



# Professional learning communities among vocational school teachers: Profiles and relations with instructional quality

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## HIGHLIGHTS

- Core PLC dimensions distinguish behavioural, ideational, and structural elements.
- Departmental profiles convey Advanced, Structurally embedded, and Rudimentary PLCs.
- Teachers from Advanced PLCs provide higher levels of application-orientation (AO).
- AO includes instruct. practices (e.g. explanations) and methods (e.g. problem solving).

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## ABSTRACT

Although improving teachers' classroom strategies presents the primary goal of PLCs, empirical evidence is still scarce, mainly derived from case-study material and confined to (pre-) K12 settings. We use profiling techniques and a comparative design to examine (a) distinct configurations in which PLCs occur within vocational school departments, and (b) their relations to instructional quality. Multilevel latent profile analysis, based on teacher assessments of core PLC dimensions, reveals three configurations. Multilevel multiple group analysis of students' instructional ratings shows that teachers from *Advanced PLC departments* create more authentic, application-oriented learning environments than teachers from other departments.

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## 1. Introduction

Recent literature reviews and meta-analytic findings indicate that high-performing schools feature complex forms of teacher cooperation such as professional learning communities (PLCs) (Fulton & Britton, 2011; Lomos, Hofman, & Bosker, 2011b; Scheerens, 2014). However, despite converging evidence regarding the impact of PLCs on important *outcomes* of pedagogical activities, as measured by student achievement, comparably little is known about how PLC membership affects *pedagogical activities per se*, as reflected in indicators of instructional quality (Stoll, Bolam, McMahon, Wallace, & Thomas, 2006; Vangrieken, Dochy, Raes, & Kyndt, 2015). Investigations of teachers' instructional practices and methods that are associated with working in a PLC thus present

a largely missing but highly relevant piece of empirical knowledge, because “[a]t its core, the concept of a PLC rests on the premise of improving student learning by improving teaching practice” (Vescio, Ross, & Adams, 2008, p. 82; Supovitz, 2002).

This deficit is particularly salient in the vocational education and training (VET) system, which has been largely overlooked by researchers despite the major challenges it poses to the teaching profession. Professional demands in the VET system are to provide students with occupational knowledge and skills they need in their future workplaces and, thus, to ensure that they are well equipped to compete on the labour market (Hellwig, 2006). Continuous and accelerating changes in many workplaces put high pressures on teachers to constantly enhance their domain-specific expertise and instructional repertoire (Grollmann & Bauer, 2008). Moreover, concerted actions of stable teams are needed to coherently design and implement curricular modifications that represent constructive pedagogical answers (referred to as action- and application-oriented ‘learning fields’) to changes of the occupational world

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(i.e., corresponding ‘activity fields’ in the workplace) (Tenberg, 2017). In German vocational schools, *departments* tackle these permanent tasks, involving staff members who manage, adapt and improve the instructional program for a specific vocational domain (Pahl, 2007). As in the present study, these highly specialized organizational sub-units may concentrate on occupations in the technical-industrial sector, in the social sector, in the commercial sector, or in the technological sector.<sup>1</sup> Owing to the diversity of Germany’s VET system, however, departments operate in different types of vocational schools, i.e., in different institutional frameworks, and are responsible for students with divergent educational backgrounds and qualification goals (see Schneider, 2008; Solga, Protsch, Ebner, & Brzinsky-Fay, 2014 for detailed descriptions and statistics). The current investigation, conducted in the Federal State of Bavaria/Germany, includes part-time and full-time vocational schools (belonging to secondary education level II), commercial colleges (sec I), and upper vocational schools (sec II and tertiary level).

Both part-time and full-time vocational schools provide full vocational qualifications and therefore award nationally recognized certificates of ‘skilled occupations’, allowing adolescents and young adults to take up a suitable position in an employing organization (e.g., as a trained retail salesman or a trained paediatric nurse). Full-time vocational schools offer VET courses that take place only at school and often prepare for occupations in the social sector. The clear majority of students who enrol in these courses holds an intermediate or even upper secondary school degree (of general education). Part-time vocational schools function as equal partners of training companies in Germany’s ‘dual system’ of VET and cover many vocational domains. Entering the dual system requires students to have an apprenticeship contract but no formal school-leaving certificate, which is why roughly a third of them has a lower secondary (general) school degree or no school degree at all. Upper vocational schools primarily prepare students for higher academic tracks (particularly universities of applied science), but they do so by offering specialization in distinct vocational domains. Consequently, they require students to do internships or even to have successfully completed a certified (dual or school-based) training in the chosen area of specialization. Commercial colleges in Bavaria – representing one of several school types within Germany’s VET system that exist in one or a few federal states only – ‘anticipate’ occupational specialization by preparing students to take up a fully qualifying VET course in the commercial sector but also to acquire a certificate of intermediate general education.

This brief outline suggests that available evidence on the prevalence, sophistication and instructional impact of departmental PLCs does not necessarily apply to vocational schools. Relevant findings stem from secondary schools in the *general* education system (for overviews, see Lomos, Hofman, & Bosker, 2011a; Visscher & Witziers, 2004). But although in both education systems, departments represent teachers’ main area of professional (inter-)action and influence (März & Kelchtermans, 2013), vocational school departments face professional demands and institutional environments that differ from those of general, academically oriented schools. Transferability of extant findings is further limited by the fact that most of them were obtained from small-scale, qualitative investigations (see section 3.1).

Against this background, our paper pursues two objectives. The first is to explore if and to what extent departments in German vocational schools *operate* as PLCs, i.e., in accordance with generic

features of PLCs. We do so by adopting a profiling approach and examining profile composition and occurrence. The second objective is to analyse if and to what extent teacher membership in different PLC profiles explains differences in instructional quality.

Since concepts and measures of PLCs vary considerably in the literature (see Slegers, den Brok, Verbiest, Moolenaar, & Daly, 2013; Vangrieken et al., 2015), we start with a theoretical framework that explicates core dimensions of PLCs as well as analytical strategies to investigate their existence and sophistication. We further summarize extant evidence on how PLCs affect classroom instruction and highlight features that may serve as indicators of instructional quality in vocational classrooms. The empirical part of the paper comprises two subsequent survey studies. To analyse our first research question, we draw on teacher ratings of core PLC dimensions for their respective organizational units (Study 1: 395 teachers from 47 departments). *Multilevel latent profile analyses* are run to identify departmental PLC profiles. *Latent profile random effects models* are employed to test the predictive value of school, department, and teacher characteristics for profile membership. To answer the second question, we use student assessments of teachers’ instructional practices and methods. Student questionnaires were administered about five months after the teacher survey (Study 2: 1243 students). *Multilevel multiple group analysis* serves to test if instructional features vary systematically between PLC profiles while accounting for the nested structure of student ratings in classes and departments. We discuss main findings synoptically at the end of our paper, highlighting their contributions to current research on PLCs and their implications for future studies.

## 2. The PLC architecture and its measurement

### 2.1. Core dimensions of professional learning communities

Professional communities represent conceptually and operationally heterogeneous fields of research (Slegers et al., 2013; Stoll et al., 2006; Vangrieken, Meredith, Packer, & Kyndt, 2017). This concerns, *inter alia*, the scale and institutional anchoring of a community. Some studies focus on small, interdisciplinary teams that evolve outside formal organizational structures while carrying out innovative projects (e.g., Owen, 2014; Schaap & de Bruijn, 2017). Others consider the entire staff of schools (e.g., Bolam, McMahon, Stoll, Thomas, & Wallace, 2005; Hord, 1997) or distinct organizational sub-units (e.g., Hallam, Smith, Hite, Hite, & Wilcox, 2015; Visscher & Witziers, 2004) as PLCs, again in varying evolutionary stages. Research in German schools predominantly refers to PLCs that are installed at a departmental level, where shared areas of responsibility and expertise both necessitate and facilitate close cooperation (e.g., Bonsen & Rolff, 2006; Buhren, 2015). Against this background, the present study concentrates on generic features in the *work* of PLC members rather than on their number or organizational affiliation. Thus, we focus on dimensions that describe the way collective professional practice is orchestrated within a PLC, and which should *all* be very pronounced in strong, fully developed PLCs.

Taking stock of the literature, we can identify three strands of modelling the work of PLCs. The first strand contains established “five-component-models” and can be subdivided into two similar but not congruent segments. In one segment, we find papers that adopt the five components put forth by Kruse, Louis, and Bryk (1995), namely *reflective dialogue*, *deprivatization of practice*, *collaboration*, *shared norms and values*, and *collective focus on student learning* (e.g., Lomos et al., 2011a; Vescio et al., 2008). In the other segment, researchers largely follow Hord’s (1997) classification, which proposes *shared personal practice*, *collective creativity*,

<sup>1</sup> See Germany’s Federal Institute of VET (BIBB) for a detailed classification of over 300 occupations into vocational domains: <https://metadaten.bibb.de/klaskifikation/> 9.

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