

Konnektivität und lernortintegrierte Kompetenzentwicklung in der beruflichen Bildung

Connectivity and Integrative Competence Development in Vocational and Professional Education and Training (VET/PET)

Herausgegeben von / Edited by
Carmela Aprea, Viviana Sappa, Ralf Tenberg

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KONNEKTIVITÄT UND LERNORTINTEGRIERTE
KOMPETENZENTWICKLUNG IN DER
BERUFLICHEN BILDUNG

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DEVELOPMENT IN VOCATIONAL AND PROFESSIONAL
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CARMELA APREA / VIVIANA SAPPÀ / RALF TENBERG

Ein Spezifikum anspruchsvollen beruflichen Lernens ist die Notwendigkeit, mehrere Lernorte in verschiedenen Erfahrungsbereichen (z. B. Betrieb bzw. Unternehmen und Schule oder Hochschule) einzubeziehen. Dies begründet sich unter anderem aus der Überlegung, dass nur durch Überschreitung des unmittelbaren Handlungsraums dessen Relativierung und Abstrahierung möglich ist. Eine solche Relativierung und Abstrahierung ist insbesondere bedeutsam mit Blick auf jene beruflichen und lebensweltbezogenen Anforderungen, wie sie sich aus der zunehmenden Digitalisierung und Globalisierung der Gesellschaft und der Arbeitswelt ergeben. Daraus resultiert indes eine unumgängliche Teilung beruflichen Lernens, welche bei allen beteiligten Akteuren Koordinations- und Integrationsbemühungen zur Sicherung eines funktionalen Alternierens zwischen den Lernorten bedingt. Darin liegt – insbesondere im Hinblick auf die Gestaltung von Curricula und Unterricht bzw. Unterweisung sowie auf die adäquate Professionalisierung von Berufsbildungsverantwortlichen – eine große Herausforderung, die sich den verschiedenen Berufsbildungssystemen stellt und von diesen sehr unterschiedlich angegangen wird. Somit konstituiert die hier skizzierte Problematik ein langjähriges Thema der Berufsbildungsforschung. Dabei lassen sich zwei Forschungsstränge unterscheiden. Der vorwiegend auf das Duale System in Deutschland orientierte Forschungsstrang befasst sich unter dem Stichwort der Lernortkooperation schwerpunktmäßig mit der Frage nach der institutionellen bzw. organisatorischen Verankerung der Verknüpfung von Lernkontexten. Er hatte eine Hochphase in den 1990er-Jahren, ebte jedoch spätestens Mitte der 2000er Jahre ab. Etwa zu diesem Zeitpunkt formierte sich ein im deutschen Sprachraum bislang wenig bekannter international ausgerichteter Forschungsstrang zur School-Workplace-Connectivity, welcher explizit auch andere Systeme und Formen der Berufsbildung einbezieht. Darüber hinaus wurde der Fokus in diesem Forschungsstrang vermehrt auf die

theoretische Fundierung und empirische Untersuchung von Lehr-Lern-Prozessen zur lernortintegrierenden Kompetenzentwicklung gelegt.

Trotz der unterschiedlichen zeitlichen Verortung und Schwerpunktsetzung betonen Vertreterinnen und Vertreter beider Forschungsstränge, dass für die weiterführende Erforschung der Verknüpfung von Lernkontexten und der lernortintegrativen Kompetenzentwicklung ein mehrperspektivischer Bezugsrahmen erforderlich sei, wobei drei Betrachtungsebenen unterschieden werden:

- Auf der *Systemebene* (Makroebene) bezieht sich diese Verknüpfung auf die Passung zwischen Bildungsinstitutionen und Arbeitswelt; diese Ebene fokussiert vor allem auf die Gestaltung der Arbeitsmarkt- und Berufsbildungspolitik.
- Die *institutionelle Ebene* (Mesoebene) betrifft die Organisation und Koordinierung der Interaktion und Kommunikation zwischen den Akteuren in Schule bzw. Hochschule und Betrieb, einschließlich der Frage, wie deren Aus- und Weiterbildung reguliert wird. Zudem werden auf dieser Ebene die curricularen Regelwerke in den Blick genommen.
- Auf der *instruktionalen Ebene* (Mikroebene) wird der Schwerpunkt auf die Verknüpfung von (hoch-)schulischen und betrieblichen Lehr-Lern-Prozessen gelegt. Hier geht es vorrangig darum, wie (hoch-)schulische und betriebliche Lernarrangements gestaltet werden müssen, um die integrative Kompetenzentwicklung der Lernenden (und auch des Berufsbildungspersonals) optimal zu fördern.

Vor dem Hintergrund dieses umfassenden Bezugsrahmens besteht das Ziel des Beiheftes darin, den deutschsprachigen wie internationalen Stand der Forschung zur Verknüpfung von Lernkontexten und lernortintegrierter Kompetenzentwicklung zu dokumentieren, unterschiedliche Forschungszugänge in diesem Bereich aufzuzeigen und die Diskussion bzw. den Austausch zwischen diesen Zugängen anzuregen sowie Desiderata und Anknüpfungspunkte für zukünftige Forschungsarbeiten zu eruieren.

Das Beiheft besteht aus vier Teilen. In Teil I werden zunächst aktuelle theoretische Zugänge zu Konnektivität und integrativer Kompetenzentwicklung aufgegriffen. Den Auftakt bildet hier ein Beitrag der Forschungsgruppe um PÄIVI TYNJÄLÄ, eine der Pionierinnen der internationalen wissenschaftlichen Auseinandersetzung mit Konnektivität und integrativer Kompetenzentwicklung. Dieser Beitrag gibt einen Überblick über zwei bekannte theoretische Ansätze zur School-Workplace-Connectivity, analysiert deren Entwicklung und Anwendung und identifiziert Gemeinsamkeiten und Unterschiede zwischen ihnen. Zudem werden einschlägige empirische Befunde zu den beiden Ansätzen dargestellt.

Der zweite Beitrag von DAVID GUILLE, ebenso ein Protagonist der Connectivity-Debatte, führt das Konzept der Rekontextualisierung von Wissen in diese Debatte ein. Vor dem Hintergrund einer kritischen Würdigung vorhandener Ansätze erörtert sein

Beitrag die Ursprünge und Entwicklung dieses Konzepts und legt dessen Bedeutung für die Verknüpfung von Lern- und Arbeitskontexten in Praxis und Forschung dar, wobei ein besonderes Augenmerk auf den Anforderungen der gegenwärtigen technologischen Entwicklung liegt.

Teil II versammelt Beiträge, welche die Realisierung von Konnektivität und integrativer Kompetenzentwicklung auf unterschiedlichen Stufen in (Berufs-)Bildungssystemen verschiedener Länder thematisieren. Der erste Beitrag in diesem Teil von STEPHEN BILLETT rekurriert auf die Einbindung von Arbeitserfahrungen in den allgemeinbildenden Bereich. Im Mittelpunkt des Beitrags stehen vor allem jene Bildungsziele, die mit einer solchen Integration verfolgt werden, wobei zwei dieser Ziele, nämlich die Berufsorientierung und die Beschäftigungsfähigkeit, besonders herausgestellt und durch empirische Studien im Kontext australischer Schulen und Hochschulen untermauert werden.

Ebenso auf Bildungsziele fokussiert der Beitrag von SUSANNE RITTER VON MARX, CHRISTINE KREUZER, SUSANNE WEBER und SANDRA BLEY, in dem unter Verwendung eines integrativ-komplementären Konnektivitätsansatzes ein Modell für nachhaltige Gestaltungskompetenz konzeptualisiert und für die Ausbildung im Einzelhandel spezifiziert wird. Dazu werden Praktiken an verschiedenen Lernorten im deutschen Berufsbildungssystem mit einschlägigen theoretischen Perspektiven und empirischen Befunden verknüpft.

Der Beitrag von HANNES HAUTZ und ANNETTE OSTENDORF beschäftigt sich mit der Einbindung von Praktika in die vollzeitschulische Berufsbildung in Österreich. Ausgehend von den Befunden einer Interventionsstudie zum Arbeiten und Lernen von Praktikantinnen und Praktikanten werden Qualitätsfaktoren eruiert, die zum Kompetenzerwerb beitragen. Zudem werden Handlungsfelder einer konnektivitätsorientierten Praktikumsdidaktik vorgestellt.

HELEN JOSSBERGER, TANJA FRANZEN und HANS GRUBER widmen sich der Frage, wie die Durchlässigkeit und Konnektivität von beruflicher und akademischer Bildung in Deutschland verbessert werden kann. Mittels Interviews erschließen sie insbesondere Beweggründe, Probleme und Unterstützungswünsche von Studierenden ohne Abitur und zeigen auf, was bei der Gestaltung von Lernarrangements in der Hochschule berücksichtigt werden kann, um ein berufsbegleitendes Studium zu erleichtern.

In Teil III werden Konnektivität und integrative Kompetenzentwicklung aus der Perspektive der Berufsbildungsakteure betrachtet. Der Beitrag von CARMELA APREA und VIVIANA SAPPÀ stellt eine Interviewstudie vor, die darauf abzielt, im Kontext des schweizerischen Berufsbildungssystems unterschiedliche individuelle Vorstellungen zum lernortintegrativen Lernen und Lehren zu identifizieren. Darüber hinaus werden Zusammenhänge zwischen diesen Vorstellungen und dem Berufsfeld der Akteure sowie deren Rolle im Lern- und Lehrprozess untersucht.

Der Beitrag von MICHAEL ROLL und DIRK IFENTHALER berichtet ebenso über eine qualitative Studie, in welcher die Erwartungen von Ausbildungsverantwortlichen in ausgewählten deutschen Unternehmen hinsichtlich der Lernortkooperation untersucht werden, um sie mit Anforderungen an digitale Handlungskompetenz bei Auszubildenden in Verbindung zu setzen, mit dem Ziel, vor diesem Hintergrund ein exploratives Modell dieser Kompetenz zu entwickeln.

In Teil IV wird schließlich exemplarisch erörtert, wie digitale Tools zur Förderung von Konnektivität und integrativer Kompetenzentwicklung eingesetzt werden können. Basierend auf einem Boundary Crossing Ansatz gehen VALENTINA CARUSO, ALBERTO CATTANEO und JEAN-LUC GURTNER mittels einer quantitativen Online-Erhebung der Frage nach, auf welche Art und Weise eine digitale Lern- und Leistungsdokumentation Auszubildende im Kontext der dualen schweizerischen Berufsbildung darin unterstützen kann, an unterschiedlichen Lernorten erworbene Wissensbestände zu artikulieren.

Auch der Beitrag von NINA KILBRINK, ANN-BRITT ENOCHSSON und LINDA SÖDERLIND greift den Boundary Crossing Ansatz auf. Der Beitrag berichtet über eine Interviewstudie, in der die Erfahrungen von Lehrpersonen in der schwedischen Berufsbildung erhoben wurden, die digitale Technologien wie Apps, Blogs und Videos als Grenzobjekte einsetzen, um ihren Schülerinnen und Schülern dabei zu helfen, das Lernen in der Schule und am Arbeitsplatz miteinander zu verbinden.

Wir bedanken uns bei allen Autorinnen und Autoren für ihre interessanten Beiträge sowie die konstruktive Zusammenarbeit und wünschen den Leserinnen und Lesern eine anregende Lektüre des Beihefts!

Carmela Aprea, Viviana Sappa und Ralf Tenberg
im November 2019

Connectivity and Integrative Competence Development in Vocational and Professional Education and Training

An Introduction to the Special Issue

CARMELA APREA / VIVIANA SAPPA / RALF TENBERG

A specific feature of complex vocational and professional education and training (VET/PET) is the need to situate learning in several sites (e.g. companies, schools, and/or universities) and provide different types of experiences. This necessity is, *inter alia*, based on the understanding that learning in different settings allows learners to relativize and abstract from experiences learnt in each of them, and thus rendering knowledge and skills more flexible. This is particularly important in view of the professional and life-world requirements arising from increasing digitalisation and globalisation of society and working environments. However, this results in an inevitable division of vocational learning, which requires coordination and integration efforts on the part of all actors involved to ensure functional alternation between learning locations. This poses a major challenge – particularly with regard to the design of curricula and teaching and instruction as well as the adequate professionalisation of those responsible for VET/PET – which is faced by the various VET/PET systems and approached very differently by them. Thus, the problems outlined here constitute a long-standing topic of VET/PET research. Two research strands can be distinguished here. One strand is centred on the dual VET system in Germany, specifically focusing on the institutional and organisational aspects of connecting the different learning locations (usually termed *Lernortkooperation*, i. e. learning location cooperation). This strand had its peak in the 1990s, but ebbed away by the mid-2000s at the latest. Around this time, an internationally oriented strand of research on School Workplace Connectivity emerged outside the German-speaking countries, which explicitly also includes other systems and forms of VET/PET. In addition, the focus in this research strand is increasingly

placed on the theoretical foundation and empirical investigation of teaching-learning processes for learning location-integrating competence development.

Despite these differences in temporal location and research focus, proponents of both strands emphasise that the investigation of connectivity and integrative competence development should preferably be done within a comprehensive framework, especially including the following aspects:

- At the *system level (macro level)*, connectivity refers to the fit between educational institutions and the world of employment; research from this perspective may, for example, focus on the organisation of labour markets or on vocational training policies.
- The *institutional level (meso level)* concerns the organisation and coordination of interaction and communication between the actors in schools, universities and enterprises, including the question of how their education and training are regulated. In addition, the types of curricula and the processes of their development should be taken into account.
- At the *instructional level (micro level)*, emphasis is placed on linking school-based and work-based teaching-learning processes. It is primarily about how school and company learning arrangements have to be designed in order to optimally promote the integrative competence development of trainees (as well as those of the VET/PET staff).

Against the background of this comprehensive framework, the aim of the Special Issue is to document current international research on connectivity and integrative competence development in VET/PET. Moreover, it intends to point out different research approaches in this area, to stimulate discussion and exchange between these approaches, and to identify desiderata and starting points for future research.

The Special Issue consists of four parts. Part I takes up current theoretical approaches to connectivity and integrative competence development. The first contribution comes from the research group around PÄIVI TYNJÄLÄ, one of the pioneers of the international scientific debate on connectivity and integrative competence development. This contribution provides an overview of two well-known theoretical approaches to School Workplace Connectivity, analyses their development and application, and identifies similarities and differences between them. In addition, relevant empirical findings on the two approaches are presented.

The second contribution by DAVID GUILÉ, also a protagonist of the connectivity debate, introduces the concept of the recontextualization of knowledge into this debate. Against the background of a critical appraisal of existing approaches, his contribution discusses the origins and development of this concept and explains its significance for the linking of learning and work contexts in practice and research, paying particular attention to the requirements of current technological developments.

Part II brings together contributions that address the realisation of connectivity and integrative competence development at various levels in (vocational) education systems in different countries. The first contribution in this part of STEPHEN BILLET refers to the integration of work experience into general education. The contribution focuses primarily on those educational goals that are pursued with such integration, whereby two of these goals, namely professional orientation and employability, are particularly emphasised and supported by empirical studies in the context of Australian schools and universities.

The contribution of SUSANNE RITTER VON MARX, CHRISTINE KREUZER, SUSANNE WEBER and SANDRA BLEY also focuses on educational goals. In particular, the authors conceptualise a model for sustainable competency to shape the future ('Gestaltungskompetenz') by using an integrative-complementary connectivity approach, which they specify for training in retail trade. For this purpose, practices at the different learning locations in the German vocational training system are linked with relevant theoretical perspectives and empirical findings.

The contribution by HANNES HAUTZ and ANNETTE OSTENDORF deals with the integration of internships into full-time school-based VET in Austria. Based on the findings from an intervention study on the work and learning experiences of trainees, the authors derive quality factors which contribute to the acquisition of competences. In addition, fields of action for a connectivity oriented instructional approach of internships are presented.

HELEN JOSSBERGER, TANJA FRANZEN and HANS GRUBER address the question of how the permeability and connectivity of vocational and academic education and training can be improved in Germany. By means of interviews, they particularly identify the motivations, problems and support wishes of students without an 'Abitur' (German university entrance qualification) and point out what should be taken into account when designing learning arrangements in higher education in order to facilitate part-time studies.

Part III looks at connectivity and integrative competence development from the perspective of VET actors. The contribution by CARMELA APREA and VIVIANA SAPPA presents an interview study that aims to identify different individual conceptions of learning and teaching in the context of the Swiss VET system. In addition, connections between these conceptions and the occupational field of the actors as well as their role in the learning and teaching process are examined.

MICHAEL ROLL and DIRK IFENTHALER also report a qualitative study in which the expectations of VET trainers in selected German companies with regard to learning location cooperation are examined and linked to the requirements for digital competence development among trainees. Their considerations particularly aim at developing an explorative model of this competence.

By providing examples, part IV finally discusses how digital tools can be used to promote connectivity and integrative competence development. Based on a Bounda-

ry Crossing approach, VALENTINA CARUSO, ALBERTO CATTANEO and JEAN-LUC GURTNER present a quantitative online survey study which they conducted to explore how a digital learning and assessment documentation can support trainees in articulating knowledge acquired at different learning locations in the context of dual Swiss vocational education and training.

The contribution by NINA KILBRINK, ANN-BRITT ENOCHSSON and LINDA SÖDERLIND also adopts the Boundary Crossing approach. The contribution reports on an interview study which collected the experiences of teachers in Swedish vocational schools who used digital technologies such as apps, blogs and videos as boundary objects in order to help their students linking learning at school and at the workplace.

We would like to thank all the authors for their interesting contributions and constructive cooperation, and we hope that readers will enjoy the Special Issue!

Carmela Aprea, Viviana Sappa and Ralf Tenberg

November 2019

Teil I:

**Aktuelle theoretische Zugänge zu Konnektivität
und integrativer Kompetenzentwicklung**

Part I:

**Current Theoretical Approaches to Connectivity
and Integrative Competence Development**

Promoting Cooperation between Educational Institutions and Workplaces

Models of Integrative Pedagogy and Connectivity Revisited

PÄIVI TYNJÄLÄ / MAARIT VIROLAINEN /
HANNU L. T. HEIKKINEN / ANNE VIRTANEN

Förderung der Kooperation zwischen Bildungseinrichtungen und Arbeitswelt

Modelle der integrativen Pädagogik und Konnektivität erneut aufgegriffen

Abstract: This theoretical review reflects on the development and application of the Integrative Pedagogical model as well as the Connective model investigating the organisation of learning in the interface between educational institutions and workplaces. The article explores the aspects that these two models emphasise, and identifies similarities and differences between them. Key studies on these approaches were reviewed to accomplish the task. The review shows how integrative pedagogy takes the individual's learning as its starting point and how educators can support students by encouraging them to combine theoretical knowledge, experience and self-regulation in learning. While this model is pedagogical, the connectivity approach is more sociological in nature and highlights interpretative change concerning knowledge in the process of recontextualisation. Both approaches emphasise the role of communities of practice in building the zone of proximal development, and have been applied to conceptualise collaborative arrangements between educational institutions and work organisations.

Keywords: integrative pedagogy, connectivity, work and learning, learning at work, theoretical models

Kurzfassung: Dieser theoretische Überblick befasst sich mit der Entwicklung und Anwendung des Integrativen Pädagogischen Modells sowie des Konnektivitätsmodells zur Untersuchung der Organisation des Lernens an der Schnittstelle zwischen Bildungseinrichtungen und Arbeitswelt. Der Beitrag untersucht Aspekte, die beide Modelle hervorheben, und identifiziert Gemeinsamkeiten

und Unterschiede zwischen ihnen. Einschlägige Studien zu diesen Ansätzen wurden zur diesem Zweck gesichtet und ausgewertet. Der Überblick zeigt, wie die integrative Pädagogik das Lernen des Einzelnen als Ausgangspunkt nimmt und wie Lehrpersonen die Lernenden unterstützen können, indem sie diese ermutigen, theoretisches Wissen, Erfahrung und Selbstregulierung beim Lernen zu kombinieren. Während dieses Modell der Pädagogik entstammt, hat der Connectivity-Ansatz seinen Ursprung eher in der Soziologie und zeigt interpretative Veränderungen des Wissens im Prozess der Rekontextualisierung auf. Beide Ansätze betonen die Rolle der Praxisgemeinschaften beim Aufbau einer „Zone der proximalen Entwicklung“ und wurden zur Konzeptualisierung des Zusammenwirkens zwischen Bildungseinrichtungen und Arbeitsorganisationen angewandt.

Schlagworte: Integrative Pädagogik, Konnektivität, Arbeit und Lernen, Lernen am Arbeitsplatz, theoretische Modelle

1 Introduction: Research questions, aims, and theoretical background

Interest in the collaboration between educational institutions and the world of work has increased over the last few decades for two major reasons. Firstly, their reciprocal relations have been understood more and more as a prerequisite to modern innovation and the present knowledge economy (see, e.g., GIBBONS/LIMOGES/NOWOTNY/SCHWARTZMAN/SCOTT/TROW, 1994; UNESCO, 2005; VÄLIMAA/PAPATSIBA/HOFFMAN, 2016). Secondly, the expansion of higher education (HE) and emergent academic unemployment have increased the interest in promoting HE institutions' collaboration with the working world (SCHOMBURG/TEICHLER, 2006). This interest has not only been reflected in efforts to improve graduates' employability, but also in efforts to develop the matching of education with labour market demands in a more systematic way (EUROPEAN COMMISSION, 2016). Accordingly, there is a need to better understand how educational institutions can collaborate with the workplaces to improve education and keep it up to date to meet the changes and transformation taking place in the world of work and society as a whole.

In parallel, research on combining learning at school with learning from experience gained outside school has been expanding (e.g., DIEPSTRATEN/DU BOIS-REYMOND/VINKEN, 2006; CHISHOLM/DAVIS, 2007; HARRIS/CHISHOLM/BURNS, 2013). This article reviews, in particular, two research approaches in order to better understand the complexities of organising these collaborative efforts and to support the combination of learning from work experience and education. First, it reflects on the long-standing development of the Integrative Pedagogy model and the rise of theoretical approaches to investigate the relations between educational institutions and the working world (TYNJÄLÄ, 2009; JÄÄSKELÄ, NYKÄNEN, & TYNJÄLÄ, 2018). Secondly, it reflects on the use of the Connective Model in research for the same purpose (GUILÉ & GRIFFITHS, 2001; GRIFFITHS & GUILÉ, 2003). Herein, we review, in particular, studies conducted at the Finnish Institute for Educational Research, University of Jyväskylä,

Finland, where both model approaches have been utilised in research to understand how practices of educational institutions and enterprises have been intertwined to promote students' expansive learning.

As the two approaches to combining education and work are complementary and partly overlap, the aim of our study was to explore what aspects these two often cited models emphasise in what way in comparison to one another. In order to fulfil this goal, we reviewed and revisited key studies and publications related to developing integrative pedagogy and connectivity. We posed these research questions:

- 1) How has the model of integrative pedagogy developed through empirical studies and the adoption of novel viewpoints over the years, since the 1990s?
- 2) What kinds of shifts have there been with respect to the research discussion regarding the model of connectivity?
- 3) How do these two approaches to promote combining learning at educational institutions with that at workplaces differ in their emphasis?

2 Development of expertise through the Integrative Pedagogy approach

Progress of the Integrative Pedagogy model

The origins of Integrative Pedagogy can be traced back to research on expertise conducted in the 1990s (e.g., BEREITER & SCARDAMALIA, 1993; ETELÄPELTO, 1997; TYNJÄLÄ ET AL., 1997). However, the actual model of Integrative Pedagogy was only developed further after extensive research on the constructivist approach to learning in higher education and on work-based learning during vocational education training (VET) (e.g., TYNJÄLÄ, 1998; TYNJÄLÄ, 1999; TYNJÄLÄ & COLLIN, 2000; COLLIN & TYNJÄLÄ, 2003; TYNJÄLÄ & VIRTANEN, 2005; TYNJÄLÄ, 2007; VIRTANEN, TYNJÄLÄ, & COLLIN, 2009).

The Integrative Pedagogy model (IP model) is based on the analysis of expert knowledge (BEREITER, 2002; BEREITER & SCARDAMALIA, 1993; ERAUT, 2004; LE MAISTRE & PARE, 2006; TYNJÄLÄ, 2009), and, at the same time, it acknowledges the sociocultural perspective as a basis for understanding the situated nature of learning and expertise development (ERAUT, 2004; ILLERIS, 2004; LAVE & WENGER, 1991; WENGER, 1998). The basic tenet of the model is that *in high-level competence, the main elements of expertise are tightly integrated and fused*. These main elements are:

- 1) *Theoretical or conceptual knowledge*, which is universal and explicit in nature and can be learned, for example, by reading professional journals and books, by listening to expert presentations, and by sharing knowledge with peers, mentors and trainees in expert networks, including via digital media.

- 2) *Experiential or practical knowledge*, which is personalised through experiences. It is derived from particular cases, phenomena and occasions. While it may be implicit or tacit in nature, it can also be narrated, reflected upon and discussed.
- 3) *Regulative knowledge*, which involves professionals' command of their own mind and activities. It includes metacognition, that is, awareness and regulation of one's cognitive capacities. It also involves self-reflection, specifically: reflection-in-action, reflection-on-action, and reflection-for-action. As such, it incorporates following one's own actions' effects through work processes not only with respect to tools and artefacts but also regarding collaborators, clients and oneself.
- 4) *Sociocultural knowledge*, which materialises in social practices and through communication means, gives access to knowledge depositories, professional networks and hierarchies, as well as involving the tools and devices used in practices.

Sociocultural knowledge deviates from the first three mentioned types of knowledge. While conceptual, practical and regulative types of knowledge are personal, sociocultural knowledge is embedded in practices. For example, each workplace has certain written and/or unwritten rules and ways of doing things as well as shared devices and materials, and the only way to gain access to this kind of sociocultural knowledge is to participate in communities of practice of that workplace. For this reason, authentic experience and problem solving in the workplace are an important part of the development of vocational competence and professional expertise in the IP model.

Because of the integrated nature of expertise, the IP model emphasises that *educational practices should support the integration and fusion of the different forms of expert knowledge* (e.g., TYNJÄLÄ, 2008; TYNJÄLÄ, SLOTTE, NIEMINEN, LONKA, & OLKINUORA, 2006; ELVIRA, IMANTS, DANKBAAR, & SEGERS, 2017). For this purpose, various pedagogical methods can be used. For example, students can reflect on their work experience in the light of theoretical models or concepts in learning journals, logs and blogs or in discussions with peers, teachers and workplace trainers. Analytic writing tasks and collaborative assignments may also be used for the same purpose. The main idea is to apply and transform theoretical and conceptual knowledge into practical problem solving, explicate and conceptualise practical knowledge, and reflect on one's experiences by using conceptual tools. The cognitive activities involved in these processes are integrative thinking (KALLIO, 2011) and problem solving (BEREITER & SCARDAMALIA, 1993; ELVIRA ET AL., 2017). The socio-personal account by BILLETT (2014) about the duality of what the workplace affords to students and how learners elect to engage in workplace learning is acknowledged in the model.

The theoretical model of Integrative Pedagogy was first presented to the international audience late in the first decade of the 2000s (TYNJÄLÄ ET AL., 2006; TYNJÄLÄ, 2008, 2009). Since then, it has been further tested empirically through imple-

mentation in several research projects (e.g., HEIKKINEN, TYNJÄLÄ, & KIVINIEMI, 2011; KORHONEN, HEIKKINEN, KIVINIEMI, & TYNJÄLÄ, 2017; TYNJÄLÄ, VIRTANEN, KLEMOLA, KOSTIAINEN, & RASKU-PUTTONEN, 2016). It has also been further refined, for example, to emphasise sociocultural context (TÄKS, TYNJÄLÄ, TODING, VENESAAR, & KUKEMALK, 2014) and to take into account the role of emotions in learning (ARPIAINEN, LACKÉUS, TÄKS, & TYNJÄLÄ, 2013; TYNJÄLÄ ET AL., 2016). It has also been applied in studies focusing on issues such as applying and designing technologies for workplace learning (TYNJÄLÄ, HÄKKINEN, & HÄMÄLÄINEN, 2014) and developing entrepreneurship education (TÄKS ET AL., 2014) as well as health care education (KOSKINEN & ÄIJÖ, 2013; ORTOLEVA & BÉTRANCOURT, 2016). In the following section, key findings of recent studies utilising this model are reviewed.

Applications and developments of the Integrative Pedagogy model

In this section, we illustrate, with the help of key examples, how the IP model has been applied and further developed in recent studies. The examples stem from various contexts, such as teacher education and teachers' professional development, engineering education, health care, different fields of VET, and e-learning at work.

In teacher education, the model has been applied in organising practica, that is, student teachers' learning from work experience. In a study by HEIKKINEN, TYNJÄLÄ AND KIVINIEMI (2011), the IP model was applied by integrating a practicum with a course in *Ethics and Philosophy in Education* to promote student teachers' professional autonomy. Writing a learning journal, composing a portfolio, as well as discussions with peers and a mentor were used to make connections between theoretical approaches to ethical action as a teacher and practical experience in teachers' work. Both student teachers and their supervisors reported that this pedagogical model provided them with a forum for reflective dialogue and collaboration. Student teachers also reported not only about the development of professional autonomy and knowledge, but also about a greater sense of community and their increased certainty regarding career choices. This can be seen as an indicator of strengthening teacher identity. Another study, conducted in the teacher education context by TYNJÄLÄ AND COLLEAGUES (2016), examined whether the IP model would work in circumstances where authentic work experience was missing and thus compensated with simulations of real-life experiences. In two courses on social competencies the theoretical literature was integrated with practical experiences by using a variety of group activities, simulations, role play, peer feedback, and reflective reading and writing. In addition to social skills, the students reported learning about domain-specific skills, academic skills, creativity, and the development of independence. Thus, both studies on teacher education suggest the feasibility of the model in teacher education.

The IP model has also been used in the development of the Finnish model of peer-group mentoring (PGM) (HEIKKINEN, JOKINEN, & TYNJÄLÄ, 2012). In this context, the model has served two purposes: first, it has been one of the main principles used in organising mentor training, and, second, it has been applied in actual peer-group mentoring activities. Both in mentor training and group-mentoring, reflection in different forms has been used as a method to combine theoretical, practical, regulative and sociocultural knowledge. A study by GEERAERTS AND COLLEAGUES (2015) showed that its participants saw PGM as an important method for professional development throughout their teaching career. KORHONEN, HEIKKINEN, KIVINIEMI AND TYNJÄLÄ (2017) examined a more recent version of PGM, that is, *mixed* peer-mentoring groups of in-service and pre-service teachers. In that study, they focused on pre-service teachers' experiences. The results showed that the pre-service teachers' experiences of the mixed peer-mentoring groups were positive and highlighted the importance of having connections to the working world. However, their experiences varied from seeing the activity like a coffee break or as peer support to experiencing it as a forum for identity construction or even as a professional community. Every participant had experiences relating to more than one of these categories, but not all of them reached the last category describing the broadest and deepest experience. One of the aspects differentiating the four categories of experience is the relationship between theory and practice. While in the 'coffee break' experience, theory was seen separate from practice, in the last category, the relationship was integrative and critically reflective. The authors stress the role of the mentor in promoting the integration of different forms of knowledge, and suggest that, in further development of the model, the mentor training should provide mentors with more practical methods for supporting the true integration of theoretical and practical knowledge.

In the context of professional and vocational education and training, the IP model has been applied, for example, in health care and engineering education. KOSKINEN AND ÄIJÖ (2013) examined how the IP model was executed during student placements in health care. They concluded that the model is a worthwhile learning framework, but that, in their research context, students should be supported more effectively in connecting theory and practice. This is exactly the same recommendation that KORHONEN AND COLLEAGUES (2017) presented in a study focusing on pre-service and in-service teachers' mixed peer-group mentoring.

In engineering education, the IP model has been used as the basis for organising an entrepreneurship course for students (TÄKS ET AL., 2014). In that particular study, all of the students found the course useful in terms of the acquisition of new knowledge, skills and self-awareness, though there was variance between the students in how they perceived the overall outcome. For some students, the course served as a first step to self-directed learning and as a preparation for work life, while some of the others experienced it as a path to possible self-employment and a context for developing leadership and responsibility for group achievement. Dealing with emotions proved to

be pedagogically important when a learning environment requires more active input from students than they have been used to in their earlier studies. For this reason, the emotional dimension was added to the IP model (TYNJÄLÄ ET AL., 2016).

ORTOLEVA AND BÉTRANCOURT (2015) extended research on Integrative Pedagogy into the field of technology-enhanced learning by using a model for designing web-based collaborative writing and discussion tasks to support the integration of school and workplace learning in the education of social and health care assistants. They found significant gains in students' self-efficacy beliefs and performance in a case-based competence test for first-year students, but not for those in their second year. The students were also highly satisfied with the pedagogical arrangements, especially the collaborative learning. TYNJÄLÄ, HÄKKINEN AND HÄMÄLÄINEN (2014) have also examined the use of the IP model in the context of technology-enhanced learning at work, and they concluded that the model has the potential to serve both as a principle for designing technologies and for applying existing technologies in workplace learning.

Evidence of the feasibility and functionality of the IP model has also been provided by some studies that did not directly focus on the use of the model itself but on more general pedagogical features of student learning in VET and HE environments. For example, in a study on factors promoting vocational students' learning at work, it was found that the integration between school and workplace learning was the second most important factor explaining students' self-perceived learning outcomes at their workplace (VIRTANEN, TYNJÄLÄ, & ETELÄPELTO, 2014). In other words, the closer the integration between school and workplace learning was, the better the students assessed their learning outcomes to be. More recently, a study in higher education contexts produced similar findings: A factor referred to as *Acting at the interface between theory and practice* was the strongest predictor of students' perceived learning of problem solving skills in general and their ability to solve occupational problems in particular (VIRTANEN & TYNJÄLÄ, 2018).

In recent studies, the IP model has been used as a basis for creating principles for designing education for professional expertise development and for developing measurement tools for evaluating learning environments. ELVIRA, IMANTS, DANBAAR AND SEGERS (2017) conducted a literature review of studies on expertise development and used the IP model as an organising framework for creating ten instructional principles. These principles include the following recommendations for designing education: support students in their epistemological understanding, provide students with opportunities to differentiate between and among concepts, practise with a variety of problems to enable students to experience complexity and ambiguity, enable students to understand how particular concepts are connected, target relevance, share inexpressible knowledge, pay explicit attention to prior knowledge, support students in strengthening their problem-solving strategies, evoke reflection, and facilitate the development of meta-cognitive knowledge and skills. In another study, ELVIRA, BEAUSAERT, SEGERS, IMANTS AND DANKBAAR (2016) developed and validated