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# ‘What can I already do well today?’ Competence development in innovative learning cultures

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## ABSTRACT

Digitalisation and a rapidly changing labour market introduce new demands on competence and these demands reinforce the renewal of Swiss apprenticeship training in businesses. The telecommunication industry is a representative example of the new challenges that vocational education and training faces. This article highlights some new approaches and pathways to apprenticeships. It shows that not only structural conditions need to be adjusted, but also the learning culture of the community of practice, which includes the shared attitudes, values and beliefs of all the actors involved in vocational education and training. As this article indicates, comprehensive changes in the apprenticeships at the enterprise studied have had a substantial impact on the development of competences such as creativity, reflection, autonomous action and initiative-taking.

## KEYWORD

*Vocational education and training (VET); career and technical education; workplace learning; apprenticeships; learning culture; innovation; creativity; flexibility; individualisation; lifelong learning; case study; telecommunication industry*

## **Innovative apprenticeships are shaped by innovative learning cultures**

Switzerland is often seen as an innovation leader in the world (SWIR, 2015; European Commission, 2017). A strength of its innovation system lies in its apprenticeships and its dual approach to vocational education and training (VET): while some learning is based in vocational schools and training centres, the larger part of the three- to four-year apprenticeship takes place in enterprises. How the young adults, who are called 'learners', are trained and in what kind of learning culture they are enabled to acquire the competences needed in a modern economy, is largely unknown. Socialisation in a learning culture means to learn in an environment shaped by particular attitudes, values and beliefs regarding the education of the next generation of workers. Being innovative means that attitudes, beliefs and values are constantly adjusted to change (Wieland, 2004). In this sense, an innovation culture is an integral part of a learning culture in an enterprise or it can emerge as a result of a particular learning culture.

The drive for innovation has various effects on workforce development. For the workforce in dynamic industries, routine skills become less important, whereas observation skills, process-management skills, and transfer and problem-solving competencies are becoming more important (Pitton, 2004; Dreher, Jenewein, Neustock & Schwenger, 2015; Hackel, Blötz & Reymers, 2015). The rapid diffusion of new technologies and new production processes changes both the daily work and current challenges in these occupations and the corresponding VET and continuing-education programmes (Dreher et al., 2015).

With new markets opening up and digitalisation increasing, careers are no longer linear but have become increasingly marked by different stages and the acquisition of new competences (Heinz, 2009). Experiential knowledge and a focus on a specific vocation may be challenged, but they persist because the concept of professionalism is 'a stable phenomenon and by no means in contradiction to the dynamics of labour market trends' (Rauner & Smith, 2010:4). In most developed countries, it is intermediate-level skills that are mostly in demand, whereas 'the proportion of jobs requiring a university degree and of jobs requiring low skills are, in many cases, static or declining' (Rauner & Smith, 2010:3). There is a concomitant trend towards implementing VET systems in different countries, but the quality of VET and of workplace learning is a concern; as a result, new structural components, such as working with coaches as advisors to apprentices, are being implemented (Onstenk, 2010).

Innovation dynamics, however, has implications for the ways in which workplace learning is organised to meet the needs of both employers and apprentices. Among the competences required are innovation management and creativity, since innovations and changes are often implemented within the duration of a VET programme (Ruiz Ben, 2005; Limacher, 2010; Barabasch, 2018). While product-specific knowledge can become less important and is often not transferable, high levels of perception skill, openness, and the ability to find and understand new information independently become more important. Learners have to take responsibility for their own learning, which requires a great deal of personal engagement and

discipline. Related to these demands on VET, teachers and trainers have to adapt their teaching: for one thing, their role is changing from that of instructor to that of coach; secondly, flexible structures and action-oriented methods are required. Moreover, teachers and trainers have to create room for learning, prepare and present subjects, give feedback, and promote reflexive learning in learners, a process that they moderate and accompany (Weicker, 2007; Modrow & Strecker, 2016).

For most apprentices in Switzerland, learning takes place in a dual arrangement of school-based and work-based learning. Both environments demand and develop different skills and competences but also need to connect in order to support learning that is relevant to practice (Rauner, 2017). Vocational learning in general aims at developing the vocational ability of apprentices or learners through continuing education, and, although the theoretical aspects contribute to vocational ability, practice is essential: vocational ability always has to be trained practically. Rauner (2017) has suggested a model that shows how vocational competences can be developed and measured. He assumes that practical work should be the point of reference to account for the validity of a diagnosis of competence in VET and he conceptualises vocational competences based on practical work. Accordingly, he assumes that all vocational learning should be based on relevant vocational tasks (Rauner, 2017). Vocational competence comprises job-related personal and social competences (Rauner, 2017:44). These competences should lead to the ability to complete vocational tasks in a holistic way. The (holistic) completion of a vocational task requires presentation/form/clarity, functionality, efficiency, sustainability, work and process knowledge, environmental compatibility, social acceptability and creativity. These requirements need to be trained in both VET and continuing education.

The learning of apprentices is always embedded in an enterprise's general learning culture. Therefore, a key issue is how learning processes can be managed. Vocational learning, especially in dual systems where workplace learning is included, can be seen as a modern form of learning or as a model for learning in a constructivist perspective, since it is (or can be) situated in a particular context.

The theory of communities of practice (CoP) can be considered as a lens through which to look at workplace training and current developments. The central elements of CoPs are 'a shared domain of interest, a community of people, and a shared practice' (Lippert, 2013:40). According to Wenger (2001), 'members of a community of practice are practitioners' who 'develop a shared repertoire of resources: experiences, stories, and ways of addressing recurring problems' (Wenger 2001:2–3). Newcomers in a community of practice – such as apprentices in the workplace – are able to avail themselves of 'legitimate peripheral participation' in the community (Lave & Wenger, 1991). 'Legitimate' means that they can actually participate in the practice; 'peripheral' signifies that they do not immediately participate fully – that they are not initially 'complete workers' – but that they are gradually proceeding towards full participation. According to Lave and Wenger (1991), it is essential that newcomers are allowed to participate in the 'real' practice of the community, just as apprentices are in the Swiss apprenticeship system.

Lave and Wenger (1991) assert that learning builds identity in a specific community of practice. Instead of the didactical setting that is typical of schools, workplace learners learn through exchanges with their peers and other employees, gradually inheriting ways of talking about the communities of practice. It is critical to appreciate that what is learnt in school is not actually part of real practice (Lave & Wenger, 1991:99); for this reason, these authors strongly advocate that workplace learning take place in real settings, because it enhances motivation:

In summary, rather than learning by replicating the performances of others or by acquiring knowledge transmitted in instruction, we suggest that learning occurs through centripetal participation in the learning curriculum of the ambient community (Lave & Wenger, 1991:100).

Workplace learning in this sense is an ideal form of learning. Here, apprentices obtain legitimate peripheral access to a community of practice (the workplace) and they gradually become members of that community as they get to know the relevant objects, tools and ways of comportment of the members. In this light, this article on the learning culture in VET focuses on the components of a modern working and learning environment, relevant practices at the workplace, and how competences are developed in a community of practice.

### **Apprenticeships in the Swiss telecommunication industry**

The information and communications technology (ICT) sector in Switzerland has seen a steep increase in the number of employees. Since 1991, it has grown four times faster than other sectors and has become one of the biggest sectors in Switzerland.<sup>1</sup> Parallel to the growth of the ICT sector, task complexity has increased. Overall, the competence requirements for employees are higher than previously and this has made it necessary to develop new job profiles (Aepli et al., 2017). This has been particularly challenging for the telecommunication industry (Ruiz Ben, 2005; Limacher, 2010). VET programmes in this sector, which are complex and intellectually demanding, comprise those in informatics and mediamatics (Stalder, 2011). Apart from a secondary-school graduation, the preconditions for starting an apprenticeship in this field are strong performance in mathematics and languages. The new competence requests also challenge conventional qualifications and learning pathways that have formerly been common practice. Not only the structural conditions of vocational learning need to change, but also attitudes, beliefs and values regarding the ways in which apprentices are treated, communication takes place, tasks are distributed, or expectations are expressed. How to shape such a new learning culture and such new practices through VET at an enterprise or in an organisation in the context of workplace learning, and which competences are particularly relevant to future jobs, will be shown via a case study that has been conducted at Swisscom, a major player in the Swiss telecommunication industry.

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1 <https://digital.swiss/de/publikationen/die-wirtschaftliche-bedeutung-der-ict-1>

In 2018, Swisscom had about 910 apprentices, who are called 'learners', of whom 483 (or 53.1%) worked in ICT occupations. In the apprenticeship programmes, human resources works with coaches, who advise the learners throughout their three- to four-year apprenticeship. Each coach looks after about 40 learners.

At Swisscom, VET was restructured in 2003. Ghisla and Zgraggen (2004) reported that this was the consequence of both societal and economic changes and new expectations of VET. Increasing national and international competition led to frequent reorganisation and rationalisation in the enterprise, which also affected the VET department. Demands included more cost transparency and a better use of synergies between VET and the required workforce. VET was no longer required to follow the rather rigid structure it had done in the past. The previous programme included one year of 'pre-training' at an isolated training centre followed by practical work at one location for the whole duration of the apprenticeship (technical occupations). Instead, the apprentices were now required to be flexibly employed on real projects, and, in support of this, a learning organisation has been installed (Ghisla & Zgraggen, 2004).

### **The Swiss case study – research questions and goals**

This case study was conducted in order to characterise learning in a specific environment. Case studies allow for adopting a holistic perspective on an object and are particularly suitable if the connection between a phenomenon and a context is not evident (Yin, 2014) or if particular contextual conditions are relevant to understanding a case (Yin & Davis, 2007). Organisational cultures or power structures and hierarchies within an enterprise are shaped by the historical, economic and social contexts (see Matthäi, 2007). An organisational culture cannot be examined without considering the context at a given time. Themes – such as the pressure to innovate, international markets, diversity, and equality of the sexes – have an impact on enterprises and are reflected in the behaviour of individuals. The methodological approach of a case study is suitable for a 'realistic' and 'relative' research orientation (Yin, 2014:17). Research with a realistic perspective starts from the perspective that objects exist in reality, independently of the viewpoint of the observer. In applying qualitative methods, the conviction exists that individuals themselves construct knowledge and that the object of research does not exist independently of the research perspective. The research perspective is made explicit in qualitative research. According to qualitative research logic, reality is also constructed in the subject area (see Mabry, 2008). Jointly constructed knowledge informs the practice of action on the part of the actors in groups. When individuals speak about such practice of action, their implicitly shared knowledge, which governs their action, becomes accessible (see Przyborski & Wohlrab-Sahr, 2014).

Integrated in this case study are, on the one hand, quantitative data – such as the number of apprentices, in which occupations they are trained, key data about the apprenticeships, and official information about the organisational culture and the apprenticeship concept. These data are relevant to the holistic description of the case and they are also referred to by the

interviewees. They form the entirety of the explicit and common knowledge, which serves as an orientation to the employees in an organisation but also influences the public image of the enterprise. Especially when aspects of an effectively lived culture are of interest, it seems meaningful to research it in order to capture the implicit knowledge of the employees. It is this knowledge which serves as a point of reference for their action in the community of practice in the enterprise. Through the analysis of interviews and focus-group discussions, it becomes obvious how the employees orientate themselves in their daily work.

By conducting an in-depth case study at a large Swiss enterprise in the telecommunication industry, the authors have been able to collect a wealth of insights into the ways in which apprenticeships are conducted, shaped and pursued. The main goal of the enquiry was to gather information about the values, attitudes and beliefs of everyone involved in pursuing an apprenticeship in order to understand the parameters and constituencies of the current learning culture. Another goal was to find explanations for how and why the established culture is innovative, supports the development of innovative products, and identifies development perspectives for shaping apprenticeships more generally. Of central interest were, among other issues, the different types of appropriation exercised by the learners.

This article responds to the following research questions:

- Which factors contribute to shaping a new, innovative learning culture in apprenticeships?
- How are competences such as creativity, reflexivity, and the ability to act autonomously and take the initiative, developed?
- How do the learners experience this learning culture? How do they benefit from it?

### **Data collection and data analysis**

The three researchers conducted semi-structured interviews among 17 learners, five coaches and three employees who work with learners. In addition, four members of management responsible for VET were interviewed. The participants were primarily selected after being recommended by gatekeepers such as managers or coaches. Additional interviewees were identified based on the snowball technique. The managers selected five coaches, each of whom selected three to four of their apprentices and also one or two employees who work with apprentices. At least one coach was drawn from each language region of Switzerland (to gather findings on the culture of the enterprise at a national level).

In order to acquire a more representative overview of the spectrum of learners, their challenges and their ways of overcoming them, additional participants who had struggled with their apprenticeship were selected.

The interviews lasted mostly between 30 and 45 minutes (in the case of the learners) or between 45 and 60 minutes (in the case of the coaches, colleagues working with learners, and

managers). The interviews were audiotaped and transcribed after the goals of the study were communicated to the interviewees and written consent was given. In addition, the researchers visited innovative projects across Switzerland that had been identified by the interviewees and their observations protocolled.

The data analysis based on the transcripts and notes was guided by a content analysis (see Kuckartz, 2016). The material was structured according to individual cases and categories representing different research topics (Kuckartz, 2016:49). In an iterative process, the narratives were coded according to emerging themes and regularly discussed by the research team to ensure the reliability and validity of the data. In this way, a comprehensive and detailed system of categories was derived. Table 1 represents the central codes of the data analysis. The coding of the material rendered visual major aspects of the learning culture from the participants' perspective. The complete set of coded data provides an orientation for the analysis of the practices, beliefs and values that were revealed.

**Table 1:** Central codes of the data analysis

Themes	Discursive elements	
Challenges Acting autonomously and taking the initiative Flexibility/agility Problem-solving competence Competition Past and present Transformation Digitalisation The future Relationships Trust Conveyance Role models	Conception of human beings Conditions for learning process Learning by doing Conditions for creativity Conditions for performance Feedback Win-win situations Motivation Passion Reflection Work-life balance Recognition Coping with mistakes	Direct speech Otherness Me and others Irritations Imagery Cursing Image of the maker

*Source: The authors*

## **Research results**

### *Innovative learning culture and agility*

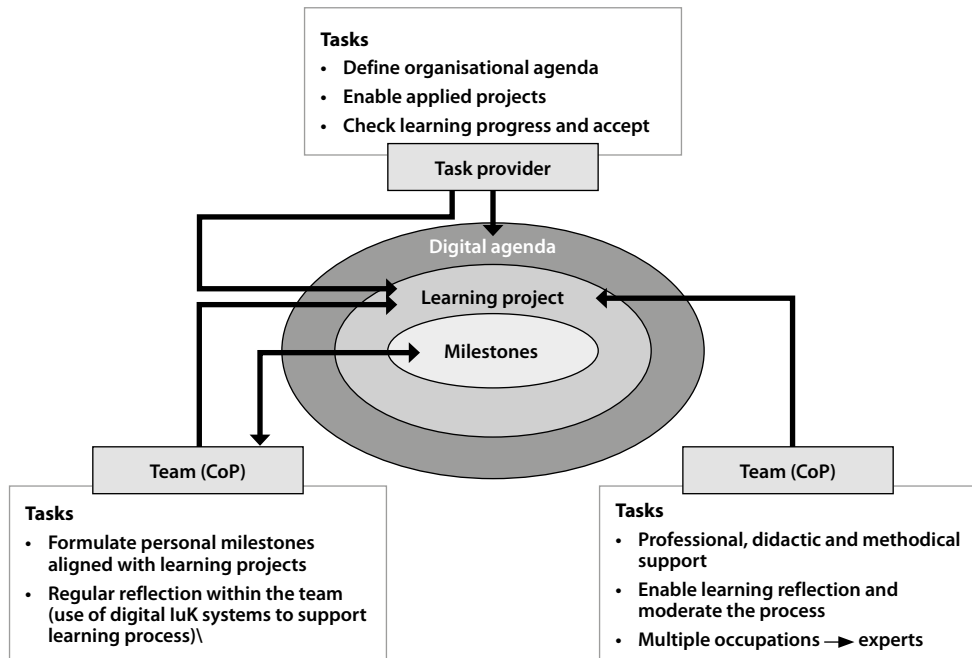
It is known that actors' attitudes, values and beliefs regarding the framework conditions for learning in enterprises characterise the existing learning culture. Largely unknown, however, is how existing practices and structures influence learners' development of competence (Sonntag, 1996). Friebe (2005) is one of the few authors who has shown that the learning culture influences the development of employees' competence. He researched the connection

between different signifying components of a learning culture and occupational competence, which – with one exception – were significant (mostly in the lower and middle sectors). In this article, the further effects of the learning culture on the development of competence in learners are described. These effects offer additional suggestions of a positive correlation. Based on a case study in VET at Swisscom (Barabasch & Keller, 2018), we introduce several aspects of the learning culture and show how they support the development of various competences.

One of the main reasons for investing in employees' further education and training is to secure and substantiate the innovative and competitive capacity of an enterprise. The challenge for VET is to meet the expectation that what is trained there is relevant at future workplaces (developed skills that match labour market demands). Employees need to be ready to acknowledge and cope successfully with the increasing complexity of their work environment (Sonntag, 2002). New conditions in the workplace can, for example, comprise working in different teams, taking over new and unknown tasks, interacting with people of different cultures and qualifications, having the ability and willingness to take on greater responsibilities, and being stress-resistant. A rapidly changing labour market characterised by new skill demands and high expectations of workers' readiness to cope competently with new challenges therefore leads to an increasing need for further education and training or learning in different settings or configurations. The enterprise in the telecommunication industry we researched has responded to the changing labour market with different organisational measures. For example, all learners are required to apply at least every half-year for a new project over the course of their three- to four-year apprenticeship, which they are able to find at an internal online portal (the 'marketplace'). In this way, instead of following a standardised pathway, the apprenticeship becomes highly individualised. However, over the course of the apprenticeship, coaches make sure that all the competences defined in the framework curricula are acquired over the duration of the apprenticeship.

An innovative learning culture in the enterprise is the foundation for the framework conditions that are conducive to competence development. A key feature of this particular enterprise is its culture of agility in which the younger generation is socialised. The term 'agility' was originally conceptualised for the business of programming software, but it was soon adopted in other sectors and functional areas (Graf, Gramß & Edelkraut, 2017). It became known through the concept of 'agile manifest' introduced by Beck et al. (2001). Agility is central to the new learning culture in apprenticeships at the enterprise (Höhne et al, 2017). It consists of multiple organisational concepts, which are continuously extended and modified (Hooper et al, 2001). The agile learning model developed by Höhne, Bräutigam, Longmuß and Schindler (2017) is based on their experiences in agile project management. The enterprise has consequently implemented agile learning and working in its apprenticeship training and this form of learning has increasingly become part of the new learning culture, as described in the model above. In Figure 1, the role of the different actors in this agile learning culture is represented.

**Figure 1:** The role of actors in the model of agile learning in the context of competence development (Höhne et al., 2017)



The role of distribution in an apprenticeship programme is oriented towards the so-called scrumming method, according to Dräther, Koschek and Sahling (2013). The authors define three actors who collaborate: the task provider is the enterprise itself, with its expectations of staff performance, but also those who announce projects on the online marketplace platform. Here the duration of the projects and the relevant fields of competence development are defined. The human resource department manages the system centrally.

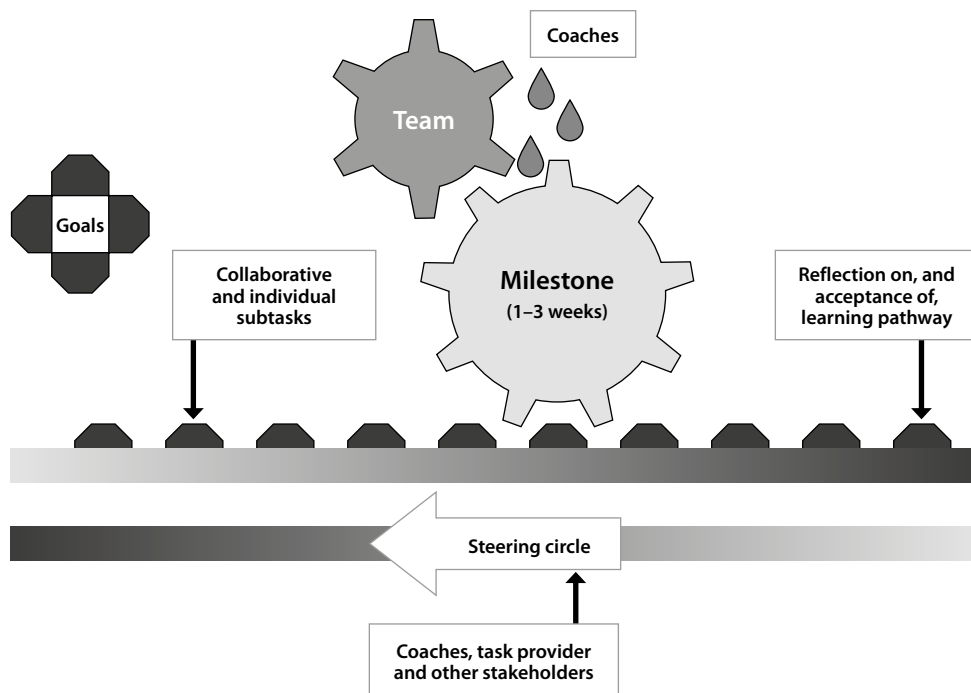
Another structural feature is the shift from workplace trainer to learning facilitator or coach. The learning facilitator or coach advises the apprentices throughout their entire apprenticeship. It is the responsibility of learning facilitators or coaches to guide both the choice of projects and all other questions regarding the training (and often above and beyond that). Although the coaches have their personal coaching styles, they are all predisposed to a 'coaching attitude' in the sense that they do not prescribe what learners have to learn and do not teach learners. Instead, the support they offer is to help learners to find their own solutions to problems, to develop initiative, to strive for achievements beyond expectations, and to find the strength to be persistent in their chosen pathways and finish their project work. At a more formal level, the coaches are responsible for the documentation of the learning processes. They gather feedback from the learners' quality point average (QPA) scores, which indicate a learner's level of achievement., make sure that, in total, the learners acquire the skills needed for the final examination, and coordinate with the vocational schools. Often, the coaches are

recruited from among regular workers in different occupations, some of whom have completed further training in coaching, and others of whom may have a background in psychology or pedagogy.

Quali-project providers (QPPs) announce projects in the online marketplace, conduct interviews with applicants, and provide professional support to those selected for the project. They are responsible for ensuring that the learners reach their competence development goals and they take care of the learners' skills development. About every three to six months, the learners change projects, which entails a new application process. In this way, they also acquire the skills to write applications and conduct interviews. In each project, they work with new teams and have a new person providing professional guidance.

While the agile method is largely applied in project work and the team takes over the steering process, for the learners the QPP is the key person to report to. Together with the coaches and the QPP, the learner sets personal milestones for their apprenticeship training, their single projects and their career progress (skills development pathway) in their apprenticeship. In this way, not only does the learner develop skills that are highly relevant in the enterprise, but they also develop the skills that are set or prescribed by the curricular framework plan for federally recognised occupational degrees. In Figure 2, the process of cooperation in an agile learning and development project is illustrated.

**Figure 2:** Process of cooperation in an agile learning and development project (Höhne et al., 2017)



The central task of the coaches is to continuously advise and, to some extent, counsel learners in order to ensure sustainable success in their learning (Höhne et al., 2017). Coaches also take on the role of process coordinator. It is their responsibility to ensure that the ways in which teaching and learning take place in the workplace lead to the intended skills development. They are also responsible for the flow of information between all the stakeholders. At the enterprise, for instance, they coordinate the information flow between QPPs, vocational schools and learners.

For agile learning projects to be implemented successfully, it is essential to involve the organisational level. A reflective process involving all the stakeholders ensures that the development of this approach to work and learning is sustainable (Zink et al., 2015). Therefore, coaches, QPPs and learners have regular meetings in which they talk about the learning progress and intentions. Overall, the systemic approaches to the organisation of learning in the enterprise indicate that, to a large extent, the principles of agile learning are guaranteed. The question, however, is this: Which implications flow from these new structural framework conditions as they influence the development of learners' competence?

### *Competence development in an agile VET culture*

Competences are personal resources or traits, such as knowledge, skills and behaviour, which allow a person to manage their daily work effectively. They can be acquired by learning and working in a real work context in an organisation (Matthäi, 2007). The learning culture has a major impact on an individual's competence development (Friebe, 2005). The next few sections focus on three competences which are particularly important for many apprentices working within a highly dynamic, competitive and agile environment such as the telecommunication industry: creativity, reflexivity, and the ability to act autonomously.

Creativity is an important precondition for the ability to actively shape and create – in sum, it can be called 'innovation competence' (Anderson, Potočnik & Zhou, 2014). Self-reflection plays a major role in agile learning processes and is an immanent component of the structural conditions relevant to the learning culture in Swisscom. Acting autonomously is one of the major goals of VET and a central component in agile organisations.

### **Creativity**

To think and act creatively is often viewed as a first step towards innovation (West, 2002) and it plays a major role in innovative enterprises and their learning culture. Generally, creativity is understood as a mental and social process of generating ideas, concepts and associations (Serrat, 2017). Research considers a transparent information flow as elementary to supporting creativity (Amabile, 1988). A learning culture, which supports risk-taking behaviour as necessary for the development of new products and processes, also supports working creatively (Sternberg, O'Hara & Lubart, 1997).

In the Swisscom telecommunication enterprise, there is a high level of consciousness of the need to communicate transparently and constructively in order to sustain trust and secure the preconditions for creative work. In regular meetings with their coaches, the learners receive feedback about their behaviour and performance. They are given the opportunity to talk about everything of concern to them and their training. Their exchanges with coaches have been described by many learners as trustful and constructive, especially also with respect to their having made mistakes. In the following example (Barabasch, 2018), a coach reports about an IT (information technology) learner who had been dissatisfied with a tool for events and who expressed his discontent quite strongly. In the conversation with his coach, he was asked what he would improve:

[F]or about two weeks there was radio silence and then he brought two or three proposals as to how to improve the tool. Then we talked about it and we made such good progress that the learner said: 'OK, then. I can build this new tool'. (Coach) The example shows how learners are supported early on in developing critical thinking skills, in acting autonomously, and in shaping products and processes creatively.

In the following areas, the learning culture has an impact on creativity (inspired by Serrat, 2017). It supports the generation of ideas and a positive culture of coping with mistakes. In addition, the coaches have pointed to communication at eye level, the establishment of a trustful relationship, and the absence of fear in communicating about mistakes as determining factors for a positive learning culture (see, also, Schneider & Breßler, 2016). According to the testimonies of coaches, this culture of constructively communicating about mistakes contributed to the learner's idea of developing a new tool and feeling confident about his skill to do so. He has first created an ambiguous image of himself by being hypocritical, but with the support of the coach redirected his attention to the problem and its solution. Instead of condemning his behaviour, the coach helped to turn strong concerns into a drive for creative action and supported the development of action competence that led to the development of a new tool. The example indicates how the tolerant and constructive handling of mistakes can contribute to the development of different competences as much as to a positive stimulation of inventiveness and creativity among learners (Hansen, Trantow, Richert & Jeschke, 2013).

That the telecommunication enterprise actively supports a positive culture of coping with mistakes is underscored in the following quotation:

A mistake is ... . So, we have hung up a poster in the front of the room: 'Making mistakes is better than doing nothing.' Because, for example, instead of only learning something, if I can really do something, test something out. When I make a mistake, then it is about 90 per cent likely that I will never make it again. And with this ... you can argue, well, Swisscom says: 'You should rather make a mistake instead of not even trying to make something'. (Learner)

In the school context, these effects on students' creativity have already been proven. Research has found that students whose teachers support autonomy act more creatively than students

who learn in a highly controlled environment (Koestner, Ryan, Bernieri & Holt, 1984; Frey, 2017). In our case study, throughout their apprenticeship, the learners developed a strong action competence in their project work and also in terms of planning and shaping their pathway through their apprenticeship:

Exactly; so promoting creativity should actually work. And it should work even in the context where you do not have a specific job to do, but are more open. (Learner) The learners can, depending on the project, chose their workplace and sometimes even their tasks within a project (for example, developing a new IT tool). The opportunity to work in hubs or co-working spaces also supports creative work by providing the environmental conditions for it. At these places, representatives of different departments and disciplines meet each other and can exchange knowledge and ideas, which supports the development of creative ideas and networking.

### **Self-reflection (reflectivity)**

Self-reflection characterises 'the ability of persons to think about their own situation'.<sup>2</sup> The sequence of objective-stage reflection and its continuation is an important component of agile learning and of the training programme at Swisscom. For a learning project to be implemented successfully, the reflexive process, with the active participation of the actors, is indispensable (Zink et al., 2015). This competence is therefore an important component of agile project management and is communicated to the learners during discussions at regular intervals – in the case of Swisscom, at least every three to six months. A learning culture in which self-reflection is an important design feature of the agile learning process should, according to Friebe (2005), have an influence on the vocational skills of learners. The following statement shows that a learner has recognised the benefits of obtaining regular feedback:

Not necessarily at the end. Instead, it really is about me going to ask the stakeholder myself for their feedback as part of the process. And, of course, afterwards, in the end, I reflect upon everything myself. But I do not necessarily just go through the whole thing again and the whole crap that you have finally built in the end. But, really, in the whole process, you should collect feedback throughout, so that afterwards you can then choose other directions in which to go. (Learner)

The repeated changing between projects promotes reflectivity in the learners, as they have to expand or adapt their acquired knowledge in new situations. At Swisscom, before each project change, a feedback discussion is held together with the QPA and the responsible coach; there, the learners' development and learning objectives are discussed. As Gebhardt and Jenert (2011) show in their study, constructive feedback is an important design feature that enables deep reflection. At Swisscom, this is a constitutive feature of the learning culture:

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2 <http://lexikon.stangl.eu/7084/selbstreflexion>.

learners receive timely, direct and constructive feedback in order to foster a factual examination of their own strengths and weaknesses.

A symbolic quotation by one learner shows how asking oneself a number of questions supports the development of reflective skills, being self-critical in the interests of self-improvement, and openness to change:

And also, well, to understand ‘Who am I? Where do I want to go? What is important to me? What can I do well already today? Where am I not so good today’ and then, well, the question could be ‘Can I really improve all of that which I cannot do so well today?’ Or could I possibly also say: ‘I know that this is my weakness and I will try to get this reasonably under control, but am I aware of it ...?’ Also, just this self-reflectivity, I believe this is extremely helpful for getting ahead. (Learner)

Learning to think and act reflectively is of great importance at the workplace. It helps employees to cope with uncertainty and ambiguity, which increasingly characterise workplace situations. Learning to be reflective is also an incremental part of maturing in one’s personal development and employment career. Coaches play a key role in the development of these skills. The ways in which they communicate with the learners and establish a culture of trust that encourages open reflection, stimulates learning.

### **Acting autonomously and taking the initiative**

Reflection on work experience is an important building block in education for self-employment and self-initiative (De Bruijn & Leeman, 2011). This independence is characterised by three aspects:

1. It is self-starting, which means that you do something without being asked by someone else;
2. It is proactive, which means that you plan your work ahead of time and foresee future action; it also means that you anticipate the problems or opportunities that may arise and act accordingly, and
3. It requires initiative and perseverance, especially in the face of setbacks (Frese, Tornau & Fay, 2008).

The following statement by a coach describes the effects that the learning culture has on independent action (Barabasch, 2018):

And at the beginning, of course, there is ... much closer support, including [for] learners who are in their first year of the apprenticeship. In the first and in the

second semester, they need a lot of support and later it becomes less. This is also very individual of course. There are fourth-year students [whom] you still have to advise intensively and who can't manage themselves well enough, but the large majority are learning fast to be independent and so they can do the ... recurring tasks independently. I check that. (Coach)

The company expects that the level of working autonomously will increase over the course of an apprenticeship and that the need to support or intervene will decrease accordingly. Throughout the first year of their apprenticeship, the learners are already encouraged to search for their projects on their own and can, within certain framework constraints, design their own projects and take ownership of their individual learning pathway. The extent to which working autonomously is possible can be determined by each individual so that particularly talented learners can be involved in challenging projects or independently develop projects early on and then work on them. Here a learner reflects on his training success:

Well, of course, I have become much more independent ... I have become more open. I'd better just go spontaneously and talk to new people, do something and work a bit more than I could before. And, that just ... comes with time here at Swisscom, because that's what you have to do. (Learner)

The quotation indicates how important education for autonomy in one's activities in the workplace is to the development of various behaviours such as taking the initiative, planning and organising one's work and learning pathway, and also communicating about one's needs in this respect. It also shows how social skills, such as being open to talking to new people, taking in their ideas, and learning to understand their needs and comments, are further supported. Such support helps to develop self-confidence and, more generally, one's communication skills. The approach also signals that it is not necessary to guide all learners strictly at the beginning of their apprenticeship, but, instead, that guidance should be adjusted to individual needs and that those learners who are capable of organising the work themselves be allowed to be as autonomous as possible. One coach describes the opportunities to work independently at the enterprise:

There are learners who are very proactive and who actually write their own projects. They just have this idea somehow of what they want to do and they just search for some godfather who will take them on as a QPA so that they can follow their plan. This was the case last year, for example, with an IT learner, who got hell-of excited about how complicated the management of absences was, and how awkwardly they were handled, at VET school. And he thought about a solution, [about] how to make this process easier electronically. He knew right from the beginning what this tool should look like. Then he just asked me: 'Would you sign for responsibility for this project formally and accompany me?' (Coach)

The learner below describes how he was soon able to take over a responsible position. He was in charge of developing a web application and points out how little guidance was given and how much it depended on him to decide which steps to take and how to manage the project:

I am someone who designs things and I have also taken on a design function in a team. But nobody tells you 'it has to look exactly like that' in the application. There are some rules and norms when you program an application that Swisscom is using. But how we manage the whole thing is totally up to us. (Learner)

The possibility of flexibly shaping one's pathway throughout the apprenticeship helps ambitious learners to follow their learning and development interests. In enabling this flexibility, the enterprise also profits from innovations initiated and often developed by the learners. The opportunity to individualise one's learning sparks motivation and ambition. It may support students who are particularly talented and those who may be bored if their work and learning pathways are largely prescribed for them.

### *Reflections on competence development in an innovative learning culture*

Competence development is understood as being a process in which the action competence as much as the ability to organise oneself is extended, restructured and updated (Erpenbeck & Sauer, 2001). The fact that social competencies play an essential role in addition to specialist and methodical competence and, in general, the competence to act, is shown by the statement of a member of management at Swisscom (Barabasch, 2018):

What does VET have to achieve today? If I can sum it up like this, I really think it's about the learners ... giving them a good base for the future, no matter in which direction. But, really, it is about them ... and not necessarily just at the level of professional competence, but also really to convey these methods and social skills. (Manager)

The sometimes very independent coordination of one's own competence development and the possible decision for a project, which enables learners to build up a specific competence profile, is a collective learning experience for the learners at Swisscom:

And I actually try to take as much as possible from this apprenticeship ... So, now, for my next project, it's rather a film crew, which is quite a lot out of and away from my field. So, I actually ask: 'What skills do I need that I do not already have?' (Learner)

The learners also become aware, not least because of the internal competition for attractive projects, that they have to prove certain competencies in order to be sufficiently prepared for new projects:

We have such an internal system which relates to the quali-project market and the projects are named quali-projects. And there you can chose a project and apply for it. You have to apply for it, because there can be many learners who are looking for a position. And afterwards, after an interview, you could be chosen. But this is really difficult. You have to have competences in order to be lucky to get the place you want. (Learner)

Steering one's learning, which involves navigating through the marketplace to find suitable projects, is also a highly competitive process. Not every learner might find a placement in a project they are interested in. Finishing these unwanted projects is also an important part of the learning process and it develops competences such as stamina for completing projects or encountering and discovering information about one's interests and motivations. Highly relevant are application and presentation skills, which are as important as career orientation and navigating one's own skills development, which is learnt by applying for projects several times throughout an apprenticeship.

## **Discussion and research perspectives**

An innovative learning culture has many components with which it can support the development of highly relevant competences. In this article, we present an example from the Swiss telecommunication industry in order to showcase how the development or unleashing of creativity can be supported as much as autonomous work and the development of initiative-taking behaviour and self-reflection. Apart from these, we indicate how the topic of developing these competences has entered the minds of all stakeholders and is consciously shaped. In principle, the results of the Swisscom study show that a lived innovative learning culture supports the development of 21st-century skills and competences in a way in which employers require them. It is important to acknowledge relevant framework constraints on and practices for shaping competence-based workplace learning. These include supporting agility, instilling trustful communication at eye level, and offering guidance and, if necessary, counselling. In addition, rendering competence development throughout an apprenticeship as flexible as possible, as implemented within the marketplace, and instilling an openness for newly initiated projects by the learners, support the development of creativity.

For these reasons, the enterprise started to implement new approaches to work and learning about ten years ago and is constantly experimenting with them and striving for improvement. Learners are often involved in testing new approaches and are asked for their opinions regarding recruitment, career guidance throughout the apprenticeship, or different learning activities.

We can assume that, as the work in this enterprise increases in complexity, social competences, agility and flexibility will gain in importance. This calls for the development of an innovative learning culture, which is key to the success of VET if it is to ensure that the next generation

of employees is sustainably prepared for their work challenges and for lifelong learning<sup>3</sup> (see, also, Hämäläinen, De Wever, Nissinen & Cincinnato, 2017; Woemann, 2017). Transfer competences and skills are gaining in importance (Moraal, Lorig, Schreiber & Azeez, 2009) and the relevance of personal competences, such as creativity, initiative-taking and working autonomously, is increasing. Particularly in the telecommunication industry, where rapid technological change is taking place, this is essential. The enterprise supported the development of these competences by adopting measures such as allowing apprentices to suggest and work on their own initiated projects, collecting proposals for innovation from them, and providing opportunities to work in different locations and with changing teams and individuals or engage in various online debates across the enterprise to share ideas and knowledge. In order to ensure that the competences defined in the framework curricula are acquired, coaches provide advice during individual sessions (being quite flexibly available in person or via various communication platforms). Overall, apprentices are gradually given autonomy in working on projects, to the extent of possibly working outside the enterprise or even outside the country. It is expected of them to use public transportation across the country for work (for which they are provided with an annual pass).

The statements of apprentices in this article indicate their satisfaction with their competence development and sometimes even offer a surprising remark about their learning progress. There is a lot of pride in working in this community of practice and in contributing to real work projects. The motivation is high among many learners because they feel trusted, are taken seriously by co-workers and coaches, can ask for advice when it is needed, and are able to steer their own learning process.

Considering that all of this is enabled by VET among apprentices between the ages of 15 and 19 years shows how much more can be achieved and supported at this stage in life in terms of learning and personal growth than is often the case in more conventional apprenticeships or other forms of competence acquisition in high schools and colleges. Among the countries in which VET is a major pathway into employment Switzerland takes the lead, because a large majority of each cohort starts off with this pathway after compulsory secondary schooling. Based on the findings of this study, we can advocate a number of innovations, as listed above, in order to innovate apprenticeships to the extent that they increase motivation, enable learners to acquire the requested competences in the workplace, and promote personal growth.

However, we are aware that this example, coming as it does from a highly dynamic sector and one of the biggest apprenticeship providers in the country, cannot easily be transferred into other sectors or into small and medium enterprises. Since every sector is marked by different practices, characteristics and requirements, a generalisation of our results is therefore not possible and more research is therefore necessary in other sectors to understand their special circumstances, affordances, developmental needs, and potential to shape their apprenticeships.

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3 <https://bildungsklick.de/internationales/meldung/zukunft-des-arbeitsmarkts-deutsche-stellen-sich-auf-lebenslanges-lernen-ein/>.

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