Highlights

- The paradoxical relationship between autonomy and collaboration is disentangled.
- Teacher (classroom) autonomy is defined in relationship to collaboration.
- Two autonomy attitudes are distinguished: A reactive and reflective attitude.
- A measure distinguishing between autonomy and collaborative attitude is developed.

Teacher autonomy and collaboration: A paradox?

Conceptualising and measuring teachers' autonomy and collaborative attitude

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Abstract

This study starts from the finding that a complex – sometimes even paradoxical - relationship exists between teacher autonomy and collaboration. Teacher autonomy is often equated to independence and individual work, excluding collaboration by definition. Hence, the first objective includes disentangling this paradoxical relationship by defining perceived autonomy and collaborative attitude as two distinct concepts. As existing autonomy measures are not equipped to capture this distinction, the second objective includes the development of a measure in line with the proposed conceptualisation. This resulted in an instrument consisting of three scales (collaborative attitude, didactical-pedagogical autonomy, curricular autonomy) with confirmed psychometric quality.

Keywords: Teacher autonomy; collaborative attitude; teacher collaboration; questionnaire development

Autonomy seems to be a central construct in education: Teachers strongly value autonomy as a desired workplace condition and it is perceived to affect their professional status and job satisfaction (Strong & Yoshida, 2014). At the same time, the importance of teacher collaboration is becoming more strongly emphasised (Ronfeldt, Owens Farmer, McQueen, & Grissom, 2015). This combination may provide challenges for traditional interpretations of autonomy. It also makes it crucial to investigate the (evolving) meaning of autonomy and how this relates to (the increasing importance of) collaboration.

Teachers' common-sense beliefs and the theoretical definitions of autonomy often equate autonomy to individualism or independence (Moomaw, 2005; Street & Licata, 1989). The long-standing culture of teacher isolation and individualism relates to and amplifies teachers' interpretation of individualised autonomy as independence. In 1975, Lortie (Westheimer, 2008) described the working context of teachers working in isolation in their classrooms as 'egg-crate' schools. This is supported by structural arrangements in schools (e.g., focus on individual teaching in separated classrooms, lack of scheduled common time for collaboration) and the 'live and let live' posture of many teachers (Anderson, 1987; Cameron, 2005; Smith, 2009; Tschannen-Moran, Uline, Woolfolk Hoy, & Mackley, 1999; Westheimer, 2008). However, these conceptualisations of autonomy become untenable in an environment characterised by a rising significance of collaboration. Teachers are expected to be effective collaborators as interrelated benefits of teacher collaboration were found for students, teachers themselves, as well as for the school as a whole (Author et al., 2015). For example, teachers demonstrate improved instructional practice and morale (Bertrand, Roberts, & Buchanan, 2006), student learning and performance improve (Main & Bryer, 2005; Ronfeldt et al., 2015), and a school climate that is more supportive of innovation is realised (Moolenaar, 2010).

This trend towards collaboration challenges the aforementioned understanding of autonomy as being equal to individual and independent work. As a consequence, there appears to be a complex, sometimes even paradoxical, relationship between autonomy and collaboration. Equating autonomy to independence induces a negative attitude towards interdependent collaboration because teachers view this to be a threat to their autonomy (Author et al., 2015; Moolenaar, 2010; O'Reilly, Chatman, & Caldwell, 1991). Hence, these conceptions of autonomy become untenable in a context in which collaboration is becoming key. Teachers, students, and schools as organisations benefit from a more lenient and inclusive autonomy concept that does not exclude a collaborative culture and attitude. This has the potential of creating win-win situations by both alleviating experienced tensions and elevating the teachers' sense of empowerment (Somech, 2005).

These challenges and tensions are demonstrated in the evolving definitions of teacher autonomy in scientific literature. While older definitions focus on autonomy as meaning independence through isolation and alienation, more recent conceptions include collaborative decision-making and freedom to make prescriptive professional choices (Willner, 1990, in Pearson & Moomaw, 2005). These definitions reveal different interpretations of and attitudes towards autonomy. They also open up a new understanding of the relationship and tension between autonomy and collaboration. This study aims to map this evolving nature of teacher autonomy and how this demonstrates varying degrees of openness towards collaboration. To realise this overarching goal, this study has two objectives. The first involves conceptually exploring and defining the meaning of teacher autonomy and the relationship with teachers' attitudes towards collaboration. It aims to clearly distinguish between autonomy and

collaborative attitude as two distinct constructs and thus presents a more inclusive autonomy concept that does not exclude collaboration in its definition.

Since an instrument capable of quantifying teacher autonomy in relation to collaboration currently does not yet exist, the second objective focuses on the development and validation of a questionnaire based upon the proposed autonomy conceptualisation.

Conceptualising Teacher Autonomy

In line with the first objective, this conceptual part of the study focuses on defining teacher classroom autonomy, with a focus on its relationship with collaboration.

Defining Autonomy

Different definitions of (teacher) autonomy are proposed in the literature. The one suggested by Hackman and Oldham (1975), explaining autonomy as the freedom a worker has to schedule work and to determine the procedures he/she used to carry it out, is often used. Translated to the educational context, Husband and Short (1994) argue autonomy to be "the ability to control daily schedules, to teach as one chooses, to have freedom to make decisions on instruction, and to generate ideas about curriculum" (p. 60).

Autonomy is often confounded with participation in decision-making. Although both constructs together are captured with the concept of control, they are distinct job aspects. Ashford and Saks (2000) argued that autonomy includes control over the immediate parameters of one's work, while participation refers to the degree of input into or influence over issues (in)directly affecting one's task domain. The difference between the two constructs derives from the areas over which one has an influence:

classroom decisions (autonomy, operational) and decisions that affect multiple classrooms, the school, or the district (participation, strategic) (Firestone & Pennell, 1993). The focus here is on autonomy regarding classroom decisions, not participation in decision-making at the school level.

Over the years, there has been a shift in the conceptualisation of teacher autonomy in research (Zeng, 2013). Looking at definitions put forward through time, the focus has changed from independence and non-reliance, centred in the norms of individualism described earlier, to personal choice and collaborative decision-making. For example, Wilches (2007) argued, "teacher autonomy can be conceptualised as a personal sense of freedom from interference or in terms of teachers' exercise of control over school matters" (p. 245). Similarly, Willner (1990, in Pearson & Moomaw, 2005) identified an older and a newer concept of teacher autonomy. While the first focuses on teachers' independence through isolation and alienation, the more recent conception of teacher autonomy includes collaborative decision-making and the freedom to make prescriptive professional choices. This evolution is related to the complex relationship between teacher autonomy and collaboration. The different definitions reveal different attitudes towards autonomy, especially in relation to collaboration. These attitudes are described below.

Attitude Towards Autonomy

Related to the aforementioned evolution in the conception of teacher autonomy, two attitudes towards autonomy are distinguished based upon a distinction made by Koestner and Losier (1996). First, a *reactive autonomy attitude* corresponds to perceptions of autonomy mostly found in older definitions of teacher autonomy that focus on independence and non-reliance (Street & Licata, 1989). In contrast, the

conception of autonomy put forward in the Self-Determination Theory (SDT) by Deci and Ryan (1991) includes a *reflective autonomy attitude*. The latter corresponds to more recent definitions of teacher autonomy, focusing on personal choice and feelings of agency. An overview of the key differences between both attitudes can be found in Table 1.

Table 1

Overview Reactive and Reflective Attitude

Reactive attitude	Reflective attitude
Freedom from the governance of others	Freedom to self-govern
Independence and non-reliance on others	Interdependence
Interpersonal process of resistance	Intrapersonal process of personal choice
Promotion of individualism	Promotion of connectedness

Reactive autonomy attitude. The idea of a reactive attitude towards autonomy originates from the work of Henry Murray (1938). He defines autonomy as "to resist influence or coercion; to defy an authority or to seek freedom in a new place. To strive for independence" (Murray, 1938, p. 467). A reactive attitude refers to individuals having the propensity of being resistant to external forces, pushing them away from others' influences, even to their detriment (Chirkov, Ryan, Kim, & Kaplan, 2003; Murray, 1938). According to Murray (1938) "the need for autonomy controls those who wish neither to lead nor to be led, those who want to go their own way, uninfluenced and uncoerced by others" (p. 152). Similarly, Gough and Heilbrun (1983), Hackman and Oldham (1975), and Street and Licata (1989) refer to *independence* from others, institutions, or social values and expectations when defining autonomy. These

definitions are related to the description of schools as *loosely coupled systems* (Weick, 1976). From this perspective, teachers tend to operate as separate individuals, more or less independent in their classroom setting. They are loosely coupled to their colleagues in the sense that limited coordination is required and that they can perform their jobs mostly individually and independently.

Hence, from a reactive perspective on autonomy, the focus is on *freedom from* governance or influence of others, including *independence and non-reliance*, presenting an *interpersonal process of resistance* to external influences (Hodgins, Koester, & Duncan, 1996; Koestner & Losier, 1996). Autonomy is defined in its relationship to others - not depending on others for one's own (job) functioning, not being influenced by others – and is related to an individualistic perspective. Thus autonomy can be seen as opposite to relatedness or *promotion of individualism* (Koestner & Losier, 1996). In the case of teachers, this conception of autonomy is based on individually centred autonomy in the classroom, independent and free from external influences.

Reflective autonomy attitude. Departing from previous dominant beliefs in personality psychology underlying reactive autonomy, Deci and Ryan (1991) propose a reflective form of autonomy. The need for autonomy described in SDT includes people wanting to possess agency, to feel that they themselves are the origin of their actions, and to have a voice in determining their own behaviour (Deci & Ryan, 1991). This sense of professional agency refers to teachers having the power to act, influence, make decisions and choices, and take stances related to their work and professional identities (Vähäsantanen, 2015). A reflective form of autonomy thus includes experiencing one's own behaviour as willingly enacted and fully endorsing actions taken and the values these represent (Chirkov et al., 2003; Ning Chua & Koestner, 2008). Hence, autonomy is

based upon having the capacity to make informed choices based on an awareness of one's needs, interests, and values (Koestner & Losier, 1996).

As opposed to a reactive attitude, a reflective attitude towards autonomy does not include total independence and non-reliance as task in(ter)dependence and autonomy are classified as distinct task dimensions (Kiggundu, 1983). The reflective autonomy of teachers possessing agency is defined as relationally embedded and shaped by historical and sociocultural practices such as curriculum guidelines, cultural norms, and social influences (Lasky, 2005; Vähäsantanen, 2015). As these external influences are inherently present, autonomy does not include complete resistance but "the issue is whether my following such influences reflects mere obedience or coercion rather than a reflective valuing of the direction or guidance that these inputs provide" (Ryan, 1993, p. 10). Social influences and interdependence are perceived as positive factors that are inherently part of the teaching profession. This attitude can for example be found in the autonomy definition put forward by Gavrilyuk et al. (2014), arguing "autonomy implies that the person is aware of his/her dependence and is able to manage this situation of dependence through making personal choice" (p. 136). Similarly, applied to the context of teachers Wermke and Hösfält (2014) describe teachers' professional autonomy as their action range to react to the dilemma or tension between their work as professional practitioners in the classroom on the one hand and depending on organisational structures (e.g., the school organisation, curriculum provided by state governance) on the other hand. Autonomous action is possible even when following others' advice. Individuals can be autonomously dependent when they enact personal choices and can lack autonomy when rejecting others' influence (Deci & Flaste, 1995; Weinstein, Przybylski, & Ryan, 2012). This relates to the distinction of Hargreaves (1994) between constrained, strategic, and elective individualism. Constrained and strategic

individualism can be considered examples of lacking autonomy when being deprived of or rejecting others' influence. In the case of constrained individualism, administrative or organisational constraints hamper or inhibit teacher collaboration while in the case of strategic individualism, teachers withdraw in isolation because of strategic reasons such as increasing pressures on them by others (Hargreaves, 1994; Kelchtermans, 2006). In both cases autonomy does not demonstrate a fully endorsed personal choice based on an awareness of one's values and needs. Elective individualism however does indicate a positive and intrinsic choice as demonstrated in a reflective attitude. Thus, reflective autonomy does not exclude external influences and can be seen as an *intrapersonal process including personal choice* (Koestner et al., 1999). The latter is determined by whether the origin of action derives from an internal or external locus of causality (deCharms, 1968). In the case of reflective autonomy, individuals see themselves as the origin or agent of the action and thus take responsibility for their actions, including making responsible judgements when taking actions (Edwards, 2015). Reflective autonomy is demonstrated in the more recent concept of autonomy proposed by Wilner (1990, in Pearson & Moomaw, 2005), which is founded on collaborative decision-making and freedom to make prescriptive professional choices concerning their teaching (as opposed to autonomy based on independence through isolation). Similarly, Wilches (2007) argues that autonomy should be perceived as "freedom for professional action, discretion within limits, interdependence, and support" (p. 254). As suggested in this definition, reflective autonomy refers to *freedom to* self-govern, in the sense of making informed agentic choices based upon an awareness of one's own needs and values (Hodgins et al., 1996; Wermke & Höstfält, 2014). Decisions are only really free if the origins of the action - the actor's desires or beliefs - are truly the agent's own, indicating a sense of agency (Cuypers & Haji, 2008; Wermke & Höstfält, 2014).

Furthermore, reflective autonomy is centred upon a positively framed *interdependence* rather than independence: The focus is not solely on the isolated and independent self but on providing high quality education in a school environment characterised by interdependence among both staff and school structures. The latter include for example grade-level curricula building on each other that create vertical interdependencies across grades, and interdisciplinary goals and objectives for students that induce horizontal interdependencies across subject lines.

In conclusion, a reflective autonomy attitude includes an *intrapersonal* perception of autonomy, referring to managing the inevitable *(inter)dependence* through making *personal choice*. It includes the *promotion of connectedness* as "the high self-awareness and lack of defensiveness of autonomous people should allow for interaction characterized by greater empathy and openness" (Hodgins et al., 1996, p. 228). It refers to *freedom to self-govern* and act in a self-directed manner built upon an awareness of one's needs, interests, and values; and to feel like an *agent* of one's own actions. This does not exclude consulting colleagues and collaborative endeavours.

Domains of Teacher Autonomy

As a teacher's job is multifaceted, teacher autonomy manifests itself in different job domains. As such, different authors refer to various domains in which teachers can exercise their autonomy (e.g., curriculum development, teaching and assessment, professional development, and school functioning [Friedman, 1999]). Teachers' desire for and attitude towards autonomy can differ in relation to these different aspects of their job.

As mentioned earlier, the focus of our conceptualisation is on autonomy regarding classroom decisions, which is the core of a teacher's job. As the domain of

teachers' classroom decisions is still very broad, different aspects are distinguished based upon existing definitions and operationalisations of classroom autonomy. The domains of autonomy distinguished here are primarily centred on the conceptualisation of Friedman (1999) (Teacher Work Autonomy scale), also used by Strong (2012), and the refined version of the Teacher Autonomy Scale validated in different studies (Moomaw, 2005; Pearson & Hall, 1993; Pearson & Moomaw, 2005; Pearson & Moomaw, 2010). A distinction is made between the content and the pedagogical aspect of classroom practice. The content aspect includes preparing lessons, choosing topics and skills to be taught, decisions about the curriculum, choice and use of textbooks, student assignments, setting goals for students, and student evaluation. The pedagogical aspect includes teaching methods and strategies, the use of time and planning, and managing student behaviour. This leads to a distinction between 10 domains in total.

Autonomy and Collaboration

As mentioned previously, a tension appears to exist between autonomy and collaboration, especially in the context of teachers. The latter is not surprising as a teacher's job mostly consists of individual work, in relative independence from others (Licata et al., 1990). Individual work seems to be structurally and culturally embedded in teachers' job (Author et al., 2015). Moreover, the ambiguous relationship between teacher autonomy and collaboration was confirmed as autonomy was found to be both a facilitating and a hindering factor for teacher collaboration (Author et al., 2015). Operating as a facilitating factor, teacher autonomy is perceived as a central condition for successful teacher collaboration (e.g., Crow & Pounder, 2000; Scribner, Hager, & Warne, 2002; Yisrael, 2008). This relates to a circular relationship between autonomy and collaboration put forward by Clement and Vandenberghe (2000), stating that

"Collegial interactions are a source for the autonomous work and autonomous initiatives often lead to meaningful collegial contacts" (p. 91). Furthermore, teachers should have a certain level of autonomy in their choices of when and how to collaborate (Clement & Vandenberghe, 2000). However, the fear of loss of autonomy hampers collaboration, which in turn leads to autonomy also becoming a hindering factor (Johnson, 2003; Somech, 2008).

This ambiguity and tension appear to be related to the autonomy attitudes presented above. Teachers often equate autonomy to independence - demonstrating a reactive attitude. This ultimately induces a negative attitude towards interdependent collaboration and team-based environments because they experience this to be a threat to their autonomy (Author et al., 2015; Moolenaar, 2010; O'Reilly et al., 1991). Teachers may see collaborative work as threatening their professional autonomy when the latter is considered as individually centred autonomy in a particular classroom (Johnson, 2003). Hence, reactive autonomy appears to be related to an aversion towards teamwork and thus unsustainable in a context in which collaboration is becoming a must (O'Reilly et al., 1991). In 1987, Anderson stated that "barriers of isolation, the sanctity of the classroom, and concerns for 'academic freedom' must be replaced by concerns for the welfare of the organization and the 'common good'" (Anderson, 1987, p. 370). The *common good* or main aim should include effective teaching that supports students' learning and educational performance. As demonstrated by Ronfeldt et al. (2015), a collaborative school culture rather than a focus on classroom isolation is positively related to students' learning. The perception that autonomy and collaboration are opposites seems to be confirmed in the wordings of the (teacher) autonomy definitions demonstrating a reactive attitude. For example, Benson (2000) referred to teacher autonomy as the right to *freedom from control by others.* This inherently

interpersonal conception of autonomy found in a reactive attitude appears to exclude collaboration in its definition.

Reflective autonomy might be more supportive with regard to opportunities for collaboration. As suggested by Frase and Sorenson (1992, p. 40), "to be isolated in a classroom without collegial interaction or meaningful feedback is not the intended spirit of autonomy". Autonomy definitions revealing a reflective attitude do not perceive autonomy to be the opposite of (inter)dependence or collaboration as they refer to an intrapersonal rather than an interpersonal conception of autonomy. Thus, teachers can be autonomous in collaboration - managing (inter)dependence through making personal choices - and can lack autonomy in isolation when such isolation is not a personal choice. For example, in the case of constrained individualism as defined by Hargreaves (1994), individualised autonomy is not a personal choice but a side effect of administrative or organisational limitations.

Hence, autonomy in itself does not have a negative relationship with collaboration. The tension between autonomy and collaboration is presumed to be caused by a reactive autonomy attitude signifying a lack of openness towards collaboration. It is the right combination of autonomy and collegiality that positively fosters teachers' professional development (Author et al., 2016; Clement & Vandenberghe, 2000). As suggested by Somech (2005), "teachers might achieve a 'win-win' situation if the norms of the profession of teaching do not translate autonomy into isolation and if collaboration is not perceived as violating teachers' freedom" (p. 260). Moreover, Zeng (2013) argued that autonomy can be developed in cooperation with others.

Overview Conceptual Framework

It can be concluded that different definitions and interpretations of autonomy include different possibilities for the combination of autonomy and collaboration. Various definitions confound autonomy and individualism or isolation and present it as opposing collaboration. These conceptions (referring to *independence, freedom from, uninfluenced*) exclude collaboration in their definition.

This study proposes a unified conceptualisation of autonomy and its relationship with collaboration, aiming to disentangle autonomy and collaboration or independence. In this regard, two autonomy attitudes – reactive and reflective – were described. A core distinguishing feature between these two attitudes includes their openness towards collaboration as they demonstrate a very different collaborative attitude. Hence, this study proposes a distinction between autonomy and teachers' collaborative attitude, both being separated constructs. In this way, autonomy in itself does not exclude collaboration. Teachers' classroom autonomy is described as the degree to which they have ownership and freedom to make decisions about their classroom practice. This can be combined with a low as well as a high collaborative attitude: When paired with an individualistic attitude, a *reactive* autonomy attitude is demonstrated, while its combination with openness towards collaboration includes a more *reflective* interpretation of autonomy. Moreover, the multifaceted nature of teachers' classroom practice resulted in the distinction between different domains of autonomy.

This conceptual framework consisting of (1) an autonomy definition unrelated to collaboration, (2) collaborative attitude, and (3) different autonomy domains, is the basis for the development of a novel measure for teacher autonomy.

Developing a Measure for Teacher Autonomy

As suggested above, there is a need to be able to measure both teacher autonomy and collaborative attitude in line with the presented conceptual framework. However, this distinction cannot be accurately captured using existing measures. Some measures tend to confound autonomy and independence and focus on an interpersonal interpretation of autonomy (Bacharach & Aiken, 1976; Hackman & Lawler, 1971; Hackman & Oldham, 1975; Morgeson & Humphrey, 2006; Sims, Szilagyi, & Keller, 1976). Moreover, none of the research focusing specifically on teacher autonomy explicitly includes a distinction between teacher autonomy in itself and attitude towards collaboration or individual work (Friedman, 1999; Pearson & Moomaw, 2010). This makes it difficult to both empirically capture this difference and to assess teachers' levels of perceived autonomy as a construct that is distinct from independence and teachers' attitude towards collaboration. Hence, the second objective of this study is to develop a measurement instrument equipped to empirically quantify this distinction.

Procedure

The instrument development comprises of three stages. In the questionnaire development phase, items were developed based upon the literature and existing scales. In this stage, practitioners provided feedback during in-depth discussions. In the next phase, the 33-item questionnaire that was developed was tested in a large-scale quantitative study. The underlying factor structure of the questionnaire was assessed and subsequent analyses were performed to assess the internal consistency and convergent and discriminant validity of the instrument. This led to a 21-item version of the questionnaire. In the third phase, the resulting instrument was retested in order to confirm the structure of the questionnaire and assess measurement invariance over time and predictive validity.

Questionnaire Development

In line with the proposed conceptualisation, the questionnaire consists of two parts: one focusing on teachers' perceived autonomy and one assessing teachers' collaborative attitude. The development process of these two parts is elaborated upon below. An overview of the items can be found in the Appendix.

Perceived autonomy. To develop the instrument assessing perceived classroom autonomy, the 10 domains of autonomy described in the theoretical framework are used as a starting point:

- Preparing lessons.
- Choosing topics and skills to be taught.
- Decisions about the curriculum.
- Choice and use of textbooks.
- Student assignments.
- Setting goals for students.
- Student evaluation.
- Teaching methods and strategies.
- The use of time and planning.
- Managing student behaviour.

Scientific literature was examined to assess previously validated scales matching our conceptualisation of perceived autonomy and the 10 domains. Principally the scales of Friedman (1999) (those items focusing on classroom autonomy) and Pearson and Moomaw (2010) were explored. Next, for each of the domains two to eight items were selected or developed (for aspects that were not tackled in existing questionnaires) and gathered in an item pool.

The following step involved the discussion of this pool of items with practitioners to assess whether the content and formulation thereof was appropriate and whether all aspects of teachers' classroom autonomy were captured. As different stakeholders are involved in education, each having a different perspective on teacher autonomy, this study aimed to include these different perspectives by questioning practitioners from different areas of educational practice – three teachers, one teacher educator, one educational counsellor. They were each asked three main questions about the questionnaire: (a) Are there items or parts of items that are unclear to you? (b) With regard to the domains of classroom autonomy: Do you think that all these domains are important and well captured in the items? Are there aspects of classroom autonomy that are missing according to you? (c) Can you indicate the most telling and clear item(s) (one or two) for each domain of autonomy? Based upon these discussions and their feedback, the final items assessing teachers' perceived classroom autonomy were selected and the formulation thereof was refined. This resulted in two to three items for each domain of autonomy being included, leading to a total of 23 items. Each item was measured with a 6-point Likert scale ranging from 'totally disagree' to 'totally agree'.

Collaborative attitude. The next step involved the development of the measure for teachers' collaborative attitude. In line with the conceptualisation presented above, it encloses teachers' attitude towards collaboration as a construct that is separate and different from perceived autonomy as such. As this is a sensitive topic for many teachers, an important issue here includes minimising social desirability bias. In consultation with the aforementioned practitioners it was opted to tackle this issue by (a) building the collaborative attitude items in parallel with the 10 domains of perceived classroom autonomy and (b) by juxtaposing two propositions, one focused on a preference towards collaboration ("in this area, I think consultation and collaboration with

colleagues is useful and desirable") and the other focused on an individualist attitude ("in this area, I prefer to work individually and independently from colleagues"). Teachers were requested to take a position in between the two on a scale ranging from 1 (totally agree with proposition 1) to 6 (totally agree with proposition 2). Hence, the scores on these collaborative attitude items have to be reversed in order for a high score to refer to a preference for collaboration. By making a distinction between different domains of autonomy instead of assessing an overall attitude and by giving teachers the possibility to take a position on a scale ranging from 1 to 6 rather than strictly making them choose one or the other, social desirability bias is reduced as much as possible.

This led to a 10-item scale, one collaborative attitude item per domain of classroom autonomy. Hence teachers' attitude with regard to these different domains is assessed as they may be more willing to collaborate in some areas of their classroom practice while embracing an individualistic attitude in other domains.

Testing the Questionnaire

In the second and third phase, the psychometric quality of the instrument was examined in a quantitative study consisting of two waves of data collection. In the first wave (November/December 2015), 1639 teachers from 37 different secondary education schools in Flanders (a region of Belgium with approximately 6,500,000 inhabitants) completed the questionnaire. The questionnaire was distributed online and administrated in Flemish. The number of participating teachers per school ranged from 10 to 142. In the second wave (April/May 2016), 1133 of the teachers participating in the first wave completed the questionnaire (retention rate of 68.94%).

Method

Instrument. The autonomy and collaborative attitude instrument that was distributed consisted of 33 items. In order to assess discriminant validity, a measure for teachers' self-efficacy was also included in the questionnaire. This 9-item scale was derived from Tschannen-Moran and Woolfolk Hoy (2001), translated and adapted to the Flemish context by Vandenberghe, de Bilde, and Van Damme (2011). Through this scale, three aspects of teacher efficacy are assessed: efficacy for the implementation of instructional strategies, student engagement in the learning process, and classroom management.

To assess predictive validity, work engagement and collaborative professional development (CPD) were measured. Work engagement is defined as a positive, fulfilling work-related psychological state of mind characterised by vigour, dedication, and absorption (Schaufeli, Salanova, González-Romá, & Bakker, 2002; Schaufeli, 2013). Autonomy and work engagement are assumed to be related as it is hypothesised that autonomy functions as a resource that fosters work engagement – based upon the rationale of the Job Demands-Resources Model (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001; Schaufeli & Bakker, 2004). The latter is measured with the 9-item Utrecht Work Engagement scale (Schaufeli & Bakker, 2003). Moreover, a measure for CPD was included to investigate predictive validity as it was hypothesised that teachers' collaborative attitude is positively related to actual collaborative activities. This measure was based upon the work of de Vries, Jansen, and van de Grift (2013). They distinguish two types of CPD activities: exchange activities (sharing ideas, experiences, information, instructional materials) and professional collaboration (joint preparation of teaching and evaluation materials, jointly preparing lessons, discussing student performance results, etc.). This measure was slightly adapted to also capture constructive conflict (i.e., open discussion of professional disagreements) and to focus on CPD within subject

departments in the schools. These are structural units within the school that gather teachers teaching the same (or related) subject(s) and who collaborate concerning subject-related matters (e.g., curriculum, student evaluation). It was opted to focus on these because they are meaningful collaborative units in all schools that are organised to collaborate on core teaching issues. This is in line with the 10 domains of autonomy described earlier (i.e., curricular issues as well as didactical-pedagogical matters).

Items of the autonomy and self-efficacy questionnaire were answered on a 6-point Likert scale ranging from 1 = 'completely disagree' to 6 = 'completely agree'. Work engagement and CPD were measured on a 7-point Likert scale ranging from 1 = 'never' to 7 = 'always'. Moreover, in order to collate background information on the sample, the following information was requested: gender, age, hours of employment per week, years of experience, and the grade(s) and education form(s) in which they teach. The questionnaire was distributed online.

Sample characteristics. Table 2 presents an overview of the main sample characteristics of teachers participating in the first wave of data collection and those also participating in the second wave. Teachers from all grades and educational tracks are represented (general secondary education, technical secondary education, secondary arts education, vocational secondary education).

Table 2

Sample Characteristics

	First wave (*N* = 1639)	Second wave (*N* = 1133)
Females (%) / males (%)	1032 (61.80%) / 607 (37.03%)	699 (61.69%) / 434 (38.31%)
Mean age (Min – Max; *SD*)	41.30 (21 – 62; 10.41)	41.12 (21 - 62; 10.26)
Teaching	16.43	16.25

experience (Min – Max; *SD*)	(0 – 46; 10.52)	(0 - 40; 10.52)
Ad interim (%)	141 (8.60%)	96 (8.47%)
Permanent appointment (%)	1320 (80.54%)	905 (79.88%)

Analyses. To determine the structure of the questionnaire, the dataset derived from the first wave of data collection was split up in two stratified random subsets in which all 37 schools were equally represented in order to create both a development (*n* = 821) and a validation sample (*n* = 818). The development sample was used to examine the structure of the questionnaire by means of principal component analysis (PCA). It was assumed that different factors derived from the questionnaire would be related. As such, it was opted to use an oblique rotation method (direct oblimin) to allow the derived factors to be correlated. Next, the derived structure was checked in the validation sample by means of confirmatory factor analysis (CFA) (maximum likelihood estimation). Moreover, internal consistency as well as convergent and discriminant validity of the factors were investigated. The retest helped confirm the factorial structure of the questionnaire in the second wave of data collection. In addition, longitudinal measurement invariance and predictive validity were investigated.

PCA was performed in SPSS version 23, longitudinal measurement invariance in Mplus version 7.4 and for all other analyses the R software (version 3.2.1) was used (R Core Team, 2015). More specifically, the lavaan package (Rosseel, 2012), psych (Revelle, 2015), and semTools package (semTools Contributors, 2015) were used.

Results

Exploring the structure. In the first step, PCA was performed on the development sample (*n* = 821) to investigate the structure of the questionnaire. First, the inter-item

correlation matrix was examined to look for very high correlations (above .75), indicating that the unique contribution of some of the items was relatively low. They were all located in the perceived autonomy scale. As both items of each of these sets of items were located in the same domain of autonomy (e.g., lesson preparation), it was opted to exclude one of the items in each set and to retain the item that was conceptually the best representation of the domain. In this way, each domain of autonomy is represented in the instrument. Based upon this criterion, eight items were removed prior to the PCA.

Next, the suitability of the data for conducting PCA was determined. The Kaiser-Meyer-Olkin measure of sampling adequacy equalled .91 and the Bartlett's Test of Sphericity was significant (X^2=10739.18, df=276, p<.001), demonstrating that PCA is appropriate.

Different criteria were assessed to determine the number of components, including the eigenvalues (i.e., larger than one), the scree plot, and conceptual arguments. This resulted in a conceptually valid three-factor solution. Moreover, items had to have a loading larger than .40 on one of the factors and were not allowed to have high cross-loadings on other factors. The difference between an item's loading on one factor and its loading on another factor was not allowed to exceed .20. All items included in the PCA matched these criteria. An overview of the factor solution can be found in Table 3.

The first factor contained 10 items, all referring to teachers' collaborative attitude. Hence there is one *collaborative attitude* factor capturing teachers' attitude regarding the 10 different domains of teacher autonomy. Factors two and three referred to two forms of perceived autonomy and resemble the distinction between general autonomy and curriculum autonomy in the Teacher Autonomy Scale (Pearson & Hall,

1993). The second factor, *didactical-pedagogical autonomy* consisted of nine items and resembles general autonomy as defined by Pearson and Hall (1993). The items referred to the domains of lesson preparation, use of textbooks, choice of student assignments, student evaluation, teaching methods and strategies, use of time and planning, and managing student behaviour. The third factor, *curricular autonomy* included five items referring to the content of curriculum to be taught and goal setting (domains of choice of topics and skills to be taught, decisions about curriculum, and setting goals for students).

Table 3

Results Principal Component Analysis

Items	F1	F2	F3
Q1	***.763***	-.040	.116
Q2	***.857***	.005	-.046
Q3	***.839***	.059	-.051
Q4	***.760***	.139	-.152
Q5	***.877***	.019	.019
Q6	***.839***	.027	-.052
Q7	***.858***	.038	-.036
Q8	***.828***	-.064	.108
Q9	***.762***	-.073	.026
Q10	***.711***	-.050	.058
Q12	.028	***.702***	-.069
Q18	.104	***.517***	.060
Q19	.024	***.750***	.002
Q24	-.022	***.664***	-.011
Q26	.009	***.663***	.065
Q28	.023	***.799***	-.110
Q30	-.060	***.684***	.066
Q31	-.084	***.643***	.177
Q32	-.010	***.632***	.015
Q13	-.032	.231	***.633***
Q15	-.025	.313	***.580***
Q16	.084	.053	***.570***
Q22	-.042	.045	***.744***
Q23	.006	-.175	***.776***

Note. Highest factor loadings are in boldface.

Based on the structure derived from the factor analyses, it is concluded that in teachers' perceived classroom autonomy a distinction can be made between didactical-pedagogical autonomy and curricular autonomy. This division was not found in the collaborative attitude scale. The latter was found to be one factor, indicating that

teachers' collaborative attitude tends to be one-dimensional and similar across the different autonomy domains.

Confirming the structure. Next, confirmatory factor analyses (CFA) were used to assess whether the identified factor structure could be confirmed in the validation sample (n = 834). Data were suitable for CFA as the ratio of sample size to number of items exceeded the ratio of 10:1 (Hair, Black, Babin, Anderson, & Tatham, 2006). Moreover, the ratio of sample size to number of free parameters requiring statistical estimates in the model (51) also exceeded the minimum ratio of 10:1 suggested by Bentler & Chou (1987).

The three-factor structure demonstrated a moderate fit with the data (X^2/df=5.92; Comparative Fit index [CFI]=.89; Tucker-Lewis Index [TLI]=.87; Root Mean Square Error of Approximation [RMSEA]=.078 [90% CI [.062; .071]]; Standardised Root Mean Square Residual [SRMR]=.051). In order to improve model fit, adjustments were made in the model. Item 23 was excluded due to a low factor loading (.376) and item 26 and item 31 were omitted based upon the modification indices. This improved the fit of the model (X^2/df=4.56 CFI=.93; TLI=.92; RMSEA=.066 [90% CI [.062; .071]]; SRMR=.040), with all fit indices meeting the generally accepted norms for CFA (Brown & Cudeck, 1993; Hu & Bentler, 1999). Table 4 provides an overview of the results of the confirmatory factor analyses and Table 5 conceptually represents the factor structure, indicating which autonomy domains are covered by each factor.

Table 4

Results Confirmatory Factor Analysis

Item	Regression weight	Standard error	Standardised regression weight	Critical ratio[a]
Collaborative attitude				
Q1	1	[b]	0.766	[b]
Q2	1.051	0.039	0.858	26.920
Q3	0.999	0.038	0.845	26.412
Q4	0.980	0.041	0.777	23.843
Q5	1.091	0.040	0.868	27.298
Q6	1.037	0.039	0.842	26.282
Q7	1.032	0.038	0.859	26.975
Q8	1.018	0.043	0.775	23.743
Q9	0.989	0.044	0.733	22.238
Q10	0.777	0.046	0.571	16.742
Didactical-pedagogical autonomy				
Q12	1	[b]	0.677	[b]
Q18	1.106	0.080	0.548	13.849
Q19	1.112	0.062	0.733	17.835
Q24	1.084	0.076	0.564	14.219
Q28	1.116	0.061	0.760	18.354
Q30	0.945	0.059	0.644	16.000
Q32	0.819	0.065	0.492	12.546
Curricular autonomy				
Q13	1	[b]	0.732	[b]
Q15	1.047	0.055	0.839	19.155
Q16	0.672	0.056	0.466	12.021
Q22	0.799	0.054	0.571	14.668

Note. Estimation method: maximum likelihood.

[a]All critical ratios: $p<0.001$.

[b]Value fixed at 1.00 for model identification purpose, hence no standard error was computed.

Table 5

Conceptual Representation of the Factor Structure

Factor structure	Autonomy domains included	Example item
Didactical-pedagogical autonomy	• Preparing lessons • Choice and use of textbooks • Student assignments • Student evaluation • Teaching methods and strategies • The use of time and planning • Managing student behaviour	I am free to select the teaching methods and strategies that seem most appropriate to me. *(Teaching methods and strategies)*
Curricular autonomy	• Choosing topics and skills to be taught • Decisions about curriculum • Setting goals for students	I am free to implement the curricula in a flexible way in my lessons. *(Decisions about curriculum)*
Collaborative attitude	• Preparing lessons • Choosing topics and skills to be taught • Decisions about curriculum • Choice and use of textbooks • Student assignments • Setting goals for students • Student evaluation • Teaching methods and strategies • The use of time and planning • Managing student behaviour	With respect to the selection and creation of assignments for my pupils, I find it useful and desirable to discuss and collaborate with colleagues. – With respect to the selection and creation of assignments for my pupils, I prefer to work individually, without colleagues. *(Student assignments)*

Internal consistency. The internal consistency of the factors was assessed by means of Cronbach's α based on the validation subsample. The values for all factors were sufficient. The standardised coefficient for the collaborative attitude scale equalled .94. For the perceived autonomy scales, Cronbach's α equalled .82 (didactical-pedagogical autonomy) and .74 (curricular autonomy). Moreover, item-total correlations were assessed to examine whether the items included correlated sufficiently with the scale. It was opted to assess corrected item-total correlations, correcting for item overlap and scale reliability (Revelle, 2015). For the collaborative attitude scale, corrected item-total correlations ranged from .59 to .87. For the didactical-pedagogical autonomy scale these scores ranged from .50 to .73 and for the curricular autonomy scale from .46 to .79. Thereby, all of the items included in the scale had sufficient correlation with their scale factors as a whole.

Convergent and discriminant validity. Squared multiple correlations (R^2) of the items were assessed to investigate convergent validity. For the collaborative attitude scale, these ranged from .326 to .751, with a mean of .63, indicating that 63% of the variance in these items was accounted for by the ten items in this scale. For didactical-pedagogical autonomy, 40.7% of the variance in the items was accounted for in this factor (range of R^2 from .242 to .578). Finally, 44.58% of the variance in the curricular autonomy items was accounted for by the three items in this scale (range of R^2 from .217 to .704).

In order to assess discriminant validity, the criteria of Fornell and Larcker (1981) were applied, stating that the Average Variance Extracted (AVE) by the latent factor should be larger than the variance that is explained by the correlation with another latent factor. Evidence for discriminant validity is satisfactory as the root of the average variance extracted is larger than the inter-factor correlations. The results proved that

the square root AVE for each factor exceeded the correlations between the respective factor and other latent factors (see Table 3). Moreover, discriminant validity was also assessed in relation to the teacher efficacy scale. The measure of teacher efficacy contains three scales: efficacy for instructional strategies, for classroom management, and for student engagement (Tschannen-Moran & Woolfolk Hoy, 2001). This theoretically assumed three-factor structure was confirmed by means of CFA (X^2/df=4.48; CFI=.98; TLI=.96; RMSEA=.065 [90% CI [.052; .077]]; SRMR=.033) and the internal consistency of each of the factors was found to be sufficient (α=.69; α=.77; α=.90). Discriminant validity of the autonomy and collaborative attitude scales in relation to teacher efficacy was demonstrated as the square root AVE for each factor exceeded the correlations between the autonomy factors and the three teacher efficacy factors (see Table 6). Based on this evidence discriminant validity of the instrument was confirmed, both among the different scales of the instrument and in relation to teacher efficacy.

Table 6

Correlation Between Autonomy and Teacher Efficacy

	1.	2.	3.	4.	5.	6.
1.Collaborative attitude	**.79**					
2.Didactical-pedagogical autonomy	.10*	**.64**				
3.Curricular autonomy	-.02	.50***	**.67**			
4. Efficacy instructional strategies	-.02	.22***	.21***	**.66**		
5. Efficacy classroom management	-.01	.25***	.19***	.64***	**.73**	
6. Efficacy student engagement	-.03	.26***	.11**	.42***	.44***	**.87**

Note. * p<.05. *** p<.001.

Retest of the Questionnaire

In the final phase of this study, the questionnaire was administered a second time among teachers from the same sample as phase 2. Retesting the questionnaire had three aims: (a) to confirm the structure of the questionnaire identified in the first test, assessment of (b) measurement invariance over time, and (c) predictive validity of the questionnaire.

Dropout analyses. By means of ANOVA analyses it was investigated whether the mean autonomy and collaborative attitude scores of teachers who were included in the second wave (n=1133) differed significantly from those who were not included in the retest (n=506). The analyses revealed that there was no significant difference between the scores of participants and non-participants in wave 2 with regard to didactical-pedagogical autonomy (F=1.80, df=1637, p=.18, η^2=.001) and curricular autonomy (F=.12, df=1637, p=.73, η^2<.001). A significant difference was found with regard to the collaborative attitude scores: teachers who participated in the second wave, scored slightly higher (F=15.02, df=1637, p<.001, η^2=.009). However, the low effect sizes indicate an overall limited effect of attrition on the results.

CFA and internal consistency. The structure of the questionnaire was confirmed in the retest by an appropriate fit of the assumed model with our data (X^2/df=6.99; CFI=.91; TLI=.90; RMSEA=.073 [90% CI [.069; .076]]; SRMR=.045). The results of the CFA are presented in Table 7. All Cronbach's α indicators were sufficient and did not significantly increase in the event that one of the items is dropped. For didactical-pedagogical autonomy, Cronbach's α coefficient was .83 and the corrected item-whole correlations ranged from .56 to .76. The coefficient for didactical-pedagogical autonomy equalled .74 and the item-whole correlations ranged from .48 to .78. Finally, for the

collaborative attitude scale Cronbach's α equalled .94 and the corrected item-whole correlations ranged from .61 to .87.

Table 7

Results Confirmatory Factor Analysis Retest

Item	Regression weight	Standard error	Standardised regression weight	Critical ratio[a]
Collaborative attitude				
Q1	1	[b]	0.754	[b]
Q2	1.065	0.035	0.841	30.101
Q3	1.006	0.035	0.812	28.888
Q4	0.994	0.037	0.758	26.680
Q5	1.112	0.035	0.872	31.421
Q6	1.051	0.034	0.854	30.645
Q7	1.037	0.035	0.836	29.900
Q8	0.986	0.037	0.766	26.984
Q9	0.983	0.040	0.700	24.356
Q10	0.825	0.041	0.592	20.234
Didactical-pedagogical autonomy				
Q12	1	[b]	0.663	[b]
Q18	1.109	0.064	0.588	17.248
Q19	1.046	0.052	0.709	20.216
Q24	1.095	0.065	0.571	16.816
Q28	1.164	0.054	0.765	21.448
Q30	.901	0.048	0.641	18.594
Q32	.929	0.055	0.570	16.771
Curricular autonomy				
Q13	1	[b]	0.728	[b]
Q15	1.024	0.043	0.860	23.907
Q16	0.690	0.046	0.490	15.098
Q22	0.734	0.045	0.532	16.381

Note. Estimation method: maximum likelihood.

[a]All critical ratios: $p<0.001$.

[b]Value fixed at 1.00 for model identification purpose, hence no standard error was computed.

Longitudinal measurement invariance. Next, a test of whether the measurements of autonomy and collaborative attitude are equivalent over time (i.e., the same construct

with the same structure is measured over time) was performed. For each factor, tests of whether factor loadings and intercepts were equal over time were performed (Coertjens, Donche, De Maeyer, Vanthournout, & Van Petegem, 2012). The results in Table 8 demonstrate that the loadings were found to be invariant for didactical-pedagogical autonomy. However, the assumption of invariant intercepts was rejected (ΔX^2=105.25, Δdf=6, p<.001, ΔCFI=.018). Assessment of the items revealed that mostly one item (Q28 in Appendix) violated the assumptions of intercept invariance. When estimating a partial intercept invariance model (freeing the constraint on the intercept of Q28) an improved model fit was identified. Although the Chi-square difference test was still significant – which is not surprising given the large sample size - the difference in CFI (ΔCFI=.002) confirmed partial intercept invariance. This partial invariance of the intercepts indicates caution when using sum scores of didactical-pedagogical autonomy when making comparisons over time. For curricular autonomy, loading and intercept invariance was confirmed. With regard to collaborative attitude, invariance of loadings was demonstrated. The Chi-square difference test for investigating invariance of intercepts was significant (ΔX^2=34.62, Δdf=9, p<.001). As this test is influenced by the large sample size employed in this study, the difference in CFI was checked, confirming intercept invariance (ΔCFI=.002).

Table 8

Longitudinal Measurement Invariance

	Model description	X^2	*df*	CFI	RMSEA	ΔX^2	Δ*df*	*p*	ΔCFI
Didactical-pedagogical autonomy	Baseline	168.658	69	.982	.036				
	Invariant loadings	177.167	75	.982	.035	8.509	6	.203	0
	Invariant intercepts	282.418	81	.964	.047	105.251	6	<.001	.018
	Partial intercept invariance	194.848	80	.980	.036	26.190	5	<.001	.002
Curriculum autonomy	Baseline	87.357	15	.976	.065				
	Invariant loadings	90.882	18	.976	.060	3.525	3	.318	0
	Invariant intercepts	95.344	21	.976	.056	4.452	3	.217	0
Collaborative attitude	Baseline	1558.810	159	.922	.088				
	Invariant loadings	1565.274	168	.922	.086	6.464	9	.693	0
	Invariant intercepts	1599.892	177	.920	.084	34.618	9	<.001	.002

Test-retest reliability. Correlations between the measure in the first and second wave equalled .64 (p<.001) for didactical-pedagogical autonomy, .65 (p<.001) for curricular autonomy, and .51 (p<.001) for collaborative attitude. Hence, while sufficient levels of test-retest reliability were demonstrated for the perceived autonomy scales, a lower correlation was found for collaborative attitude. As stated by Author et al. (2014), moderate values can indicate that the underlying constructs in themselves are not stable over time. Moreover, test-retest reliability assumes that the whole group of participants changes in the same way over time and does not take individual differences in these evolutions into account. However, the constructs being measured – such as collaborative attitude – refer to individual perceptions and attitudes, which can be assumed to reveal high levels of individual differences.

Predictive validity. The predictive validity of the measures for teacher autonomy and collaborative attitude was assessed by investigating their relationship to work engagement and collaborative professional development, respectively. Determination of whether didactical-pedagogical and curricular autonomy (first wave) are related to work engagement (second wave) was carried out. CFA demonstrated an appropriate fit of the work engagement scale with the collated data (X^2/df=6.39; df=24; CFI=.98; TLI= .98; RMSEA=.069 [90 % CI [.059; .080]]; SRMR=.031). Next, the relationship between collaborative attitude (first wave) and collaborative professional development in subject teams (second wave) was examined. CFA demonstrated an appropriate fit of the CPD scale with our data when allowing covariances between two pairs of items belonging to the same factor (X^2/df=10.42; df=147; CFI=.92; TLI= .90; RMSEA=.091 [90 % CI [.087; .095]]; SRMR=.058).

Didactical-pedagogical and curricular autonomy were significantly correlated to the different aspects of work engagement (Table 9). Correlations ranged from .15 to .22.

Furthermore, collaborative attitude was significantly correlated to the different CPD components. Correlations equalled .21 (p<.001) for exchange activities, .27 (p<.001) for professional collaboration, and .12 (p<.001) for constructive conflict.

Table 9

Correlation Between Autonomy and Team Work Engagement

	Didactical-pedagogical autonomy	Curriculum autonomy
Vigour	.22***	.15***
Dedication	.20***	.16***
Absorption	.15***	.15***

Note. ***p<.001.

Conclusion and Discussion

The educational context is increasingly characterised by both a push and a pull towards creating a collaborative culture. While the increasingly complex nature of teachers' job and the workload included herein push towards a need to collaborate, the aforementioned variety of benefits resulting from collaboration act as pull factors. This evolution challenges traditional and common-sense interpretations of autonomy as independence, as this leads autonomy and collaboration to exclude each other. This study aimed to tackle these challenges by proposing a clarified and inclusive conceptualisation of autonomy in relation to collaboration and by developing a measurement instrument that is able to empirically grasp this.

Conceptualising Teacher Autonomy in Relation to Collaboration

The conceptual part of this study focused on defining teacher classroom autonomy particularly in relation to collaboration. In order to transcend the paradoxical

relationship between autonomy and collaboration, perceived autonomy and teachers' attitude towards collaboration or individual work were defined as two distinct concepts.

Classroom autonomy was defined as teachers' ownership and their perception of their freedom to make decisions about various aspects of classroom practice. Founded upon an exploration of different autonomy conceptualisations and the underlying relationship between teacher autonomy and collaboration, two autonomy attitudes were distinguished. These were proposed to explain the complex relationship between autonomy and collaboration; both reinforcing and excluding each other. These attitudes were grounded upon a distinction between two types of autonomy suggested by Koestner and Losier in 1996: reactive and reflective. While a reactive attitude entails an interpersonal interpretation of autonomy focusing on independence and non-reliance, a reflective attitude is inherently intrapersonal, referring to personal choice and freedom to act in a self-directed manner in an inherently interdependent context. Hence, a reactive attitude tends to hamper collaboration, whereas a reflective attitude facilitates collaborative work.

Development of a Measurement Instrument

Based upon this conceptualisation, a measurement instrument was developed distinguishing between perceived autonomy and collaborative attitude.

The instrument consistsed of three scales, two referring to aspects of perceived classroom autonomy (didactical-pedagogical and curricular autonomy) and one assessing collaborative attitude. The first scale, didactical-pedagogical autonomy, refers to teachers' actual classroom practice (e.g., lesson preparation, classroom management).

The second scale, curricular autonomy, includes the content of the curriculum to be taught and goal setting. The division in these two aspects of perceived autonomy

relates to the distinction between two levels of autonomy (internal and external) described by De Jonge (1995). Didactical-pedagogical autonomy refers to the internal level, indicating employees' or teachers' opportunities within given job standards or actual classroom practices (e.g., teaching [methods], specific lesson preparations). Curricular autonomy is related to the external level, referring to the contextual aspects of job autonomy or the various opportunities of employees' in determining several input and output requirements of their tasks. Similarly, curricular autonomy refers to elements related to instruction that influence classroom practices as they set the boundaries for these practices: Curriculum and goal setting for students that are mostly set by the educational ministry and educational umbrella organisations (i.e., mergers of schools' administrative departments) in the attainment levels and curricula. Hence, the level of curricular autonomy partly sets the boundaries in which didactical-pedagogical autonomy takes place.

The third scale of the instrument refers to teachers' collaborative attitude regarding different aspects of autonomy. It captures the degree to which teachers think collaboration and consultation with colleagues is useful and desirable, or the degree to which they prefer individual and independent work. Teachers' collaborative attitude appears to be a one-dimensional construct. While teachers' perceived autonomy was split up into two scales, teachers' perceived collaborative attitude seems to be similar across the different autonomy domains. Teachers' preference for individual work or collaboration seems to be similar for didactical-pedagogical and curricular domains. Small correlations between the two components (Table 6) confirm that autonomy and collaborative attitude indeed are separate constructs and that autonomy cannot be equated to mere independence.

Limitations

This study has some limitations that need to be taken into account when using the questionnaire and interpreting the results. First, the questionnaire was administrated and thus validated in Flemish. Hence, an important aim for future research includes validating the instrument in other languages to establish the degree of validity and reliability of the instrument across linguistic borders. In order to foster the use of this questionnaire in English, the items were translated to English by a professional academic translation agency and provided in the Appendix. Moreover, as teacher autonomy is likely to be influenced by cultural characteristics of a country and the structure of the local educational landscape, it would be valuable to assess the functioning and structure of the instrument in different geographical contexts.

Furthermore, analyses revealed that only partial intercept invariance over time was reached for the scale of didactical-pedagogical autonomy. This indicates that the results and comparisons thereof over time should be interpreted with caution. When analyses starting from the items rather than sum scores (structural equation modelling and latent growth curve analyses) are used, this can be modelled in the analysis. Thus when using this scale in longitudinal designs, change over time can be investigated using latent growth curve models.

Contributions and Practical Implications

The first contribution of this study derives from the development of a conceptual framework of autonomy in relation to collaboration. By mapping different autonomy definitions and causing the underlying evolution in its relation to collaboration to be explicit, this study contributes to the conceptual clarification of the tension between

teacher autonomy and collaboration. The framework aiming to explain the understanding of autonomy underlying these different definitions was built from the distinction between a reactive and reflective attitude (Koestner and Losier, 1996). Although this distinction appears to offer at least a conceptual explanation for the complex relationship between teacher autonomy and collaboration, it was not yet included in school research. Hence, the first contribution includes the conceptual introduction of this distinction in theorising about autonomy in relation to collaboration. This takes previous theorising on this issue one step further. While previous research suggested the existence of different types of teacher autonomy and different natures of autonomy with respect to how it relates to collaboration (e.g., Clement & Vandenberghe, 200; Hargreaves, 1994, Kelchtermans, 2006), a unified theoretical framework did not yet exist. This study's proposed conceptual framework consists of two parts: (1) a clarified and inclusive concept of autonomy and (2) a distinct concept of teachers' collaborative attitude. When autonomy is paired with a strong desire for individual and independent work, this can be seen as a reactive autonomy attitude found in older definitions of autonomy (focused on independence and non-reliance). However, when it is combined with a high degree of openness towards collaboration, a more reflective attitude is demonstrated. In the latter case, interdependence is perceived as inherently present and does not hamper teachers' autonomy. The intrapersonal perspective starts from teachers' professional agency which provides them with the means to make self-directed professional choices when managing interdependence towards the 'common good', including collectively striving for effective education and resulting student learning. Furthermore, given the multifaceted nature of teaching, teacher autonomy and collaborative attitude are defined with respect to different domains of classroom autonomy. This allows for teachers' autonomy and collaborative attitude to vary across

different domains of classroom practice. However, as demonstrated in the questionnaire structure derived from factor analyses, while teachers' perception of classroom autonomy varies across two different areas of practice (didactical-pedagogical and curricular), collaborative attitude is one unified factor. This indicates that teachers tend to have a one-dimensional attitude with this respect: their preference for individual work or collaboration tends to be more or less similar across different domains of their classroom practice.

Moreover, this distinction between a reactive and a reflective attitude was rarely investigated empirically (e.g., Hodgins et al., 1996; Koestner et al., 1999) and was not found in measures of teacher autonomy. Hence, a measurement instrument matching our conceptual framework in this context did not previously exist. This study delivered an instrument matching the proposed conceptualisation. The instrument that was developed and the results of the analyses performed in this study already present a first step in validating the conceptual distinction between teacher autonomy and collaborative attitude. The very low and mostly non-significant correlations illustrate the discriminant validity of the two autonomy factors (didactical-pedagogical and curricular autonomy) and collaborative attitude (Table 6) supporting the theoretical assumption that they are distinct concepts. These results prove that autonomy in itself does not exclude a desire to collaborate as was found in older definitions and conceptions of (teacher) autonomy (Murray, 1938; Street & Licata, 1989). Teacher autonomy can both be combined with a preference for individual work or a desire to collaborate. The combination of autonomy and a high collaborative attitude indicates a more inclusive and intrapersonal definition of autonomy. Future research should assess whether this is indeed related to a win-win situation for teachers and whether actual differences in teacher collaboration are found.

The conceptual implications of this study can provide some valuable suggestions for practice and future research. First of all, an awareness among practitioners should be created reinforcing that autonomy does not exclude collaboration and vice versa. In this regard, it is important to create a collaborative school climate that does not exclude teacher autonomy. This can be realised by giving teachers voice in decisions about the collaborative structures in the schools while also making room for bottom-up collaborative initiatives. The latter tend to be more easily able to develop the circular relationship between autonomy and collaboration – both reinforcing each other – proposed by Clement and Vandenberghe (2000). Moreover, teacher education can also play a role in creating this awareness among (future) teachers. As (school) cultural changes are difficult to realise, fostering a collaborative mind-set among students from the onset of teacher education may also be a valuable approach. Demonstrating to them the potential benefits of a balanced combination of autonomy and collaboration and coaching them in functioning in a collaborative and interdependent climate without being fully deprived of autonomy, may help create and foster an inclusive conception of autonomy in the context of education. The latter is particularly important for (future) teachers to cope with the increasingly collaborative nature of their job without feeling deprived of autonomy. Finally, future research should aim to further disentangle the relationship between autonomy and collaboration by building on the proposed unified framework. A question for future research could include investigating which combinations of autonomy and collaborative attitude are best equipped in realising successful teacher collaboration and ultimately resulting in improved instructional practice.

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Appendix. Overview of items

	Item
Q1	*With respect to the design and preparation of lessons, I find it useful and desirable to discuss and collaborate with colleagues – With respect to the design and preparation of lessons, I prefer to work individually, without colleagues*
Q2	*With respect to the selection of course content, I find it useful and desirable to discuss and collaborate with colleagues – I prefer to select course content individually, without colleagues*
Q3	*With respect to the implementation of curricula, I find it useful and desirable to discuss and collaborate with colleagues – With respect to the implementation of curricula, I prefer to work individually, without colleagues*
Q4	*With respect to the selection and use of coursebooks, I find it useful and desirable to discuss and collaborate with colleagues – With respect to the selection and use of coursebooks, I prefer to work individually, without colleagues*
Q5	*With respect to the selection and creation of assignments for my pupils, I find it useful and desirable to discuss and collaborate with colleagues – With respect to the selection and creation of assignments for my pupils, I prefer to work individually, without colleagues*
Q6	*With respect to the selection of learning objectives, I find it useful and*

	desirable to discuss and collaborate with colleagues – I prefer to select learning objectives individually, without colleagues
Q7	*With respect to the assessment of my pupils and the selection of assessment tools and criteria, I find it useful and desirable to discuss and collaborate with colleagues - With respect to the assessment of my pupils and the selection of assessment tools and criteria, I prefer to work individually, without colleagues*
Q8	*With respect to the selection of teaching methods, I find it useful and desirable to discuss and collaborate with colleagues – I prefer to select teaching methods individually, without colleagues*
Q9	*With respect to the planning and timing of lessons, I find it useful and desirable to discuss and collaborate with colleagues – I prefer to plan and time my lessons individually, without colleagues*
Q10	*With respect to classroom management, I find it useful and desirable to discuss and collaborate with colleagues – I prefer to select useful classroom management strategies individually, without colleagues*
Q11	I am free to create my own lesson plans [a]
Q12	*I am free to design and prepare lessons in my own way*
Q13	*I am free to make my own decisions regarding the content that I teach to my pupils*
Q14	I am free to tailor the content of my lessons to my target group [a]
Q15	*I am free to implement the curricula in a flexible way in my lessons*

Q16	*The curricula do not give me much freedom regarding teaching approaches*
Q17	I have a say in the selection of coursebooks that reflect my vision
Q18	*I am free to use coursebooks in a flexible way in my lessons*
Q19	*I am free to select assignments for my pupils on my own*
Q20	I am free to create assignments for my pupils on my own [a]
Q21	I am free to tailor the content of my pupils' assignments to my target group [a]
Q22	*My lessons are based on learning objectives that I select because I consider them important*
Q23	My lessons are based on learning objectives that are chosen by others
Q24	*I am free to assess my pupils as I want*
Q25	I am free to design assessment tools for my pupils in the way that seems most appropriate to me [a]
Q26	I have a say in the selection of assessment criteria
Q27	I have the opportunity to use creative teaching methods [a]
Q28	*I am free to select the teaching methods and strategies that seem most appropriate to me*
Q29	I am free to select teaching methods according to my pupils' needs [a]
Q30	*In my classes, I am responsible for time management*

Q31	I am free to design a schedule that I deem feasible for my groups
Q32	***I am free to use and adapt classroom management strategies (related to the norms and rules for my pupils' behaviour in class and to making sure that these norms and rules are respected) in the way that seems most appropriate to me***
Q33	I am free to deal with my pupils' behaviour in the way that seems most appropriate to me [a]

[a] These items were omitted from the questionnaire prior to the PCA based upon inter-item correlations *Note.* The items were translated for publication purposes. The original and validated questionnaire is in Dutch. Items that were retained in the final version of the instrument are indicated in bold and italics.