

“There’s no need to drive from A to B”:

Exploring the lived experience of students and lecturers
with digital learning in higher education

Andreas Gegenfurtner*

Nina Schwab*

Christian Ebner*

ABSTRACT

In many rural regions worldwide, people drive by car or ride a bus to travel to distant cities in which educational training programs are offered. In an era of growing digitalization of higher education and adult training, however, learning environments become increasingly accessible online. Students can thus access digital learning material or attend technology-enhanced training classes from virtually any place worldwide. This increasing ubiquity of training—together with the geographical flexibility afforded by blended distance learning in the form of learning centers, webinars, or virtual courses—reduces the need for automotive mobility in rural regions. The purpose of this study was to explore the experiences of nontraditional students and their lecturers associated with this reduced need for mobility. Grounded in Gibson’s theory of affordances and an interest in the narrative interpretations of lived experience, the study reports qualitative analyses of reflective interview data on how trainees and lecturers experience flexible and ubiquitous synchronous and asynchronous technology-enhanced training programs. Implications of the study for theory development and the practical implementation of digital training for non-traditional students in rural regions are discussed.

In vielen ländlichen Regionen weltweit nehmen Menschen den Bus oder das Auto, um zu Städten zu gelangen, in denen Bildungsangebote und Trainingsprogramme angeboten werden. In einer Zeit wachsender Digitalisierung werden Lernumgebungen und Weiterbildungen jedoch zunehmend auf Online-Plattformen zugänglich gemacht. Studierende haben so Zugang zu digitalem Lernmaterial oder können an technologiebasierten Veranstaltungen von jedem Ort weltweit partizipieren. Diese wachsende ubiquitäre Verfügbarkeit von Bildung – zusammen mit einer geographischen Flexibilität, die Blended Learning in Form von LernCentern, Webkonferenzen und virtuellen Kursen ermöglicht – reduziert die Notwendigkeit von (Auto-)Mobilität in vielen ländlichen Regionen. Der Zweck dieser Studie war, die Erfahrungen von nicht-traditionellen Studierenden und deren Dozierenden hinsichtlich reduzierter mobiler Anforderungen zu explorieren. Basierend auf Gibsons Theory of Affordances und einem Forschungsinteresse in der narrativen Interpretation lebensumweltlicher Erfahrung berichtet die Studie qualitative Analysen von reflexivem Interviewmaterial, das beschreibt, wie Teilnehmende und Dozierende die flexiblen, ubiquitär verfügbaren, synchron und asynchron angebotenen Weiterbildungsangebote wahrnehmen. Implikationen der Studie werden diskutiert hinsichtlich Theorieentwicklung und der praktischen Implementierung digitaler Bildung für nicht-traditionelle Studierende in ländlichen Regionen.

KEYWORDS

Digitalization, training, theory of affordances, higher education, narrative analysis

Digitalisierung, Weiterbildung, Theory of Affordances, Hochschulbildung, narrative Analyse.

* Institut für Qualität und Weiterbildung, Technische Hochschule Deggendorf

Dieser Beitrag im BIAS wurde gefördert vom Bundesministerium für Bildung und Forschung (BMBF) im Rahmen des Förderprogramms „Aufstieg durch Bildung: Offene Hochschulen“



1. Introduction

In many rural regions worldwide, people drive by car or ride a bus to travel to distant cities in which educational training programs are offered. In an era of ever-growing digitalization of higher education and adult training [1–7], however, training materials become increasingly available online. Participants can thus access digital learning material or attend technology-enhanced training classes from virtually any place worldwide [8–13]. This increasing ubiquity of learning and training, together with high levels of geographical flexibility afforded by distance learning in the form of learning centers, webinars, or virtual courses [14–20] have decreased the need for automotive mobility in rural regions and increased participation in educational activities [13, 21–27]. The present study contributes to the qualitative evidence of how trainees and lecturers perceive and experience digital training in geographically rural regions. An analytic interest of the study lies in the lived experiences [28] of students with digital tools and their associated affordances.

1.1. Affordances of digital tools

In his seminal work on how humans perceive the world, James J. Gibson [29] introduced the notion of an affordance. Affordances refer to both the environment and humans, and imply a complementarity of humans and objects they perceive. For example, a chair affords sitting-on-it if one is tired or standing-on-it if one needs to reach for something high or hiding-beneath-it when children play. According to Gibson’s theory of affordances, objects have no single use or objective “values” or “meanings”; rather, it depends on individual subjective perceptions of humans how objects in their environment are experienced and used. For instance, depending on the situation, smartphones afford communication when we call each other; they afford photography when we take pictures or

selfies; and they afford mass when we need to weigh down a sheet of paper in order to prevent it from being blown off the table on a windy day outdoors. Different objects can offer the same affordances to people [29, 30]. In digital learning, different technological tools—such as desktop computers, smartphones, tablets, or wearables—all offer the possibility to seek and retrieve information. It is thus reasonable to focus on how people perceive objects and to focus on the mutual affordances in the interaction between tools and people [30, 31]. Gibson [29, p. 134] wrote: “The theory of affordances rescues us from the philosophical muddle of assuming fixed classes of objects, each defined by its common features and then given a name. As Ludwig Wittgenstein knew, you *cannot* specify the necessary and sufficient features of the class of things to which a name is given. They have only a ‘family resemblance’. But this does not mean you cannot learn how to use things and perceive their uses. You do not have to classify and label things in order to perceive what they afford.”

If we follow Gibson’s theory of affordances [29], then an interest arises in how people perceive and experience technological tools and systems. More specifically, it is interesting to focus on the lived experiences people have with digital media and objects as they use them. Such a focus foregrounds the subjective nature of human experience and highlights how (digital) objects are utilized; what different tools afford to people; and how technology is lived with and, ultimately, mediates human practices.

In research on technology-enhanced learning, many authors have shared an interest in the lived experiences of learners and how affordances emerge in and shape learning situations [32–36]. For example, Cornelius [15] adopted a phenomenological lens to analyze transcripts from four qualitative, semi-structured interviews

with experienced facilitators who used webinars in UK higher education institutions. Reflecting on their experiences, all four interviewees described teaching with webinars as “intense” and “demanding” and how they planned, encouraged, and facilitated interaction during the webinar sessions. Such analyses on how lecturers engage with digital tools are useful because they inform us in how the affordances of virtual learning arrangements intersect with subjective meaning-makings and attempts at creating interactive learning scenarios in the digital.

The present study contributes to this line of research by focusing on how people in a rural region perceive the affordances of distance learning tools. Technology—or more specifically: digital learning formats—offers a

unique opportunity for people in rural regions to participate in education and training that would otherwise be hard (or even impossible) to get access to because of the sheer distance between homes and educational institutions. What are the lived experiences of students and lecturers in rural regions when they participate in digital, technology-enhanced training formats?

1.2. Digital, technology-enhanced training formats

Because digital training programs vary greatly, it is reasonable to consider the lived experiences people have with a number of different technology-enhanced training formats. Among frequently used digital formats for adult training and higher education are learning centers, webinars, and virtual courses. Each tool is specified in turn. Table 1 offers a descriptive summary.

	Advantage	Disadvantage
Learning center	Direct social interaction with peers and lecturers, synchronous communication	Temporal inflexibility, traveling to physical environment needed
Webinar	Synchronous communication, ubiquity	Temporal inflexibility, internet connectivity needed
Virtual course	Asynchronous communication, individual learning at one’s own pace, temporal flexibility, ubiquity	No direct social interaction with peers or lecturers, temporally delayed communication, internet connectivity needed

Table 1: Description of digital learning environments

First, learning centers are traditional face-to-face classrooms in geographically distant training centers that are connected by video streams. Lectures and discussions are thus synchronously available in and distributed across two or more different places. On monitors, lecturers can observe and react to trainees even if they are not in the same room with them [20]. Learning centers afford social presence and direct interaction between trainees and between trainees and lecturers—but at the cost of geographical flexibility [16]. This is because even if learning centers are installed in multiple rural locations, participants need to leave their workplace or their home and take a ride to attend classes. Still, although learning centers do not afford ubiquitous training, they still reduce the need for automotive mobility because participants can flexibly choose

a learning center location that is in high proximity to their home or workplace [22].

Second, webinars and web conferencing systems are digital tools to deliver training through synchronous, audiovisual communication among remotely located training instructors and participants [13, 14, 37]. The digital availability of the webinar environment offers high levels of geographical independence for trainees and lecturers because rides by car, train, or bus to attend lectures in physical classrooms are unnecessary [22]. In recent years, webinars have attracted increasing attention for training and development purposes, largely because of their affordability to connect geographically distant members by offering real-time training communication [38, 39].

Third, virtual courses afford the highest level of ubiquity, that is: the digital learning materials are accessible from anywhere and are not contingent on specific geographic locations (given internet connections are available). In virtual courses, trainees work on prepared assignments on their computing devices and lecturers correct or provide feedback to task solutions [22]. Trainees can learn at their own pace and flexibly access training where, when, and how often they prefer [16]. This geographical flexibility and ubiquitously available learning opportunities reduce the need for automotive mobility because learning is not contingent to the physical boundaries of classrooms or training institutes.

Digital learning environments afford varying degrees of geographical flexibility. While some environments are completely online, which offers an absolute level of ubiquity, some environments are in line with a blended learning approach, which offers a reduced need for traveling but does not absolutely eliminate traveling to physical spaces (e.g., the nearest learning center). It is important to note that levels of geographical flexibility are not the affordance of the learning material itself but of the digital learning / pedagogical arrangements designed for the training. Therefore, it is necessary to conceptualize learning materials as being embedded within educational learning environments; these learning environments for digital training—more specifically: learning centers, webinars, and virtual courses—emerge at the nexus of education and technology (see Figure 1).

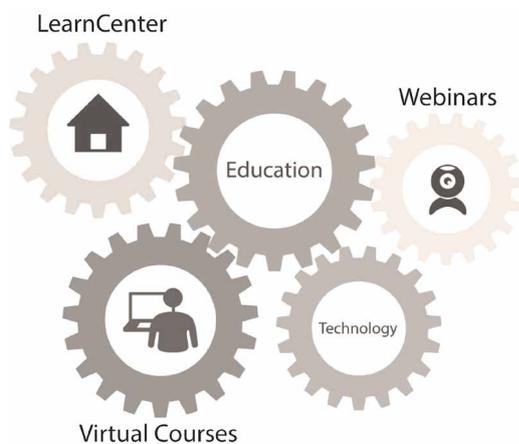


Figure 1: Digital learning environments at the confluence of education and technology

1.3. Aims and research question

The purpose of the present study was to explore the lived experiences of trainees and lecturers with the affordances of digital, technology-enhanced training programs. A particular focus was on how the ubiquitous availability of training material that is embedded in digital learning arrangements affords reduced levels of mobility and, more importantly, how trainees and lecturers perceive this afforded geographical flexibility. Because digital training programs vary greatly, the study considered three different training formats: learning centers, webinars, and virtual courses. Grounded in the theory of affordances [29, 30] and an interest in the narrative interpretations of lived experience, the research question was: How do trainees and lecturers experience the geographical flexibility and ubiquity afforded by digital, technology-enhanced training programs?

2. Methods

2.1. Participants and training formats

The study employed a qualitative methodology and examined the lived experiences of trainees and lecturers who were all engaged in off-the-job training programs designed and administered at a large training center for adult and continuing education adjacent to the Bavarian Forest, a rural region in Southern Germany. The training center is part of a higher education institute and offers numerous academic courses for non-traditional students on evenings and weekends that participants attend off-the-job in lieu of their regular work duties. Non-traditional students are students who are typically older than regular students, have family and / or work duties, and return to higher education to obtain academic degrees [38, 40]. The study focused on training programs that were technology-enhanced and included digital elements that afforded ubiquitous access to training. Three programs were considered: The first training program was a 9-month course on supply chain management; the second training program was a 9-month course on industrial management; and the third training program was a 5-month course on early childhood education. Participation in these programs was voluntary [41]. All these training programs included the three instructional formats learning centers, webinars, and virtual courses. Among the instructional activities planned in the training curricula were both learner-centered and knowledge-centered activities, including

lectures, discussions, demonstrations, and small group activities. Participants in the study were twenty-three persons—15 trainees and 8 lecturers—recruited from the three training programs. Among them were (a) four trainees (one woman, three men) and three lecturers (one woman, two men) recruited from supply chain management; (b) six trainees (three women, three men) and three lecturers (one woman, two men) recruited from industrial management; and (c) five trainees (four women, 1 man) and two lecturers (1 woman, 1 man) from early childhood education. Trainees and lecturers volunteered to participate in the study and received no compensation. Anonymity and confidentiality were guaranteed for all responses.

2.2. Data collection

Grounded in a qualitative research methodology, data for the study were collected with semi-structured face-to-face reflective interviews [42, 43]. A total of 23 interviews were performed by a trained interviewer with a standardized set of questions in individual sessions that ranged from 11:26 to 41:18 minutes. Total interview time was 326:36 minutes for trainees and 305:17 minutes for lecturers. In addition to the standardized set of questions, interviewer and interviewee were free to talk and discuss other aspects not covered in the question guide. The main purpose of the interviews was to evaluate the attended training programs. From the collected interview material, a major research interest for the present study was in the lived experiences of the participants and how they perceived the ubiquity and geographical flexibility afforded by the digital, technology-enhanced training programs. A semi-structured interview guide with a set of prepared questions was used for collecting data. Among the set of questions, we selected some questions and their associated answers for the analysis in the present study. These questions were (a) for the trainees: Why have you decided to participate in this program? How have you experienced the learning centers, webinars, and virtual courses? and (b) for the lecturers: What were your experiences with the learning centers, webinars, and virtual courses? If you consider your trainees, how do you think they experienced the learning centers, webinars, and virtual courses? Interviews were performed within one week after each training program has ended. Talk during all interview sessions was recorded; a trained student assistant transcribed the interview recordings verbatim.

2.3. Data analysis

Based on an interest in the narrative accounts of lived experience [28], qualitative analysis of the interview transcripts sought to explore how students and lecturers intersubjectively perceived and experienced the digital training formats. The analytic approach took as starting point the empirical realm of everyday lived experience [28, 42, 43]. Analysis was identical for both training roles: trainees and lecturers.

Following the procedures of the circular deconstruction [44], data analysis included three steps. First, the individual interview transcripts were summarized and paraphrased. Next, the summarized and paraphrased interview transcripts were further condensed to deconstruct predominant themes and subthemes as they relate to geographical flexibility and reduced needs for automotive mobility. These two analysis steps were performed on the level of a single interview and identical for all 23 interview transcripts [44].

Finally, the deconstructed themes from each individual interview were compared and contrasted across transcripts to develop categories. In the present study, the developed categories mirrored the three instructional training formats learning centers, webinars, and virtual courses. These three categories unveil the lived experiences of students and lecturers associated with the geographical flexibility afforded by the digital learning environments. To guide the reader through the analyses, the three categories learning centers, webinars, and virtual courses are used to structure the first paragraphs of the following Results section.

3. Results

How do trainees and lecturers experience the geographical flexibility and ubiquity afforded by digital, technology-enhanced training programs? The following sections present results from the interview analyses separately for each of the three training formats: learning centers, webinars, and virtual courses.

3.1. Learning centers

Learning centers afford participation in classroom activities close to the trainees' homes. This high geographical proximity between learning centers and home is a positive aspect for many trainees. As ST1 argued: "For me, this

was optimal because it was so close to my home, to have classes right in front of my front door, so to speak, with very short distances. This was a huge advantage for me". And TT1 said: "It was great that the training program was offered at the learning center close to my home. Because, if you have to drive around in the evening... I simply was here for class". Along these lines, also KT1 said that similar training programs do not exist in her rural region; the installment of a learning center close to her home thus afforded her participation in the training program.

Trainees communicated to their lecturers how learning centers afforded them to integrate work duties, family duties, and training participation. For example, the lecturer KL3 argued that she did not think that learning centers—with a distance of 50 kilometers only—would have been significant enough to facilitate training participation because she thought that this small distance can be bridged easily by car. At multiple occasions, however, her trainees expressed that they would not have started the training program if they had to drive 50 kilometers on evenings or weekends to regularly attend classes. These multiple statements seem to suggest that the regional proximity offered by learning centers indeed promotes training participation.

3.2. Webinars

Webinars afford a high level of ubiquity because participants can attend webinars flexibly at any place with internet connection. This geographical flexibility was perceived very positively by trainees. For example, TT2 stated: "Generally, I like webinars quite a lot because I can do them at home on my sofa". KT3 said that webinars even make redundant the already short drive to the nearest learning center. ST4 argued that, for webinars, "you could attend them at home. There's no need to drive from A to B. I think that, for most, this made it easier to integrate the whole issue with your daily work duties". ST2 said: "Well, so, what was really handy for me was that you could do this from home. You didn't have to drive to attend classes but could do it in your kitchen or living room. This is an immense benefit".

Not only trainees, but also the lecturers enjoyed the ubiquity and geographical flexibility afforded by webinars. KL2 articulated that "webinars are great because we say let's do them in the evening after work when nearly everyone has time (...) trainees and also we lecturers don't

have to drive to class again." This high level of ubiquity thus reduces car or bus rides for both lecturers and trainees.

Although webinars afford ubiquitous learning spaces, some trainees raised critical voices associated with webinars. Specifically, KT2 argued: "(...) I have to honestly say that a webinar will never replace a personal talk. Because it offers a limited perception only. And not like when you sit next to each other and can perceive all other facets of human communication. So this is a limitation."

3.3. Virtual courses

Virtual courses afford asynchronous ubiquity of the training material. Trainees perceived this local and temporal independence and flexibility of virtual courses very favorably because, as KT5 said, she could easily coordinate work, family, and training activities: "I like that I can be autonomous in when I do what, how much I do (...) temporally and geographically totally free". The possibility to access training from virtually anywhere was also appreciated by ST3; he stated: "I have to say that, at the moment, I have lots of stress at work and so it was great that I could access the learning content in the evenings or on weekends at home and follow things up. Even if I did not understand something immediately, I had the peace to sit at home and repeat exercises and look up things and that was the ultimate best for me".

In addition to trainees, also lecturers enjoyed the flexibility that virtual courses afforded. For example, KL1 articulated that virtual courses are great for those who work on a daily basis because "virtual courses minimize the need for travels, rides, and drives to attend classes." Along these lines, SL1 said: "I think that an apparent benefit is that trips are shortened. Like, not only driving to class, but the whole think around it. I don't have to rush out of work to get to class". In summary, both trainees and lecturers appreciated the advantages of ubiquitously available learning material that virtual courses afford.

3.4. Differences per training role, content, and gender

A closer analysis on similarities and differences was performed to compare answers as a function of training role, age, and gender. First, training role was defined as trainee or lecturer. Considering the given responses, both trainees and lecturers

appreciated the geographical flexibility afforded by the digital learning environments; no dedicated qualitative differences emerged. Second, content was defined as supply chain management, industrial management, and early childhood education. No qualitative differences in the articulated experiences emerged as a function of content. Third, gender was defined as male or female. Prior research examined gender as a moderator for training participation [45] and training motivation [46]. In the present analysis, no differences between women and men emerged in either of the two training roles.

4. Discussion

4.1. Main findings

The purpose of the present study was to explore how training participants and their lecturers in a rural region perceive the affordances of digital training formats that make training ubiquitously available and thus reduce the need for automotive mobility [28–31]. Because technological tools for digital training vary greatly, the study considered three different formats: learning centers, webinars, and virtual courses [22]. Analyses of qualitative interview data [43] suggest that both training participants and training lecturers appreciate the geographical flexibility and ubiquity afforded by distance learning. This was a consistent finding for all examined digital tools, including learning centers, webinars, and virtual courses.

Learning centers close to trainees' workplaces or homes reduced the time needed for traveling to formerly very distant educational institutions. This higher proximity affords time savings that could alternatively be spent for work or family obligations. Even more drastically, some trainees articulated that they started the training programs only because learning centers were installed close to their homes; they would not have participated in training if they had needed to drive 50 kilometers to access physical face-to-face classrooms. In terms of Gibson [29], learning centers afford closeness in a rural region and participation in training that was previously precluded due to geographical distance.

Webinars brought the training program directly into the homes and workplaces of training participants and lecturers. While learning centers decreased the time for driving and

traveling, webinars made drives obsolete. People perceived no need to leave their homes or workplaces because the webinar environment afforded digital access to all training content, material, and lecturers. Following Gibson's theory of affordances, webinars afforded synchronous participation in training with high levels of geographical flexibility. Participants appreciated and benefited from webinars because this tool saved even more time from traveling than learning centers did.

Finally, virtual courses afforded identical levels of ubiquity and geographical flexibility like webinars. In addition, however, virtual courses also afforded temporal flexibility. That is, the asynchronous communication patterns and time-independent access to training were experienced as possibilities to engage with the training content whenever and wherever needed. These benefits that virtual courses afforded were perceived by both trainees and lecturers alike. In both groups, the minimized (and even removed) need to take a ride to get to class was strongly appreciated. The narrative analyses of the lived experiences highlight that virtual courses contributed to continuous training participation and learner satisfaction with educational activities in rural regions.

4.2. Theoretical and practical implications

Implications of the study for theory development include analyses of digital technologies and how they are associated with levels of training motivation. Particularly, it can be speculated that easier access to training thanks to ubiquitous learning material can promote interest [47, 48], mastery goal orientations [49, 50], or motivation to transfer [51, 52] because experiencing lower physical barriers (in Gibson's terms: negative affordances) to training and the positive affordances of geographical flexibility might be associated with increasing levels of affective reactions from trainees and lecturers. However, these directions for future research need to be theorized, conceptualized, and put into the focus of further empirical research.

Implications of the study for educational practice center on the installment of more learning centers. If people strongly appreciate the geographical proximity of learning centers—and the educational activities they afford—then it seems intuitive that more learning centers in more rural regions would offer access to training for more participants. A second implication for educational practice is to

design, deliver, and implement more webinars and virtual courses in concert with improved broadband infrastructure and internet connectivity in these regions. Webinars and virtual courses afford geographical independence—even without buses or cars, training becomes accessible for people, regardless how rural and remote they might live. Particularly for regions with long distances to educational activities, webinars and virtual courses can afford unique possibilities to engage with training and participate in adult education. Ultimately, this increased level of participation and access to educational training activities can benefit not only the people, but also entire rural regions, including the one examined in the present study: the Bavarian Forest.

4.3. Limitations and directions for future research

Limitations of this study relate to the qualitative approach to data collection and analysis. Specifically, based on a limited sample, the study utilized 8 lecturers and 15 trainees. While this is a small number of research participants if one adopts a quantitative perspective on empirical research, qualitative research often uses an even smaller number of participants to reach data saturation and to reconstruct case evidence [15, 28, 42, 43]. As such, the presented qualitative evidence is robust but we still note that additional follow-up studies using quantitative survey methodologies can be employed to triangulate the qualitative interview findings.

Another limitation of this study relates to the study focus. If we consider the sheer amount of collected interview material of more than 300 minutes each for the groups of trainees and lecturers, then numerous focal analyses would be possible. In the present manuscript, a decision was made to highlight the experiences associated with the afforded geographical flexibility and the reduced need for mobility. On one hand, this decision was made because of the focus of this special issue on mobility. On the other hand, this decision was made because both trainees and lecturers articulated repeatedly—in all interviews—how favorably they experienced the ubiquitous nature of the attended digital training programs. It was thus obvious to highlight analytically what was articulated empirically in the qualitative interview material. Directions for future research relate to replications of these analyses in different rural regions in different countries to examine how stable the described experiences are in changed contexts. Similarly,

as the present study focused on non-traditional trainees [40, 53], future research can investigate experiential differences with digital learning between nontraditional and traditional students in higher education. One could assume that positive experiences relate with positive levels of motivation and transfer—an assumption that needs to be tested empirically in further studies [45, 54, 55], particularly with regard to the commitment level that could act as a moderating variable. Finally, this study considered two training roles: trainees and lecturers. More training roles exist, such as training designers [22], evaluators [56], or technologists [20] whose experiences can also be collected and analyzed in lieu the views of trainees and lecturers. Future research can thus triangulate multiple perspectives when examining the intersubjective nature of affordances of digital training environments in higher education.

5. Acknowledgements

This work was supported by the Federal Ministry of Education and Research (Bundesministerium für Bildung und Forschung) [BMBF; grant number 16OH21004].

6. References

- [1] Balacheff, Nicolas; Ludvigsen, Sten; Jong, Ton de; Lazonder, Ard; Barnes, Sally (2009): *Technology-enhanced learning: Principles and products*. New York: Springer.
- [2] Brand-Gruwel, Saskia; Testers, Laurent; Gegenfurtner, Andreas (2014): Motivation to transfer: Factors influencing transfer of learned competences to the job. In: A. Baran und et al. (Hg.) (Hg.): *New technologies and the future of teaching and learning*. Krakow, S. 63–74.
- [3] Gegenfurtner, Andreas; Veermans, Koen; Vauras, Marja (2013): Effects of computer support, collaboration, and time lag on performance self-efficacy and transfer of training: A longitudinal meta-analysis. In: *Educational Research Review* 8 (1), S. 75–89.
- [4] Gegenfurtner, Andreas; Quesada Pallarès, Carla; Knogler, Maximilian (2014): Digital simulation-based training: A meta-analysis. In: *British Journal of Educational Technology* 45 (6), S. 1097–1114.

- [5] Helle, Laura; Nivala, Markus; Kronqvist, Pauliina; Gegenfurtner, Andreas; Björk, Pasi; Säljö, Roger (2011): Traditional microscopy instruction versus process-oriented virtual microscopy instruction: A naturalistic experiment with control group. In: *Diagnostic Pathology* 6 (S1), S. S81-S89.
- [6] Poos, Jackie M.; van den Bosch, Karel; Janssen, Christian P. (2017): Battling bias: Effects of training and trianing context. In: *Computers & Education* 111 (August), S. 101-113.
- [7] Testers, Laurent; Gegenfurtner, Andreas; van Geel, R.; Brand-Gruwel, Saskia (in press): From monocontextual to multicontextual transfer: Organizational determinants of the intention to transfer generic information literacy competences to multiple contexts. In: *Frontline Learning Research*.
- [8] Bernard, Robert M.; Abrami, Philip C.; Lou, Yiping; Borokhovski, Evgueni, Wade, Anne; Wozney, Lori; Wallet, Peter Andrew et al. (2004): How does distance education compare to classroom instruction? A meta-analysis of the empirical literature. In: *Review of Educational Research* 74 (3), S. 379-439.
- [9] Klement, Milan (2017): Models of integration of virtualization in education: Virtualization technology and possibilities of its use in education. In: *Computers & Education* 105 (February), S. 31-43.
- [10] Li, Jessica (2016): Technology advancement and the future of HRD research. In: *Human Resource Development International* 19 (3), S. 189-191.
- [11] Stout, James W.; Smith, Karen; Zhou, Chuan; Solomon, Cam; Dozor, Allen J.; Garrison, Michelle M.; Mangione-Smith, Rita (2012): Learning from a distance: Effectiveness of online spirometry training in improving asthma care. In: *Academic Pediatrics* 12 (2), S. 88-95.
- [12] Testers, Laurent; Gegenfurtner, Andreas; Brand-Gruwel, Saskia (2015): Motivation to transfer learning to multiple contexts. In: Lourense Das, Saskia Brand-Gruwel, Kees Kok und Jaap Walhout (Hg.): *The School Library Rocks: Living it, Learning it, Loving it*. Proceedings of the 44th International Association of School Librarianship International Conference, Incorporating the 19th International Forum on Research in School Librarianship (Welten Institute of the Open University Netherlands and Meles Meles School Library Service; June 28th-July 2nd 2015; Maastricht, Netherlands). Heerlen, Niederlande, S. 473-487.
- [13] Wang, Shiang-Kwei; Hsu, Hui-Yin (2008): Use of the webinar tool (Elluminate) to support training: The effects of webinar-learning implementation from student-trainers' perspective. In: *Journal of Interactive Online Learning* 7 (3), S. 175-194.
- [14] Edwards, Roger A. (2017): Randomized controlled study of a remote flipped classroom neuro-otology curriculum. In: *Frontiers in Human Neuroscience* 8 (Article 349).
- [15] Cornelius, Sarah (2014): Facilitating in a demanding environment: Experiences of teaching in virtual classrooms using web conferencing. In: *British Journal of Educational Technology* 45 (2), S. 260-271.
- [16] Fisch, Karina; Reitmaier, Martina (2016): *Flexibles Lernen. Didaktisches Konzept im Projekt DEG-DLM*. Deggendorf: Technische Hochschule Deggendorf.
- [17] Olson, Joann S.; McCracken, Fawn E. (2015): Is it worth the effort? The impact of incorporating synchronous lectures into an online course. In: *Online Learning Journal* 19 (2), S. 73-84.
- [18] Siewiorek, Anna; Gegenfurtner, Andreas (2010): Leading to win: The influence of leadership style on team performance during a computer game training. In: Kimberly Gomez, Leilah Lyons und Joshua Radinsky (Hg.): *Learning in the disciplines* (Proceedings of the 9th International Conference of the Learning Sciences [ICLS 2010], Vol. 1). Chicago, IL, USA, S. 524-531.
- [19] Tseng, Jun-Jie; Cheng, Yuh-Show; Yeh, Hsi-Nan (2019): How pre-service English teachers enact TPACK in the context of web-conferencing teaching: A design thinking approach. In: *Computers & Education* 128 (January), S. 171-182.
- [20] Zitt, Alexander; Oswald, Andreas (Hg.) (2016): *Technik-Konzept*. Technische Hochschule Deggendorf (THD). Deggendorf.
- [21] Crompton, Helen; Burke, Diana (2018): The use of mobile learning in higher education: A systematic review. In: *Computers & Education* 123 (August), S. 53-64.
- [22] Gegenfurtner, Andreas; Spagert, Lina; Weng, Gabriele; Bomke, Christine; Fisch, Karina; Oswald, Andreas et al. (2017): *LernCenter: Ein Konzept für die Digitalisierung berufsbegleitender Weiterbildungen an Hochschulen*. In: *Bavarian Journal of Applied Sciences* 3 (1), S. 261-276.

- [23] Knogler, Maximilian; Gegenfurtner, Andreas; Quesada Pallarès, Carla (2013): Social design in digital simulations: Effects of single versus multi-player simulations on efficacy beliefs and transfer. In: Nikol Rummel, Manu Kapur, Mitchell Nathan und Sadhana Puntambekar (Hg.): To See the World and a Grain of Sand: Learning across Levels of Space, Time, and Scale (Proceedings of the 10th International Conference on Computer Supported Collaborative Learning [CSCL], University of Wisconsin - Madison, June 15th-19th 2013). Madison, WI (Vol. 2), S. 293–294.
- [24] Means, Barbara; Toyama, Yukie; Murphy, Robert; Baki, Marianne (2013): The effectiveness of online and blended learning: A meta-analysis of the empirical literature. In: *Teachers College Record* 115 (3), S. 1–47.
- [25] Mueller, Daniel; Strohmeier, Stefan (2011): Design characteristics of virtual learning environments: state of research. In: *Computers & Education* 57 (4), S. 2505–2516.
- [26] Nicklen, Peter; Keating, Jenny L.; Paynter, Sophie; Storr, Michael; Maloney, Stephen (2016): Remote-online case-based learning: A comparison of remote-online and face-to-face, case-based learning – a randomized controlled trial. In: *Education for Health* 29 (3), S. 195–202.
- [27] Siewiorek, Anna; Gegenfurtner, Andreas; Lainema, Timo; Saarinen, Eeli; Lehtinen, Erno (2013): The effects of computer-simulation game training on participants' opinions on leadership styles. In: *British Journal of Educational Technology* 44 (6), S. 1012–1035.
- [28] van Manen, Max (2016): Researching lived experience. Human science for an action sensitive pedagogy. Second edition. New York, London: Routledge Taylor & Francis Group.
- [29] Gibson, James Jerome (1979): The ecological approach to visual perception. Boston: Houghton Mifflin.
- [30] Greeno, James G. (1994): Gibson's affordances. In: *Psychology Review* 101 (2), S. 336–342.
- [31] Säljö, Roger (2010): Digital tools and challenges to institutional traditions of learning: technologies, social memory and the performative nature of learning. In: *Journal of Computer Assisted Learning* 26 (1), S. 53–64.
- [32] Bower, Matt; Sturman, Daniel (2015): What are the educational affordances of wearable technologies? In: *Computers & Education* 88 (October), S. 343–353.
- [33] Jeong, Heisawn; Hmelo-Silver, Cindy E. (2016): Seven affordances of computer-supported collaborative learning: How to support collaborative learning? How can technologies help? In: *Educational Psychologist* 51 (2), S. 217–265.
- [34] Lai, Chih-Hung; Yang, Jie Chi; Chen, Fei-Ching; Ho, Chin-Wen; Chan, Tak-Wai (2007): Affordances of mobile technologies for experiential learning: The interplay of technology and pedagogical practices. In: *Journal of Computer Assisted Learning* 23 (4), S. 326–337.
- [35] Mao, Jin (2014): Social media for learning: A mixed methods study on high school students' technology affordances and perspectives. In: *Computers in Human Behavior* 33 (April), S. 213–223.
- [36] Song, Yanjie; Kong, Siu Cheung (2017): Affordances and constraints of BYOD (Bring Your Own Device) for learning in higher education: Teachers' perspectives. In: Siu Cheung Kong, Tak Lam Wong, Min Yang, Cheuk Fai Chow und Ka Ho Tse (Hg.): Emerging practices in scholarship of learning and teaching in a digital era. Singapore: Springer, S. 105–122.
- [37] Amhag, Lisbeth (2015): Learner centered experiences with flipped classroom and mobile online webinars in distance higher education programs. 11th International Conference on Mobile Learning. Madeira, Portugal, March 2015.
- [38] Johnson, Carrie B.; Schumacher, Joel B. (2016): Does webinar-based financial education affect knowledge and behavior? In: *Journal of Extension* 54 (1), S. 1–10.
- [39] Polanco-Bueno, Rodrigo (2013): Blogs, webinars and significant learning: A case report on a teacher training program for college teachers. In: *Higher Learning Research Communications* 3 (1), S. 56–67.
- [40] Schuetze, Hans G.; Slowey, Maria (2002): Participation and exclusion: A comparative analysis of non-traditional students and lifelong learners in higher education. In: *Higher Education* 44 (3-4), S. 309–327.
- [41] Gegenfurtner, Andreas; Könings, Karen D.; Kosmajac, Nikola; Gebhardt, Markus (2016): Voluntary or mandatory training participation as a moderator in the relationship between goal orientations and transfer of training. In: *International Journal of Training and Development* 20 (4), S. 290–301. DOI: 10.1111/ijtd.12089.
- [42] Charmaz, Kathy; Belgrave, Linda Liska (2012): Qualitative interviewing and grounded theory analysis. In: Jaber F. Gubrium, James A. Holstein, Amir B.

- Marvasti und Karyn D. McKinney (Hg.): The SAGE Handbook of Interview Research: The Complexity of the Craft, S. 347–366.
- [43] Roulston, Kathryn (2010): Reflective Interviewing: A Guide to Theory and Practice. London: Sage.
- [44] Jaeggi, Eva; Faas, Angelika; Mruck, Katja (1998): Denkverbote gibt es nicht! Vorschlag zur interpretativen Auswertung kommunikativ gewonnener Daten. Berlin. In: Forschungsbericht aus der Abteilung Psychologie im Institut für Sozialwissenschaften: Technische Universität Berlin, Institut für Sozialwissenschaften, Abt. Psychologie, S. 2–98.
- [45] Quesada Pallarès, Carla; Pineda-Herrero, Pinar; Espona, Berta; Ciraso, Anna; Stoian, Alexandra (2012): Gender differences in the participation in continuing training in Catalonia. In: Joanna Ostrouch-Kamińska, Christine Fontanini und Sheila Gaynard (Hg.): Considering gender in adult learning and in academia: (In)visible act. Wrocław: Wydawnictwo, S. 89–108.
- [46] Gegenfurtner, Andreas (in press): Testing the gender similarities hypothesis: Differences in subjective task value and motivation to transfer training. In: *Human Resource Development International*.
- [47] Knogler, Maximilian; Harackiewicz, Judith M.; Gegenfurtner, Andreas; Lewalter, Doris (2015): How situational is situational interest? Investigating the longitudinal structure of situational interest. In: *Contemporary Educational Psychology* 43 (1), S. 39–50.
- [48] Laine, Erkka; Veermans, Marijana; Lahti, Aleks; Veermans, Koen (2017): Generation of student interest in an inquiry-based mobile learning environment. In: *Frontline Learning Research* 5 (4), S. 42–60.
- [49] Gegenfurtner, Andreas (2011): Motivational influences on transfer: Dimensions and boundary conditions. Turku, Finland: Painosalama.
- [50] Laine, Erkka; Gegenfurtner, Andreas (2013): Stability or change? Effects of training length and time lag on achievement goal orientations and transfer of training. In: *International Journal of Educational Research* 61 (1), S. 71–79.
- [51] Gorges, Julia; Gegenfurtner, Andreas; Kuper, Harm (2015): Motivationsforschung im Weiterbildungskontext. In: *Zeitschrift für Erziehungswissenschaft* 18 (Sonderheft 30).
- [52] Quesada Pallarès, Carla; Gegenfurtner, Andreas (2015): Toward a unified model of motivation for training transfer: A phase perspective. In: *Zeitschrift für Erziehungswissenschaft* 18 (Suppl. 1), S. 107–121.
- [53] Johnson, Marcus Lee; Taasobshairazi, Gita; Clark, Lauren; Howell, Leah; Breen, Mischele (2016): Motivations of traditional and nontraditional college students: From self-determination and attributions, to expectancy and values. In: *Journal of Continuing Higher Education* 64 (1), S. 3–15.
- [54] Reinhold, Sarah; Gegenfurtner, Andreas; Lewalter, Doris (2018): Social support and motivation to transfer as predictors of training transfer: testing full and partial mediation using meta-analytic structural equation modelling. In: *International Journal of Training and Development* 22 (1), S. 1–14.
- [55] Segers, Mien; Gegenfurtner, Andreas (2013): Transfer of training: New conceptualizations through integrated research perspectives. In: *Educational Research Review* 8 (1), S. 1–4.
- [56] Lankes, Eva-Maria; Vaccaro, Didier; Gegenfurtner, Andreas (2013). In: *Unterrichtswissenschaft* 41 (3), S. 197–215.



Dr. Andreas Gegenfurtner

Andreas Gegenfurtner studied Pedagogy, Psychology and Sociology at the University of Regensburg. He obtained his doctorate in Educational Science at the University of Turku (Finland) in 2011. Between 2012 and 2014, he was a post-doc at the Technical University of Munich and a visiting professor to the University of Cambridge (England). Moreover, he held a junior professorship at the University of Maastricht (The Netherlands) from 2014 until 2016. In 2016, he returned to his hometown Deggendorf and has, ever since, been working as a scientist and project manager at DIT's Further Education Center IQW. His research concentrates on digital learning environments, expertise research, motivational psychology and transfer of training in further education.

Andreas Gegenfurtner studierte Pädagogik, Psychologie und Soziologie an der Universität Regensburg. Er promovierte 2011 an der Universität Turku (Finnland) im Fach Erziehungswissenschaften. Von 2012 bis 2014 war er Post-Doc an der TU München und Gastprofessor an der Universität Cambridge (England). Von 2014 bis 2016 war er Juniorprofessor an der Universität Maastricht (Niederlande). Im Jahr 2016 kehrte er in seine Heimatstadt Deggendorf zurück und arbeitet seitdem als wissenschaftlicher Mitarbeiter und Projektleiter am Institut für Qualität und Weiterbildung (IQW) an der THD. Seine Forschung fokussiert auf digitale Lernumgebungen, Expertiseforschung, Motivationspsychologie und Lerntransfer in Weiterbildungen.

Contact / Kontakt

✉ andreas.gegenfurtner@th-deg.de



Nina Schwab

Nina Schwab received her Bachelor's degree in Business Administration from DIT. She has been working as an advisor for further education at the Further Education Center (IQW) since March 2017. There, she is responsible for the contents of two on-the-job training programmes: a Bachelor's degree programme in childhood pedagogics and a certificate in Supply Chain Management.

Nina Schwab absolvierte ihr Bachelorstudium in Betriebswirtschaft an der THD. Seit März 2017 arbeitet sie als Weiterbildungsreferentin im Projekt DEG-DLM am Institut für Qualität und Weiterbildung (IQW). Sie ist inhaltlich für den berufsbegleitenden Bachelorstudiengang Kindheitspädagogik sowie für das Zertifikat Supply Chain Management verantwortlich.

Contact / Kontakt

✉ nina.schwab@th-deg.de



Christian Ebner

Christian Ebner (M.Sc) studied Psychology with a focus on clinical psychology at the University of Regensburg. Since 2018 he works as research associate in the project DEG-DLM (Deggendorfer Distance-Learning Modell). In the context of this project, methods of distance-learning are implemented and evaluated in study offers for non-traditional students.

Christian Ebner (M.Sc.) studierte Psychologie mit dem Schwerpunkt auf klinischer Psychologie an der Universität Regensburg. Seit 2018 ist er als wissenschaftlicher Mitarbeiter im Projekt DEG-DLM (Deggendorfer Distance-Learning Modell)tätig. Im Rahmen dieses Projekts werden Methoden des Distance-Learning in berufsbegleitende Weiterbildungsangebote implementiert und deren Einsatz evaluiert.

Contact / Kontakt

✉ christian.ebner@th-deg.de