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# Online and Soft Skills Trainings in Vocational Education in International Context: Reflections about the State-of-the-Art and Future Potential on the Example of China

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## Abstract

Additional to ongoing digital transformation COVID-19 pushed forward the need to integrate online trainings in Vocational Education Training Systems as one element of digital educational offerings. However, in many industries there is still limited acceptance for online trainings among trainers and learners due to the long-standing habits and influence of traditional training models with proportionally large face-to-face parts. Even in China with its digital pioneering role, only reserved interest in online trainings could be observed during the pandemic as a result in the BMBF-funded project INWICA (Innovative further education for workers in China). For the future, it will be necessary to exploit the still highly unused potential of live e-learning in means of a well thought-out didactic and culture-sensitive design. Additional to new online training formats, soft skills as a training content, summarised as the 4Cs rule - critical thinking, communication, collaboration and creativity - play an increasingly vital role in new world economics requirements (Ungureanu, 2020; Yan & Kongjit, 2020). Both, the design of trainings in an adequate online format and the growing importance of soft skills as an increasingly meaningful content in Industry 4.0-context, are important sub-topics when it comes to educational reforms on national as well as on international level. Both topics are closely linked to questions about new competencies and how to meet the changing demands of new teaching and learning formats in the ongoing digitization in Vocational Education Training. The concept of soft skills still lacks a clear definition (Matteson, 2016), in the INWICA project this term is referring to skills, needed for effective interpersonal interaction in socially diverse environment, such as (intercultural) communication and leadership. This paper summarizes insights about technical, organizational and didactical challenges for designing online trainings in a hybrid setting on basis of three exemplarily pilot trainings in China. Furthermore, it describes the findings from ten half-structured interviews with training experts about culture-sensitive design and demanded topics in China when offering soft skills trainings in an online format.

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**Keywords**

vocational education and training, digitalization, hybrid training settings, soft skills for teamleaders, intercultural competences, culture-sensitive online-moderation

## 1 Problem definition and research questions

The research project INWICA, within the funding line "internationalisation of vocational education", originally aims to culturally adapt parts of existing certified qualification programs for subsequently transferring them to German companies located in China. Part of the learning content should be delivered via culture-sensitive adapted interactive live e-learning format. Live e-learning in the project means synchronous trainings in the virtual classroom vitero, a software that was provided from the project partner vitero GmbH. The addressed target group are workers in production and middle management.

The learning content was planned to be based on the curricula of the "Industriefachkraft 4.0" and the "Industriemeister". In discussion with corporate partners in INWICA, such as Kern-Liebers, Heidelberger or Mubea, it quickly became clear that the main interest of Human Resources and Management lies on company-specific practice-orientated and modular training offers to gain specific technical know-how (e.g., operation of machines of certain manufacturers) or on specific soft skills acquisition to bridge intercultural communication gaps (e.g., competences in giving critical feedback). A clear wish was expressed that only time-limited and modular training offers would be of interest. This experience is in line with findings from other research activities that, also from the perspective of vocational training providers, curricula play an increasingly minor role and that the teaching of selected skills is of interest instead (Peters & Meyne, 2021). As early as 2009, education experts pointed out the increasing importance of blended learning and competence-oriented modular learning, also in view of Europe's demographic development and the need for lifelong learning (Baumgartner, 2009).

Against this background the original project goal was changed into creating a time-limited modular 40-hour 'INWICA learning offer', including on-site exercises on an industrial road at the project partner GAMI combined with soft skills trainings in the format of live e-learning. Due to external conditions (reduced availability of rooms and computers) the intended setting of 'classic live e-learning' was changed into a 'hybrid setting'. Hybrid setting means here that a group logs in to the virtual room as a whole while the trainers log-in from another place as individual users.

In this paper we refer to experiences from conducting three piloting sessions for soft skills trainings in an online hybrid format. In addition, we expand the experience horizon from the piloting with analyzing statements of ten semi-standardized interviews with training experts in China.

We address the following research question:

- *Which technical, didactical and organizational conditions are important to consider for designing successful online trainings?*
- *How is the acceptance of (online) soft skills trainings in China? What are training topics needed in the context of Industry 4.0?*
- *What is important to consider when adapting training content and formats in a culturally sensitive way?*

## 2 Theoretical framework

### 2.1 State of the art – online trainings

While blended learning scenarios – the combination of online and offline learning sessions in a longer training measure – are well established for many years, the so-called hybrid learning

setting has developed to a more and more common meeting and learning format during the pandemic. In a hybrid training (or meeting), a subset of the people is located together in the same place. Other participants join the meeting individually logged in to virtual classroom (or web conference system).

This format means a combination of physical presence of parts of a group with remote individually logged in participants during one and the same educational session. This setting requires new competencies for all roles, involved in producing and conducting trainings, such as (1) organizers, (2) facilitators & teachers and (3) training participants.

Considering the multitude of new requirements and the relatively short time since online training formats have been developing so rapidly since Covid-19, it is not surprising that many traditional educational services are only at the beginning of the transition towards digitized offerings.

### 2.2 State-of-the-art: Soft skills trainings

In a recent study on "Future Skills 2021" (Stifterverband für Deutsche Wissenschaft e.V., 2021), in a survey of 500 German companies, the importance of dialog and conflict skills in particular, as well as the ability to make judgments as cross-sector skills in professional life, are named as some of "21 competencies for a changing world". These competencies are assigned to the "transformative competencies" as a new field for educational research. According to Massaro et al. (2016) there seemed to be a tendency towards over-emphasizing hardcore business techniques and neglecting soft skills. Soft skills more and more are considered as needed by the industrial world to be able to help develop companies well and significantly. Many industries choose workers with good soft skills compared to other abilities due to current weaknesses in human resources in soft skills (Apriyani et al., 2022).

Regarding soft skills requested by Industry 4.0, a constellation map of soft skills was designed and validated based on feedback of university students (Cotet et al., 2017; Cotet et al., 2020). The evaluation of key skills supporting Industry 4.0 has been conducted. In particular, the top skills have been highlighted such as decision-making, leadership, team thinking (Kaur et al., 2020). The conceptual map – transformations for Industry 4.0 described the important topics of soft skills including give and receive feedback, problem solving in interdisciplinarity (Kipper et al., 2021). By considering a human-centered Industry 4.0, a maturity model has been developed to assess the important skills for future production workers such as personal skills and interpersonal skills (Bretz et al., 2022).

Nevertheless, there is still a lack of sufficient insights how to set a holistic training program including soft skills and hard skills in a proper way. An online survey with a PEST analysis (abbreviation for Political, Economic, Social and Technological analysis) from the project partner KIT/wbk at the beginning of the project showed that, concerning future demand for Industry 4.0 training content, a growth for soft skills and social skills is estimated while for technical skills, methodological and media competences a reduction is predicted.

### 2.3 State-of-the-art: Intercultural competencies

At the latest since the research of Geert Hofstede in the 1980ies it is considered proven that human values and behavior is highly imprinted by the culture in which we rise. The (formerly) five cultural dimensions Hofstede declared (which are the degree of masculinity, of uncertainty avoidance, of collectivism, of power distance and of long-term orientation) have been used – not without criticism – a long time as a helpful first orientation when approaching to a foreign culture. Other scientists as Eduard Hall said that “culture is all about communication” and developed the model of high and low context cultures. We refer to the newest cultural science approaches by Erin Meyer (2014) and the GLOBE-study by Robert House et al. (since 1991), which both build on the earlier findings of Hofstede and others.

Very useful for the description and evaluation of learning settings are the following four of the eight dimensions of Erin Meyer`s Culture Map: the degree in which a culture (generally speaking) communicates (high or low context), judges (giving directly or indirectly negative feedback), builds trust (based on tasks or on relationship) and argues (confrontational or avoiding conflicts) has high impact on the learning and teaching behavior.

## 3 Empirical approach / methodology

Insights and results from the project INWICA are gained by using the following methods:

**(1) Piloting of online soft skills-trainings**

The piloting for online soft skills-trainings were conducted in three different organisations with different target groups and in different settings. The key data are shown in the following table:

**Table 1**

Three piloting trainings in the project INWICA

| | **Pilot 1** | **Pilot 2** | **Pilot 3** |
|---|---|---|---|
| **Organisation** | Suzhou Industrial Park Institute of Services Outsourcing (SISO) | Kern-Liebers Pieron Autoparts (Taicang) Co. | Heidelberger Druck |
| **Branch** | College | Automotive supplier | Printing |
| **Date of training** | July 2021 | July 2021 | November 2022 |
| **Participants** | 20 Students (age 20-22), specializing in “Artificial Intelligence and Innovation” | 10 Shopfloor employees in supervisor position | 22 Supervisors from the production line |
| **Training topics** | moderation skills, intercultural communication, leadership | moderation skills, intercultural communication, leadership | Leadership, communication, time management |
| **Trainer** | Project partner, located in Germany | Project partner, located in Germany | Commissioned training agency in Shanghai |
| **Extension of the trainings** | Four training units à 1,5 hours | Four training units à 90 minutes | 2 half-day trainings on site, 1 training in hybrid setting (1,5 h), 1 follow-up training in classic e-learning setting (1,5 h) |
| **Training language** | English | English (translation of the lecture parallel by using the software MS translator and dsipalying the translation on the screen) | Chinese |
| **Training setting** | Hybrid setting using MS Teams (1 training) and Zoom (3 trainings) | Hybrid setting using virtual classroom vitero | On-site combined with subsequent online training in hybrid and classic setting (using vitero) |

In the settings of Pilot 1 and 2 the Chinese participants were sitting together as a group of about 20 persons in a conference room and were accompanied by a Chinese teacher (not involved in the training).

**(2) Ten interviews with training experts**

For a better understanding of challenges related to the topic of (online) soft skills training in China, Fraunhofer Institute for Industrial Engineering conducted ten interviews with training experts between January and May 2022. The epistemological interest of the interviews focused on the role and the design of online and soft skills trainings in China and the mutual learning potential for China and for Germany. The results will be published in a separate document.

**(3) Development of a guideline about how to design interactive online trainings in a culture-sensitive way**

The creation of a guideline on how to design and conduct culture-sensitive trainings aims to support trainers of another culture in adapting their learning content, exercises and didactical methods to different cultures, in this case to the Chinese culture. The procedure included three steps. The first step is to get an impression and orientation regarding the target country (here: China) by studying the findings of cultural science approaches (see above 2.3). The second is to derivate assumptions on how to best address and moderate groups of Chinese learners according to their 'high-context' culture. These assumptions and derivations for trainers were checked from Chinese native education experts from the project network and German intercultural expert trainers. The third ongoing step is to explore the helpfulness of the guideline in daily work-life with e-learning designers and online trainers specialized on China. Medium-term it is planned to transfer the procedure to other countries respectively cultural spaces.

## 4 Findings/Insights

Experiences of the piloting and results of the interviews reveal some success factors to consider for the design of online or hybrid soft skills trainings. Referring to our research question '*Which technical, didactical and organizational conditions are important to consider for designing successful online trainings?'* we would like to summarize our insights as following:

1. In China the spatial infrastructure and the technical communication habits brought up specific conditions such as (1) for employees in companies it is less common to use single offices, (2) it is much more common to only own a mobile device as a smart phone but not a laptop. Due to these given conditions, we changed the intended setting of 'classic live e-learning' (each learner sits in front of his/her own laptop) to a 'hybrid setting'. The following table summarizes the insights about pros and cons of each format, summarised in the table below.

**Table 2**

Pros and Cons of classic live e-learning and hybrid training settings

| | **Classic live e-learning setting**<br>Single users log in individually on their own computers | **Hybrid training setting**<br>Groups as a whole + individuals log in from one or several locations to the virtual room |
|---|---|---|
| **Pros** | • Trainings can be designed in a very interactive format<br>• Combination of theory input and exchange with activation exercises can be implemented easily<br>• Visibility of each participant optionally as avatar or via webcam in the virtual classroom vitero | • Direct communication between participants and (co)trainers on site can contribute to a stimulating group effect.<br>• Good option to introduce a new format of online training adapted to spatial & cultural conditions (in China) |
| **Cons** | • Technical requirements must be double-checked by each participants at the own location<br>• Teachers should be didactically well trained in the design of interactive | • Advantages of live e-learning as digital interaction (e.g. active contributions or anonymous feedback from individual perspective) and collaboration |

| | | |
|---|---|---|
| | training, otherwise sustainable learning effects will be rather small<br>• Live e-learning in groups by using virtual classrooms is uncommon in China (preference of WeChat or other tools) | possibilities (e.g. small-group work) cannot be used<br>• Visibility only of the group: Challenge for trainers to capture the mood in the group on site from remote position.<br>• Individual learner barely visible and addressable by trainer (much more impersonal training)<br>• High risk that training takes on a purely lecture character |

2. With the hybrid setting we experienced the following challenges, requiring new competencies especially for organisers and moderators:

1. In high-context cultures – as in China – learners like to sit together as a group in a physical room. The non-verbal and verbal interactions of the physical group are hard to capture for the (remote) trainer and the virtual group. The moderator, respectively lecturer, needs to split his attention between the physical and the virtual group. Especially for interactive training parts there is a high risk to lose contact with the remote group participants. To balance the difference of presence and visibility between the physical and the remote participants, there is a higher need to establish rules of communication, collaboration and feedback. This has to be considered in e-learning conception and is highly challenging for the trainer – especially if he/she comes from another culture – and requires high-level culture-sensitive online moderation skills.
2. Additionally, the hybrid setting requires a high degree of coordination between moderators in the virtual room and moderators of face-to-face groups in a physical room. Furthermore, organizational tasks need to be coped, such as double-checking the technical devices in the physical room (e.g. screens, whiteboards, cameras, loudspeakers) and arranging them in a communication-friendly way, supporting interactive exercises up to planning short-term coordination across different time zones.

Referring to the research question about '*What the acceptance of (online) soft skills trainings in China'* the statements brought up a range of topics. The following selection of statements about the acceptance of 'Online Trainings' are similar to the experiences in the piloting trainings.

**Table 3**
Statements about the acceptance of online trainings in China.

| |
|---|
| • "People want to experience to do something together face to face - that is something Chinese." (I_06_D) |
| • "The ideal way of working is in presence, because in the online format again it is more cognitive. Some things can certainly be done online, but it's difficult with exercises, especially cooperation exercise." (I_03_C) |
| • „Since the pandemic, there has been a significant increase in online training, which used to be almost non-existent. Corona has caused it to be accepted and also to go beyond the national borders to Asia Pacific. This is increasing very strongly. There are various formats. Some trainers are on site, others online with break-out groups, different formats are being tried out." (I_01_D) |
| • „Due to the large number of students in China, it would be advantageous if the hybrid format remained and learning videos, links, etc. could be sent in advance. The hybrid format will increase." (I_02_D) |

- „I can say that the online world is an alternative, especially in the soft skills area, but in some areas coaching presence is required and still the more ideal option. We are not in an ideal world, it works, but it does not replace a physical presence. Just if we look at the work behavior in China [...], they are more human or more focused on that interpersonal contact than we are." (I_05_D)

**Explanations to the table:**

- The interviews were held in German language and thus the listed statements were translated.
- The codes in brackets are using the 'C' for interviews with training experts with Chinese as mother tongue and the 'G' for interviews with training experts with German as mother tongue.

Concerning the research question '*What are topics needed for soft skills training in Industry 4.0 context'* the following statements show a tendency focusing on communication, leadership and intercultural competence.

**Table 4**
Statements about topics for soft skills trainings in China

- "Intercultural communication and cooperation, including conflict management. These topics are particularly important for China." (I_03_C)
- "Many companies have also recognized the importance of intercultural competence." (I_08_C)
- "All about communication, staff meetings.... Leadership and feedback are also an important topic in production". (I_09_C)
- "The focus is on creativity. This does not mean that the Chinese are not creative, but it is not encouraged there... Collaboration etc. will remain an issue in all companies and cultures." (I_01_D)
- "Vocational action competence is the current term. There is still a gap between German skilled worker training and the level of college education in China. Communication and collaboration are needed to solve this." (I_02_D)
- "In the business world, there is a huge need to catch up, for example on the topic of "How does leadership and cooperation work?" (I_06_D).

During the piloting trainings, it also became clear that only modular and company-specific topics as well as training in the Chinese mother tongue have a chance of being commissioned.

## 5 Discussion and conclusion

Based on experiences in the project as well as on a review of the literature we derive the following theses.

**Thesis 1:** The potential of online training in vocational education is far from exhausted. National and international training providers and companies should open up more for experimentation and systematic testing of new online formats such as 'hybrid formats'.

In addition to the practical insights about organising and conducting a hybrid training, one of the most obvious insights was the need for flexibility in organising online trainings in different conglomerations – offering a virtual training session in which individuals as well as one or several groups in physical rooms meet in the virtual classroom. This setting goes along with the demanding challenge to involve all participants in interactive communication 'at eye level', independent if he/she is a member of a physical group or joins remotely as a single user.

Facilitation in such distributed settings requires high competencies on coordination between (co)moderators, setting up clear communication rules, operating technical functionalities in the virtual room, culture-sensitive competencies to address a mostly wide range of nationalities in global teams in an adequate way and finally a great attention span to keep an eye on what is happening in all rooms.

Further research is necessary on how to bring the single remote participants nearer to the on site groups, bridging the natural group cohesion triggered by physical closeness. Furthermore, train-the-trainer programs could help to build competences in (culture-sensitive) online moderation to spread such challenging settings more easily. Training providers and well trained online trainers could so become multipliers of new formats for online training.

**Thesis 2:** Soft Skills become more and more important as part of Industry 4.0 knowledge – independent of country and culture.

The significant asset of the Industry 4.0 framework are people. In fact, the workforce represents a critical element for implementation of Industry 4.0 technologies. Besides of hard skills, soft skills become more and more important. First of all, there are dramatically increased needs to create a broader structured knowledge of the basic concepts related to soft skills for the Industry 4.0. The workforce needs to understand and internalise soft skills to fit the new organization of factory, which is characterized agile, robust and resilient. This requires a workforce that is able to create cross functional synergy with each other and find the proper way to solve the organisation challenge (decision making in decentralized function).

Furthermore, soft skills should be improved and integrated, considering the practical requirements revising the training contents, especially with regards to technical topics, specific application fields. One interesting possibility is creating customized case studies as a training and learning method. It could improve the soft skills of workforce by encouraging their digitization and smart interaction between the various actors involved. Good examples of applications carried out in this direction are represented by Pilot 3 at Heidelberger Druck.

Contrary to the trends in Industry 4.0 toward technological advancement and innovation best practices, next generation of industry will bend back toward serving humanity. At workplaces, this industrial revolution will shed greater light on the human intelligence than ever. Soft skills will influence and enhance the workforce to harmonize more through variant soft intelligence such as emotional intelligence, emotional recognition and expression to perform better according to the survey (Chin, 2021).

From the view of global production, soft skills are main factors to keep workforce healthy and inspired to transfer the smart and sustainable industry in the future. In this context, it is obviously important to pay more attention on soft skills for promoting awareness of collaboration and communication in the broader scope, no matter in which country or under which culture.

**Thesis 3:** Intercultural competences become more important the less face-to-face contact is possible and the more unpredictable external framework conditions arise

The impact of culture on our learning behavior is essential to look at when designing e-learning and vocational (online) training. Trainers who come from a different culture must be sensitized to the cultural values of their participants. The way of teaching (didactical approach), moderating, giving feedback and interacting with the group has to be adapted to offer an effective and high-quality online training. It can be summarized that culturally sensitive design of trainings should basically refer to all three dimensions: Training content, didactical design and training format (including training technology).

Looking back at the pandemic time period and considering the current world situation it seems growingly important to foster competencies in understanding diversity of people, in the own as well as in different cultures.

Even though insights as described in this paper are related to experiences with China, we are convinced that the challenges about how to design interactive online trainings for soft skills (and for other topics) and methods about how to adapt those trainings in a culture-sensitive way can be transferred to other countries and will gain in importance for international vocational and educational training providers. Further research on both topics will contribute to exploit unused potential of trainings in national and international settings and to foster transcultural communication.

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