Journal of Technical Education

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Development of competences as an integration process that is alternating in the learning venue – current considerations

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Abstract

This paper attempts to give an introduction of German and international theoretical starting points, findings and especially of questions in the context of a divided occupational learning. The studies of the German-speaking area can be summarized under the term of "Lernortkooperation". A glance in the international literature shows, that an integrative professional learning is not a genuine aspect of the German dual system in VET and exists in similar form in other vocational training systems. The studies/approaches of Gulie & Griffiths (2001, 2003) and Tynjälä (2009) on "Connectivity" and "Transformation" seem to be an interesting starting point, because they take both, organizational and didactic perspectives of integrative mediation and of professional competence into account.

Keywords: German dual system, Vocational and Educational Training, Connectivity, Transformation, integrative learning.

Lernortalternierende Kompetenzentwicklung

Zusammenfassung

Im vorliegenden Beitrag wird das Problem einer Verknüpfung von theoretischen und praktischen Lernprozessen an unterschiedlichen Lernorten im deutschen dualen System der Berufsausbildung aufgegriffen. Es ist festzustellen, dass sich die deutschsprachigen Studien größtenteils auf organisatorische Aspekte (Konzept der Lernortkooperation) beziehen, didaktische Aspekte sind unterrepräsentiert. Ein Blick in die internationale Literatur zeigt, dass die Lernortteilung kein genuiner Aspekt des deutschen Dualen Systems ist, sondern in unterschiedlichen Ausprägungen auch in anderen Berufsbildungssystemen existiert. Die Ansätze von Guile & Griffiths (2001, 2003) und Tynjälä (2009) zu „Connectivity" und „Transformation" zeigen sich als ein interessanter Ausgangspunkt weiterführender Forschung,

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[1] Dieser Beitrag ist mit ähnlichem Inhalt in deutscher Sprache erschienen als: Pittich, D. und Tenberg, R. (2013). Kompetenzentwicklung als lernortalternierender Integrationsprozess – Aktuelle Überlegungen zu einem etablierten Grundkonzept beruflicher Didaktik. In: I. Bausch, G. Pinkernell, O. Schmitt, (Hrsg.): Unterrichtsentwicklung und Kompetenzorientierung. Festschrift für Regina Bruder. Münster: WTM-Verlag (in Druck).

da dort sowohl organisatorische, als auch didaktische Perspektiven für eine integrative berufliche Kompetenzvermittlung aufgearbeitet werden.

Schlüsselwörter: Duales System, Lernortgeteilte berufliche Bildung, integrativer Kompetenzerwerb, Theorie-Praxis Reflexion, Connectivity

1   Description of the problem – Analysis

Besides the mandatory attendance at vocational schools in the early 20th century in Germany, the Dual System of VET was founded. Vocational learning was hence allocated within two main learning venues, assuming that this cooperation is beneficial for the occupational competences of the apprentices. By now, in addition to the established fulltime schooling based VET systems (VET schools, BMSs and BHS's), the Dual System continued its relevance and plays a vital role within the German occupational training till nowadays.[2]

Already in 2005 Schelten rightly observed that this easy division of duties and competences has become intolerable by now, as the demands for the dual partner systems have changed substantially in our time; and the accompanying orientation towards a structure to optimize professional action competence (Schelten, 2005). Complex knowledge of occupational work structures, proven competence and special profile requirements of interdisciplinary skills should already be integrated *(should have already been integrated)* in the cross-sector-trainings of the apprentices by now.

In order to create the corresponding dispositions which enables them to undertake demanding and challenging jobs and thereby acquire their own possibilities of development, independently, and thus, contribute to the dynamics of change for one's own company. In spite of this noticeable paradigm shift from former abilities to new skills and knowledge concerning their proficiency, the policy of an alternating series of learning venues in the Dual System of German VET was never fundamentally modernized or revised. The alternating learning system still distinguishes between practical and theoretical learning locations, and it is kept as such, even if the learning requirements of the learning venues have radically changed with respect to the vocational training schools. Besides the Dual System of VET an equal rise of full-time school training schemes has emerged and established their own traditional learning programs. The term full-time schooling should not imply that the learning takes place without the necessary contact to the business (firm), but that the central place for undertaking these studies is not the company itself, but the school. This means a vivid alternation takes place in schooling and in-company learning, by means of practical experiences -merely the timing of both learning venues is interchanged. A basic aspect of German vocational training is normatively established and socially founded: this includes alternating learning venues by incorporating school and in-company scenarios. The core

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[2] The Dual System of occupational training methods provides approximately 54 % (Ausbildungsanfängerquote; AAQ, 2009 bzw. 2010) of the central employment system (Grunau, 2012). In Austria, on the other hand, only 40% absolve the Dual System of VET, and almost the same per cent of the population undertake an off- the job training /a degree in school (Hoeckel, 2010). 84% of the Swiss population is trained within their Dual Adapted System of VET, business operations ("Betriebslehre") (BBT, 2012).

aspect of an alternating learning venue that develops competences, that is how this integrative development of professionalism operates, and how individually specific it can be − has not been empirically examined, so far. Based on German literature, the following data is being provided of 1) Research results based on the organizational level and particularly 2) the discussion of learning-specific results, which refer back to the integrative interaction of two learning venues. Within the concepts of theories of learning, international research will be taken into account, too.

2   Current Research

Studies focusing on the organization of learning aspects, which discuss the issue of co-operation and learning placements, have been addressed for three centuries under the heading of learning cooperation and venues. The studies of Euler (e.g. Euler et al., 1999; Euler, 2004; Euler, 2010) and Pätzold (2003) are considered as outstanding works of reference, here. Pätzold mainly focused on the theoretical aspects of learning venues and cooperation. He defined these venues and cooperations as a technically organized and educational based interaction of teaching staff and trainees that took part in the occupational training at these specific locations (Pätzold, 2003, p. 72)[3]. A cooperation takes place by means of an exchange; this cooperation is particularly aimed for young people, who learn at two different learning venues, and thus enable them through "good teaching methods" and "good guidance" to recognize the internal coherences among the respective taught and training contents, on the one hand, and the learning tasks that should be processed, on the other hand (Pätzold, 2003, p. 72 pp.). A major difficulty, according to Pätzold (2003, p. 72) has been caused by the differences in the guiding of objectives and the organizational structures of the learning locations. With the learning cooperation comes a change for the internal configuration of organizational structures" and there has to be a reliable, common, new structure, shaping strategies and culture (Pätzold, 2003, p. 70)[4].

Euler et al. (1999, p.11) distinguished into different facets or purposes within learning venues cooperations from a professional, political and educational point of view. The professional-political facet comprehends the term learning venue cooperation as "a means of effective implementation of reformed rules on how to train employees (AEVO) and relevant curricula". The professional political aspect is highly significant, it should be considered as the first premise for rationalization of the Dual System, and second as the condition for the process of deregulation of the Dual System; as well as a stronger transfer of (between) decision-making competences and liability to regional networks at a local level? (Euler et al., 1999, p. 11). Compared with this the learning venue cooperation becomes from a didactic point of view a mean to effectively creating teaching and learning procedures (curricula) in the schools and in

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[3] „technisch-organisatorische und […] pädagogisch begründete Zusammenwirken des Lehr- und Ausbildungspersonals der an der beruflichen Bildung beteiligten Lernorte" (Pätzold, 2003, p. 72)
[4] „eine Veränderung der internen Organisationsstrukturen" verbunden und es müsse „eine verbindliche gemeinsame neue Struktur, Strategie und Kultur geformt werden" (Pätzold, 2003, p. 70)

the business, which are trading and transfer-orientated (Euler et al. 1999, p. 12)[5]. Because of these specifications the need of coordination can be assessed through the convergence of theoretical and practical contents in schools and in companies which then again, on the level of organized learning, has proven to be highly relevant. Attempts to optimize these learning venues cooperations, according to Euler, have both qualitative and quantitative goals. […]. To accomplish these specific objectives, we must develop innovative solutions, especially with regard to the coordination of learning targets, study contents, teaching and learning methods belonging to the participating vocational learning venues (Euler et al, 1999, p. 1)[6]. The policy of systematization was caused by the accounting of several model studies, which have been carried out in the 1990s with regard to the topic of learning venues cooperations. These model studies formed the starting point (the basis) for further studies, mainly BLK supporting program KOLIBIRI. In the final report of this program, a wide range of different approaches of learning locations and co-operations are being introduced, altogether 28 patterns for modeling tests were integrated, here (Diesner et al., 2004). The results of this research are mainly programmatic and they do refer back to the representation of professional-political facets in a much broader sense. Empirical data regarding learning and teaching strategies are almost non-existent. The few existing studies are mostly explorative, bringing about no clear results. If the results had been obvious, effective statements of learning venues and co-operations could have been made.

The overwhelming, unexpected, disenchanting findings of KOLIBRI identified areas for potential improvement of learning venues and cooperations in the Dual System of VET, but was also seen as contradictory in itself. Lipsmeier attributed the Dual System a relatively high level of cooperation, as compared with mere schooling and in-company based mono-concepts in other systems of vocational education and training (Lipsmeier, 2000, p. 20). All in all, this brief assessment shows rightly, that both Pätzold (2003) and Euler (1999) tended to have a reserved attitude towards the cooperations themselves, when considering both venues of learning, with regard to professional training. From the didactic point of view of vocational training this raises the question how and under which circumstances the alternating learning system can help to promote competences of learning. Following the studies of learning venues and cooperations of the year 2000, specific questions regarding the integrative methods of development of competences and abilities at two different locations of learning, were hardly ever posed. The educational terms of vocational capacity to act was relatively new back then, and was shifted to the vocational training and the educational implementation of local projects. Furthermore, hitherto no major impact studies have been carried out in the contexts of "Business and Human Resource Education". Following the DFG Priority Program, which dealt chiefly with the educational and the training processes in basic vocational training in business and office administration; research data of teaching and learning in the area of Business Education and Educational Management was just beginning to emerge. Studies that

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[5] „als ein Mittel zur effektiven Gestaltung von handlungs- und transferorientierten Lehr-Lernprozessen in Schule und Betrieb verstanden" (Euler et al., 1999, p. 11)
[6] „sowohl qualitative als auch quantitative Ziele. […] Zur Realisierung dieser Ziele müssen innovative Lösungen erarbeitet werden, insbesondere zur Abstimmung der Lernziele, Lerninhalte und Lehr-/Lernmethoden zwischen den beteiligten beruflichen Lernorten" (Euler et al., 1999, p. 1)

were chiefly considered as being relevant for teaching and learning in alternating learning venues were therefore more than rare. During recent years, however, it can be collected incidental findings in which the specific locations of learning and aspects were scrutinized with regard to Business Education and Educational Management. In relation to interests and motivations in school and training locations, the provable differences are quite striking (for instance Volet & Järvelä, 2001; Rosendahl & Straka, 2007). Research data regarding knowledge based on convictions of the apprentices in industrial-technical areas, according to Zinn (2011) claim that 20% of the trainees are convinced that the attendance of professional training schools is necessary only to complete successfully their compulsory education. Moreover a vast majority of trainees firmly believes that the skills being taught at the professional training centres have little or no relevance, at all to the practical experiences in the firms itself. According to the apprentices themselves, the in-firm-trainers play a key role in the acquisition of knowledge. The in-firm trainers are considered by the trainees themselves as authorities of knowledge in the field of teaching and training. Against the background of personal acquisition of knowledge the infirm trainers are evaluated far better than the professional schooling teachers. The in-firm training is consequently regarded as more relevant for to the apprentices than their learning at schools (Zinn, 2011, 2013).

Pittich (2011) offered a qualitative study of carpenter-apprentices relating to their learning competence and their vocational knowledge. He ascertained a comprehensive process of know-how and technical expertise, in the sense of an operational approach, and directly efficacious for their professional competence; and the conceptual know-how, in the sense of a knowledge of reflection and founded in-depth-knowledge, and he pointed out that there is a connection between vocational competence and the know-how of the apprentices. With this highly elaborated and yet qualitative and exploratory data analysis, the importance and relevance of knowledge for the implementation to the professional competence to act is made obvious. In similar manner Gschwendter et al. (2009) ascertained with the help of simulation tasks of diverse aspects of knowledge, which seemed relevant for the diagnostic services of the automotive mechatronics. The findings of Pittich (2011) and Nickolaus et al. (i.a. 2008, 2011) seem all to agree that explicitly technical know-how is strongly recommendable for the occupational competence and they spelled out the previous internal sharp depreciation of vocational learning as the current problem. It can be assumed that the theoretical dispute of the apprentices plays an important decisive role for their own professionalization, nonetheless, and within the given frame of alternating learning venues, this cannot take place in an optimal way. The existing concepts of better learning venues co-operations are hardly suitable and have failed to bring about the desired improvements (Diesner et al., 2004, p. 90). In most cases, this improvement would only be successful in an ideal situation of schools and business operations characterized by dominant industrial classes that are made up by one to three large group-sections and are realizable almost exclusively thanks to the commitment beyond expectations of a few participants (of a few individuals). Considering the situation the handicraft trade has to face today, we have to find means and ways to foster new approaches, in which alternating learning becomes independent from cooperative and organizational bodies, as normally all trainees of a vocational school do come from a variety of companies. From an international perspective, difficulties facing the access of theoretical and practical

aspects of a trade are also noticeable in Finland, Great Britain and the Netherlands, even if the Dual System of VET is hard to find outside the German-speaking countries. Similarly to Euler (i.a. 1999, 2004) and Pätzold (2003), Onstenk for instance, points out with regard to the Dual System of occupational training in the Netherlands that didactic approaches to the learning locations do often fail to interact. "Research shows that many practice coaches are unaware of the content and subject taught at school [...], or that things taught at school are experienced by practice coaches as irrelevant for solving occupational problems" (Onstenk, 2009, p. 196). These deficits he encounters with regard to theoretical aspects within occupational training context, he opposes to the inschool practical deficits. "The objective of deep learning by apprentices is difficult to realise. Many school teachers do not know enough about vocational practice to help them understand the links. There is often little preparation for or effective use of workplace learning experiences in school settings" (Onstenk, 2009, p. 198). Vocational training systems focused on learning and teaching methods, to a large extend, show noticeable deficits in the correspondences of dual learning locations, in spite of the implementations of various forms of practical experiences. It is quite possible that the occurring problems are of an inverted nature as compared to the ones existing in divided learning venues. Tynjäla (2009, p. 11), for instance, describes research results from a Finnish perspective, which demonstrates convincingly that former graduates of professional training schools have developed their decisive competences, much later, in the employment itself, and not prior through learning activities. The problematic issue of integrating two learning venues with different profiles and orientations and so achieving a promotion of competences, can therefore not been regarded as a system-specific difficulty, but it does exist as a whole. So far, there does not exist an ideal integrative learning location, in which an optimum level of theoretical and practical knowledge and skills in equal measure can be build up, nor it has been implemented in any of the existing models of vocational training. The improvements of alternating learning signifies a system-wide challenge for all participating educational approaches. It could be assumed, furthermore that in terms of learning-organisation-effects these have a co-influence upon the connections, which are beneficial for the competence enhancing measures, as well as for the theoretical and practical aspects at various learning venues. And yet, absolutely fundamental and vital are the intrinsic didactic methodology mechanisms for educational curricula and the situations of the specific teaching venues. The approach proposed below, under the term "connectivity", suggests a constructive solution in theory for the didactic methodology problematic in relation to the alternation of learning venues.

3   Connectivity

Based on the previously explored and subsumed assumptions Tynjäla (2009, p. 19) developed an integrative didactic model of learning, bearing in mind socially constructive approaches (i.e. Bereiter & Scardamalia, 1993; Lave & Wenger, 1991). This vision (this model) unifies two totally different perspectives of the so-called "Connectivity Problem": First a symmetric organization and learning perspective, second an individual assumption based on a didactic and theoretical competence approach. The author takes the works of Engeström (i.e., 2001) into account, when considering the systematic perspective. Engeström defines the terms

"workplace" and "expansive learning" with respect to cultural-historical theoretical models, as an "interconnected activity system". In view of the individual perspective she highlights a reciprocal alternation of transformation, explanation and conceptualization of theoretical (universal, formal, explicit) and practical knowledge (consens particular cases, intuitive, tacit). The theoretical knowledge is composed of universal, formal and explicit factors, and the practical knowledge concerning particular cases, which are either intuitive or tacit. By productively alternating these forms of knowledge by means of several "mediating tools", that is through methodological approaches, as there were the handling of analytic tasks. The creation of journals of learning, in groups-discussions, tutoring, mentoring and coaching. Throughout these approaches the self-regulation in the learning process should be promoted. Selfregulated learning is considered mandatory for a productive transference of formal knowledge (book knowledge) into informal knowledge (expert knowledge) through problem-solving tasks. "Professional education should involve on the one hand, the transformation of theoretical knowledge into a form where it becomes available for use in particular cases, and, on the other hand, the explication and conceptualisation of tactic knowledge derived from work experience. In other words, theories should be considered in the light of practical experiences and practical experiences in the light of theories (Tynjälä, 2009, p. 19). A concentration of enrichment of schooling and learning situations, as counterpart with operational reference and backgrounds will be established through necessary transformation explications and conceptual processing. "Therefore it is important that theoretical knowledge is used in solving practical problems" (Tynjälä, 2009, p. 20). „Formal knowledge is turned into skills when it is used to solve practical problems, and into informal knowledge when it is used to solve problems of understanding" (Tynjälä, 2009, p. 20). Onstenk as well as Tynjäla follow the analysis and debates on concepts of connectivity, relating to the quality of didactic correspondences of several vocational locations. This concept can be attributed to Guile and Griffiths (2001, p. 126): „We employ the term "connectivity" to define the purpose of the pedagogic approach which would be required in order to take explicit account of the vertical and horizontal development of learners". Vertical development is portrayed as a formal way of learning and horizontal development is represented by informal learning. Formal learning methods are equated with learning at school, informal learning is identified with in-firm learning (Guile & Griffiths, 2001, p. 116). „Supporting students to understand the significance of these two dimensions of development constitutes a pedagogic challenge, albeit a rewarding one, for teachers in educational institutions as well as for those with responsibility for development in the workplace" (Guile & Griffiths, 2001, p. 126). What is important here is that the apprentices are made aware of the co-operations of the actual facets of both learning venues and to reinforce this cooperation thoroughly and doing this over and over to reinstate this fact. "It involves encouraging students to understand workplaces as a series of 'interconnected activity systems' [...] which consist of a range of 'communities of practice' [...] „The general separation of 'vertical' from 'horizontal' development accentuates for students the problem of trying to relate them. To some extent, a similar situation exists in relation to vocational education. Bodies of knowledge and types of skill have often been viewed as separate and bounded entities which can be taught independently of their actual, practical application" (Guile & Griffiths, 2001, p. 116). Guile & Griffiths attribute the deficits

in connectivity for most parts to the occupational learning. They generate a typology in which they characterize with 5 motions, the vocational learning itself, but only one out of the five motions is giving the rightful credit to the ideal connectivity support. The mere professional approaches differ according to their intentions, to their concepts and to the roles of trainers and trainees and finally, with regard to the learning expectations. The traditional model is the easiest approach here, corresponding to vocational further training in the business. As most the most complex but by all means not ideal approach "The Work Process Model" can be regarded as equivalent to the German Dual System of VET, or the Australian TAFE System. It is designed to provide a multiple coherence with regard to the field of working, the work and business operations are encompassed individually within complex connections, the trainers regard themselves as supportive and giving the necessary feedback. This is supported together with schools, but the transfer and integration of theoretical know-how will not be supported soundly throughout the vocational learning and progress. "They conclude, in relation to the German VET programmes, that these programmes will have to be further evolved to help students to connect formal and informal learning more explicitly. They do not, however, provide any explicit guidance on how to achieve that objective, other than suggesting that students need to be coached to 'reflect-on' and 'reflect-in' action" (Guile & Griffiths 2001, p. 125). They suggest as a consequent extension of the work process model, a "Connective Model". At the core of this proposal lies correspondences of formal and informal skills (horizontal and vertical). "From this perspective, learners need to be encouraged to conceptualise their experiences in different ways and for this conceptualisation to serve different curriculum purposes" (Guile & Griffiths, 2001, p. 125).Working becomes a theory and abstract, their own aspects of procedure become systematic. With the metacognitive approach trainees are being taught to recognize how their knowledge of their profession corresponds with their own understanding of the subject matter. They should be motivated, so that theory and practical experience becomes a permanent part of their vocational learning endeavors. Tynjälä (2009) and Guile and Griffiths (2001, 2003) refer to the works of Engeström (Engeström et al., 1995, 2001), in order to justify their remarkable training and teaching proposals. In this sense the modern skilled workers are described as boundary-crossers, who must be able to take part in the development of new employee-organization-technologies (Tynjälä, 2009, pp. 22). A vision that is strongly linked with the German concept of occupational competence to act professionally. The "Connective Model" focuses on a specific high quality of knowledge, the so-called "Work-Process-Knowledge" (with reference to Boreham, 2002). This idea of high-quality-knowledge, which corresponds to "working processes" specific work-procedures, but it does not relate by any means to what is known in the German-speaking world as knowledge of working processes, as for instance explained by Stuber & Fischer (1998), that is functional know-how of the workers, and which is being implemented in the direct planning performance, and the evaluation of operations and on which is built upon. The aspiration of the word "work process knowledge" exceeds this by far. "This term refers to an overall understanding of one's work process including not only personal skills but also the broader context of that work. Work process knowledge arises from the combination of theoretical and practical knowledge" (Tynjälä, 2009, p. 23). One form of problem-solving, as described by Bereiter and Scardamalia (1993) is moving towards

expertise and development, in which formal knowledge merges in abilities consolidated with informal knowledge by means of correspondences. According to Guile & Griffiths (2003) the trainees must develop the so-called "Kernel concepts", in order to fulfill this specific problem-solving procedure. This way, apprentices are enabled to overcome the division of learning venues (in space, time and thematically) and so employ the corresponding developed knowledge in an interactive and reciprocal way (Tynjälä, 2009, p. 23). These key concepts allow room for projections, in which on the one hand, the individual can decide, when and at which point the theories become relevant for practical usage, and on the other hand, how to specify, correct and transform these theories from a practical point of view (Tynjälä 2009, p.23). Behind the development of "work process-knowledge" is therefore a highly reflective and projective learning-process, conditioned by theoretical and practical experience, a comprehensible alternation.

Vocational learning that is comprehensible is described by Leinhard et al. (1995) as a process which is interactive and reciprocal all the same, in which alternating practical experience is theorized and established within theory. The connectivity approach is taken up by Tynjälä, and in order to verify it, she recalls an internal study in which the differences of theoretical and practical correspondences were pointed out in Finnish proposals for vocational training. In a talk given at the EARLI SIG conference in Munich in 2010 (Tynjälä, 2010) she presented research data from an unpublished Finnish study, in which she clearly shows, that the intergration of schooling and occupational training in business is of paramount importance to the building of competences for the trainees (relevant variance 21%), as well as for their occupational development of identity (relevant variance 20%). Tynjälä appoints the term "transformation" (Tynjälä, 2009, pp. 24) as measure for learning efficiency corresponding in theory and practical exchange. She refers to Mezirows "Transformational Learning Theory" (1991). This constructivist approaches in adult education, describes learning as a continuous adjustment of new experiences with the already existing knowledge and understandings of the individual. This is equally important here that, such adjustments between thinking and acting require alternating processes. Connectivity is therefore, not just to be seen as a simple bracket between learning venues, but is regarded as far more complex and dynamic, in view of connective spaces in which individual structures of knowledge can be build and re-constructed, again.

4   Perspectives

The above named approaches forms the first and broader theoretical framework for an improvement of alternating learning venues. It is not known, however, in which way these previous concepts, which are chiefly implicit and highlighting aspects of knowledge that are determined by experiences (i.e. Engeström et al., 1995, 2001; Boreham, 2002) can be put into practice at all from the didactic point of view. The further question remains unanswered, as to which degree these intended improvements can be induced. Despite of these open questions it is noticeable that the learning and organizing aspects are taken into account, in connection with the term "connectivity", similarly as the approaches suggested in German-speaking countries. Special importance is given here to the didactic facets. Vocational learning should

overall be implemented in such ways, that a comprehensive construction of knowledge should be achieved between the proving of theories and the insight to practical experiences. Tynjälä proposes a circle of four single elements, in accordance with Guile and Griffiths (2003): "Thinking, dialogical inquiry, boundary crossing and resituation of learning" (Tynjälä, 2009, p. 23).

The support of learners relates to 1. knowledge learned at school, in order to clarify the relationships out of the practice, and the ways in which these can be actively used in inclass-systems. 2. Find a way to evaluate accurately the existing techniques and work processes, and thus to promote where it is necessary and possible. 3. existing skills, know-how and competences should be taken to new contexts; as in doing so, we are able to transgress the boundaries, which are specific to the learning location. 4. Relevant knowledge must be exchanged with other experts in the trade and in the schools (Tynjälä, 2009, pp. 22). Empirical studies with these didactic considerations have not yet been published.

Finally it can be argued that there is a great potential for research and development for the correspondence of divided learning venues, and vocational training as such, both nationally and internationally. The to-date collected empirical research data does not allow at present, statements about conditions and factors of influences, or results of connectivity.

The basic principle of an improved accentuation of the learning processes with a diversity of learning venues has to be made available from various directions, the current approaches present themselves to a large extent as coherent (in cohesion). Unfortunately, this is hardly applicable to the related didactic surveys, as these exhibit a vage constructivist background, and have hitherto been collected and refined very little, indeed.

From the point of view of up-to-date research of development of competences, the topic of connectivity can delineate facets were hardly noticeable up until now. The fact that both dual learning venues in Germany operate with different curricula, mediating professional competences and very diverse concepts of methodology (and interpret these considerably different, too) a grey area is created with the approaches regarding pure location-based aspects, in which the part of the other learning location is omitted on purpose. As the concept of professional competence to act is considered explicitly as transgressive learning venues of premisses of vocational training, in the future, it cannot be enough to reduce the competence-development scenarios to didactic and learning-specific venues (vocational research of teaching and training) or in the diagnostics of competences just to relate to the non-specific outcome of both learning spaces (professional diagnostics in performance).

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