	1.71 (1.04)	1 – 6
IAV	3,032	6.20 (5.04)	1 – 45
SAV	41	1.32 (0.60)	1 – 3
SV	239	1.73 (1.49)	1 – 10
ADJ	2,517	5.21 (3.77)	1 – 22

Anmerkungen: N = 515 AC-Beobachtungen

Der LCM-Score der Beobachtungen beträgt im Mittel 2.78 ($SD = 0.45$). Ein t-Test gegen den Skalenmittelwert 2.5 des LCM-Scores, der eine mittlere Abstraktheit der Beobachtungen repräsentiert, zeigte dass die gefundenen LCM-Scores ($M = 2.78$, $SD = 0.45$) im Mittel signifikant höher sind als dieser Skalenmittelwert ($t(513) = 14.08$, $p < .001$). Auch nachdem vier Ausreißer aus den LCM-Scores entfernt wurden, deren z-Werte größer als 3 sind, ist der Unterschied zum Skalenmittelwert noch signifikant ($M = 2.79$, SD

= 0.43, $t(509) = 15.41$, $p < .001$). Insgesamt sind die 515 Beobachtungen gemäß LCM-Score also eher abstrakt als konkret. Da die Verteilung der Differenzen zwischen den LCM-Scores und dem Skalenmittelwert von 2.5 aber steilgipflig ist ($Kurtosis = 1.76$, $SE = 0.22$), sind die Ergebnisse der t-Tests nur eingeschränkt interpretierbar. Tabelle 2 zeigt die Interkorrelationen der fünf LCM-Kategorien und des LCM-Scores.

Tabelle 2.

Interkorrelationen der LCM-Variablen und des LCM-Scores

LCM-Variablen	1	2	3	4	5
1. DAV					
2. IAV	.17*				
3. SAV	-.27	.15			
4. SV	.17	.64**	-.11		
5. ADJ	.25**	.59**	-.13	.41**	
6. LCM-Score	-.11	-.10*	.15	-.06	-.22**

Anmerkungen: * $p < .05$; ** $p < .01$.

Tabelle 3 gibt einen Überblick über die Mittelwerte und Standardabweichungen der gewählten fünf Coh-Matrix-Variablen, welche die Abstraktheit/Konkretheit von Texten angeben. Vier dieser fünf Variablen korrelieren signifikant negativ mit den LCM-Score, der ein Maß für die Abstraktheit von Texten ist (s. Tabelle 4). Das deutet auf eine zufriedenstellende konvergente Validität dieser Variablen hin.

Tabelle 3.

Coh-Matrix-Variablen für Abstraktheit/Konkretheit

	<i>M (SD)</i>	Range
Konkretheit für lexikalische Wörter	343.54 (45.04)	0.00 – 609.00
Hyperonymie für Verben	1.83 (0.67)	0.00 – 6.50
Hyperonymie für Nomen	6.36 (1.23)	0.00 – 8.44
Hyperonymie für Verben + Nomen	1.91 (0.61)	0.00 – 6.22
Wortkonkretheit (z-Wert)	0.53 (2.34)	-11.77 – 10.14

Anmerkungen: N = 515 AC-Beobachtungen

Tabelle 4.

Korrelationen zwischen Coh-Matrix-Variablen (z-Werte) für Abstraktheit und LCM-Variablen

Variablen	DAV	IAV	SAV	SV	ADJ	LCM-Score
Wortkonkretheit	-.01	-.22**	.02	-.16	-.25**	-.11*
Konkretheit für lexikalische Wörter	.07	-.03	.15	-.01	.04	-.20**
Hyperonymie für Verben	-.09	.00	.25	-.09	-.01	-.36**
Hyperonymie für Nomen	-.06	.08	.06	-.12	.08	-.05
Hyperonymie für Verben + Nomen	-.13*	-.11*	-.18	.14	-.19**	-.20**

*Anmerkungen: * $p < .05$; ** $p < .01$.*

Tabelle 5 zeigt die Mittelwerte und Standardabweichungen der Hauptkomponenten aus der Hauptkomponentenanalyse von Graesser et al. (2011). Die Hauptkomponente Wortkonkretheit ist bereits in Tabelle 3 angegeben.

Tabelle 5.

Coh-Matrix-Variablen (z-Werte) aus Hauptkomponentenanalyse von Graesser et al. (2011)

	<i>M (SD)</i>	Range
Narrativität	-0.60 (1.44)	-6.01 – 3.05
Referenzielle Kohäsion	0.62 (1.60)	-3.80 – 5.76
Kausale Kohäsion	-0.68 (2.54)	-6.60 – 10.56
Verbkohäsion	1.89 (2.52)	-10.76 – 13.70

Anmerkungen: N = 515 AC-Beobachtungen.

Qualitätsbeurteilung durch Experten

Der Mittelwert der zusammengefassten Expertenurteile über die 160 zufällig ausgewählten Beobachtungen ist $M = 3.13$ ($SD = 0.90$). Die zusammengefassten Expertenurteile korrelieren signifikant positiv mit der Wörteranzahl der Beobachtungen ($r = .54$, $p < .001$). Abbildung 2 zeigt den Zusammenhang zwischen Wörteranzahl der Beobachtungen und den zusammengefassten Expertenurteilen dieser Beobachtungen.

Das Streudiagramm weist auf einen logarithmischen Zusammenhang zwischen Wörteranzahl und Expertenurteilen hin. Nachdem die Wörteranzahl logarithmiert wurde, zeigte sich ein noch stärkerer Zusammenhang zwischen Wörteranzahl und Expertenurteilen ($r = .61$, $p < .001$). Das bedeutet, dass Beobachtungen mit mehr Wörtern zwar von den Experten besser beurteilt werden, ab einer gewissen Wortmenge dieser Zusammenhang aber abnimmt und die Expertenurteile stagnieren. In der weiteren Analyse nutzen wir daher die logarithmierte Transformation der Variablen Wörteranzahl.

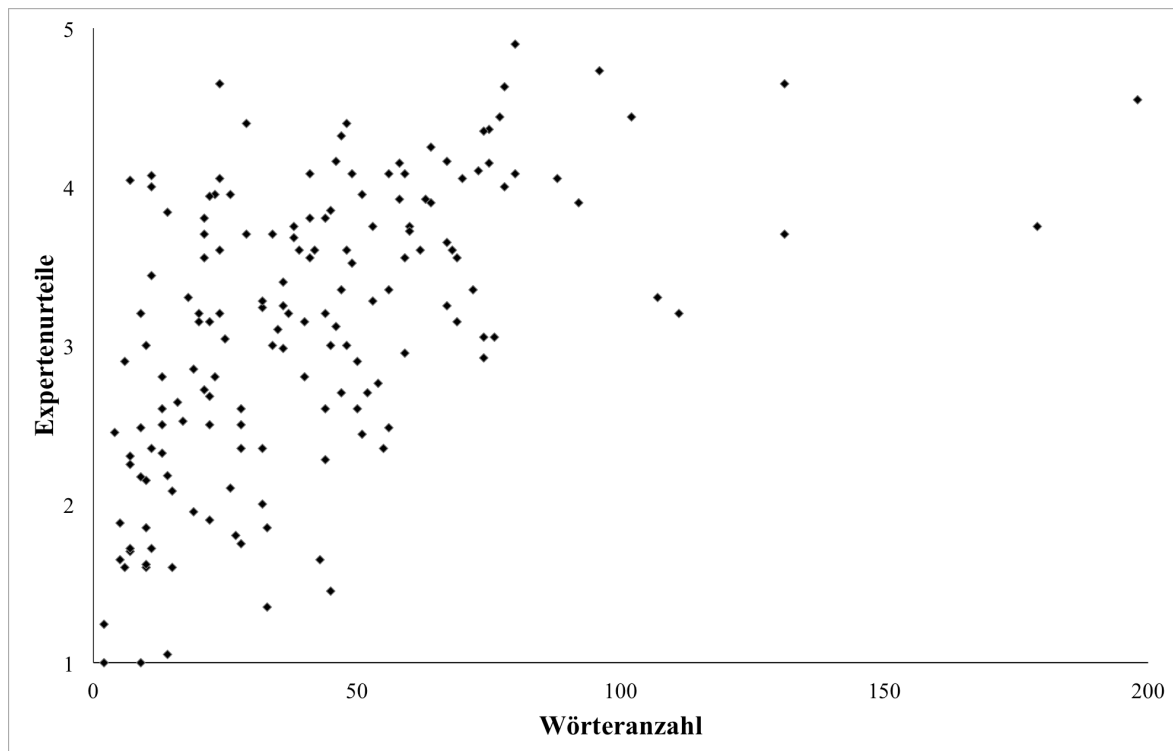


Abbildung 2. *Beziehung zwischen Wörteranzahl und Expertenbeurteilungen der AC-Beobachtungen*

Expertenurteile und das linguistische Kategorienmodell. IAVs und Adjektive sind die mit Abstand am häufigsten vorkommenden LCM-Kategorien in den untersuchten Beobachtungen (siehe Tabelle 1). Den Einfluss von IAVs und Adjektiven auf die zusammengefassten Expertenurteile haben wir mittels hierarchischer Regressionsanalyse untersucht. Zusätzlich wurde auch der Einfluss von SVs auf die Expertenurteile untersucht, da SVs keine Handlungen im eigentlichen Sinn beschreiben sondern mentale und emotionale Zustände ohne klare Zeitbegrenzung. Fraglich ist, ob Beschreibungen von mentalen oder emotionalen Zuständen der AC-Kandidaten die wahrgenommene Qualität von Einträgen in Beobachtungsbögen beeinflussen. Die zusammengefassten Expertenurteile korrelieren signifikant positiv mit der Anzahl an IAVs ($r = .43, p < .001$), SVs ($r = .34, p < .05$) und der Anzahl Adjektiven ($r = .52, p < .001$).

Im ersten Schritt der Regressionsanalyse wurde Wörteranzahl (logarithmiert) als Prädiktor in die Analyse eingefügt, um für einen möglichen Einfluss dieser Variable zu

kontrollieren. Wörteranzahl korreliert signifikant positiv mit der Anzahl an IAVs ($r = .91$, $p < .001$), SVs ($r = .62$, $p < .001$) und der Anzahl Adjektiven ($r = .76$, $p < .001$). In der Regressionsanalyse zeigt sich, dass Beobachtungen mit hoher Wörteranzahl von den Experten besser beurteilt wurden als Beobachtungen mit weniger Wörtern ($\beta = .35$, $p < .05$). Im zweiten Schritt wurde die Anzahl an IAVs als Prädiktor integriert ($\beta = -.03$, $p = .91$). Außerdem wurden die Anzahl an SVs ($\beta = .23$, $p = .20$) und die Anzahl an Adjektiven als Prädiktor in die Regressionsanalyse integriert ($\beta = .36$, $p < .05$). Der Zusammenhang zwischen Wörteranzahl und Expertenurteilen war im zweiten Schritt nicht mehr signifikant ($\beta = .02$, $p = .93$). Die Resultate zeigen, dass die Experten AC-Beobachtungen dann besser beurteilen, wenn mehr Adjektive verwendet werden. Tabelle 6 zeigt die Ergebnisse der Regressionsanalyse. Die Änderung in R^2 (ΔR^2) bei jedem Schritt gibt an, wie sehr der neu hinzugefügte Prädiktor zur Aufklärung der Varianz beiträgt, nachdem der Einfluss der bereits hinzugefügten Prädiktoren kontrolliert wurde. Der Anteil an Varianz, der von allen Prädiktoren aufgeklärt wird, ist $R^2 = .23$ (Korrigiertes $R^2 = .16$).

Tabelle 6.

Hierarchische Regressionsanalyse mit Wörteranzahl (logarithmiert), Anzahl IAVs, Anzahl SVs und Anzahl Adjektive als Prädiktoren für die Expertenurteile

Prädiktoren:	Expertenurteile (zusammengefasst)		
	ΔR^2	$B (SE B)$	β
Schritt 1:	.12*		
Wörteranzahl		0.41 (0.16)	.35*
Schritt 2:	.11*		
Wörteranzahl		0.03 (0.30)	.02
IAV		0.00 (0.02)	-.03
SV		0.13 (0.10)	.23
Adjektive		0.06 (0.03)	.36*

*Anmerkungen: N = 160 AC-Beobachtungen, * $p < .05$, ** $p < .001$.*

Expertenurteile und Coh-Matrix-Variablen. Fünf Coh-Matrix-Variablen geben die Abstraktheit/Konkretheit eines Texts an, wovon zwei Variablen (Hyperonymie für Nomen und Verben, Wortkonkretheit) Kombinationen aus mehreren Variablen sind. In der Analyse zum Einfluss auf die zusammengefassten Expertenurteile haben wir uns auf die anderen drei Coh-Matrix-Variablen fokussiert, deren Ergebnisse eindeutiger zu interpretieren sind. Die zusammengefassten Expertenurteile korrelieren signifikant positiv mit Konkretheit für lexikalische Wörter ($r = .16$, $p < .05$), Hyperonymie für Verben ($r = .16$, $p < .05$) und Hyperonymie für Nomen ($r = .22$, $p < .01$).

Tabelle 7.

Hierarchische Regressionsanalyse mit Wörteranzahl (logarithmiert), Konkretheit für lexikalische Wörter, Hyperonymie für Verben und Hyperonymie für Nomen als Prädiktoren für die Expertenurteile

Prädiktoren:	Expertenurteile (zusammengefasst)		
	ΔR^2	$B (SE B)$	β
Schritt 1:	.37**		
Wörteranzahl		0.64 (0.07)	.61**
Schritt 2:	.02		
Wörteranzahl		0.61 (0.07)	.58**
Konkretheit für lexikalische Wörter		0.00 (0.00)	-.02
Hyperonymie für Verben		0.12 (0.08)	.10
Hyperonymie für Nomen		0.07 (0.05)	.09

*Anmerkungen: N = 160 AC-Beobachtungen, * $p < .05$, ** $p < .001$.*

Um den Einfluss dieser drei Coh-Matrix-Variablen auf die zusammengefassten Expertenurteile zu untersuchen, wurde eine hierarchische Regressionsanalyse durchgeführt. Auch in dieser Regressionsanalyse wurde Wörteranzahl (logarithmiert) im ersten Schritt als Prädiktor eingefügt, um für dessen Einfluss zu kontrollieren ($\beta = .61$, $p < .01$). Im zweiten Schritt wurde Konkretheit für lexikalische Wörter in die Analyse integriert ($\beta = -.02$, $p = .78$). Auch Hyperonymie für Verben ($\beta = .10$, $p = .12$) und Hyperonyme von Nomen ($\beta = .09$, $p = .19$) haben keinen signifikanten Einfluss auf die Expertenbeurteilung der AC-Beobachtungen. Tabelle 7 zeigt die Ergebnisse dieser

Regressionsanalyse. Alle Prädiktoren klären einen Anteil der Varianz von $R^2 = .39$ (Korrigiertes $R^2 = .37$) auf.

Diskussion

Linguistische Eigenschaften

Die Ergebnisse zum linguistischen Kategorienmodell zeigen, dass Assessoren das Verhalten der Kandidaten in Rollenspielen eher abstrakt als konkret beschreiben und relativ viele Adjektive nutzen. Zusätzlich fällt auf, dass IAVs die meistverwendete Verbkategorie des LCM sind. IAVs beschreiben generelle Verhaltenskonstrukte (z.B. organisieren, führen, unterstützen) und lassen daher mehr Interpretationsspielraum als DAVs, die spezifische Handlungen mit gleichbleibender physischer Eigenschaft beschreiben (z.B. nicken, sprechen, küssen). Da die Assessoren in kompetenzbezogenen Beobachtungsbögen dazu angehalten sind, Verhalten in Bezug auf die jeweilige Kompetenz zu beschreiben, ist es denkbar, dass sich die Assessoren stark von den Verhaltensbeispielen der Ratingskalen auf den Beobachtungsbögen beeinflussen lassen (siehe Abbildung 1). Diese Verhaltensbeispiele weisen mehr IAVs auf als DAVs. Dafür spricht, dass Einträge in den Beobachtungsbögen gefunden wurden, die inhaltlich den Verhaltensbeispielen ähnelten, auch wenn sie anders formuliert waren. Eine weitere mögliche Erklärung ist, dass Assessoren besonders allgemeine Eindrücke der Kandidaten im Gedächtnis behalten und daher das Verhalten eher allgemein statt konkret beschreiben (Lance et al., 2004).

Die Ergebnisse der Coh-Matrix-Variablen zur Abstraktheit/Konkretheit der Texte zeigen insgesamt ebenfalls, dass die Einträge in den Beobachtungsbögen eher abstrakt als konkret sind. Einzig die Variable „Hyperonymie für Nomen“ hat eher hohe Werte. Die von Assessoren verwendeten Nomen weisen also im Durchschnitt viele hierarchisch übergeordnete Oberbegriffe auf und können daher als konkret bezeichnet werden (Graesser

et al., 2004). Die Tatsache, dass vier dieser Coh-Matrix-Variablen signifikant negativ mit dem LCM-Score korrelieren, kann als Hinweis darauf interpretiert werden, dass diese Variablen eine ähnliche Art von Abstraktheit/Konkretheit messen. Da wir bei der Kodierung gemäß dem LCM lediglich Verben und Adjektive kategorisiert haben und keine Nomen überrascht es nicht, dass die Korrelation zwischen der Coh-Matrix-Variablen „Hyperonymie für Nomen“ und dem LCM-Score nicht signifikant war. Überraschend war hingegen die signifikant negative Korrelation zwischen DAVs und „Hyperonymie für Verben + Nomen“. Letztere Variable weist höhere Werte auf, je konkreter die verwendeten Nomen und Verben sind und DAVs sind die konkreteste Verbkategorie des LCM (Graesser et al., 2004; Semin & Fiedler, 1991). Daher hätten wir im Sinne einer konvergenten Validität eine positive Korrelation zwischen diesen beiden Variablen erwartet. Da DAVs sehr spezifische Handlungen beschreiben gehen wir davon aus, dass diese auch eine niedrige Hyperonymie aufweisen.

Von den gewählten Coh-Matrix-Variablen aus der Hauptkomponentenanalyse von Graesser et al. (2011) weist keine im Durchschnitt sehr niedrige oder sehr hohe z-Werte auf.

Qualitätsbeurteilung durch Experten

Der stärkste gefundene Zusammenhang zwischen Expertenurteilen und linguistischen Eigenschaften von Einträgen in Beobachtungsbögen ist die Präferenz der befragten Assessoren für Einträge mit vielen Adjektiven. Adjektive bilden im LCM die abstrakteste Wortkategorie, da sie relativ viel Interpretationsspielraum bieten (z.B. großzügig, detailliert, zurückhaltend; Semin & Fiedler, 1991). Wir haben aber nicht nur personenbezogene Adjektive kategorisiert, sondern grundsätzlich alle verwendeten Adjektive. Es kann sein, dass der Zusammenhang zwischen Expertenurteilen und Adjektiven für personenbezogene Adjektive anders ausgeprägt ist als für Adjektive die

sich nicht auf Personen beziehen. Und aus unserer Sicht können Adjektive trotz ihrer Abstraktheit den Informationsgehalt erhöhen, wenn sie bspw. Handlungen oder deren Ergebnisse beschreiben. Zum Beispiel der Satz „Die Kandidatin macht eine *detaillierte* Beschreibung des Problems“ liefert aus unserer Sicht mehr Informationen über die Kandidatenleistung als der Satz „Die Kandidatin beschreibt das Problem“. Daher ist die Verwendung von Adjektiven nicht grundsätzlich als nicht wünschenswert anzusehen, sondern sie kann den Informationsgehalt steigern.

Wir hätten allerdings einen signifikanten positiven Zusammenhang zwischen den Expertenurteilen und der Anzahl verwendeter DAVs erwartet. Diese Verbkategorie beschreibt sehr konkrete Handlungen und wir hatten erwartet, dass die befragten Assessoren Einträge mit vielen DAVs als klarer, konkreter und nützlicher beurteilen würden. Eine Ursache dafür, dass dieser Zusammenhang nicht signifikant war, könnte darin liegen, dass in den Beobachtungen insgesamt zu wenig DAVs verwendet wurden, als dass dieser Zusammenhang hätte statistisch signifikant werden können.

Ein weiterer Zusammenhang zeigte sich zwischen den Expertenurteilen und der logarithmierten Wörteranzahl der Einträge in Beobachtungsbögen. Die befragten Assessoren bewerteten Einträge mit mehr Wörtern besser als Einträge mit weniger Wörtern, wobei dieser Zusammenhang bei steigender Wörteranzahl abnahm.

Grenzen der Ergebnisse

Die verwendete Datenbasis von Einträgen in Beobachtungsbögen weist mehrfach Abhängigkeiten auf. Mehrere Beobachtungen wurden von den selben Assessoren verfasst und beziehen sich auf die selben Kandidaten, AC-Übungen oder Kompetenzen. Sowohl Kandidaten als auch Assessoren gehören teilweise den selben Organisationen an und mehrere ACs wurden für die selben Organisationen mit den selben Kompetenzen durchgeführt. Den Einfluss dieser Abhängigkeiten in den Daten konnten wir leider nicht

kontrollieren, da die Datenbasis dafür viel grösser sein müsste. Daher ist es möglich, dass die Ergebnisse verzerrt sind.

Da die Verteilung der Differenzen zwischen LCM-Scores und Skalenmittelwert steilgipflig ist, sind die beiden t-Tests der LCM-Scores gegen den Skalenmittelwert nur eingeschränkt interpretierbar. Insgesamt deuten die Ergebnisse der LCM-Variablen und der Coh-Matrix-Variablen jedoch auf eine eher abstrakte Beschreibung des Kandidatenverhaltens durch die Assessoren hin.

Bezüglich der Expertenurteile besteht die Möglichkeit, dass sich die befragten Assessoren systematisch bezüglich der eigenen Englischkenntnisse überschätzt haben. Dagegen spricht die zufriedenstellende Interrater-Reliabilität und die Tatsache, dass die Assessoren bezüglich der Sprache weder per E-Mail noch im Kommentarfeld des Fragebogens entsprechende Aussagen gemacht haben.

Ausblick

Für die zukünftige Forschung über schriftliche Beurteilungen von AC-Kandidaten lassen sich aus dieser Studie vor allem zwei Fragen ableiten. Die erste ist, inwieweit die in dieser Studie gefundenen Ergebnisse zu den linguistischen Eigenschaften von Einträgen in Beobachtungsbögen auch bei anderen AC-Daten auftreten. Zwar ist die in dieser Studie verwendete Datenbasis heterogen, aber alle Texte wurden in Beobachtungsbögen des webbasierten Tools enAC eingetragen. Daher wäre es hilfreich, die sprachlichen Eigenschaften anderer AC-Daten anhand des LCM und des Coh-Matrix-Tools zu analysieren, um zu prüfen, ob sich die Ergebnisse dieser Studie auch bei anderen AC-Daten bestätigen.

Eine zweite Frage für zukünftige Forschung wäre, was die linguistischen Eigenschaften von Assessmentberichten sind. Die Datenbasis dieser Studie waren Einträge in Beobachtungsbögen, die vor dem Verfassen des Assessmentberichts gemacht wurden.

Zwar sind diese Einträge in Beobachtungsbögen die Grundlage für die Assessmentberichte, sie haben aber eher den Charakter von Notizen. Ein Assessmentbericht, der den Auftraggebern und den jeweiligen Kandidaten gezeigt wird, würde daher vermutlich andere sprachliche Eigenschaften aufweisen.

Die Ergebnisse dieser Studie zeigen, dass Assessoren das Verhalten von Kandidaten eher abstrakt als konkret beschreiben. Als Implikation für die Praxis ergibt sich daraus, dass Assessoren deutlich gemacht werden sollte, welchen Mehrwert konkretere Verhaltensbeschreibungen bieten, z.B. eine Erhöhung der Präzision der Beschreibungen und eine Verringerung des fundamentalen Attributionsfehlers (Semin & Fiedler, 1991).

Eine weitere Implikation für die Praxis wäre, dass man Assessoren computergestütztes Feedback zu ihren Einträgen in Beobachtungsbögen geben könnte. Diese Einträge dienen der Begründung der gewählten Ratings für die jeweiligen Kompetenzen und bilden die Grundlage für das Verfassen des Assessmentberichts (Ballantyne & Povah, 2004; Grüterich, 2006; Hennessy et al., 1998). Wenn Assessoren ihre Beobachtungen bzw. Beurteilungen in ein computerbasiertes Tool eingeben, könnte dieses quasi „im Hintergrund“ die linguistischen Eigenschaften der Eingaben analysieren und den Assessoren zeitnahes Feedback geben. Wenn Assessoren beispielsweise sehr wenig DAVs nutzen oder die Konkretheit der Wörter gemäß Coh-Matrix-Variablen gering ist, dann könnte eine automatische Meldung die Assessoren daran erinnern, dass sie möglichst konkret das Verhalten der Kandidaten beschreiben sollen. Eine automatische Analyse und Rückmeldung durch geeignete Software könnte so die Qualität schriftlicher Beurteilungen von AC-Kandidaten erhöhen.

Literatur

- Arthur, W., Day, E. A., McNelly, T. L., & Edens, P. S. (2003). A meta-analysis of the criterion-related validity of assessment center dimensions. *Personnel Psychology*, *56*, 125-154. doi: 10.1111/j.1744-6570.2003.tb00146.x
- Azevedo, R., & Bernard, R. M. (1995). A meta-analysis of the effects of feedback in computer-based instruction. *Journal of Educational Computing Research*, *13*, 111-127. doi: 10.2190/9LMD-3U28-3A0G-FTQT
- Ballantyne, I., & Povah, N. (2004). *Assessment and development centres* (Second ed.). Aldershot, UK: Gower.
- Bernardin, H. J. (1978). Effects of rater training on leniency and halo errors in student ratings of instructors. *Journal of Applied Psychology*, *63*, 301-308. doi: 10.1037/0021-9010.63.3.301
- Biedermann, A. (2008). *Qualität verhaltensbezogener Beurteilungen: Computergestütztes Feedback im Assessment Center und dessen Auswirkung auf die Beurteilung sozialer Kompetenz*. (Diplomarbeit), Philipps-Universität Marburg. Retrieved from: http://www.ki-bit.com/web/component/option,com_docman/task,doc_download/gid,94/
- Bowler, M. C., & Woehr, D. J. (2006). A meta-analytic evaluation of the impact of dimension and exercise factors on assessment center ratings. *Journal of Applied Psychology*, *91*, 1114-1124. doi: 10.1037/0021-9010.91.5.1114
- Bycio, P., Alvares, K. M., & Hahn, J. (1987). Situational specificity in assessment center ratings: A confirmatory factor analysis. *Journal of Applied Psychology*, *72*, 463. doi: 10.1037/0021-9010.72.3.463

- Cedefop. (2014). Gemeinsamer europäischer Referenzrahmen für Sprachen. Retrieved April 18th, 2014, from: <http://europass.cedefop.europa.eu/en/resources/european-language-levels-cefr>
- Coenen, L., Hedeboew, L., & Semin, G. (2006). *The linguistic category model (LCM) manual*. Amsterdam, Netherlands: Free University Amsterdam.
- Coltheart, M. (1981). The MRC psycholinguistic database. *The Quarterly Journal of Experimental Psychology*, 33, 497-505. doi: 10.1080/14640748108400805
- Graesser, A. C., McNamara, D. S., & Kulikowich, J. M. (2011). Coh-Metrix providing multilevel analyses of text characteristics. *Educational Researcher*, 40, 223-234. doi: 10.3102/0013189X11413260
- Graesser, A. C., McNamara, D. S., Louwrese, M. M., & Cai, Z. (2004). Coh-metrix: Analysis of text on cohesion and language. *Behavior Research Methods, Instruments, & Computers: A Journal of the Psychonomic Society, Inc*, 36, 193-202. doi: 10.3758/BF03195564
- Grüterich, F. (2006). *Beurteilungsqualität im Assessment Center: Chancen und Risiken eines prozessbegleitenden, computergestützten Feedbacks an die Assessoren*. (Diplomarbeit), Universität zu Köln. Retrieved from: http://www.ki-bit.com/web/component/option,com_docman/task,doc_download/gid,7/
- Harvey, J. H., Town, J. P., & Yarkin, K. L. (1981). How fundamental is "the fundamental attribution error"? *Journal of Personality and Social Psychology*, 40, 346. doi: 10.1037/0022-3514.40.2.346
- Hennessy, J., Mabey, B., & Warr, P. (1998). Assessment centre observation procedures: An experimental comparison of traditional, checklist and coding methods. *International Journal of Selection and Assessment*, 6, 222-231. doi: 10.1111/1468-2389.00093

- Howard, A. (1997). A reassessment of assessment centers: Challenges for the 21st century. *Journal of Social Behavior and Personality, 12*, 13-52.
- Kanning, U. P., Pöttker, J., & Gelléri, P. (2007). Assessment Center-Praxis in deutschen Großunternehmen. *Zeitschrift für Arbeits-und Organisationspsychologie A&O, 51*, 155-167. doi: 10.1026/0932-4089.51.4.155
- Kleinmann, M. (2003). *Assessment-Center*. Göttingen, Germany: Hogrefe.
- Lance, C. E. (2008). Why assessment centers do not work the way they are supposed to. *Industrial and Organizational Psychology, 1*, 84-97. doi: 10.1111/j.1754-9434.2007.00017.x
- Lance, C. E., Foster, M. R., Gentry, W. A., & Thoresen, J. D. (2004). Assessor cognitive processes in an operational assessment center. *Journal of Applied Psychology, 89*, 22-35. doi: 10.1037/0021-9010.89.1.22
- Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics, 33*, 159-174. doi: 10.2307/2529310
- Lievens, F. (2001). Assessor training strategies and their effects on accuracy, interrater reliability, and discriminant validity. *Journal of Applied Psychology, 86*, 255-264. doi: 10.1037/0021-9010.86.2.255
- Lievens, F. (2002). Trying to understand the different pieces of the construct validity puzzle of assessment centers: An examination of assessor and assessee effects. *Journal of Applied Psychology, 87*, 675-686. doi: 10.1037//0021-9010.87.4.675
- Lievens, F. (2009). Assessment centres: A tale about dimensions, exercises, and dancing bears. *European Journal of Work and Organizational Psychology, 18*, 102-121. doi: 10.1080/13594320802058997

- Lievens, F., Dilchert, S., & Ones, D. S. (2009). The importance of exercise and dimension factors in assessment centers: Simultaneous examinations of construct-related and criterion-related validity. *Human Performance, 22*, 375-390. doi: 10.1080/08959280903248310
- Lievens, F., Tett, R. P., & Schleicher, D. J. (2009). Assessment centers at the crossroads: Toward a reconceptualization of assessment center exercises. *Research in personnel and human resources management, 28*, 99-152. doi: 10.1108/S0742-7301(2009)0000028006
- McNamara, D. S., Graesser, A., & Louwrese, M. (2012). Sources of text difficulty: Across genres and grades. In J. P. Sabatini, E. R. Albro & T. O'Reilly (Eds.), *Measuring up: Advances in how we assess reading ability* (pp. 89-116). Plymouth, UK: Rowman & Littlefield Education.
- McNamara, D. S., Louwrese, M. M., Cai, Z., & Graesser, A. (2012). Coh-Metrix version 3.0. Retrieved from: <http://tool.cohmetrix.com/>
- Rubini, M., & Menegatti, M. (2008). Linguistic bias in personnel selection. *Journal of Language and Social Psychology, 27*, 168-181. doi: 10.1177/0261927x07313653
- Sagie, A., & Magnezy, R. (1997). Assessor type, number of distinguishable dimension categories, and assessment centre construct validity. *Journal of Occupational and Organizational Psychology, 70*, 103-108. doi: 10.1111/j.2044-8325.1997.tb00634.x
- Schmidt, F. L., & Hunter, J. E. (1998). The validity and utility of selection methods in personnel psychology: Practical and theoretical implications of 85 years of research findings. *Psychological Bulletin, 124*, 262-274. doi: 10.1037/0033-2909.124.2.262
- Schneider, J. R., & Schmitt, N. (1992). An exercise design approach to understanding assessment center dimension and exercise constructs. *Journal of Applied Psychology, 77*. doi: 10.1037/0021-9010.77.1.32

- Schollaert, E., & Lievens, F. (2011). The use of role-player prompts in assessment center exercises. *International Journal of Selection and Assessment, 19*, 190-197. doi: 10.1111/j.1468-2389.2011.00546.x
- Semin, G. (1994). The linguistic category model and personality language. In J. Siegfried (Ed.), *The status of common sense in psychology*. (pp. 305-321): Westport, CT: Ablex Publishing.
- Semin, G., & Fiedler, K. (1988). The cognitive functions of linguistic categories in describing persons - Social cognition and language. *Journal of Personality and Social Psychology, 54*, 558-568. doi: 10.1037/0022-3514.54.4.558
- Semin, G., & Fiedler, K. (1991). The linguistic category model, its bases, applications and range. *European Review of Social Psychology, 2*, 1.30. doi: 10.1080/14792779143000006
- Shore, T. H., Thornton, G. C., & McFarlane Shore, L. (1990). Construct validity of two categories of assessment center dimension ratings. *Personnel Psychology, 43*, 101-116. doi: 10.1111/j.1744-6570.1990.tb02008.x
- Ter Doest, L., & Semin, G. (2005). Retrieval contexts and the concreteness effect: Dissociations in memory for concrete and abstract words. *European Journal of Cognitive Psychology, 17*, 859-881. doi: 10.1080/09541440540000031
- Ter Doest, L., Semin, G., & Sherman, S. J. (2002). Linguistic context and social perception: Does stimulus abstraction moderate processing style? *Journal of Language and Social Psychology, 21*, 195-229. doi: 10.1177/0261927X02021003001
- Thornton, G. C., & Cleveland, J. N. (1990). Developing managerial talent through simulation. *American Psychologist, 45*, 190-199. doi: 10.1037/0003-066X.45.2.190

Thornton, G. C., & Rupp, D. E. (2006). *Assessment centers in human resource management: Strategies for prediction, diagnosis, and development*. Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Thornton, G. C., & Krause, D. E. (2009). Selection versus development assessment centers: An international survey of design, execution, and evaluation. *The International Journal of Human Resource Management*, 20, 478-498. doi: 10.1080/09585190802673536

General Discussion

General Discussion

The use of ICT for HRD is a widespread organizational reality and will most likely increase in the future (K. G. Brown, Charlier, & Pierotti, 2012; Salas et al., 2012). For ICT utilization to be effective, the factors influencing the technology acceptance of users have to be known, and the effectiveness of the used technology has to be tested. Furthermore, there are untapped potentials of ICT utilization in HRD that can be further cultivated in the future, for instance the automatic sensing of behavior or the use of virtual reality environments (Aguinis et al., 2001; Frauendorfer et al., 2014).

In this dissertation, I focused on three important aspects of ICT utilization in HRD, namely technology acceptance, the use of ICT for competency development, and its use for competency assessment. In the first study, I showed that many coaches see potential benefit in the use of ICT. More specifically, the attitudes of coaches toward computer use in coaching correlate positively with their Internet self-efficacy and their preference for a systematic coaching approach. Thus, coaches who believe that they are competent in Internet-related activities (e.g., using a search engine) and who prefer empirically validated coaching methods as well as clear and measurable coaching objectives are likely to have positive attitudes toward ICT utilization.

In the second study, I experimentally tested the effectiveness of a Web-based tool for competency development. I investigated if using the Web-based tool enTalent for defining development objectives and for planning the development process leads to better competency development. Participants were randomly allocated to either the treatment group or the control group. Both groups used enTalent to make self-evaluations and ask others for feedback, but only the treatment group used enTalent to define development objectives and plans. The results did not show significant differences between the two conditions or between the pretest and posttest measures. Thus, there was no significant

competency development within the two months neither for the treatment group nor for the control group. One possible explanation for these results is the fact that the process lasted only for two months, which might be not enough for significantly developing the competencies that the participants could select. Other possible explanations are the lack of guidance and control by supervisors or mentors and the lack of clear incentives for significant competency development.

The third study of this dissertation examined the linguistic characteristics of assessors' descriptions of AC candidates. Entries in the observation sheets of the Web-based tool enAC were analyzed with regards to their linguistic characteristics. In addition, we recruited assessors that were not involved in writing these entries and asked them to evaluate their quality. Findings revealed that assessors describe the behavior of candidates rather abstract than concrete. Moreover, results showed a positive correlation between the number of adjectives and the evaluations of the descriptions by assessors.

Contribution

Technology acceptance

Technology acceptance is a vital success factor of ICT utilization. Negative user reactions toward new ICT often lead to negative implementation outcomes (Aiman-Smith & Green, 2002; Davis, 1989). Technology acceptance is especially crucial in processes in which the personal contact between the persons involved is regarded as important (e.g., coaching, mentoring, psychotherapy). Only few published studies exist that deal with technology acceptance in e-coaching or e-mentoring. For instance, a survey on coaches' perceptions of the quality of their working alliance with clients showed no significant differences between distance coaching practices (e.g., coaching by e-mail or phone) and face-to-face coaching (Berry, Ashby, Gnilka, & Matheny, 2011). And in a study on e-coaching for junior scientists, the participants indicated high acceptance of the program

(Cornelius, Schumann, & Boos, 2009). Furthermore, in a study on e-mentoring for women, the majority of participants indicated satisfaction with the electronic communication (e.g., e-mail, online meetings) with the mentors (Headlam-Wells et al., 2005). However, the first study of this dissertation examined not only if coaches accept ICT utilization in coaching or not, but also examined correlates of positive attitudes toward ICT. The results show a significant correlation of positive attitudes toward ICT utilization in coaching with Internet self-efficacy and with the preference for a systematic coaching approach. Thus, our study demonstrated that coaches who feel competent in Internet-related activities and coaches who prefer structured and empirically validated coaching methods are those who would rather use ICT in coaching than others.

Soft Skills Development with Information and Communication Technology

E-learning for soft skills development is a complex endeavor. Developing hard skills is mostly about the memorization of knowledge and its application in clearly defined contexts, whereas developing soft skills is about learning to adapt one's behavior according to diverse information in different situations (Morgan & Adams, 2009). Given that soft skills training is often only about the application of general principles, training transfer is more difficult for soft skills than for hard skills (Blume et al., 2010). However, soft skills have an impact on performance and career development and therefore organizations strive to develop the soft skills of their employees (Heckman & Kautz, 2012; Salvisberg, 2010). For instance, in DCs and performance appraisals the soft skills of employees are assessed and development objectives are defined (Appelbaum, Harel, & Shapiro, 1998; Thornton & Krause, 2009; Wilson & Western, 2000). For competency development to be effective, development objectives should be not more than three and they should be clear, behavioral and measurable (Bracken et al., 2001; Byham, 2005; Grote, 1996). Development objectives and plans should be put into writing and possible

difficulties should be thought of at the beginning of a development process (Bracken et al., 2001; Byham, 2005; Grote, 1996). Moreover, in e-learning processes for soft skills learners should be able to choose learning activities on their own and evaluate their progress with pre- and posttests (Adams et al., 2010).

The Web-based tool enTalent complies with all these recommendations. However, the results of the validation study (Study 2) did not show a significant competency development after the utilization of enTalent for two months. Hence, our study demonstrated that complying with the recommendations mentioned above is not enough for competency development to be effective, at least after two months. Most likely, the learners need more guidance and control by supervisors, mentors or coaches in order to significantly develop competencies such as “Acting under pressure”, “Generating solutions” or “Structuring tasks and projects”. The findings of our study contradict basic notions of some of the most influential adult learning theories, such as the andragogy model or models of self-directed learning (SDL) (Ellinger, 2004; Knowles, 1973; Merriam, 2001). But they are in line with findings that e-learning processes in which the learners have a lot of autonomy are often not very effective (Salas et al., 2012). The present dissertation contributes therefore to a better understanding of soft skills development and e-learning by showing that a structured approach with comprehensive development plans, evaluations by others and self-evaluations is not sufficient. Learners probably need more guidance and help by others as well as maybe more time than two months. Furthermore, learners might need more incentive to invest effort in their competency development. For instance, organizations could recognize significant development with promotion, the delegation of interesting tasks or bonus payments.

Supporting Assessors with Information and Communication Technology

Many organizations use ACs and DCs in order to assess job applicants or to develop the competencies of their employees (Appelbaum et al., 1998; Kanning, Pöttker, & Gelléri, 2007; Klebl & Nerdinger, 2010). There are many empirical studies on the quality of assessors' evaluations, but they focus on the validity of the ratings for the assessed competencies (Arthur et al., 2003; Lievens et al., 2009; Schmidt & Hunter, 1998; Shore, Thornton, & McFarlane Shore, 1990). It has been tested to use computer-based feedback to support assessors in rating competencies, but with only little success so far (Biedermann, 2008; Grüterich, 2006). Beyond rating the assessed competencies, assessors also describe the behavior of candidates in observation sheets and assessment reports (Ballantyne & Povah, 2004; Hennessy et al., 1998; Thornton & Rupp, 2006). These descriptions play an important role in the assessment process. They are used in order to justify the ratings for the observed competencies or to give feedback about the candidates' performance to supervisors, HR managers or to the candidates themselves. To my knowledge, the linguistic characteristics of these descriptions have not yet been empirically investigated.

The present dissertation analyzed the linguistic characteristics of 515 descriptions of candidates' behavior in observation sheets. The results demonstrate that assessors describe the behavior of candidates rather abstract than concrete. Furthermore, by asking assessors to evaluate the quality of these entries in observation sheets, we were able to show that assessors find descriptions with many adjectives more useful than descriptions with few adjectives.

This dissertation contributes to the foundation of ICT utilization for the quality improvement of assessors' evaluations. Analyzing linguistic characteristics of assessors' descriptions is the groundwork for the development of ICT-based tools that support

assessors. ICT-based tools could give assessors automatic feedback about the linguistic characteristics of their texts and advise them accordingly (e.g., to use more concrete language). Automatic feedback might be less costly than assessor training and without difficulty it can be used repeatedly as well as during the actual writing. However, it needs to be tested if such automatic feedback is effective with regards to improving the assessors' writing and developing the competencies of assessors in the long run.

Limitations

Technology acceptance

Instead of a paper-pencil questionnaire, an online questionnaire was used to examine the attitudes of coaches toward computer use in coaching (Study 1). Therefore, the results could be biased as mainly coaches with positive attitudes toward computer use could have answered the questionnaire. In addition, overall the participants indicated a high level of Internet self-efficacy. This might also be due to the fact that an online questionnaire was used. However, the participants needed only to click on a hyperlink in an e-mail to start the questionnaire. In order to complete the questionnaire, the participants had only to click on response options or type in answers. Hence, the participants needed only a low level of ICT skills to participate in this survey.

When creating the online questionnaire we tried to comply to best practices of survey design in order to maximize the response rate and sample size (Baruch & Holtom, 2008). We created the online questionnaire in the two most widely spoken languages of Switzerland (i.e., German and French), sent a reminder mail to coaches and tried to limit the completion time to 20 minutes. However, the response rate was rather low. Many coaches we contacted via e-mail did not fill in the questionnaire and the results could therefore be biased. Despite that, the participants of our online questionnaire resemble participants of a survey of the coaching market in Switzerland in characteristics such as

age, gender, approach to coaching, professional experience, educational background, and membership in associations (Seiger & Künzli, 2012). Therefore we assume that our participants do not differ significantly from the general population of coaches in Switzerland with regard to important characteristics.

Soft Skills Development with Information and Communication Technology

In Study 2, we experimentally investigated the effectiveness of the Web-based tool enTalent that aims to support the competency development of its users. Usually, a supervisor or mentor helps the user in defining development objectives and plans and often the supervisors evaluate the competencies. Furthermore, a supervisor or mentor can be given access to the development objectives and plans so that they can control them and make comments as well as download the development plans and evaluation results. However, the feedback providers in our study were colleagues of the participants and not their supervisors. And no mentor or supervisor but we controlled the participants' activity in enTalent and sent reminder mails in case participants had not fulfilled a task. Furthermore, as this was a study with volunteers and not a development process in an organization, participants could not improve their chances of promotion or impress their supervisors by a significant competency development. All these differences in comparison with the real-life utilization of enTalent reduce the generalizability of the results. Especially the motivation of the participants might have been lower than in a real-life utilization.

Supporting Assessors with Information and Communication Technology

In Study 3, we analyzed the linguistic characteristics of assessors' entries in observation sheets. These observation sheets were written by 21 different assessors in 11 ACs and describe the behavior of overall 33 candidates. Assessors and candidates sometimes belonged to the same organizations. Furthermore, the assessors filled in several

observation sheets for the same candidates, exercises and competencies. In addition, several ACs were conducted for the same organizations, sometimes assessing the same competencies. Therefore, the data of our study are not independent, but dependent in multiple ways. In order to control for this non-independence of our data, we would have needed a much larger sample size. Thus, it is possible that our results are biased.

One way of measuring the abstraction/concreteness of texts is to calculate their LCM score that indicates abstraction on a score between 1 (very concrete) and 4 (very abstract) (Semin & Fiedler, 1991). In order to examine if assessors use rather abstract or concrete language, we conducted a t-test for the mean of the LCM scores against the test value 2.5, which represents the midpoint between abstraction and concreteness. However, the distribution of the differences between LCM scores and the midpoint of the scale is leptokurtic. Therefore, the data violate the assumption of the t-test that “the sampling distribution of the differences between scores should be normal” (p. 326) and the results can only be interpreted in a limited way (Field, 2009). Nevertheless, the results of the LCM variables and Coh-Metrix variables indicate that assessors describe candidates’ behavior rather abstract than concrete.

We asked assessors to evaluate the quality of entries in observation sheets that were all written in English. Thus, we also asked the assessors to indicate the level of their English skills according to the Common European Framework of Reference for Languages (Cedefop, 2014). It might be that assessors systematically indicated a higher level of English skills than they actually possess. However, no assessor asked any questions via e-mail or wrote any comments in the comment field at the end of the online questionnaire that would indicate problems with understanding the entries in the observation sheets. Furthermore, the inter-rater reliability showed substantial agreement between the assessors.

Therefore we assume that the English skills of the assessors were sufficient for completing the online questionnaire.

Implications for Research

Technology acceptance

Research shows that technology acceptance is a prerequisite of successful ICT utilization (Aiman-Smith & Green, 2002; Davis, 1989; Lee et al., 2009). Therefore, there are already several studies on technology acceptance in e-learning or e-assessment (Jones & Dages, 2003; Lee et al., 2009; Selim, 2003). We showed that Internet self-efficacy and the preference for a systematic coaching approach predict positive attitudes of coaches toward ICT utilization in coaching. So far, we have not investigated the attitudes of clients toward computer use in coaching. However, the technology acceptance of clients is essential given that coaching focuses on the clients and their behavior. Therefore, one important task for future research is to analyze clients' attitudes toward ICT utilization, as well as the attitudes of their supervisors or HR managers who are often involved in the initiation of the coaching process.

Moreover, future research should further validate the role of Internet self-efficacy as predictor of technology acceptance. Outside of HRD, it was shown that Internet self-efficacy is positively correlated with the use of Web-based tax-filing services (Hsu & Chiu, 2004). The use of ICT in HRD often implies Web-based applications, for example in e-learning, e-assessment, e-coaching or e-mentoring (Averweg, 2010; L. Brown et al., 2006; Headlam-Wells et al., 2005; Hils & Bahner, 2005; Konradt & Sarges, 2003). Therefore, Internet self-efficacy could also be an important predictor of technology acceptance in other fields than coaching.

Another avenue of future research could be to examine age differences in technology acceptance. Unlike older generations, many children today grow up with ICT being a

natural component of their everyday life. Future generations of employees might therefore show a higher degree of technology acceptance in general, as they are more used to ICT utilization. Already more than a decade ago, research showed age differences in reactions and behavior toward ICT among workers (Morris & Venkatesh, 2000). However, we did not find significant age differences in coaches' attitudes toward computer use in coaching (Study 1). Thus, it needs to be further investigated in which fields of activity, for which technologies and between which age cohorts potential age differences in technology acceptance are significant.

Soft Skills Development with Information and Communication Technology

Future research should further test the effectiveness of methods and tools for competency development with randomized controlled trials. For example, there are only few published studies about the effectiveness of e-coaching. With regard to e-learning for soft skills, its key success factors need to be further investigated, as the results of empirical studies are often ambiguous (Adams et al., 2010; Bruns et al., 2013; Park & Wentling, 2007). Our study on the effectiveness of the Web-based tool enTalent shows that a structured approach with comprehensive development plans, evaluations by others and self-evaluations is not enough for soft skills development to be significant (Study 2). In particular, the motivation of participants and how their motivation could be increased would be an important avenue for future research. Development processes in which the learners have a great deal of autonomy should be compared with processes in which learners are guided and supervised by mentors or coaches in order to see which approach is more effective (Salas et al., 2012).

Supporting Assessors with Information and Communication Technology

Organizations use ICT since decades for the assessment of skills, knowledge and attitudes (Hertel & Konradt, 2004; Laumer et al., 2009). However, there are only few

studies on the issue how ICT could directly support assessors in ACs and DCs (Biedermann, 2008; Grüterich, 2006). In Study 3, we examined linguistic characteristics of assessors' entries in observation sheets in the Web-based tool enAC. Thereby we identified several linguistic characteristics of assessors' descriptions of candidates. But that is just the start for developing ICT-based tools as support for assessors. In order to develop effective ICT-based tools that support assessors in describing and evaluating candidates' behavior, more research is necessary. First of all, replication studies should test if our results can be confirmed by data from other ACs and DCs. Only then our results can be generalized to ACs and DCs that are not carried out by using the Web-based tool enAC. Secondly, the effectiveness of automatic feedback should be tested. Does automatic feedback really improve assessors' texts and does it increase their competency as assessors in the long run? And if so, is it more effective than assessor training? Ideally, future research should answer these questions before such ICT-based tools are used in practice.

Another avenue for research would be to analyze the linguistic characteristics of assessment reports. We analyzed entries in observation sheets. These entries are made before the assessment reports are written. The entries in observation sheets are the basis for writing the assessment report, but they are often less well formulated and elaborated, because unlike the assessment report they are usually only shown to other assessors. Given that the assessment report is shown to the candidates, HR managers and supervisors, the linguistic characteristics might be different.

Future research could also test if assessors could use pre-formulated texts for writing assessment reports. Assessors could save time by using already formulated sentences. Computer-based tools could provide assessors with large databases of texts that describe candidates' behavior. However, it has to be tested if pre-formulated texts can be accurate enough in describing behavior so that the resulting text is a useful report of candidates'

performance. Furthermore, it has to be investigated if candidates, HR managers and supervisors can accept pre-formulated texts and perceive them as relevant and accurate. Otherwise, the use of pre-formulated texts might lead to negative reactions and their implementation will fail.

Implications for Practice

In Study 1, we showed that Internet self-efficacy is a predictor of positive attitudes toward ICT utilization. A practical implication would be to train people in the use of Web-based technology. This might enhance their Internet self-efficacy and could thereby increase their technology acceptance. For example, training curricula in coaching, HR management or adult education could include training in ICT utilization. Furthermore, organizations should make sure that the future users of new ICT possess sufficient capabilities for using it. For instance, before starting a Web-based training, the ICT skills of the future users could be assessed and, if necessary, developed via training. Training future users would not only increase their ICT skills but could also reduce negative reactions toward the new technology. What is more, users with better ICT skills are also more capable to accurately assess the advantages and disadvantages of new ICT. Thereby, negative reactions of these users toward new technology are probably more justified and meaningful than negative reactions of users with only little ICT skills.

In Study 2, we demonstrated that the development of soft skills is complex. Inconsistent with basic notions of important adult learning theories such as the andragogy model of Knowles (1973) or SDL models (Ellinger, 2004; Merriam, 2001), development processes in which learners have a lot of autonomy might not be very effective. As was shown by the results of our study, a structured approach with comprehensive development plans and the possibility to be evaluated by others as well as evaluating oneself is not always sufficient. Therefore, a practical implication would be to let trainers or mentors

guide and supervise learners in e-learning, because it might increase the effectiveness of the learning process (Salas et al., 2012). Guidance and support might be especially important in e-learning for soft skills, as it can mostly only teach general principles instead of hard facts (Morgan & Adams, 2009). Together with the learners, trainers or mentors could define development objectives, plan development activities and support the learners in the realization of these activities. Furthermore, trainers or mentors could control the learners' activities and evaluate their progress. Thereby, the learners' autonomy would be lower, but it could help them to deal with motivation gaps or with uncertainty about how to plan or realize learning activities.

In Study 3, we demonstrated that assessors describe candidates behavior in ACs rather abstract than concrete. Furthermore, we demonstrated that assessors prefer descriptions with many adjectives. A computer-based tool could make use of these results and give assessors automatic feedback about the linguistic characteristics of their texts and suggest improvements, for instance the use of more concrete language. There are already Web-based tools used by assessors to fill in observation sheets and write assessment reports (e.g., enAC), and there are Web-based tools that automatically analyze the linguistic characteristics of texts (e.g., Coh-Metrix). Therefore, a practical implication would be to develop a combination of both kinds of tools in order to help assessors to write better (e.g., more concrete) texts about candidates' behavior.

The use of ICT in HRD also implies certain risks, given that most of the processes in HRD deal with personal data. Assessment and development processes in organizations focus on employees and job applicants and their behavior. The data produced in these processes (e.g., development plans, learning progress reports, test results, assessment reports) are often confidential. Therefore, data protection is essential and organizations should apply best practices of data protection. In other fields, ethical principles and

regulations of ICT utilization have already been established. For example, the American Psychological Association (2013) and the Canadian Psychological Association (2006) have developed principles and guidelines about the use of communication technology for psychological services. Organizations would profit if they would establish such guidelines and principles for ICT utilization in HRD too. This could not only increase trust on the part of the employees, but could also prevent damage to the organizations' public image.

Conclusion

Without doubt, ICT will further evolve and so will its use in HRD. Research is needed in order to ensure that organizations use scientifically validated methods and tools in, for example, e-learning, e-coaching or e-assessment. The present dissertation focuses on three different aspects of ICT utilization in HRD. I have shown how attitudes toward computer use are correlated with the beliefs and preferences of potential users. I have tested a Web-based application and could thereby demonstrate the challenges of soft skills development. Finally, I have illustrated how assessors describe candidates' behavior in a Web-based tool and I have suggested how ICT could support assessors in the process. However, these are only some aspects of ICT utilization in HRD that have to be investigated. It is beyond the scope of the present dissertation to scientifically examine the whole field of ICT utilization in HRD. Nonetheless, the three studies analyzed aspects that have to be examined in order to ensure effective use of ICT in HRD. In coaching, in soft skills development and in ACs and DCs, the use of ICT will most likely increase in the future. The results illustrate factors that influence the use of ICT in these processes. Furthermore, the results give indications on how to improve ICT utilization in HRD, for instance by training users in Web-based technology, by guiding and supervising learners in e-learning for soft skills, and by combining different types of ICT-based tools in order to support assessors in ACs and DCs.

References

- Adams, J., Hanesiak, R., Morgan, G., Owston, R., Lupshenyuk, D., & Mills, L. (2009). *Blended learning for soft skills development (2009-5)*. York, Canada: York University, Institute for Research on Learning Technologies. Retrieved from: <http://irlt.yorku.ca/reports/TechReport2009-5.pdf>
- Aguinis, H., Henle, C. A., & Beaty Jr, J. C. (2001). Virtual reality technology: A new tool for personnel selection. *International Journal of Selection and Assessment*, 9, 70-83. doi: 10.1111/1468-2389.00164
- Aiman-Smith, L., & Green, S. G. (2002). Implementing new manufacturing technology: The related effects of technology characteristics and user learning activities. *Academy of Management Journal*, 45, 421-430. doi: 10.2307/3069356
- American Psychological Association (2013). Guidelines for the practice of telepsychology. Retrieved from: <http://www.apapracticecentral.org/ce/guidelines/telepsychology-guidelines.pdf>
- Andrews, J., & Higson, H. (2008). Graduate employability, 'soft skills' versus 'hard' business knowledge: A European study. *Higher Education in Europe*, 33, 411-422. doi: 10.1080/03797720802522627
- Appelbaum, S. H., Harel, V., & Shapiro, B. (1998). The developmental assessment centre: The next generation. *Career Development International*, 3, 5-12. doi: 10.1108/13620439810368574
- Arthur, W., Day, E. A., McNelly, T. L., & Edens, P. S. (2003). A meta-analysis of the criterion-related validity of assessment center dimensions. *Personnel Psychology*, 56, 125-154. doi: 10.1111/j.1744-6570.2003.tb00146.x
- Averweg, U. R. (2010). Enabling role of an Intranet to augment e-coaching. *Industrial and Commercial Training*, 42, 47-52. doi: 10.1108/00197851011013715

- Azevedo, R., & Bernard, R. M. (1995). A meta-analysis of the effects of feedback in computer-based instruction. *Journal of Educational Computing Research, 13*, 111-127. doi: 10.2190/9LMD-3U28-3A0G-FTQT
- Ballantyne, I., & Povah, N. (2004). *Assessment and development centres* (Second ed.). Aldershot, UK: Gower.
- Baruch, Y., & Holtom, B. C. (2008). Survey response rate levels and trends in organizational research. *Human Relations, 61*, 1139-1160. doi: 10.1177/0018726708094863
- Berger, T., & Andersson, G. (2009). Internetbasierte Psychotherapien: Besonderheiten und empirische Evidenz. *Psychotherapie, Psychosomatik, Medizinische Psychologie, 59*, 159-170. doi: 10.1055/s-0028-1090162
- Bernardin, H. J. (1978). Effects of rater training on leniency and halo errors in student ratings of instructors. *Journal of Applied Psychology, 63*, 301-308. doi: 10.1037/0021-9010.63.3.301
- Berry, R. M., Ashby, J. S., Gnilka, P. B., & Matheny, K. B. (2011). A comparison of face-to-face and distance coaching practices: Coaches' perceptions of the role of the working alliance in problem resolution. *Consulting Psychology Journal: Practice and Research, 63*, 243-253. doi: 10.1037/a0026735
- Biedermann, A. (2008). *Qualität verhaltensbezogener Beurteilungen: Computergestütztes Feedback im Assessment Center und dessen Auswirkung auf die Beurteilung sozialer Kompetenz*. (Diplomarbeit), Philipps-Universität Marburg. Retrieved from: http://www.ki-bit.com/web/component/option,com_docman/task,doc_download/gid,94/

- Blume, B. D., Ford, J. K., Baldwin, T. T., & Huang, J. L. (2010). Transfer of training: A meta-analytic review. *Journal of Management*, *36*, 1065-1105. doi: 10.1177/0149206309352880
- Bono, J. E., Purvanova, R. K., Towler, A. J., & Peterson, D. B. (2009). A survey of executive coaching practices. *Personnel Psychology*, *62*, 361-404. doi: 10.1111/J.1744-6570.2009.01142.X
- Bowler, M. C., & Woehr, D. J. (2006). A meta-analytic evaluation of the impact of dimension and exercise factors on assessment center ratings. *Journal of Applied Psychology*, *91*, 1114-1124. doi: 10.1037/0021-9010.91.5.1114
- Bracken, D. W., Timmreck, C. W., & Church, A. H. (2001). *The handbook of multisource feedback*. San Francisco, CA: John Wiley & Sons.
- Brotman, L. E., Liberi, W., & Wasylyshyn, K. M. (1998). Executive coaching: The need for standards of competence. *Consulting Psychology Journal: Practice and Research*, *50*, 40-46. doi: 10.1037/1061-4087.50.1.40
- Brown, K. G., Charlier, S. D., & Pierotti, A. (2012). E-learning at work: Contributions of past research and suggestions for the future. *International Review of Industrial and Organizational Psychology*, *27*, 89-114. doi: 10.1002/9781118311141.ch4
- Brown, L., Murphy, E., & Wade, V. (2006). Corporate eLearning: Human resource development implications for large and small organizations. *Human Resource Development International*, *9*, 415-427. doi: 10.1080/13678860600893607
- Bruns, A. K., Keith, N., & Müller, S. C. (2013). *Self-regulated performance improvement through deliberate practice in organizations: The case of female employees and skills to career advancement*. Paper presented at the Sixteenth Congress of the European Association of Work and Organizational Psychology, Münster, Germany.

- Byham, T. (2005). *Factors affecting the acceptance and application of developmental feedback from an executive assessment program*. (Electronic Dissertation), University of Akron, OhioLINK Electronic Theses and Dissertations Center. Retrieved from: <https://etd.ohiolink.edu/>
- Callinan, M., & Robertson, I. T. (2000). Work sample testing. *International Journal of Selection and Assessment*, 8, 248-260. doi: 10.1111/1468-2389.00154
- Canadian Psychological Association (2006). Providing psychological services via electronic media. Retrieved from: <http://www.cpa.ca/aboutcpa/committees/ethics/psychserviceselectronically/>
- Carless, S. A., & Roberts-Thompson, G. P. (2001). Self-ratings in training programs: An examination of level of performance and the effects of feedback. *International Journal of Selection and Assessment*, 9, 217-225. doi: 10.1111/1468-2389.00175
- Cedefop. (2014). Gemeinsamer europäischer Referenzrahmen für Sprachen. Retrieved April 18th, 2014, from: <http://europass.cedefop.europa.eu/en/resources/european-language-levels-cefr>
- Chen, H.-J. (2010). Linking employees' e-learning system use to their overall job outcomes: An empirical study based on the IS success model. *Computers & Education*, 55, 1628-1639. doi: 10.1016/j.compedu.2010.07.005
- Cornelius, C., Schumann, G., & Boos, M. (2009). Zeit- und Ziele-Management für Nachwuchswissenschaftler/innen. *Organisationsberatung, Supervision, Coaching*, 16, 54-65. doi: 10.1007/s11613-009-0110-3
- Dalsgaard, C. (2006). Social software: E-learning beyond learning management systems. *European Journal of Open, Distance and E-Learning*, 2. Retrieved from: http://www.eurodl.org/materials/contrib/2006/Christian_Dalsgaard.htm

- Davis, F. D. (1986). *A technology acceptance model for empirically testing new end-user information systems: Theory and results*. Unpublished doctoral dissertation, Massachusetts Institute of Technology. Retrieved from <http://hdl.handle.net/1721.1/15192>
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *Mis Quarterly*, *13*, 319-340. Retrieved from: <http://www.jstor.org/discover/10.2307/249008?uid=3737760&uid=2&uid=4&sid=21104069236607>
- Dillon, A., & Morris, M. G. (1996). User acceptance of information technology: Theories and models. *Annual Review of Information Science and Technology*, *31*, 3-32. Retrieved from: <http://hdl.handle.net/10150/105584>
- Eastin, M. S., & LaRose, R. (2000). Internet self-efficacy and the psychology of the digital divide. *Journal of Computer-Mediated Communication*, *6*. doi: 10.1111/j.1083-6101.2000.tb00110.x
- Ellinger, A. D. (2004). The concept of self-directed learning and its implications for human resource development. *Advances in Developing Human Resources*, *6*, 158-177. doi: 10.1177/1523422304263327
- Fahy, P. J. (2004). Web-based training. *The Internet Encyclopedia*. Retrieved from: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.91.8406&rep=rep1&type=pdf>
- Field, A. (2009). *Discovering statistics using SPSS*. London, UK: Sage publications.
- Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: An introduction to theory and research*. Boston, MA: Addison-Wesley Pub. Co.

- Fisher, S. L., & Howell, A. W. (2004). Beyond user acceptance: An examination of employee reactions to information technology systems. *Human Resource Management, 43*, 243-258. doi: 10.1002/Hrm.20018
- Frauendorfer, D., Schmid Mast, M., Nguyen, L., & Gatica-Perez, D. (2014). Nonverbal social sensing in action: Unobtrusive recording and extracting of nonverbal behavior in social interactions illustrated with a research example. *Journal of Nonverbal Behavior, 38*, 231-245. doi: 10.1007/s10919-014-0173-5
- Gold, J., Holden, R., Stewart, J., Iles, P., & Beardwell, J. (2013). *Human resource development: Theory and practice* (Second ed.). Hampshire, UK: Palgrave Macmillan.
- Graesser, A. C., McNamara, D. S., Louwerse, M. M., & Cai, Z. (2004). Coh-metrix: Analysis of text on cohesion and language. *Behavior Research Methods, Instruments, & Computers: A Journal of the Psychonomic Society, Inc, 36*, 193-202. doi: 10.3758/BF03195564
- Grant, A. M. (2005). What is evidence-based executive, workplace and life coaching? In M. Cavanagh, A. M. Grant & T. Kemp (Eds.), *Evidence-based coaching* (Vol. 1, pp. 1-12). Bowen Hills, Australia: Australian Academic Press.
- Grote, R. C. (1996). *The complete guide to performance appraisal*. New York City, NY: AMACOM Div American Mgmt Assn.
- Grüterich, F. (2006). *Beurteilungsqualität im Assessment Center: Chancen und Risiken eines prozessbegleitenden, computergestützten Feedbacks an die Assessoren*. (Diplomarbeit), Universität zu Köln. Retrieved from: http://www.ki-bit.com/web/component/option,com_docman/task,doc_download/gid,7/

- Hamlin, B., & Stewart, J. (2011). What is HRD? A definitional review and synthesis of the HRD domain. *Journal of European Industrial Training*, 35, 199-220. doi: 10.1108/03090591111120377
- Harvey, J. H., Town, J. P., & Yarkin, K. L. (1981). How fundamental is "the fundamental attribution error"? *Journal of Personality and Social Psychology*, 40, 346. doi: 10.1037/0022-3514.40.2.346
- Headlam-Wells, J., Gosland, J., & Craig, J. (2005). "There's magic in the web": E-mentoring for women's career development. *Career Development International*, 10, 444-459. doi: 10.1108/13620430510620548
- Headlam-Wells, J., Gosland, J., & Craig, J. (2006). Beyond the organisation: The design and management of e-mentoring systems. *International Journal of Information Management*, 26, 372-385. doi: 10.1016/J.Ijinfomgt.2006.04.001
- Heckman, J. J., & Kautz, T. (2012). Hard evidence on soft skills. *Labour Economics*, 19, 451-464. doi: 10.1016/j.labeco.2012.05.014
- Hennessy, J., Mabey, B., & Warr, P. (1998). Assessment centre observation procedures: An experimental comparison of traditional, checklist and coding methods. *International Journal of Selection and Assessment*, 6, 222-231. doi: 10.1111/1468-2389.00093
- Hertel, G., & Konradt, U. (2004). *Human Resource Management im Inter- und Intranet*. Göttingen, Germany: Hogrefe.
- Hils, M., & Bahner, J. (2005). Electronic Human Resource Management (E-HRM) in Deutschland - Stand und Entwicklung. *Wechselwirkungen, Jahrbuch aus Lehre und Forschung der Universität Stuttgart*. Retrieved from: <http://elib.uni-stuttgart.de/opus/volltexte/2006/2852/>

- Hoogervorst, J. A., Koopman, P. L., & Flier, H. v. d. (2002). Human resource strategy for the new ICT-driven business context. *International Journal of Human Resource Management, 13*, 1245-1265. doi: 10.1080/09585190210149501
- Hsu, M. H., & Chiu, C. M. (2004). Internet self-efficacy and electronic service acceptance. *Decision Support Systems, 38*, 369-381. doi: 10.1016/J.Dss.2003.08.001
- Jones, J. W., & Dages, K. D. (2003). Technology trends in staffing and assessment: A practice note. *International Journal of Selection and Assessment, 11*, 247-252. doi: 10.1111/1468-2389.00248
- Joo, B.-K. (2005). Executive coaching: A conceptual framework from an integrative review of practice and research. *Human Resource Development Review, 4*, 462-488. doi: 10.1177/1534484305280866
- Kanning, U. P., Pöttker, J., & Gelléri, P. (2007). Assessment Center-Praxis in deutschen Großunternehmen. *Zeitschrift für Arbeits- und Organisationspsychologie A&O, 51*, 155-167. doi: 10.1026/0932-4089.51.4.155
- Keist, M., & Gissler, M. (2013). E-Learning bei der Schweizerischen Post wird laufend mobiler. In C. Witt & A. Sieber (Eds.), *Mobile Learning* (pp. 219-239). Wiesbaden, Germany: Springer Fachmedien.
- Kemp, T. J. (2005). Psychology's unique contribution to solution-focused coaching: Exploring clients' past to inform their present and design their future. In M. Cavanagh, A. M. Grant & T. Kemp (Eds.), *Evidence-based coaching* (Vol. 1, pp. 37-47). Bowen Hills, Australia: Australian Academic Press.
- Klebl, U., & Nerdinger, F. W. (2010). Kompetenzentwicklung durch Development-Center. *Zeitschrift für Arbeits- und Organisationspsychologie A&O, 54*, 57-67. doi: 10.1026/0932-4089/a000012

- Klein, K. J., & Sorra, J. S. (1996). The challenge of innovation implementation. *The Academy of Management Review*, 21, 1055-1080. doi: 10.2307/259164
- Kleinmann, M. (2003). *Assessment-Center*. Göttingen, Germany: Hogrefe.
- Kleinmann, M., & Strauß, B. (1998). Validity and application of computer-simulated scenarios in personnel assessment. *International Journal of Selection and Assessment*, 6, 97-106. doi: 10.1111/1468-2389.00078
- Knatz, B. (2012). Coaching per Internet - wie es geht und wie es wirkt. In H. Geißler & M. Metz (Eds.), *E-Coaching und Online-Beratung*. Wiesbaden, Germany: Springer VS.
- Knowles, M. (1973). *The adult learner: A neglected species*. Houston, TX: Gulf Publishing Company.
- Knowles, M. (1975). *Self-directed learning*. New York, NY: Association Press.
- Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development* (Vol. 1). Englewood Cliffs, NJ: Prentice-Hall.
- Konradt, U., & Sarges, W. (2003). *E-recruitment und e-assessment*. Göttingen, Germany: Hogrefe.
- Lance, C. E., Foster, M. R., Gentry, W. A., & Thoresen, J. D. (2004). Assessor cognitive processes in an operational assessment center. *Journal of Applied Psychology*, 89, 22-35. doi: 10.1037/0021-9010.89.1.22
- Laumer, S., von Stetten, A., & Eckhardt, A. (2009). E-assessment. *Business & Information Systems Engineering*, 1, 263-265. doi: 10.1007/11576-009-0169-7
- Lee, B.-C., Yoon, J.-O., & Lee, I. (2009). Learners' acceptance of e-learning in South Korea: Theories and results. *Computers & Education*, 53, 1320-1329. doi: 10.1016/j.compedu.2009.06.014

- Lievens, F., Dilchert, S., & Ones, D. S. (2009). The importance of exercise and dimension factors in assessment centers: Simultaneous examinations of construct-related and criterion-related validity. *Human Performance*, 22, 375-390. doi: 10.1080/08959280903248310
- Luoma, M. (2000). Investigating the link between strategy and HRD. *Personnel Review*, 29, 769-790. doi: 10.1108/00483480010296960
- Luthans, F., Avey, J. B., & Patera, J. L. (2008). Experimental analysis of a Web-based training intervention to develop positive psychological capital. *Academy of Management Learning & Education*, 7, 209-221. doi: 10.5465/amle.2008.32712618
- Macpherson, A., Elliot, M., Harris, I., & Homan, G. (2004). E-learning: Reflections and evaluation of corporate programmes. *Human Resource Development International*, 7, 295-313. doi: 10.1080/13678860310001630638
- Marler, J. H., & Liang, X. (2012). Information technology change, work complexity and service jobs: A contingent perspective. *New Technology, Work and Employment*, 27, 133-146. doi: 10.1111/j.1468-005X.2012.00280.x
- McKenna, D. D., & Davis, S. L. (2009). Hidden in plain sight: The active ingredients of executive coaching. *Industrial and Organizational Psychology*, 2, 244-260. doi: 10.1111/j.1754-9434.2009.01143.x
- Merriam, S. B. (2001). Andragogy and self-directed learning: Pillars of adult learning theory. *New Directions for Adult and Continuing Education*, 89, 3-14. doi: 10.1002/ace.3
- Moore, G. C., & Benbasat, I. (1991). Development of an instrument to measure the perceptions of adopting an information technology innovation. *Information Systems Research*, 2, 192-222. doi: 10.1287/isre.2.3.192

- Morgan, G., & Adams, J. (2009). Pedagogy first: Making web-technologies work for soft skills development in leadership and management education. *Journal of Interactive Learning Research*, 20, 129-155. Retrieved from: <http://www.editlib.org/p/25256>
- Morris, M., & Venkatesh, V. (2000). Age differences in technology adoption decisions: Implications for a changing work force. *Personnel Psychology*, 53, 375-403. doi: 10.1111/j.1744-6570.2000.tb00206.x
- Park, J.-H., & Wentling, T. (2007). Factors associated with transfer of training in workplace e-learning. *Journal of Workplace Learning*, 19, 311-329. doi: 10.1108/13665620710757860
- Piccoli, G., Ahmad, R., & Ives, B. (2001). Web-based virtual learning environments: A research framework and a preliminary assessment of effectiveness in basic it skills training. *Mis Quarterly*, 25, 401-426. doi: 10.2307/3250989
- Riggio, R. (2002). Employee training and development. In R. Riggio (Ed.), *Introduction to industrial/ organizational psychology* (Fourth ed.). Upper Saddle River, NJ: Prentice-Hall.
- Sagie, A., & Magnezy, R. (1997). Assessor type, number of distinguishable dimension categories, and assessment centre construct validity. *Journal of Occupational and Organizational Psychology*, 70, 103-108. doi: 10.1111/j.2044-8325.1997.tb00634.x
- Salas, E., Tannenbaum, S. I., Kraiger, K., & Smith-Jentsch, K. A. (2012). The science of training and development in organizations: What matters in practice. *Psychological Science in the Public Interest*, 13, 74-101. doi: 10.1177/1529100612436661
- Salvisberg, A. (2010). *Soft Skills auf dem Arbeitsmarkt: Bedeutung und Wandel*. Zürich, Switzerland: Seismo.

- Schmidt, F. L., & Hunter, J. E. (1998). The validity and utility of selection methods in personnel psychology: Practical and theoretical implications of 85 years of research findings. *Psychological Bulletin*, *124*, 262-274. doi: 10.1037/0033-2909.124.2.262
- Schön, D. A. (1987). *Educating the reflective practitioner*: San Francisco, CA: Jossey-Bass.
- Seiger, C., & Künzli, H. (2012). Der Schweizerische Coachingmarkt 2011 aus der Sicht von Coachs [The Swiss coaching market 2011 from the perspective of coaches]. *ZHAW Onlinepublikation*, 1-22. Retrieved from: http://www.psychologie.zhaw.ch/fileadmin/user_upload/psychologie/Downloads/Forschung/SeigerK%C3%BCnzli12_Schweizerischer_Coachingmarkt11_Korr.pdf
- Selim, H. M. (2003). An empirical investigation of student acceptance of course websites. *Computers & Education*, *40*, 343-360. doi: 10.1016/S0360-1315(02)00142-2
- Semin, G., & Fiedler, K. (1991). The linguistic category model, its bases, applications and range. *European Review of Social Psychology*, *2*, 1-30. doi: 10.1080/14792779143000006
- Shore, T. H., Thornton, G. C., & McFarlane Shore, L. (1990). Construct validity of two categories of assessment center dimension ratings. *Personnel Psychology*, *43*, 101-116. doi: 10.1111/j.1744-6570.1990.tb02008.x
- Sitzmann, T., Kraiger, K., Stewart, D., & Wisher, R. (2006). The comparative effectiveness of Web-based and classroom instruction: A meta-analysis. *Personnel Psychology*, *59*, 623-664. doi: 10.1111/j.1744-6570.2006.00049.x
- Ter Doest, L., & Semin, G. (2005). Retrieval contexts and the concreteness effect: Dissociations in memory for concrete and abstract words. *European Journal of Cognitive Psychology*, *17*, 859-881. doi: 10.1080/09541440540000031

- Ter Doest, L., Semin, G., & Sherman, S. J. (2002). Linguistic context and social perception: Does stimulus abstraction moderate processing style? *Journal of Language and Social Psychology, 21*, 195-229. doi: 10.1177/0261927X02021003001
- Thompson, R. L., & Higgins, C. A. (1991). Personal computing: Toward a conceptual model of utilization. *Mis Quarterly, 15*, 125-143. Retrieved from: <http://search.ebscohost.com/login.aspx?direct=true&db=buh&AN=9604086252&site=ehost-live>
- Thornton, G. C., & Krause, D. E. (2009). Selection versus development assessment centers: An international survey of design, execution, and evaluation. *The International Journal of Human Resource Management, 20*, 478-498. doi: 10.1080/09585190802673536
- Thornton, G. C., & Rupp, D. E. (2006). *Assessment centers in human resource management: Strategies for prediction, diagnosis, and development*. Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
- Tough, A. M. (1971). *Adults' learning projects: A fresh approach to theory and practice in adult education*. Ontario, Canada: Ontario Institute for Studies in Education.
- Tynjälä, P., & Häkkinen, P. (2005). E-learning at work: Theoretical underpinnings and pedagogical challenges. *The Journal of Workplace Learning, 17*, 318-336. doi: 10.1108/13665620510606742
- Ubben, C. (2005). Coaching und Internet? Chancen und Grenzen des Internets für Coaches und Klienten. *Organisationsberatung, Supervision, Coaching, 12*, 75-87. doi: 10.1007/s11613-005-0092-8

- Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science*, 46, 186-204. doi: 10.1287/mnsc.46.2.186.11926
- Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *Mis Quarterly*, 27, 425-478.
Retrieved from:
<http://www.jstor.org/discover/10.2307/30036540?uid=3737760&uid=2&uid=4&sid=21104069439797>
- Watson, W. R., & Watson, S. L. (2007). An argument for clarity: What are learning management systems, what are they not, and what should they become? *TechTrends*, 51, 28-34. doi: 10.1007/s11528-007-0023-y
- Werner, J., & DeSimone, R. (2011). *Human resource development*. Mason, OH: Cengage Learning.
- Wilson, J. P., & Western, S. (2000). Performance appraisal: An obstacle to training and development? *Journal of European Industrial Training*, 24, 384 - 391. doi: 10.1108/03090590010377754
- Ziemons, M. (2012). Blended Business Coaching - Internet-unterstütztes Transfer-Coaching. *Organisationsberatung – Supervision – Coaching*, 19, 217-225. doi: 10.1007/s11613-012-0281-1