

Baez, Charlotte; Vogt, Franziska; Kunz Heim, Doris

Teacher collaboration in class team networks in Switzerland. Characteristics and typology

Schlesier, Juliane [Hrsg.]; Frey, Anne [Hrsg.]; Hoya, Fabian [Hrsg.]; Parade, Ralf [Hrsg.]; Rank, Astrid [Hrsg.]: Foundations of learning. Unveiling the mosaic of primary education systems worldwide. Bad Heilbrunn : Verlag Julius Klinkhardt 2026, S. 270-294. - (Grundschule International / Primary Education International)



Quellenangabe/ Reference:

Baez, Charlotte; Vogt, Franziska; Kunz Heim, Doris: Teacher collaboration in class team networks in Switzerland. Characteristics and typology - In: Schlesier, Juliane [Hrsg.]; Frey, Anne [Hrsg.]; Hoya, Fabian [Hrsg.]; Parade, Ralf [Hrsg.]; Rank, Astrid [Hrsg.]: Foundations of learning. Unveiling the mosaic of primary education systems worldwide. Bad Heilbrunn : Verlag Julius Klinkhardt 2026, S. 270-294 - URN: urn:nbn:de:0111-pedocs-358025 - DOI: 10.25656/01:35802; 10.35468/6239-10

<https://nbn-resolving.org/urn:nbn:de:0111-pedocs-358025>

<https://doi.org/10.25656/01:35802>

in Kooperation mit / in cooperation with:



<http://www.klinkhardt.de>

Nutzungsbedingungen

Dieses Dokument steht unter folgender Creative Commons-Lizenz: <http://creativecommons.org/licenses/by-sa/4.0/deed.de> - Sie dürfen das Werk bzw. den Inhalt vervielfältigen, verbreiten und öffentlich zugänglich machen sowie Abwandlungen und Bearbeitungen des Werkes bzw. Inhaltes anfertigen, solange sie den Namen des Autors/Rechteinhabers in der von ihm festgelegten Weise nennen und die daraufhin neu entstandenen Werke bzw. Inhalte nur unter Verwendung von Lizenzbedingungen weitergeben, die mit denen dieses Lizenzvertrags identisch, vergleichbar oder kompatibel sind. Mit der Verwendung dieses Dokuments erkennen Sie die Nutzungsbedingungen an.

Terms of use

This document is published under following Creative Commons-License: <http://creativecommons.org/licenses/by-sa/4.0/deed.en> - You may copy, distribute and transmit, adapt or exhibit the work or its contents in public and alter, transform, or change this work as long as you attribute the work in the manner specified by the author or licensor. New resulting works or contents must be distributed pursuant to this license or an identical or comparable license.

By using this particular document, you accept the above-stated conditions of use.



Kontakt / Contact:

peDOCS
DIPF | Leibniz-Institut für Bildungsforschung und Bildungsinformation
Informationszentrum (IZ) Bildung
E-Mail: pedocs@dipf.de
Internet: www.pedocs.de

SWITZERLAND

Charlotte Baez, Franziska Vogt and Doris Kunz Heim

Teacher Collaboration in Class Team Networks in Switzerland: Characteristics and Typology

Abstract

Teacher collaboration is widely recognized as a key factor in teacher professional development and school improvement. In Swiss primary schools, where subject-specific teaching, job-sharing, and part-time work are common, collaboration within class teams plays a particularly central role. Nevertheless, its specific characteristics and contextual influences remain underexplored. This study investigates how collaboration among 32 Swiss fifth-grade class teams can be categorized into types (RQ1) and how these differ in terms of contextual characteristics (RQ2). Using a mixed-methods design, data were collected through interviews, questionnaires, and classroom observations. Collaboration was measured via network-based indicators, aggregated at the team level, and analysed using factor and cluster analyses to identify its typologies. Robust analyses of variance were then applied to explore the contextual differences between collaboration types. The findings suggest that class teams vary in the intensity and foci of their cooperation, resulting in distinct collaboration typologies. Fostering collaboration on classroom management may be particularly effective in supporting teachers, highlighting the importance of considering not only the intensity but also the focus of collaboration when designing professional development initiatives.

Keywords: Teacher Collaboration, Classroom Management, Teacher Stress, Primary School in Switzerland, Network Typology

1 Introduction

Collaboration within the class team, defined as including all teaching staff responsible for a particular class, appears to be a frequent occurrence in schools (Doppenberg et al., 2012; Vogt et al., 2022), but has not yet been thoroughly investigated. While numerous studies have demonstrated the positive outcomes of teacher collaboration, the specific components that are particularly beneficial remain uncertain. In the present work, the term ‘collaboration’ is understood to signify “joint interaction in the group in all activities that are needed to perform a shared task” (Vangrieken et al., 2015, p. 23). Collaboration within schools stimulates the professional development of the teachers involved, as well as the development of the school as a whole (Doppenberg et al., 2012), which can lead to better learning outcomes for students (e.g., Holtappels, 2020; Muckenthaler et al., 2020; Reeves et al., 2017).

Teacher collaboration has been characterized in a number of ways. On one hand, collaboration characteristics such as intensity and focus can be examined. For example, Muckenthaler et al. (2020) found that teachers reporting higher collaboration intensity perceived more benefits as a result. Conversely, an investigation can be undertaken into the context characteristics of collaboration. These may include the structural characteristics such as team size, institutionalization, or the scope of the collaboration (Vangrieken et al., 2015). Research indicates that the extent of collaboration among class teams, and consequently their functioning as a team, varies (Vangrieken et al., 2015). Teams have become an important aspect of the work of primary school teachers in Switzerland. Although primary school teachers are trained to teach all subjects, collaboration with other teachers is required: some subjects are taught by other teachers. In Switzerland, job-sharing and part-time employment are quite prevalent among primary teachers, thus again rendering teacher collaboration vital.

1.1 Collaboration Characteristics

1.1.1 Intensity of Collaboration

The intensity of collaboration, defined as a combination of frequency and depth, has been identified as a crucial aspect of cooperation quality (Goddard et al., 2015). The frequency of cooperation varies across different collaboration settings within a school, such as whole-school meetings that encompass all teaching staff, discussions between teachers teaching at the same level, and project groups (Doppenberg et al., 2012; Vogt et al., 2016). However, the optimal frequency for achieving favourable outcomes from collaboration, for example in terms of student achievement, remains unclear (Ronfeldt et al., 2015).

Gräsel et al. (2006) propose a taxonomy of collaboration intensity, distinguishing between four degrees of sharing and autonomy as follows: exchange, synchronization, division of tasks, and co-construction. It is noteworthy that higher levels of collaboration intensity, otherwise termed 'deep-level collaboration', occur infrequently (Gräsel et al., 2006; Muckenthaler et al., 2020; Vangrieken et al., 2015). Nonetheless, research suggests that higher-intensity levels of collaboration may be advantageous for teachers' professional development, but could reduce teaching autonomy (Vangrieken et al., 2015).

1.1.2 Focus of Teacher Collaboration

The nature of teacher collaboration may encompass a variety of subjects, including, but not limited to, the development of instructional practices, the coordination of shared events, and classroom management. However, research findings on this topic are scarce and unclear. For example, Goddard et al. (2015) found that collaboration has an indirect effect on instructional improvement for student achievement in mathematics, but no effects related to policy or for formal collaboration. Similarly, Ronfeldt et al. (2015) reported that collaboration has positive effects on assessment for mathematics achievement and instructional strategies for reading achievement, whereas collaboration about students showed no significant effects.

Current research has not yet investigated possible differences between class teams in terms of their focus of collaboration, either in Switzerland or internationally. In Switzerland, primary school classes are typically taught by a principal teacher in conjunction with multiple other ones, such as specialists in disciplines such as arts and crafts, foreign languages, sports, and special educational needs (Vogt et al., 2022). Teachers do not typically collaborate in a team-teaching arrangement; rather, each teacher teaches the class individually. Vogt et al. (2022) noted that most class teams in primary schools in Switzerland consist of five to seven teachers. Given that teachers within a class team typically specialize in different subjects, a potential area for collaborative focus could be enhancing class engagement. As high student engagement has been found to predict students' academic achievement (e.g., Lundervold et al., 2017; Roorda et al., 2017), and a low level has been linked to teacher burnout (e.g., Baeriswyl et al., 2014; Wettstein et al., 2021), it is evident that student engagement is a matter of significance for all teachers.

1.2 Context Characteristics of Teacher Collaboration – International Evidence and the Swiss Primary School Context

A number of structural conditions within a school have been found to be related to teacher collaboration. These include characteristics of the teachers, classes, and school, such as school standards for collaboration, teacher class-

room management, and stress, as well as student engagement (Vangrieken et al., 2015; Vogt et al., 2016). Since structural conditions for teacher collaboration are shaped by the organization of the education system, a brief overview of the Swiss context is provided below.

The Swiss education system is structured into three levels – primary, lower secondary, and upper secondary – with distinct teacher qualification pathways for each level. A graphic representation of the Swiss primary (teacher) education system can be found in Tab. 1. It should be noted that primary schools provide education for children from the age of four years, as kindergarten is a part of compulsory schooling (Swiss Conference of Cantonal Ministers of Education [EDK], n.d.-a). The transition from primary to secondary school only occurs after grade six at the age of 12 (EDK, n.d.-a). The primary setup is characterized by a main class teacher and additional ones providing education in selected subjects (Vogt et al., 2022). Accordingly, primary school teachers in Switzerland are typically trained as generalists, qualifying them to teach six or more subjects throughout the entire eight-year primary level, including kindergarten (EDK, n.d.-b). In contrast, at secondary school, encompassing the ages of 13 to 16 years, a higher number of teachers teach a given class, as they only teach ca. four subjects (EDK, n.d.-c).

Table 1: Swiss Primary (Teacher) Education System

School System	Track	Teacher Qualification	Grade	Age
Upper secondary school (<i>Sekundarstufe 2</i>)	Academic (<i>Gymnasium</i>)	Subject-related bachelor's (180 ECTS) + Teaching Diploma for Upper Secondary Education (60 ECTS)	10 - 13	15 - 18
	Pre-professional (<i>Fachmittelschule</i>)	Subject-related bachelor's (180 ECTS) + Teaching Diploma for Upper Secondary Education (60 ECTS)	10 - 13	15 - 18
	Vocational (<i>Berufliche Grundbildung</i>)	Federal VET Diploma or subject-related master's degree (~ 270 ECTS) + Teaching Diploma for Vocational Education (~ 40 – 60 ECTS)	10 - 13	15 - 18
Lower secondary school (<i>Sekundarstufe 1</i>)		Master of Arts in Secondary Education (270 ECTS)	7 - 9	12 - 14
Primary school (<i>Primarschule</i>)		Bachelor of Arts in Primary Education (180 ECTS)	1 - 6	6 - 11
Kinder-garten (<i>Kindergarten</i>)		Bachelor of Arts in Primary Education (180 ECTS)	-	4 - 5

1.2.1 School Standards for Collaboration

School leaders who demonstrate an appreciation for collaboration may also foster it (Harazd & Drossel, 2011), provided that teachers are not subjected to undue pressure to collaborate (Muckenthaler et al., 2020). The facilitation of collaboration by the school leadership with structural and systemic measures (e.g., the provision of favourable conditions regarding time and space for collaboration) was found to be particularly important for teacher collaboration (Goddard et al., 2015; Vangrieken et al., 2015).

1.2.2 Classroom Management, Student Engagement, and Teacher Stress

Collaboration within class teams may facilitate the exchange of professional knowledge and has been associated with improved teaching quality (Vangrieken et al., 2025). Drawing on this assumption – and in line with the concept of collaborative professionalism, which emphasizes shared responsibility, mutual dialogue, and deep professional learning as key components of effective teacher collaboration (Hargreaves & O'Connor, 2018) – it can be postulated that that more effective classroom management strategies may emerge through collaboration, potentially leading to higher levels of student engagement. Empirical studies support this link: teachers who collaborate more intensively report fewer behavioural disruptions and more engaged student behaviour (York-Barr et al., 2007; Holtappels, 2020). Moreover, lessons that are collaboratively planned tend to show higher levels of student engagement (Collyer et al., 2020). Since classroom misbehaviour is a key driver of teacher stress and burnout (Baeriswyl et al., 2014; Wettstein et al., 2021), collaboration may indirectly contribute to teachers' wellbeing. Affective-motivational characteristics have been shown to predict dropout intentions as early as the teacher education stage (Westphal et al., 2024), underlining the importance of psychological factors for long-term teacher retention.

Classroom management is understood to encompass "all teachers actions aimed to establish the stimulative learning environment" (Djigic & Stojiljkovic, 2011, p. 19). It is regarded as the "gatekeeper of learning" (Freiberg, 2013, p. 228) and as fundamental to the quality of teaching (Ophardt & Thiel, 2019). Effective classroom management has been shown to result in a greater proportion of time being dedicated to academic learning as opposed to behaviour management (Lundervold et al., 2017).

A body of research has identified a positive association between teachers' collaborative efforts and student behaviour. Specifically, studies have shown that teachers who collaborate more intensively report less student misbehaviour and more engagement (e.g., Collyer et al., 2020; Holtappels, 2020; York-Barr et al., 2007).

Disruptive classroom behaviour has been identified as a significant contributing factor to teacher stress and burnout (e.g., Baeriswyl et al., 2014; Wettstein et al., 2021). Consequently, student engagement behaviour can be conceptualized as a mediating factor in the relation between teacher collaboration and teacher stress. Nevertheless, the interplay of these relationships – particularly how teacher collaboration influences classroom management and, in turn, affects student engagement and teacher wellbeing – has not yet been explored comprehensively. Existing studies tend to examine isolated links (e.g., between collaboration and student behaviour, or between classroom management and stress), but rarely investigate these processes as an interconnected system, nor do they consider mediating or moderating mechanisms across multiple levels.

1.3 The Present Study

Previous studies indicate that teacher collaboration fosters instructional quality, effective classroom management, and student engagement, and may have positive effects on teacher wellbeing. However, it remains unclear which specific forms and foci of collaboration are particularly beneficial, and how collaboration relates to contextual factors such as team composition or structural school conditions. While individual links between collaboration, teacher wellbeing, and classroom processes have been studied, their interplay has rarely been addressed in a systematic and integrated way. It is the aim of this work to empirically identify a typology of class teams with regard to their collaboration and to examine whether clusters can be distinguished regarding their collaboration and context characteristics. The following two research questions are embedded in an exploratory research design with two complementary analytical steps: an inductive typology and a comparative analysis of contextual variables. While both questions follow an exploratory logic, they differ in their analytical purpose.

- RQ1: How can class teams be categorized into types based on their collaboration?

Although the typology is developed inductively, it is informed by theoretical and empirical work on teacher collaboration (Vangrieken et al., 2015; Muckenthaler et al., 2020; Gräsel et al., 2006). Based on these studies, we expect variation across teams in terms of collaboration intensity (e.g., exchange vs co-construction) and focus (e.g., instruction, student engagement, or classroom management). While deep-level collaboration is relatively rare (Vangrieken et al., 2015), it has been associated with professional learning and shared responsibility (Hargreaves & O'Connor, 2018).

- RQ2: Are there differences between the types of class teams regarding the context characteristics?

For the second research question, we formulate the following hypothesis: class team types differ significantly in contextual characteristics, including perceived leadership support, workload, and classroom management. This hypothesis is grounded in findings suggesting that collaboration is influenced by school-level structural and cultural factors (Vangrieken et al., 2015; Goddard et al., 2015; Vogt et al., 2016). Moreover, research links collaborative practices to improved classroom processes (Collyer et al., 2020; Holtappels, 2020) and teacher wellbeing (Wettstein et al., 2021; Baeriswyl et al., 2014), indicating that such contextual differences may manifest across collaboration-based team types.

2 Methodology

2.1 Study Design

The study has been designed to systematically answer the research questions using a mixed-methods approach, combining interviews, questionnaires, and observations. Class team collaboration was assessed through interviews and questionnaires, measuring variables such as exchange, co-construction, and collaboration on student performance and classroom management. The collaboration variables were aggregated at the class team level using a social network approach and a subsequent factor analysis to identify team collaboration patterns. The following data analysis was carried out in two steps. Initially, a cluster analysis was employed to categorize class teams based on their collaboration characteristics. Subsequently, robust analyses of variance were conducted to compare the contextual characteristics between teams and teachers within these clusters. The integration of qualitative and quantitative methodologies enabled the effective categorization of collaboration types and the exploration of contextual influences, thereby facilitating a comprehensive understanding of class team collaboration dynamics.

2.2 Sample

Our sample includes 32 class teams, each with a minimum of three teachers participating in the study in either 2018 or 2019. The total number of teachers included was 122 (84.4 % of whom were female). Recruitment followed a stratified random sampling procedure (adapted from Zimmermann et al., 2004), with strata based on the percentage of foreign nationals in the municipality. This indicator was used to increase diversity in migration status, which is associated with academic achievement and classroom engagement (e.g., Nielsen & Rangvid, 2012; Finn et al., 1995). The mean (M) highest international social and economic index of the participating classes was $M = 55.46$ (standard de-

viation [SD] = 12.91). The average number of years of work experience among the participating teachers was 16.40 years (SD = 10.66), and the mean total workload was 21.14 lessons per week (SD = 6.68).

2.3 Instruments and Measures

Three instruments were used to collect data: individual teacher interviews (one per teacher) and an online teacher questionnaire, as well as standardised observations. The first instrument, a semi-standardised teacher interview, was conducted individually with each participating teacher. The interviews followed a thematic interview guide, allowing for consistent coverage of key topics while offering flexibility for follow-up questions. Each interview lasted approximately 30 minutes and was conducted either directly before or after the classroom observations. The interviews were audio-recorded and subsequently coded into a quantitative format for analysis. The content focused on teachers' experiences with classroom collaboration, leadership support, and perceived classroom dynamics.

The second instrument, an online teacher questionnaire, was made available to the participating teachers after the interview and was completed asynchronously. It included questions on teaching roles and experience, as well as school context and collaborative practices within the class team. The questionnaire comprised both factual items (e.g., subjects taught, weekly teaching hours) and rating scales assessing the frequency and perceived quality of collaboration with various team members (e.g., trust, shared decision-making, joint handling of student behaviour). The items were adapted from established instruments (see Tab. 2 and Tab. 4 for the statistical parameters).

The third instrument was a structured classroom observation targeting classroom management (CLM), based on a rating manual adapted from the Classroom Assessment Scoring System (CLASS) framework (Pianta et al., 2012). Observations were conducted during regular lessons in arts and crafts, English, German, or social and natural sciences. Trained observers rated three core dimensions: behavioural management (e.g., clarity of expectations, efficiency of corrections), organization of workflow (e.g., smooth transitions, task pacing, accessibility of materials), and classroom climate (e.g., respectful interactions, emotional tone). Ratings were completed after the lesson based on global impressions. The manual included behaviourally anchored examples and was revised following an interrater reliability study. Descriptive statistics and scale parameters (means, standard deviations, and internal consistency estimates) are reported in Tab. 4.

Table 2: Overview of the Collaboration Characteristics Assessed by the Teacher Interview and Questionnaire

Dimension	Variables	Response options	I
Intensity	Intensity of collaboration	1 = weak, 2 = medium, 3 = strong	Int
	Last general exchange	1 = some time ago, 2 = some weeks ago, 3 = this week, 4 = today / every day	Int
	Last exchange on student participation	1 = some time ago, 2 = some weeks ago, 3 = this week, 4 = today / every day	Int
	Frequency of exchange (3 items)	1 = never, 2 = rarely / once per semester, 3 = sometimes / once per month, 4 = frequently / once per week, 5 = very frequently / 2-3 x per week, 6 = all the time / daily	Q
	Frequency of co-construction (4 items)	1 = never, 2 = rarely / once per semester, 3 = sometimes / once per month, 4 = frequently / once per week, 5 = very frequently / 2-3 x per week, 6 = all the time / daily	Q
Foci of collaboration	Student performance	1 = no, 2 = exchange regarding grades, 3 = holistic exchange	Int
	Classroom rules	1 = exchange, 2 = synchronization, 3 = co-construction	Int
	Seating arrangements	1 = exchange, 2 = synchronization, 3 = co-construction	Int

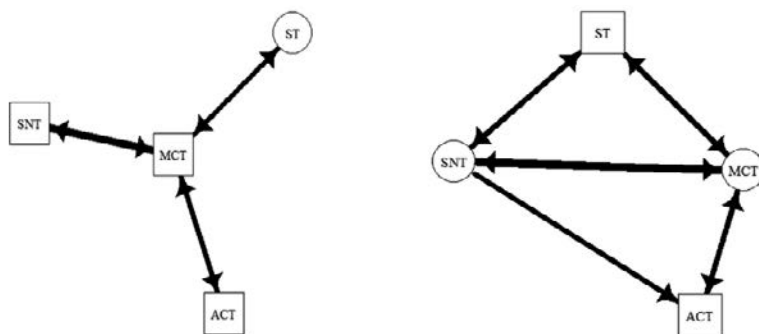
Note. I = instrument; Int = interview; Q = questionnaire; adapted from Gräsel et al., 2006).

The questionnaire items were used to compute dyadic indicators of collaboration between individual teachers (e.g., teacher A's ratings of teacher B). As the resulting measures were not aggregated into person-level scales, internal consistency coefficients (e.g., Cronbach's α or McDonald's ω) are not applicable (see Section 2.3.1 concerning the network approach of aggregating the dyadic collaboration variables at the class team level). This approach is consistent with social network research, where the analytical unit is the tie rather than the individual (Borgatti et al., 2018).

2.3.1 Collaboration Variables

The collaboration characteristics between the teachers in each class team were assessed through the interview and the questionnaire. For each item, teachers were asked to respond in relation to each member of their class team (see Tab. 2).

In order to manage the varying ranges of variables, normalization via min-max normalization was applied (Han et al., 2012). Given that the research question of the present paper focuses on class team collaboration, a social network approach was chosen to aggregate the dyadic collaboration variables at the class team level. For each collaboration variable, a global clustering coefficient of the collaboration within the class team was computed using R 4.0.3 (R Core Team, 2020) with the "igraph" (Csárdi & Nepusz, 2006) and the "Directed Clustering" (Clemente & Grassi, 2018) packages. The value of the global clustering coefficient ranges between 0 and 1, with higher values indicating a greater investment by teachers in collaboration with other teachers who are also highly cooperative within the class team (network; see Fig. 1).



(a) Global clustering coefficient = .00

(b) Global clustering coefficient = .60

Note. MCT = main class teacher, ST = subject teacher (except arts and crafts), ACT = arts and crafts teacher, SNT = special educational needs.

Figure 1: Example Teacher Networks with (a) a Very Low and (b) a High Global Clustering Coefficient

To reduce the number of collaboration network variables used in this paper, an exploratory factor analysis was performed on the global clustering coefficients of the collaboration variables using IBM SPSS Statistics 27. The Bartlett test ($\chi^2(36) = 86.99, p < .0001$) and the Kaiser-Meyer-Olkin measure ($KMO = .58$) indicated that the variables were adequate for the analysis. Consequently, a principal component analysis employing a varimax rotation was conducted. The exploratory factor analysis yielded a solution comprising four factors, accounting for 77.7 % of the variance. While no absolute threshold applies across disciplines, the explained variance exceeds the commonly accepted minimum of 60 % in the social sciences, where measurement constructs are often less precise and more complex (Hair et al., 2019).

Four factors were found: exchange, co-construction, collaboration on student performance, and collaboration on classroom management (see Tab. 3).

Table 3: Descriptive Statistics and Reliability Values of the Four Collaboration Characteristics

Factor	M	SD	Reliability	N
Exchange intensity (variables: frequency of exchange, intensity of collaboration, exchange)	0.50	0.11	$\alpha = .72$ $\omega = .79$	32
Co-construction intensity (variables: last exchange, co-construction)	0.60	0.12	SB = .72 $\omega = .67$	32
Intensity of collaboration regarding student performance (variables: last exchange relating to student participation, exchange regarding student performance)	0.22	0.21	SB = .65 $\omega = .64$	32
Intensity of collaboration regarding class-room management (variables: exchange regarding classroom rules, exchange regarding seating arrangements)	0.08	0.15	SB = .62 $\omega = .72$	32

Note. M = mean; SD = standard deviation; N = number of class teams; α = Cronbach's alpha; ω = McDonald's omega; SB = Spearman-Brown coefficient, used for two-item scales (Eisinga et al., 2013).

2.3.2 Context Variables

In Tab. 4 an overview of the context variables included in the analysis is presented.

Table 4: Overview on All Context Variables Included in the Present Study

Aspect	Variables	Statistical parameter	Response options	I
School and teacher characteristics	School size	$M = 3.29$, $SD = 1.23$	1 = < 10, to 6 => 50 teachers	Q
	Team size	$M = 4.08$, $SD = 0.94$	Number field	Q
	School standards for collaboration ¹	$M = 1.60$, $SD = 0.79$	0 = no (asked) standard to 4=all	Int
	Head-teacher's attitude towards collaboration ^{2,3}	$M = 2.52$, $SD = 0.63$, $N = 73$	1 = low to 3 = high	Int
Classroom management ⁴	Behavioural management	$M = 3.35$, $SD = 0.59$, $\alpha = .82$, $\omega = .76$, $N = 51$	1 = does not apply to 4 = applies	O
	Organization of workflow	$M = 3.54$, $SD = 0.56$, $\alpha = .76$, $\omega = .81$, $N = 67$	1 = does not apply to 4 = applies	O
	Classroom climate	$M = 3.52$, $SD = 0.51$, $\alpha = .66$, $\omega = .79$, $N = 51$	1 = does not apply to 4 = applies	O
Class	Teacher perception of class engagement ⁵	$M = 3.49$, $SD = 0.65$, $\alpha = .86$, $\omega = .86$, $N = 77$	1 = not at all inter- ested to 6 = very interested	Q
	Perceived stress from teaching the class ⁶	$M = 2.85$, $SD = 0.94$, $\alpha = .86$, $\omega = .86$, $N = 78$	1 = never to 5 = very often	Q

Note. Instruments were adapted from ¹Goddard et al. (2015); ²Harazd and Drossel (2011); ³Maag Merki et al. (2010); ⁴Pianta et al. (2012); ⁵Schrader and Helmke (1987); ⁶Sandmeier et al. (2017). I = instrument; Int = interview; Q = questionnaire; O = observation; M = mean; SD = standard deviation; N = number of teachers; α = Cronbach's alpha; ω = McDonald's omega.

2.4 Data Analysis Strategy

To address the two research questions, the analysis followed a two-step procedure corresponding to the two complementary analytical aims of this study:

- RQ1: How can class teams be categorized into types based on their collaboration?
- RQ2: Are there differences between the types of class teams regarding the context characteristics?

Step 1 (RQ1): To identify a typology of class teams based on their collaboration characteristics, a hierarchical cluster analysis was conducted using Ward's method and squared Euclidean distance in IBM SPSS Statistics 27. The number of clusters retained was determined by visual inspection of the dendrogram, the agglomeration schedule, and theoretical interpretability. This yielded a five-cluster solution.

Step 2 (RQ2): To compare contextual characteristics between the identified clusters, multiple analyses of variance (ANOVAs) were performed using the R software environment (R Core Team, 2020). To account for potential heteroscedasticity, HC3 correction was applied, which adjusts standard errors in linear models to provide more robust inference when the assumption of homoscedasticity is violated. HC3 gives more weight to high-leverage observations and is considered a conservative and reliable estimator, particularly in small to moderate sample sizes (Long & Ervin, 2000). If the omnibus ANOVA indicated significant differences, Tukey-Kramer post hoc tests were conducted to explore which cluster comparisons were significant. These are recommended for use with unequal sample sizes (Howell, 2018). All tests were two-tailed, in line with the exploratory nature of the study.

Accordingly, missing values were handled using pairwise deletion for the ANOVAs.

The complete teacher sample was used for the extraction of clusters. For the ANOVAs comparing context characteristics, only main and subject teachers were included, as no observational measures were available for special educational needs (SEN) teachers, given that they typically do not instruct entire classes.

Missing data were minimal and occurred only in isolated cases, such as when specific indicators of classroom management could not be observed during a lesson or when individual teachers could not rate certain team members. As the overall proportion of missing values was low and not systematically patterned, no imputation procedures or missing completely at random (MCAR) tests were applied.

3 Results

3.1 Cluster Analysis for Class Team Collaboration

A hierarchical cluster analysis (Ward's method, squared Euclidean distance) was implemented with IBM SPSS Statistics 27. As the hierarchical cluster analysis is an exploratory statistical analysis technique, the number of clusters is chosen depending on the heterogeneity gaps in the dendrogram as well as the theoretical plausibility. Figure 2 shows the dendrogram resulting from the hierarchical cluster analysis. In the present study, the biggest heterogeneity gap was noted between a one- and a three-cluster solution. Between the three- and five-cluster solutions, the heterogeneity gaps were similarly large, while after that they narrowed down. In the theoretical interest of an exploratory differentiation of the class teams with regard to their collaboration, a five-cluster solution was chosen. Two of the five clusters were very small but not negligible, as the first of the two small clusters already arises with the three-cluster solution.

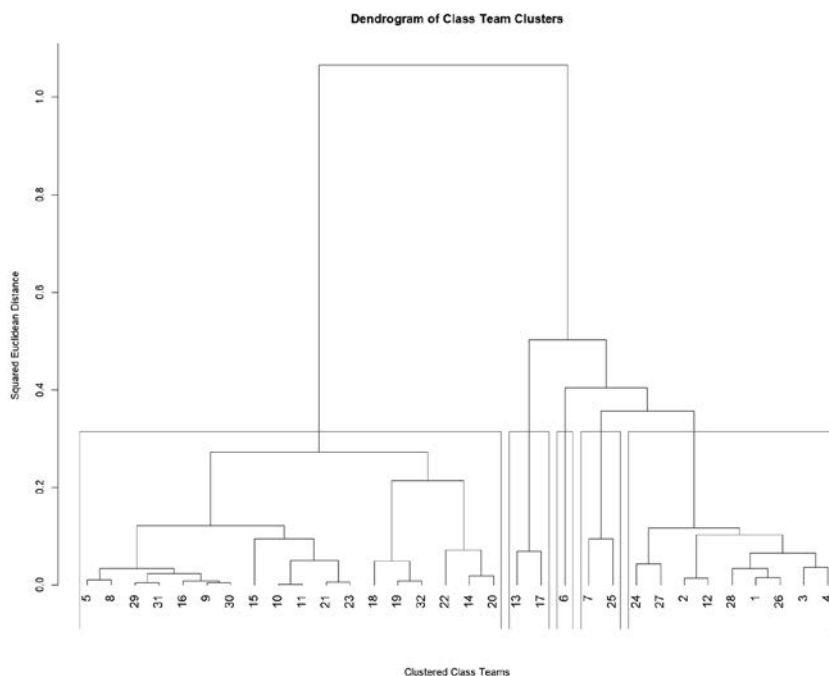


Figure 2: Dendrogram Illustrating the Hierarchical Clustering of Class Teams

The five clusters vary with regard to collaboration and context characteristics. The descriptive statistical parameters of all five clusters in relation to the different variables and scales are described in Table 5.

Clusters differed significantly in all four collaboration characteristics. Cluster B consistently reported lower exchange intensity than Clusters A, C, and E ($F(4,113) = 11.40, p < .001, \eta^2 = .27$). Cluster C showed higher co-construction intensity than B ($F(4,112) = 17.40, p < .001, \eta^2 = .09$). Regarding collaboration on student performance, Cluster C clearly stood out, scoring significantly higher than all other clusters, while Clusters A and D were higher than B and E ($F(4,97) = 154.49, p < .001, \eta^2 = .59$). In terms of classroom management, Cluster D displayed the highest collaboration levels ($F(4,76) = 95.38, p < .001, \eta^2 = .35$).

Significant differences also emerged in context characteristics. Cluster A reported more frequent school standards for collaboration than B ($F(4,111) = 2.78, p = .030$). Cluster D had larger teams than A and E ($F(4,108) = 3.10, p = .019$), and school size and service length differed between clusters without significant pairwise effects. No significant differences were found in teaching experience or headteachers' attitudes.

In classroom management, Cluster C scored significantly lower than A and E regarding organization of workflow ($F(4,62) = 2.98, p = .026$), though no differences were found in classroom climate. Teachers in Cluster C also perceived their class engagement more negatively than those in all other clusters ($F(4,106) = 62.84, p < .001$). Observed engagement did not differ significantly. Perceived teacher stress varied significantly ($F(4,107) = 6.57, p < .001$): Cluster E reported lower stress than A and C, and Cluster D noted lower stress than C. Overall, the clusters differed most notably in school standards, team size, workflow, teacher-perceived class engagement, and stress. An overview of the cluster comparison can be found in Table 6.

Table 5: Means (Standard Deviations) of Variables in Each of the Five Clusters

Variables	Cluster A (N=10)	Cluster B (N=12)	Cluster C (N=2)	Cluster D (N=2)	Cluster E (N=6)
Exchange intensity	0.52 (0.12)	0.41 (0.10)	0.61 (0.09)	0.46 (0.08)	0.54 (0.12)
Co-construction intensity	0.53 (0.19)	0.46 (0.17)	0.67 (0.03)	0.48 (0.13)	0.56 (0.20)
Intensity of collabora- tion regarding student performance	0.36 (0.13)	0.15 (0.12)	0.74 (0.04)	0.34 (0.11)	0.09 (0.21)
Intensity of collabora- tion regarding class- room management	0.13 (0.19)	0.10 (0.15)	0.09 (0.09)	0.53 (0.11)	0.09 (0.15)
School size	3.29 (1.30)	3.26 (1.29)	2.50 (0.55)	4.00 (1.00)	3.17 (1.15)
Team size	2.97 (0.71)	3.20 (0.94)	2.83 (0.98)	4.00 (1.50)	2.61 (0.61)
Frequency of school standards for collaboration	0.97 (0.80)	0.44 (0.65)	0.50 (0.55)	0.33 (0.71)	0.65 (0.59)
Headteachers' attitude towards collaboration	2.50 (0.62)	2.40 (0.59)	2.40 (0.89)	3.00 (0.00)	2.42 (0.69)
Behavioural management	3.57 (0.43)	3.15 (0.65)	2.90 (0.76)	3.29 (0.43)	3.80 (0.33)
Organization of workflow	3.67 (0.38)	3.48 (0.54)	2.89 (1.05)	3.62 (0.49)	3.86 (0.18)
Classroom climate	3.61 (0.32)	3.48 (0.56)	3.00 (1.20)	3.73 (0.43)	3.44 (0.34)
Teacher perception of class engagement	3.49 (0.59)	3.58 (0.68)	2.56 (0.09)	3.83 (0.67)	3.86 (0.44)
Perceived stress	2.90 (0.93)	2.64 (1.07)	3.78 (0.91)	2.37 (0.95)	2.09 (0.55)

Note. N = number of class teams.

Table 6: Results of Comparisons Between Clusters in Collaboration and Context Variables

Variables	Analysis of variance	Statistically significant pairwise comparisons
Exchange intensity	$F(4, 113) = 11.40$, $p < .001$, $\eta^2 = .27$	$B < A$ ($p < .001$), $B < C$ ($p < .001$), $B < E$ ($p < .001$)
Co-construction intensity	$F(4,112) = 17.40$, $p < .001$, $\eta^2 = .09$	$C > B$ ($p = .044$)
Intensity of collaboration regarding student performance	$F(4,97) = 154.49$, $p < .001$, $\eta^2 = .59$	$A > B$ ($p < .001$), $A > E$ ($p < .001$), $C > A$ ($p < .001$), $C > B$ ($p < .001$), $C > D$ ($p < .001$), $C > E$ ($p < .001$), $D > B$ ($p < .001$), $D > E$ ($p < .001$)
Intensity of collaboration regarding classroom management	$F(4,76) = 95.38$, $p < .001$, $\eta^2 = .35$	$D > A$ ($p < .001$), $D > B$ ($p < .001$), $D > C$ ($p < .001$), $D > E$ ($p < .001$),
School size	$F(4,109) = 3.37$, $p = .012$, $\eta^2 = .05$	Not significant
Team size	$F(4,108) = 3.10$, $p = .019$, $\eta^2 = .132$	$D > A$ ($p = .021$), $D > E$ ($p = .002$)
Frequency of school standards for collaboration	$F(4,111) = 2.78$, $p = .030$, $\eta^2 = .11$	$A > B$ ($p = .009$)
Headteachers' attitude towards collaboration	$F(4,99) = 1.67$, $p = .162$, $\eta^2 = .063$	-
Behavioural management	$F(4,46) = 3.03$, $p = .027$, $\eta^2 = .21$	Not significant
Organization of workflow	$F(4,62) = 2.98$, $p = .026$, $\eta^2 = .18$	$C < A$ ($p = .017$), $C < E$ ($p = .013$)

Variables	Analysis of variance	Statistically significant pairwise comparisons
Classroom climate	$F(4,46) = 0.61$, $p = .657$, $\eta^2 = .10$	-
Teacher perception of class engagement	$F(4,106) = 62.84$, $p < .001$, $\eta^2 = .18$	$C < A$ ($p = .006$), $C < D$ ($p = .001$), $C < E$ ($p < .001$)
Perceived stress	$F(4,107) = 6.57$, $p < .001$, $\eta^2 = .14$	$E < A$ ($p = .031$), $E < C$ ($p = .002$), $D < C$ ($p = .042$)

4 Discussion

4.1 Interpretation of Results

The findings of this study suggest that different types of class teams can be distinguished in terms of their collaboration characteristics (RQ1). The analysis identified five distinct clusters, each exhibiting unique collaboration characteristics. The clusters differ in size. Cluster B, which is characterized by comparatively lower levels of collaboration, contains the highest number of class teams, approximately a third of the sample. This finding indicates that intense teacher collaboration is not a prevalent feature of many class teams in Swiss primary schools, thereby raising questions about the nature of team cohesion, considering that teamwork is understood as a group of people working with shared responsibility towards shared goals (Vangrieken et al., 2015).

The clusters differ with regard to their context characteristics, as described in the following section. Clusters A and E, representing half of the sample, are both moderate in terms of intensity of exchange. However, a divergence emerges in the perception of collaboration intensity for student performance among teachers in these clusters. Specifically, teachers in Cluster A report a moderate level of intensity of collaboration, while those in cluster E note a lower intensity. The two smallest clusters are distinguished by their unique collaboration characteristics: Cluster C has high values for intensity of exchange, co-construction, and intensity of collaboration for student performance. Conversely, Cluster D exhibits the highest values for intensity of collaboration regarding classroom management. The following interpretations could potentially explain the small number of class teams falling into these clusters. The relatively limited number of classes in Cluster D could be indicative of a lower prevalence of collaboration concerning classroom management. Cluster C is distinguished by high values for teacher perceived stress and low values for

teacher perception of class engagement. The small number of classes in this cluster might be due to a sampling bias in terms of differential participation: teachers who perceive their class as particularly demanding or stressful may have been less likely to take part in a study, whereas class teams with more favourable context characteristics were probably more willing to participate. This pattern of selective non-participation is consistent with findings from educational and psychological research. For example, Guillemot et al. (2024) report that teachers experiencing higher occupational stress or more challenging classroom conditions are less likely to respond to survey invitations. Similarly, Meinck et al. (2017) note that in large-scale assessments, non-response is often systematically associated with contextual characteristics and may introduce bias in favour of better-resourced or less strained settings. In our case, the focus of the investigation on active learning time may have further contributed to this bias, as teachers working in difficult conditions could have felt hesitant to have their classroom dynamics scrutinized or perceived participation as burdensome.

In relation to RQ2, the discussion will focus on teacher perceived stress and teacher perception of class engagement as a combined entity. As cooperation characteristics are high in both Clusters C and D, it could be assumed that Clusters C and D would have positive values for context characteristics. However, this is not the case. Cluster D perceives its classes as moderately challenging, expressing moderate values of stress, while Cluster C views its classes as demanding and shows a high value for perceived stress and the lowest teacher perception of class engagement. Consequently, the findings imply that the hypothesis that collaboration generally leads to a reduction in teacher stress, as previously suggested by the research literature (Dizinger et al., 2011), may not be valid. The outcomes indicate that the *focus* of collaboration is a salient factor. For cluster D, the focus of collaboration lies on classroom management. As discussed in the literature review, it can be assumed that collaboration with a focus on classroom management has a positive impact on class engagement, which in turn leads to a more positive perception of the class and lower levels of teacher stress.

Conversely, Cluster C focuses on student performance, yet teachers in this cluster exhibit a notably diminished perception of student engagement and report elevated levels of stress. This suggests that, in this particular cluster, collaboration does not alleviate the challenges faced by teachers. It can thus be hypothesized that the emphasis on student performance may constrain the potential of collaboration to collectively address challenges in class, i.e., with class engagement. In contrast, in Cluster D classes are perceived as moderately challenging. The focus of the high collaboration intensity in Cluster D lies on classroom management. Although empirical findings on the effects of specific

collaboration foci remain mixed (Goddard et al., 2015; Ronfeldt et al., 2015), focusing on classroom routines and behavioural strategies may help create a more structured learning environment. This, in turn, could support students' behavioural engagement and contribute to more positive teacher perceptions of the class climate.

However, teachers in Cluster E perceive their classes as relatively straightforward, exhibiting low levels of perceived stress and moderate to high teacher perceptions of class engagement. In this context, collaboration appears to function at a low-intensity level, primarily as a form of informal exchange. Such collaboration may be sufficient for monitoring purposes and ensuring that teachers are alerted if difficulties arise, but it does not require continuous or in-depth engagement. This interpretation aligns with findings by Gräsel et al. (2006), who describe teacher collaboration as often situation-specific and reactive, emerging in response to concrete problems rather than being embedded in systematic professional learning processes. Accordingly, the findings suggest that the effectiveness of collaboration is not inherent to its intensity, but emerges from how well its focus aligns with contextual demands. This highlights the need for a more differentiated perspective on teacher collaboration as a context-sensitive professional resource.

4.2 Limitations and Future Research

4.2.1 Limitations

It is important to note several limitations of the present study. Primarily, the sample size is relatively modest. Despite the random selection of class teams, it is acknowledged that the 32 class teams may not be representative of all fifth-grade class teams in Switzerland. Moreover, the sample is context-specific, focusing on German-speaking Swiss primary schools, which may limit the generalizability of the findings to other educational systems or cultural settings.

The analysis indicates that the foci of collaboration may offer valuable insights into understanding teacher collaboration in class teams. However, the investigation only inquired about two foci, classroom management and class performance, which had previously been identified in the research literature. It is conceivable that there are others that are pertinent to teacher collaboration in class teams.

In addition, the cross-sectional design precludes any inference of causal relations. Although the analysis of variance identified significant differences between clusters in terms of context characteristics, it does not allow for conclusions regarding the direction or dynamics of these relationships. For instance,

teacher stress might be elevated due to a class being perceived as demanding, which could subsequently influence the focus of collaboration.

Further limitations concern the use of self-reported data, which may be subject to social desirability or perceptual bias. The study also focused on observable patterns of collaboration rather than deeper qualitative processes or informal practices that may not be reported in surveys. Moreover, the range of contextual variables included in the analysis was limited; additional variables such as leadership, school climate, or team tenure could yield further insights. Lastly, potential measurement limitations should be acknowledged, particularly regarding the operationalization of collaboration foci and the reliance on single-item or adapted scales for some constructs.

4.2.2 Future Research

The findings of the research reveal several areas which could be of interest for future research into teacher collaboration. Given the limited sample size, which consisted only of fifth-grade primary classes, it would be worthwhile replicating the clusters in a different sample. Further analyses on the relations between classroom management, teacher self-efficacy, teacher stress, class engagement, and foci of collaboration could prove beneficial in addressing the interdependences.

The impact of teacher collaboration must be considered in relation to the specific context of the educational environment. As previous research has shown, the nature and function of collaboration are shaped by situational demands and local working conditions (Gräsel et al., 2006; Vangrieken et al., 2015). The findings of this study suggest that there is a decline in both collaborative efforts and the degree of focused collaboration in instances where the engagement of the class is perceived as positive. This observation could be interpreted as a salient characteristic of collaboration, suggesting that teachers may identify a reduction in the necessity for collaboration in a class that is regarded as 'easier', leading to a concomitant reduction in stress. However, it is important to note that collaboration focused on classroom management is associated with reduced stress. Future research could seek to determine the elements of collaboration focused on classroom management and the characteristics that support the establishment of such a collaboration, with a view to reducing stress.

Moreover, a paucity of longitudinal research exists on teacher collaboration. The implementation of a longitudinal design would facilitate the examination of causal relationships, as well as interactions and moderators, with regard to class team collaboration, classroom management, and student engagement.

5 Conclusion

Teacher collaboration in the class team, involving all teachers teaching a given class, is characterized by a large heterogeneity. Nevertheless, it is possible to identify clusters. The typology provides a framework for comprehending the interplay between intensity and foci. The findings of this study emphasize the significance of collaboration foci for both school development and the evolution of teaching practices. Of particular interest is the emphasis on classroom management within class teams, as this collaborative approach assists teachers in managing challenging classes and reducing stress. It is recommended that headteachers establish standards for collaboration that encourage a high collaboration intensity, whilst also guiding collaboration towards foci such as classroom management, which helps teachers to ensure class engagement and improve student achievement. The results underscore the repercussions of counterproductive foci, such as an exclusive emphasis on performance, and the intricacies involved in establishing the foundations of teacher collaboration in a manner that ensures its operationalization in challenging scenarios. The interplay between context characteristics and teacher collaboration requires further attention in both practice and research.

References

- Baeriswyl, S., Krause, A., & Kunz-Heim, D. (2014). Arbeitsbelastungen, Selbstgefährdung und Gesundheit bei Lehrpersonen. Eine Erweiterung des Job Demands-Resources Modells. [Job demands, self-compromising behavior and occupational health of teachers - an extension of the job demands-resources model.] *Empirische Pädagogik*, 28(2), 128–146.
- Borgatti, S. P., Everett, M. G., & Johnson, J. C. (2018). *Analyzing Social Networks* (2nd ed.). SAGE.
- Clemente, G. P., & Grassi, R. (2018). Directed clustering in weighted networks: A new perspective. *Chaos, Solitons & Fractals*, 107, 26–38.
- Collyer, E., Lawrence, C., Jacobs, L., Mitchell, R., & Fox Goddard, P. (2020). "Harder than other lessons but good": The effect of colleague collaboration on secondary English pupil engagement. *English in Education*, 54(4), 334–345.
- Csárdi, G., & Nepusz, T. (2006). *The igraph software package for complex network research* [Computer software].
- Dizinger, V., Fussangel, K., & Böhm-Kasper, O. (2011). Lehrer/in sein an der Ganztagschule: Neue Kooperationsanforderungen – neue Belastungen? [Being a teacher in all-day schools: new types of cooperation and stress experience?] *Zeitschrift für Erziehungswissenschaft*, 14(Suppl. 3), 43–61.
- Djigic, G., & Stojiljkovic, S. (2011). Classroom management styles, classroom climate and school achievement. *Procedia - Social and Behavioral Sciences*, 29, 819–828.
- Doppenberg, J. J., den Brok, P. J., & Bakx, A. W. E. A. (2012). Collaborative teacher learning across foci of collaboration: Perceived activities and outcomes. *Teaching and Teacher Education*, 28(6), 899–910.
- Eisinga, R., Grotenhuis, M. T., & Pelzer, B. (2013). The reliability of a two-item scale: Pearson, Cronbach, or Spearman-Brown? *International Journal of Public Health*, 58(4), 637–642.

- Finn, J. D., Pannozzo, G. M., & Voelkl, K. E. (1995). Disruptive and inattentive-withdrawn behavior and achievement among fourth graders. *The Elementary School Journal*, 95(5), 421–434.
- Freiberg, H. J. (2013). Classroom management and student achievement. In J. Hattie & E. M. Anderman (Eds.), *International Guide to Student Achievement* (pp. 228–230). Taylor and Francis.
- Goddard, R., Goddard, Y., Sook Kim, E., & Miller, R. (2015). A theoretical and empirical analysis of the roles of instructional leadership, teacher collaboration, and collective efficacy beliefs in support of student learning. *American Journal of Education*, 121(4), 501–530.
- Gräsel, C., Fussangel, K., & Pröbstel, C. (2006). Lehrkräfte zur Kooperation anregen – Eine Aufgabe für Sisyphos? [Encouraging teachers to cooperate – a task for Sisyphus?] *Zeitschrift Für Pädagogik*, 52(2), 205–219.
- Guillemot, F., Lacroix, F., & Nocus, I. (2025). Teachers' non-response bias in questionnaires about their attitude towards inclusive education. *Journal of Research in Special Educational Needs*, 25(3), 312–322.
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate Data Analysis* (8th ed.). Cengage Learning.
- Han, J., Kamber, M., & Pei, J. (2012). *Data Mining: Concepts and Techniques* (3rd ed.). Morgan Kaufmann.
- Harazd, B., & Drossel, K. (2011). Formen der Lehrkooperation und ihre schulischen Bedingungen. Empirische Untersuchung zur kollegialen Zusammenarbeit und Schulleitungshandeln. [Types of teacher cooperation and its educational conditions -empirical examination about collegial collaboration and school-administrative actions.] *Empirische Pädagogik*, 25, 145–160.
- Hargreaves, A., & O'Connor, M. T. (2018). Collaborative Professionalism: When Teaching Together Means Learning for All. Corwin.
- Holtappels, H. G. (2020). Lehrkooperation und Teamarbeit in Schulen – Zur Bedeutung der Kooperation für Professionalisierung, Schulentwicklung und Unterrichtsqualität. [Teacher co-operation and teamwork in schools – The importance of cooperation for professionalisation, school development and teaching quality.] In H. G. Holtappels, Karin Lossen, Aileen Edele, Fani Laueremann, & Nele McElvany (Eds.), *Jahrbuch der Schulentwicklung: Vol. Band 21* (pp. 10–44). Beltz.
- Howell, D. C. (2018). *Multiple Comparisons with Unequal Sample Sizes*. University of Vermont.
- Long, J. S., & Ervin, L. H. (2000). Using heteroscedasticity consistent standard errors in the linear regression model. *The American Statistician*, 54(3), 217–224.
- Lundervold, A. J., Bøe, T., & Lundervold, A. (2017). Inattention in primary school is not good for your future school achievement – A pattern classification study. *PLOS ONE*, 12(11), e0188310.
- Maag Merki, K., Kunz, A., Werner, S., & Luder, R. (2010). *Professionelle Zusammenarbeit in Schulen*. [Professional collaboration in schools.] Universität Zürich & Pädagogische Hochschule Zürich.
- Meinck, S., Cortes, D., & Tieck, S. (2017). Evaluating the risk of nonresponse bias in educational large-scale assessments with school nonresponse questionnaires: A theoretical study. *Large-scale Assessments in Education*, 5, 3.
- Muckenthaler, M., Tillmann, T., Weiß, S., & Kiel, E. (2020). Teacher collaboration as a core objective of school development. *School Effectiveness and School Improvement*, 31(3), 486–504.
- Nielsen, H. S., & Rangvid, B. S. (2012). The impact of parents' years since migration on children's academic achievement. *IZA Journal of Migration*, 1, 6.
- Ophardt, D., & Thiel, F. (2019). Klassenführung/Klassenmanagement. [Classroom management.] In E. Kiel, B. Herzig, U. Maier, & U. Sandfuchs (Eds.), *Handbuch Unterrichten an allgemeinbildenden Schulen* (pp. 257–264). Verlag Julius Klinkhardt.
- Pianta, R. C., Hamre, B. K., & Mintz, S. (2012). Classroom Assessment Scoring System (CLASS) Upper Elementary Manual. Teachstone.
- R Core Team. (2020). *R: A language and environment for statistical computing*. [Computer software]. R Foundation for Statistical Computing.

- Reeves, P. M., Pun, W. H., & Chung, K. S. (2017). Influence of teacher collaboration on job satisfaction and student achievement. *Teaching and Teacher Education*, 67, 227–236.
- Ronfeldt, M., Farmer, S. O., McQueen, K., & Grissom, J. A. (2015). Teacher collaboration in instructional teams and student achievement. *American Educational Research Journal*, 52(3), 475–514.
- Roorda, D. L., Koomen, H. M. Y., Spilt, J. L., & Oort, F. J. (2011). The influence of affective teacher–student relationships on students’ school engagement and achievement: A meta-analytic approach. *Review of Educational Research*, 81(4), 493–529.
- Sandmeier, A., Kunz Heim, D., Windlin, B., & Krause, A. (2017). Negative Beanspruchung von Schweizer Lehrpersonen. Trends von 2006 bis 2014. [Negative stress among Swiss teachers. Trends from 2006 to 2014.] *Schweizerische Zeitschrift Für Bildungswissenschaften*, 39, 75–94.
- Schrader, F.-W., & Helmke, A. (1987). Diagnostische Kompetenz von Lehrern: Komponenten und Wirkungen. [Teachers’ diagnostic competence: Components and effects.] *Empirische Pädagogik*, 1(1), 27–52.
- Swiss Conference of Cantonal Ministers of Education. (n.d.-a). Compulsory education. In *EDK – Education system Switzerland*. Retrieved 20 June 2025, from
- Swiss Conference of Cantonal Ministers of Education. (n.d.-b). Lehrerin/Lehrer für die Primarstufe. [Primary school teacher] In *EDK – Bildungssystem Schweiz*. Retrieved 20 June 2025, from
- Swiss Conference of Cantonal Ministers of Education. (n.d.-c). Lower secondary school teacher training. In *EDK – Education system Switzerland*. Retrieved 20 June 2025, from
- Vangrieken, K., Dochy, F., Raes, E., & Kyndt, E. (2015). Teacher collaboration: A systematic review. *Educational Research Review*, 15, 17–40. <https://doi.org/10.1016/j.edurev.2015.04.002>
- Vogt, F., Kunz Heim, D., Baez, C., Safi, N., & Zumwald, B. (2022). Kooperation in Klassenteams: Qualität und Wirkungen aus der Sicht von Klassenlehrpersonen. [Cooperation in class teams – Quality and effects from the perspective of class teachers] *Beiträge zur Lehrerinnen- und Lehrerbildung*, 40(2), 213–229.
- Vogt, F., Kunz Heim, D., & Zumwald, B. (2016). Kooperationsqualität: Strukturqualität, Prozessqualität, Wirkungen und Forschungsdesiderate. [Quality of collaboration: Structural quality, process quality, effects and research desiderata.] In A. Kreis, J. Wick, & C. Kosorok Labhart (Eds.), *Kooperation im Kontext schulischer Heterogenität* (pp. 15–32). Waxmann.
- Westphal, A., Schulze, A., Schlesier, J., & Lohse-Bossenz, H. (2024). Who thinks about dropping out and why? Cognitive and affective-motivational profiles of student teachers explain differences in their intention to quit their teaching degree. *Teaching and Teacher Education*, 150, 104718.
- Wettstein, A., Schneider, S., grosse Holtforth, M., & La Marca, R. (2021). Teacher stress: A psychological approach to stressful interactions in the classroom. *Frontiers in Education*, 6, 681258.
- York-Barr, J., Ghore, G., & Sommersness, J. (2007). Collaborative teaching to increase ELL student learning: A three-year urban elementary case study. *Journal of Education for Students Placed at Risk*, 12(3), 301–335.
- Zimmermann, M. B., Gubeli, C., Puntener, C., & Molinari, L. (2004). Overweight and obesity in 6-12 year old children in Switzerland. *Swiss Medical Weekly*, 134(35–36), 523–528.

Author Information

Baez, Charlotte, Dr.

St.Gallen University of Teacher Education

Institute of Digital and Computer Science Education

Areas of Expertise: Social Interactions in Learning, Social Networks, and Communities of Practice in the Digital and AI-Shaped World

Address: St. Gallen University of Teacher Education

Müller-Friedbergstrasse 34

9400 Rorschach, Switzerland

E-Mail: charlotte.baez@phsg.ch

ORCID: 0000-0003-1085-8441

Vogt, Franziska, Prof. Dr.

St. Gallen University of Teacher Education

Institute of Early Childhood Education 0 to 8 years

Areas of Expertise: Early Childhood Education, Teacher Collaboration, and Teaching and Learning

Address: St. Gallen University of Teacher Education

Notkerstrasse 27

9000 St. Gallen, Switzerland

E-Mail: franziska.vogt@phsg.ch

ORCID: 0000-0002-2023-0431

Kunz Heim, Doris, Prof. Dr.

University of Applied Sciences and Arts Northwestern Switzerland

Institute for Research and Development, School of Education

Areas of Expertise: Psychosocial Health of Teachers and Professional Development of Teachers in an Institutional Context

Address: University of Applied Sciences and Arts Northwestern Switzerland

Bahnhofstrasse 6

5210 Windisch, Switzerland

E-Mail: doris.kunz@fhnw.ch

ORCID: 0000-0002-5077-6996