

Professional integration of teachers through the many aspects of socialisation at work using ISaTE as a measurement tool

Napoleon Arrey Mbayong^{a*}, Stephen Mokondo Moki^a

Abstract

This study presents the design and validation process for an instrument to measure the socialisation at work of beginning teachers. In pursuit of these objectives, we propose in this contribution the design and validation process for a scale for measuring socialisation at work specific to the teaching profession. A total of 1487 teachers from different levels of compulsory education in Cameroon were interviewed. The theoretical foundations and exploratory and confirmatory factorial analyses highlighted four dimensions of socialisation at work: socialisation to the work group, to the micro-political climate, to teaching tasks and to the organisation. To test and validate ISaTE, an online questionnaire was widely distributed in primary and secondary schools via teachers enrolled in a Master's programme in Education Sciences at our universities.

In compliance with various consensus criteria for scale validation processes, the proposed instrument presents strong validity arguments. This contribution addresses the major issue of a global approach to teacher induction that goes beyond approaches centred on the teacher's work in the classroom. In this contribution, we have modelled teachers' socialisation at work and presented a measurement instrument (ISaTE) that makes it possible to jointly examine the multiple dimensions of the teaching profession. Our results indicate that four dimensions coexist in the process of teachers' socialisation at work: teaching tasks, the work group, the micro-political climate and the organisation. The obvious importance of each of these leads us to question the theoretical postulate formulated following Ball (1994) and to assert that socialization to the micropolitical climate is not a component of socialization to the work group, but a distinct dimension. As a result, we have adapted our attempt to model teachers' socialization to work by including this dimension in its own right.

Keywords: Socialisation at work, Novice teachers, Professional development, Measurement Scale validation process, Measurement instrument design, Professional integration.

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1. INTRODUCTION

Origin of the need to develop a model and scale of socialisation at work adapted to the teaching profession

To date, the induction of novice teachers has been the subject of numerous studies and continues to be a central concern for educational researchers (e.g., Colognesi et al., 2020; De Stercke et al., 2010; Mukamurera et al., 2013). To describe this difficult period, a number of studies examine how teachers feel about their first steps in the profession and study their sense of personal effectiveness in carrying out their teaching tasks (Lamaurelle et al., 2016; Tschannen-Moran and Woolfolk-Hoy, 2001). Others look at 'reality shock', a well-known metaphor in the field of education to describe the first encounters between the teacher and

everyday life in the classroom (Dicke et al., 2015). Still others study their performance through pupils' results (Goldhaber et al., 2011).

What these approaches have in common is that they focus on the teacher's work in the classroom. The question then arises of the other aspects inherent in the teaching profession, such as links with colleagues, understanding how the school works and other elements that take place 'outside' the classroom and which are also part of the profession (Richards et al., 2013; Tang et al., 2016).

In recent years, work in the educational sciences has focused more and more on teachers' work within the school as an organisation, given the growing complexity of the profession (Carpentier, 2019; Maroy

and Cattonar, 2002; März and Kelchtermans, 2020). This research considers that teachers take their first steps in the classroom, but also in a school (Kelchtermans, 2019). In this way, more and more importance is attributed to perspectives that argue that the teaching profession is embedded in an organisation, which makes it essential to take account of the organisational level in the objects of analysis (Kearney, 2014).

However, research on teacher induction takes little account of this reality and of the organisational issues associated with induction (Coppe et al., in press; Kearney, 2015; Tang, Cheng and Wong, 2016). Many researchers therefore suggest studying teachers' entry into the profession from a holistic viewpoint that takes account of all the aspects they face in their induction process (Kelchtermans, 2017; Rots et al., 2012; Saka et al., 2009).

Furthermore, over the last twenty years or so, critical accounts and systematic reviews of the literature dealing with the induction of teachers have highlighted the diversity of opinions on what constitutes a successful induction (Bickmore and Bickmore, 2010; Kearney, 2014). Some studies operationalise it in terms of retention, others on the basis of teaching effectiveness, and still others are based on the job satisfaction of beginning teachers (Ingersoll and Strong, 2011). This multiplicity of approaches makes the evaluation of induction programmes complex (Kearney, 2014) and calls for reflection on tools that specifically measure induction as a process, rather than through its consequences (Bickmore and Bickmore, 2010).

In order to respond to these two observations, namely the need to adopt a holistic vision to question professional integration and the need for a specific tool to measure the process as such, and not by operationalising it through its consequences, drawing inspiration from work on organisational socialisation proves to be particularly rich. This work is mostly present in the field of sociology of work, organisational psychology and management sciences (Batistič and Kaše, 2015).

The concept of organisational socialisation developed by Van Maanen and Schein (1979), also known as occupational socialisation or socialisation at work (Martineau et al., 2009) when used in a broad perspective, as in this contribution, is of major importance in the literature on occupational integration, all work contexts taken together (Haueter et al., 2003). It refers to the integration of novices into their profession and in their organisation, with all that this implies (Cooper-Thomas and Anderson, 2006). A series of studies, including those by Chao (2012) and Van Maanen and Schein (1979), have focused on understanding how a novice becomes a fully-fledged

member of an organisation, what elements the novice needs to master and what strategies can support this integration, all of which refer to successful socialisation.

Despite this growing interest, there is not necessarily a consensus on a precise definition of socialisation (Chao, 2012; Martineau et al., 2009). Various attempts to operationalise the concept have made available different scales for measuring socialisation (Chao, 2012), but these are adapted only to specific work environments and must be tailored to the context under study in order to capture the process accurately (Bourhis, 2004). Some educational research, mostly qualitative, represents progress towards a holistic approach to contextualised induction into the teaching profession (Duchesne and Kane, 2010; Niyubahwe et al., 2018), notably the seminal text by Feiman-Nemser (2003) highlighting the acculturation process of novice teachers. Nevertheless, this contextualisation work was never done with the aim of making available an operational measurement scale for the teaching profession (Richards et al., 2014). Consequently, the field of socialisation at work offers rich theoretical foundations for thinking about the professional integration of teachers in a holistic approach and for making progress in research on its measurement (Kearney, 2015).

In pursuit of these objectives, we propose in this contribution the design and validation process for a scale for measuring socialisation at work specific to the teaching profession.

Theoretical frame of reference

This theoretical framework is divided into two sections. First, we review the work done on socialization at work in general, to arrive at a definition of teachers' socialization at work. Next, we present the dimensions of socialization at work that have been selected for the teaching context, and we propose a definition of these dimensions. This section provides a strong theoretical foundation to support the choices made in designing the measurement instrument proposed in this article.

Towards a definition of teachers' socialisation at work

While the many developments in the definition of socialisation agree on the nature of the phenomenon (Klein and Heuser, 2008), they nevertheless approach the content in different ways. At the outset, Schein (1968) presented organisational socialisation as a process of learning the norms, behaviours and value system of the organisation required to be a member of it; in other words, he referred to a process of acculturation. This socialisation content was then extended to include work group socialisation, relating to integration into the collective of colleagues (Anakwe and Greenhaus, 1999; Chao et al., 1994). Other studies add to this the learning

of tasks specific to the role the worker takes on, targeting here the mastery of professional gestures (Chao et al., 1994; Taormina, 2004). Haueter et al (2003), and subsequently Perrot and Campoy (2009), also moving towards an increasingly exhaustive approach to content, propose an integrative perspective on socialisation. They highlight three areas of socialisation: tasks/work, the work group and the organisation. Haueter et al (2003) explain that "each domain of socialisation consists of acquiring knowledge about that domain" (p. 23).

As a result of these different developments, socialisation is no longer considered solely from the perspective of acculturation, but is intended to encompass all the aspects that enable a member to take on his or her role, with the multiple learning processes that this implies. Chao (2012) explicitly describes this holistic approach, specifying that the process is no longer seen as socialisation into the organisation, but as socialisation within the organisation. This author reinforces the tendency to consider areas of socialisation beyond learning the norms, values and behaviours expected in the organisation.

In the context of teaching work, these three areas (tasks, work group and organisation) echo various works that highlight the facets of the profession. They can be found in the writings of De Stercke et al. (2010), Girinshuti (2019) and Mukamurera et al. (2019), who highlight didactic/pedagogical, relational and organisational components when analysing the teaching profession. Following on from them, we approach teachers' socialisation at work as a concept combining these three areas, which are unfolded in the next section.

Areas of socialisation at work for teachers

In this section, we explain the content of these three areas of socialisation and relate them to the literature in the field of teacher induction.

Socialisation to tasks

It is presented in the scientific literature as an important area, since it is inherent in the practice of a profession (Chao et al., 1994). Defined by Haueter et al. (2003) as "acquiring information about one's work and learning the tasks for which one has been hired" (p. 23, free translation), this dimension refers to mastery of the so-called technical aspects of the job (Lacaze, 2007).

In the teaching context, Mukamurera et al (2013) explain that this involves the acquisition and consolidation of pedagogical and didactic skills. Fernet et al (2008) point out that this includes aspects such as lesson planning, managing learning activities, assessing pupils, managing the class and carrying out administrative tasks.

Socialisation in the work group

It refers to the relationships that professionals have with their colleagues (Haueter et al., 2003; Kearney,

2015; Perrot and Campoy, 2009). During the period of professional integration, these contacts enable the newcomer to become anchored in the collective, which has its own functions.

This is particularly true for teachers, since the collaborations they establish are central to the practice of their profession (Tardif and Lessard, 1999). They enable them to move from an individualistic approach to teaching to a social and interactive approach to the profession (Tardif and Lessard, 1999). Teachers' participation in collective activities, reflection within their professional community and peer support all contribute to their professional development (Lecat et al., 2019) and to the transformation of their profession. This collaboration is crucial for beginning teachers, since their professional gestures are still relatively unstable. The social interactions established between a novice teacher and his colleagues influence the way in which he adjusts his practices with a view to continuous adaptation to the demands of the field as well as maintaining internal cohesion within the collective, likely to confer a certain legitimacy on him within his professional community (Dupriez and Cattonar, 2018).

Beyond this aspect of collaboration, Kelchtermans and Vanassche (2017) highlight the importance of learning to navigate the micro-political climate of the school. Indeed, these authors believe that, although the school is a structured organisation with its own guidelines and objectives, it is necessary to consider that the nature of teaching work involves choices, debates, positions taken and, therefore, a particular micro-political climate that needs to be mastered. In the final analysis, the micro-political climate, although it straddles a fine line with the organisational culture described in the next paragraph, refers above all to the relational aspect and interactions between colleagues. Thus, following Ball (1994), who states that in schools "micropolitics is a matter of relationships, rather than structure" (p. 3822, free translation), we postulate that, in our teaching context, the aspects linked to the micropolitical climate are inherent in the work group dimension, even if it is a dimension which appears to be distinct in other work contexts (see Chao et al., 1994) in which power structures and relationships are often more formalised.

Socialisation into the organisation

It corresponds to the actors' understanding of the aims, values and culture of an organisation in the process of acculturation (Chao et al., 1994). According to Feldman (1981), these are elements which are sometimes difficult to understand, but which are very important for understanding the work environment in which the employee, in this case the teacher, operates. Based on their understanding of these aspects, Perrot

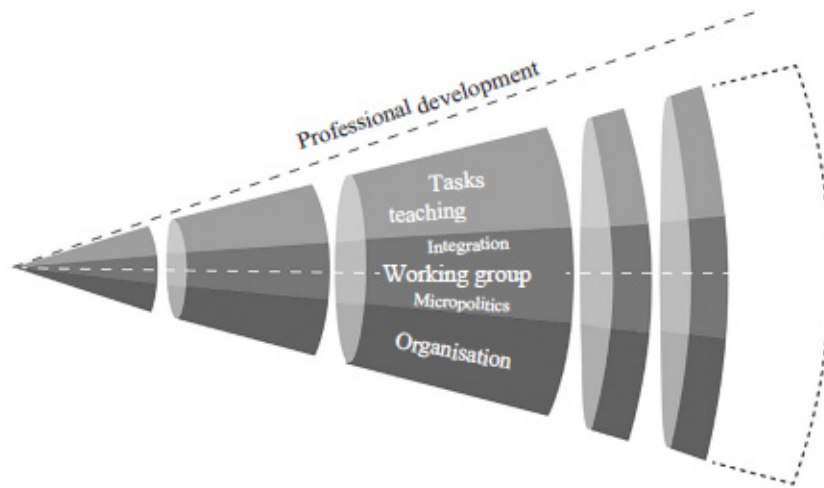


Figure 1: An attempt to model teachers' socialisation at work

and Campoy (2009) consider that their degree of acceptance is also important. They explain that, although it is important to know and understand the aims, values and, more generally, the culture of one's organisation, if the individual rejects them, the socialisation process may suffer. This organisational dimension also makes sense for the particular organisation that is the school. It is imbued with a particular culture, specific objectives and certain traditions that need to be discovered and mastered in order to become a fully-fledged member of it (Feiman-Nemser, 2003; März et al., 2019).

The model presented below (see Figure 1) illustrates and summarises the theoretical thinking presented. We have chosen the shape of a truncated cone in several places to articulate the three dimensions and to highlight a perspective that evolves with each career stage. Although socialisation at work is particularly critical at the start of a job, it is described as a process that evolves throughout a career, following a continuum (not necessarily linear) from the moment a person enters the profession until they leave it (Lacaze, 2007).

2. Methodology of Study

Study variables

Five variables were considered in the analyses described in the rest of this methodology section:

1. The central variable in this study is the scale developed, the "Instrument de mesure de la socialisation au travail des enseignants (ISaTE)" (Tool for measuring Teachers' socialisation at work); Three variables are used to obtain evidence of the validity of the relationship with other (predictive) variables in the scale:
2. Collegiate leadership as a predictive variable and therefore as an antecedent of socialisation;
3. The feeling of personal effectiveness at work;
4. Affective commitment to the organisation. These

last two are used as variables predicted by socialisation and therefore consequences of it;

5. Status as a first or second career teacher, a variable used to assess intergroup differences.

These different variables make it possible to assess the quality of the instrument designed through several validity-related criteria (Boateng et al., 2018).

Instrument design

Variable 1: ISaTE

On the basis of the literature review reported in the theoretical section and the three dimensions of the proposed model, we formulated 43 items constituting the first version of our measurement scale (see Appendix A).

Some of these items are taken from two scales measuring socialisation at work in contexts other than teaching and have therefore been reformulated to correspond to our specific context (scales by Chao et al., 1994 and Haueter et al., 2003). Although, to our knowledge, no work socialisation scale has been created specifically for teachers, Mukamurera et al. (2013) propose a scale considering novice teachers' need for support that takes up certain dimensions similar to those of work socialisation, but does not address all of them.

We also drew on this work three scales as the basis for developing an instrument tailored to the teaching profession, structured around the three dimensions of socialisation at work: socialisation to teaching tasks, socialisation to the work group and socialisation to the organisation. Responses to the measurement instrument are Likert-type, with five propositions ranging from 'strongly disagree' to 'strongly agree'.

Relationship with other variables (predictive evidence)

To obtain evidence of valid relationships with other ISaTE variables, we selected one variable considered to be a predictor of socialisation at work and two variables considered to be a consequence of socialisation at work.

Variable 2: Collegial leadership (Hoy and Sabo, 1998)

Numerous studies have shown that the posture of principals has an impact on the integration of novice teachers and, more generally, on teachers' professional development (Bickmore and Bickmore, 2010; Colognesi et al., 2020). Collegial leadership refers to a supportive, open and equitable management posture which, in a caring climate, informs its teachers of what is expected of them (Hoy and Sabo, 1998). We therefore expect college leadership to positively predict teachers' socialisation at work. The scale is composed of 9 items (5-point Likert), of which the following is an example translated from French: "Management treats all faculty members equally". It shows a good internal consistency index for our sample ($\alpha = 0.93$).

Variable 3: sense of personal effectiveness at work (Schyns and Von Collani, 2002)

The feeling of personal efficacy at work is the perception of a professional's ability to do his or her job. The many studies that have looked at this concept for teachers show, among other things, that teachers' professional development helps to strengthen their sense of efficacy (Tschannen-Moran and McMaster, 2009; Yoo, 2016). This suggests that teachers' socialisation at work will positively predict their sense of self-efficacy. We submitted the short version of the Rigotti et al. (2008) scale, an example of which is translated from English: "I feel ready to cope with most of the demands of my job". The scale is composed of 6 items (5-point Likert) and shows a good internal consistency index for our sample ($\alpha = 0.83$).

Variable 4: affective commitment to the organisation (Perreira et al., 2018)

Cohen and Veled-Hecht (2010), in an empirical study, show that the more an individual is socialised in their work, the more committed they are to their organisation and that, of the various facets of this commitment, affective commitment best represents this phenomenon. We therefore expect teachers' socialisation at work to positively predict their affective commitment to the organisation. Perreira et al (2018) propose a scale that has undergone a validation process in French to measure this concept, of which here is an example of an item: "Je suis fier(ère) de dire que je travaille pour mon organisation" (I am proud to say that I work for my organisation). The scale is composed of 3 items (Likert with 5 propositions) and shows a good internal consistency index within our

sample ($\alpha = 0.84$).

*Proof of validity of relationships with other variables: intergroup differences**Variable 5: first or second career teacher*

Several authors have highlighted the socialisation difficulties encountered by second-career teachers (Coppe et al., 2021; Coppe et al., in press; Tigchelaar et al., 2010). Second-career teachers have to take on a new professional role, and the specific characteristics of second-career teachers make this socialisation process complex (Trent, 2018). This is due in particular to the fact that they arrive with cultural and organisational patterns built up in their previous profession that do not correspond to the school (Haggard et al., 2006). These various factors lead us to believe that this group of teachers will report a lower score for socialisation at work than first-career teachers.

Data collection and participants

To test and validate ISaTE, an online questionnaire was widely distributed in primary and secondary schools via teachers enrolled in a Master's programme in Education Sciences at our universities. They were invited to send the questionnaire to their network of colleagues. Data collection took place between November and December 2023. Consent to use the information provided was obtained from all participants on the basis of the questionnaire.

The sample was collected in order to obtain a broad population of teachers, whatever their seniority, because, as explained in the Theoretical background section, socialisation at work, although critical at the start of a career, takes place throughout it (Lacaze, 2007). In the Results section, we also use measurement invariance analyses to verify the relevance of this broad sampling.

The first part of the survey, which included demographic information and questions about teachers' status (workload, seniority, initial training or not, teaching order, etc.), was used to characterise the participants. The variables questioned were proposed in a randomly generated order for each participant. A total of 1,427 teachers responded to the survey. Of these, 9% were pre-school teachers, 38.5% primary, 34.1% lower secondary³ and 18.4% upper secondary. Of these, 16.5% are men and 83.5% are women. This distribution corresponds approximately to the reality of education in the Wallonia-Brussels Federation, both by level of education and by gender (Wallonia-Brussels Federation, 2018). The average age of our sample is 36.73 years (SD = 10.29). The average seniority in teaching is 12.72 years (SD = 9.90), with a minimum of 1 and a maximum of 45 years of seniority. Also, 85.3% were first-career teachers, while 14.7% were second-career teachers.

Data analysis

The structure and validity evidence of the ISaTE was verified according to several steps that are a consensus in the literature dealing with the creation of psychometric instruments (Boateng et al., 2018). To carry out these different steps, we randomly divided our total sample into two sub-samples (Boateng et al., 2018). These two sub-samples comprise 629 and 662 teachers respectively. Traditionally, a sufficient number of participants for scale validation analyses respects an item-respondent ratio of 1:10 and includes at least 200 participants (Shanmugam and Marsh, 2015). T-tests on demographic variables indicate that these groups are not predictive of the number of participants.

There were no significant differences for age [$t_{(1484)} = 1,08$; $p = 0,282$], seniority [$t_{(1487)} = 1,02$; $p = 0,31$] or teaching level [$t_{(1240)} = -0,27$; $p = 0,79$]. The chi-square test on first- or second-career teacher status also shows that there is no over-representation of teachers in the teaching profession of a type of teacher in one of the groups [$\chi^2(1) = 0,11$; $p = 0,74$].

The evaluation of the measurement instrument was organised into three sub-studies:

1. First, exploratory factor analyses were carried out on the first sub-sample to retain the relevant items and extract the factor structure of the scale;

2. The aim of the second study was to verify the psychometric properties of the instrument and to check the relevance of the broad construct of socialisation at work by using confirmatory factor analyses and checking the reliability coefficient of the different sub-dimensions. This second study was carried out on the second sub-sample;

3. The third study, involving all our participants, involved obtaining evidence of validity by means of predictive verification and of intergroup differences in the instrument.

All analyses were carried out using Mplus software version 8.4 (Muthén and Muthén, 1998-2017).

In order to maintain a certain degree of consistency in the interpretation of this contribution, the statistical criteria used for these different stages are presented in the introduction to each sub-study.

*Results**Sub-study 1: exploratory factorial analyses*

The aim of this first sub-study is twofold. Firstly, it brings out the different dimensions making up the ISaTE. Secondly, it enables us to select, from the original 43 items, a list of items that are as parsimonious as possible and as accurate as possible for measuring teachers' socialisation at work.

Statistical criteria

Numerous methods exist for choosing the number of factors to be extracted in exploratory factor analyses.

The current trend is to use parallel analyses. However, Hayton et al (2004) and Wood et al (2015) recommend using the 'screeplot' as a basis for deciding the number of factors to extract when this is obvious to interpret. In addition, as the parallel analysis method was developed as part of principal component analysis, it is not always suitable for use in the following situations for exploratory factor analyses, as it tends to overestimate the number of factors to be retained in the case of the latter (DeVellis, 2016). We therefore chose to interpret the 'screeplot'.

The first selection of items was made in compliance with two constraints:

- (a) have a factor loading coefficient $\geq 0,50$ (Yong and Pearce, 2013) and
- (b) not have a factor loading coefficient $> 0,30$ on different factors. From this first choice, for the sake of parsimony, we eliminated some questions when they were redundant, while keeping a minimum of three items per dimension (Brown, 2014).

Each of the factor analyses was performed using a robust maximum likelihood (MLR) extraction method and the oblique rotation method (Muthén and Muthén, 1998-2017).

Results

Interpretation of the 'screeplot' elbow from the first exploratory factorial analysis reveals the four-factor solution to be the most relevant. The first three factors correspond to the dimensions of work group, organisation and tasks. The fourth dimension brings out the micro-political dimension, which we theoretically discussed as belonging to the work group dimension, but which emerges here as a factor in its own right.

Analysis of the factorial saturation matrix after rotation enabled an initial sorting of the 43 items according to the factorial saturation criteria presented above (saturation coefficient $> 0,50$). After this initial selection, 27 items were retained. The second factorial analysis verified that the pre-selected items still had a factorial saturation coefficient $> 0,50$, and a second selection stage was carried out to ensure parsimony and avoid redundant questions. Finally, 20 items were retained after this second selection (see Appendix B for this final version of the instrument). The initial and final saturation matrices and the selection of the corresponding items are presented in Table 1.

The ISaTE has a four-factor structure, corresponding to the dimensions of organisation, work group, teaching task and micro-policy of socialisation at work. These dimensions comprise 6, 3, 8 and 3 items respectively, for a total of 20 items. Each of these items has a high factor load on the factor to which it belongs, and a very low to almost non-existent factor load on the others.

Table 1: Factor loading after oblique rotation (n = 629)

Initial factor matrix					Final factor matrix				
	1	2	3	4		1	2	3	4
SG12					SG1	0,512*			
SG10M					SG2	0,826*			
SG11M					SG3	0,812*			
SG13M				0,554*	SG13M			0,535*	
SG1	0,688*				SG8M			0,716*	
SG2	0,690*				SG9M			0,857*	
SG3	0,696*				SO2		0,842*		
SG4					SO3		0,664*		
SG5	0,599*				SO5		0,840*		
SG6					SO6		0,729*		
SG7M					SO7		0,582*		
SG8M				0,723*	SO8		0,597*		
SG9M				0,829*	ST1				0,690*
SO11					ST2				0,595*
SO10					ST4				0,644*
SO12					ST7				0,590*
SO1		0,503*			ST8				0,573*
SO2		0,844*			ST9				0,713*
SO3		0,630*			ST11				0,647*
SO4		0,630*			ST14				0,505*
SO5		0,837*							
SO6		0,727*							
SO7		0,573*							
SO8		0,584*							
SO9									
ST1			0,671*						
ST2			0,611*						
ST3			0,536*						
ST4			0,639*						
ST5									
ST6			0,543*						
ST7			0,594*						
ST8			0,619*						
ST9			0,732*						
ST10			0,684*						
ST11			0,657*						
ST12									
ST13									
ST14			0,539*						
ST15									
ST16									
ST17									
ST18			0,517*						

Note. SG = working group; SGM = micro-policy; ST = teaching tasks; SO = organisation. * 5% significance level. Items in bold were retained after factor analysis. Items in italics were removed after factor analysis. Factor loadings of less than 0.5 are not shown in the table.

Sub-study 2: Confirmatory factor analyses and reliability

This second sub-study has two objectives. The first is to evaluate the psychometric properties of the ISaTE and to verify its factor structure on a sample independent of the first. For this first objective, we also check that the different dimensions selected do indeed define a broader construct of socialisation at work represented by a second-order factor. The second objective is to check whether the measurement instrument has a stable factor structure for both novices and more experienced teachers.

To pursue the first objective, we carried out confirmatory factor analyses and checked the reliability index for each dimension. Different models were tested to assess the best factor structure based on the criteria explained in the next section.

For the second objective, measurement invariance analyses were carried out between the novices in our sample (0 to 5 years' seniority) and the more experienced teachers (6 years' seniority and more).

Statistical criteria

Various indices were used to assess the quality of the models tested. The Tucker-Lewis Index (TLI) and Comparative Fit Index (CFI) indicate a fit to the data ranging from acceptable to good (0.90 to 0.95) and evolving to very good (0.99). Standardized Root Mean Square Residual (SRMR) and Root Mean Square Error of Approximation (RMSEA) indicate a fit to the data ranging from acceptable to good (0.08 to 0.05) and moving towards very good (0.01) (Little, 2013). The existence of the second-order factor representing the general construct of socialisation at work was verified by comparing the model with and without this factor using the Satorra-Bentler (2010) chi-square difference test.

To test the reliability of the different dimensions, McDonald's omega (>0.70) was preferred to Cronbach's alpha, as it takes into account the factor loading of each item to assess the reliability of the latent construct (Dunn et al., 2014).

To interrogate measurement invariance, we

sequentially tested models of increasing constraint, namely successively the configurational, metric (1er order and 2e order) and scalar (1er order and 2e order) invariance models. Each of the stages is reached when the model corresponding to the stage, compared with the model from the previous stage, does not show a decrease in CFI greater than 0.01, an increase in RMSEA greater than 0.015 or an increase in SRMR greater than 0.03 (Putnik and Bornstein, 2016).

Results

Five models were tested to verify the factor structure of ISaTE:

1. A unidimensional model using the 20 items retained in a single factor;
2. A three-factor model combining the dimensions micropolitics and workgroups in the same factor;
3. The same three-factor model, but combined into a second-order factor;
4. A model directly deduced from exploratory factorial analyses, therefore formed by four factors;
5. A model adapted from the four-factor model with a second-order factor comprising the four first-order factors.

The fit indices for these different models are shown in Table 2.

The first three models have poor indices. The first-order four-factor model and this same model with a second-order factor have adequacy indices ranging from acceptable to good, depending on the index used. This suggests that the model with a second-order factor should be chosen, since it estimates fewer parameters and is therefore more parsimonious. The Satorra-Bentler chi-square difference test (2010) confirms this choice, which establishes the existence of the general construct of sociability at work [$\chi^2(2) = 3.41$; $p < 0.18$]. Also, this model presents large and significant estimated saturation coefficients [$\lambda > 0.4$; $p < 0.001$]. The complete model is shown in Figure 2.

Table 2: Suitability indices for the different models tested in CFA

Model	TLI	CFI	SRMR	RMSEA	χ^2 (dl)	Correction factor (MLR)
1 factor	0,554	0,601	0,095	0,107	1466,256 (170)	1,2112
3 factors	0,806	0,829	0,075	0,071	722,726 (167)	1,1826
3(+1) factors	0,806	0,829	0,075	0,071	722,730 (167)	1,1826
4 factors	0,907	0,920	0,057	0,049	424,572 (164)	1,1829
4(+1) factors	0,908	0,919	0,058	0,049	427,969 (166)	1,1830

Note. TLI = Tucker-Lewis index; CFI = comparative fit index; SRMR = weighted root mean square; RMSEA = root mean square error of approximation; χ^2 (dl) = chi-square (degree of freedom); MLR = robust maximum likelihood.

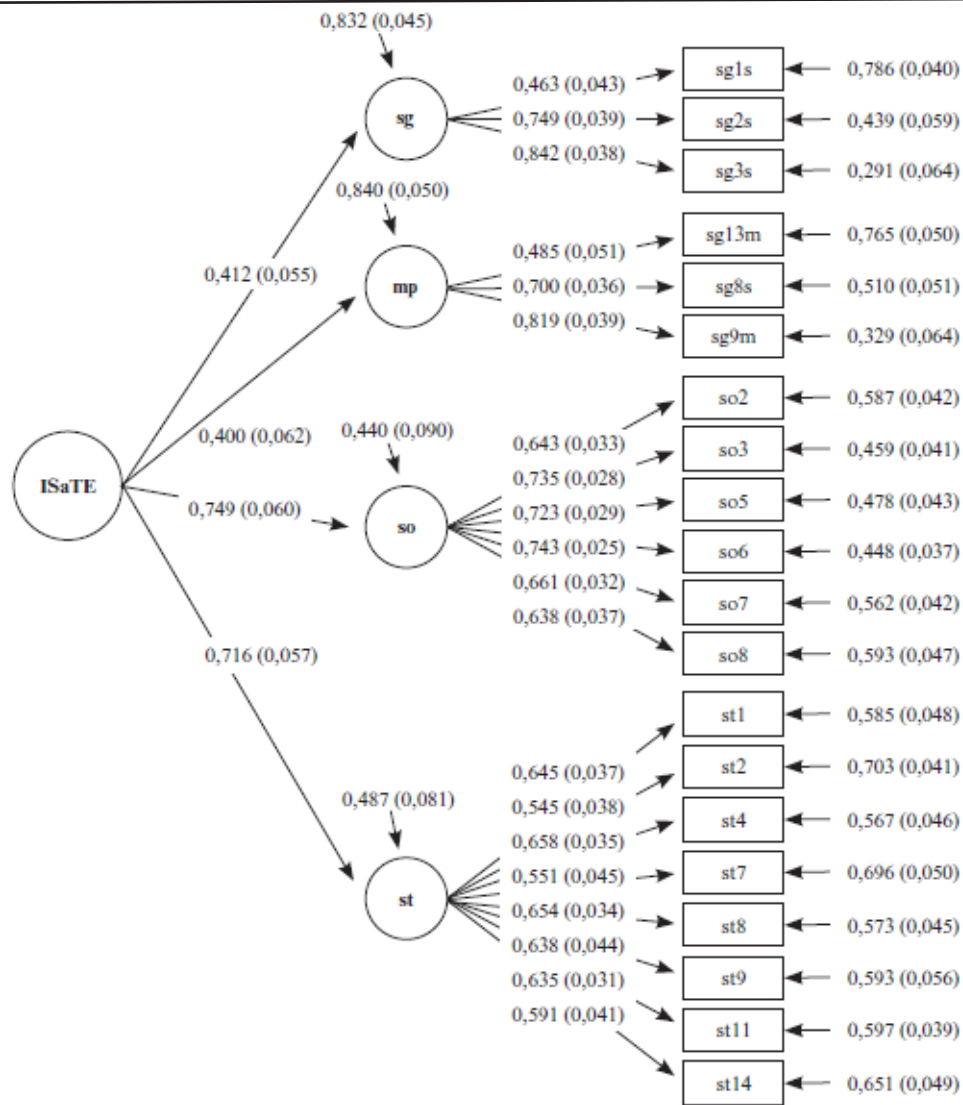


Figure 2: Model with 4 first-order factors and 1 second-order factor (n = 662)

Each of the dimensions shows sufficient to high reliability coefficients (McDonald's omega) for the dimensions work group ($\omega = 0.74$), micropolitics ($\omega = 0.72$), organisation ($\omega = 0.85$) and teaching tasks ($\omega = 0.80$).

Based on the model selected, we tested the invariance of measurement between novice teachers (0 to 5 years' seniority) and more experienced teachers (6 years' seniority and more). Since socialisation at work is presented in the Theoretical framework section as a career-long process, the verification of measurement invariance between novice and more experienced teachers shows that it was appropriate to choose a sample of teachers of all seniorities. Table 3 presents the different models, which evolve towards increasingly important constraints, allowing us to conclude that there is strong invariance (Putnik and Bornstein, 2016). *Sub-study 3: relationship with other variables: predictive component of ISaTE*

The objective of this third sub-study is to evaluate the links between our hypothetical variable predicting teachers' socialization at work and the

variables predicted by the construct. It also examines the differences between two groups hypothetically known to exhibit different behaviours with regard to socialisation at work, namely first-career and second-career teachers.

Statistical criteria

For this sub-study, the links between predictors of socialisation, the instrument designed and the variables predicted by socialisation were analysed using a structural equation model. This model includes the collegial leadership variable posited as a predictor of the work socialisation variable, and the variables feeling of personal effectiveness at work and affective commitment to the organisation inserted as variables predicted by the work socialisation variable. This model presents indices of adequacy ranging from acceptable to good according to the indices [$\chi^2(553) = 1937,92$; CFI = 0,922; TLI = 0,916; RMSEA = 0,042; SRMR = 0,065].

A difference-in-means t-test was conducted to verify the hypothetical difference in behaviour between second-career and first-career teachers with regard

Table 3: Test of measurement invariance between novices (0-5 years) and more experienced teachers (6+ years)

Model	χ^2	dl	$\Delta\chi^2$	Δdl	RMSEA	90% CI RMSEA	CFI	TLI	SRMR	ΔCFI	$\Delta RMSEA$	$\Delta SRMR$
Configural	813,34	332	-	-	0,053	0,048-0,057	0,916	0,904	0,062	-	-	-
Metric 1 st order	828,17	348	19,32	16	0,052	0,047-0,056	0,916	0,908	0,067	0,000	-0,001	0,005
Metric 2 nd order	831,41	351	3,56	3	0,051	0,047-0,056	0,916	0,909	0,068	0,000	-0,001	0,001
Scalar 1 st order	895,46	367	68,81	16	0,053	0,048-0,057	0,908	0,904	0,071	-0,008	0,002	0,003
Scalar 2 ^e order	914,35	370	20,73	3	0,053	0,049-0,058	0,905	0,902	0,073	-0,003	0,000	0,002

Note. χ^2 = chi-square; dl = degree of freedom; RMSEA = root mean square error of approximation; CFI = comparative fit index; TLI = Tucker-Lewis's index; SRMR = weighted root mean square value.

Table 4: Test of measurement invariance between first and second career teachers

Model	χ^2	dl	$\Delta\chi^2$	Δdl	RMSEA	90% CI RMSEA	CFI	TLI	SRMR	ΔCFI	$\Delta RMSEA$	$\Delta SRMR$
Configural	887,07	332	-	-	0,051	0,046-0,055	0,921	0,909	0,056	-	-	-
Metric 1 st order	900,23	348	19,97	16	0,050	0,046-0,054	0,921	0,914	0,062	0,000	-0,001	0,006
Metric 2 nd order	905,87	351	5,60	3	0,049	0,046-0,053	0,921	0,914	0,063	0,000	-0,001	0,001
Scalar 1 st order	926,06	367	17,07	16	0,049	0,045-0,052	0,92	0,918	0,064	-0,001	0,000	0,001
Scalar 2 nd order	937,04	370	11,83	3	0,049	0,045-0,053	0,919	0,917	0,065	-0,001	0,000	0,001

Note. χ^2 = chi-square; dl = degree of freedom; RMSEA = root mean square error of approximation; CFI = comparative fit index; TLI = Tucker-Lewis's index;

to socialisation at work. As a preliminary step to this t-test, we performed a test of measurement invariance between first and second career teachers, which is a prerequisite for making a comparison between these two groups (Dimitrov, 2010).

Results

The collegial leadership variable significantly predicted teachers' socialization at work and explained a non-negligible portion of its variance ($\beta = 0,501$; $R^2 = 0,25$; $p < 0,001$). The designed work socialisation instrument significantly predicted feelings of self-efficacy at work ($\beta = 0,566$; $p < 0,001$; $R^2 = 0,321$; $p < 0,001$) and affective commitment to the organisation ($\beta = 0,771$; $p < 0,001$; $R^2 = 0,595$; $p < 0,001$). The shares of variance explained are also significant for these two predicted variables.

As regards the comparison of socialisation at work between first and second career teachers, the measurement invariance between these two sub-groups of our sample is presented in Table 4. Strong invariance authorises the comparison. The theoretical hypothesis formulated is verified. First-career teachers ($M = 4,04$; $SD = 0,49$) score higher than second-career teachers ($M = 3,87$;

$SD = 0,53$) and the difference is significant [$t_{(dl)} = 4,36(1289)$; $p < 0,001$]. Dimension by dimension, from the most important to the least important, we found a difference of 0,244 ($p < 0,001$) in socialisation at the group; 0,133 ($p < 0,01$) for socialisation to the micro-political climate; 0,122 ($p < 0,01$) for socialisation to

teaching tasks; and 0,083 ($p = 0,20$) for socialisation to the organisation, the latter not being significant. Second-career teachers had the lowest scores on each of these dimensions.

Discussion and conclusion

As we said at the outset, and as much of the scientific literature shows, the teaching profession is complex. This means that researchers need to carry out work on induction, so as to have the knowledge and tools to support new teachers during this period.

However, most of these studies focus on just one facet of the profession, i.e., teaching, whereas a teacher's work is not limited solely to these didactic and pedagogical elements. It is also and necessarily part of a school, with all that this implies (Kelchtermans, 2019; März et al., 2019; Tang et al., 2016). Therefore, in order to fully assume their professional role, teachers have to acclimatise to the organisation in which they work, but also integrate socially and professionally, and understand how the group around them functions (Rots et al., 2012). And while work on socialisation at work sheds light on these different dimensions (Chao et al., 1994), it has not, until now, been rigorously contextualised to the teaching profession (Richards et al., 2014). Bourhis (2004) draws attention to the fact that the contextualisation of this concept is of major importance in understanding induction and, more broadly, professional development as a whole for a specific profession.

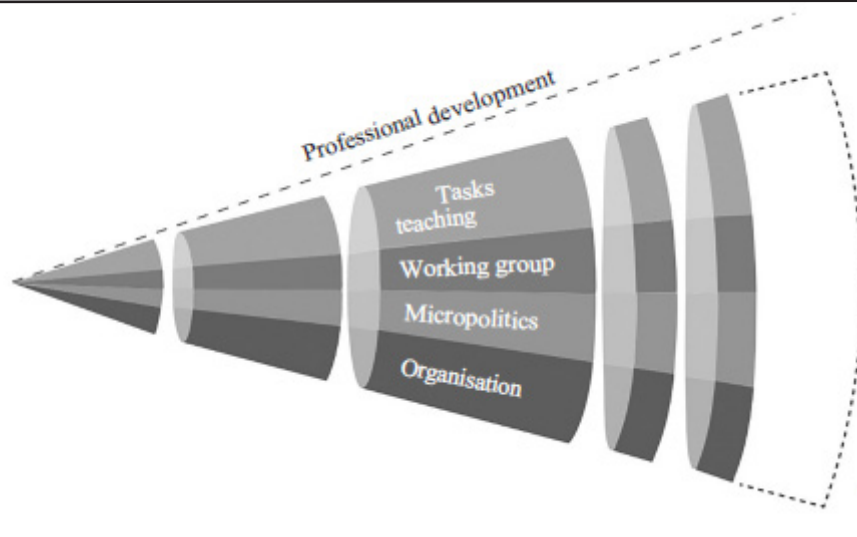


Figure 3: Modelling teachers' socialisation at work

This is the thrust of our contribution. In this contribution, we have modelled teachers' socialisation at work and presented a measurement instrument (ISaTE) that makes it possible to jointly examine the multiple dimensions of the teaching profession. Our results indicate that four dimensions coexist in the process of teachers' socialisation at work: teaching tasks, the work group, the micro-political climate and the organisation. The obvious importance of each of these leads us to question the theoretical postulate formulated following Ball (1994) and to assert that socialization to the micropolitical climate is not a component of socialization to the work group, but a distinct dimension. As a result, we have adapted our attempt to model teachers' socialization to work by including this dimension in its own right (see Figure 3).

The results thus contribute to recent discussions on the components of the teaching profession and their professional development (Tang et al., 2016). They confirm that practising the profession involves learning and adaptations that go well beyond the mere fact of teaching, as recent studies have been able to show by examining the assumption of duties by teachers through an approach based on the support needs felt by novices (Auclair Tourigny, 2017; Carpentier, 2019; Mukamurera et al., 2019).

We also put forward a measurement instrument (the ISaTE) that operationalises these four dimensions and makes them visible. The results of the analyses show a stable 20-item dimensional structure with high factor loadings. Each dimension has an adequate to high reliability index. In addition, the analyses revealed, beyond these four constituent dimensions, the existence of the all-encompassing construct of teachers' socialisation at work.

Proof of the instrument's validity was also obtained through the prediction and explanation of intergroup differences. Thus, college leadership significantly predicted socialisation at work, with a

particularly high coefficient for this first organisational predictor. In addition, the feeling of personal effectiveness at work and affective commitment to the organisation are strongly predicted by socialisation at work. The hypothesis of a difference in behaviours between first and second career teachers also verifies that second career teachers report a lower socialisation score than first career teachers.

The instrument is also characterised by strong invariance criteria, both according to the status of first or second career teacher and according to the career stage (seniority) of the participants. This last criterion justified the choice of our sample, which was not restricted to novice teachers, for designing and validating the instrument.

Limitations

Our work is not without its limitations. We have sought to operationalise teachers' level of socialisation at work, which reflects the state of the individual. However, following Feldman (2012), we argue that the socialisation process is a dynamic of learning for the individual, but also a dynamic of recognition of the individual by colleagues and the organisation. In order to take account of this dual direction, we need to combine other research methods in addition to an instrument that questions individual perceptions, such as qualitative approaches focusing on the experience of the process and the context in which it takes place.

Research prospects

Several research perspectives may therefore be relevant. Firstly, given that four dimensions are involved in teachers taking up their duties, there seems to be a major interest in analysing each of these dimensions in detail and highlighting what helps the socialisation process for each of them.

Secondly, the obvious difference in socialisation between first- and second-career teachers invites future research to examine this theoretically postulated and empirically verified state of affairs in greater detail, in

order to understand the reasons for it and to propose appropriate courses of action.

Thirdly, methodologically speaking, this initial evaluation of ISaTE, while conclusive, could be confirmed by future studies, ideally in other sub-populations in the same context, but also in other cultures and languages.

Finally, in terms of practice, it seems that the detailed conceptualisation of socialisation proposed in this paper could have an impact on teacher training and on the support systems for beginning teachers. In this sense, integrating the four dimensions into training curricula would make it possible to equip future teachers. In schools, they can also be mobilised to provide closer support to teachers as they take their first steps

NOTES

1. Process seen as the integration of the organisation's culture.
2. A second-career teacher is a professional who worked in a profession other than teaching before joining the teaching profession (Berger and D'Ascoli, 2012).
3. Corresponding to invariance in factor structure, factor saturation indices and intercepts between the two groups.

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APPENDIX A: Original and selected items

"SG2: I do n't usually like to be part in informal social events organized by colleagues (R).	Chao et al (1994)
"SG3: I do n't usually attend informal gatherings of colleagues (R)	adapted Chao et al
SG4: At my school, people would easily identify me as "a member of the team".	(1994) adapted Chao et
	al (1994) adapted
SG5: I am quite popular with my colleagues.	Chao et al (1994)
adapted SG6: I think most of my colleagues like me.	Chao et al (1994)
SG7 micropol: It's a learnt how things really 'work' between colleagues in my school.	Chao et al (1994)
"SG8 micropol: I know who the most influential people are among my colleagues.	adapted Chao et al
"SG9 micropol: I can identify the most important people among my colleagues.	(1994) adapted Chao et
SG10 micropol: I don't quite understand who has a formal role among my colleagues (C.PPT, CE, union representative, etc.). (R)	al (1994) adapted
SG11 micropol: I have a good understanding of the reasons behind my colleagues' actions.	N. A.
SG12: I understand the expertise that each colleague brings to the school	Chao et al (1994)
"SG13 micropol: I understand the informal politics between colleagues (e.g. who has influence, what needs to be done to improve or maintain a good team climate).	Haaster et al (2005)
ORGANISATIONAL SOCIALIZATION (SOI)	Haaster et al (2005)
SO1: I would be a good representative of my school.	Chao et al (1994) adapted
"SO2: My school's goals are also my goals.	Chao et al (1994) adapted
"SO3: I think I fit in well with my school.	Chao et al (1994)
adapted SO4: I don't always believe in the values defended by my school. (R)	Chao et al (1994)
adapted	
"SO5: The values of my school are also my values.	Perrot and Campoy (2009) adapted
"SO6: I support the objectives set by my school.	Chao et al (1994) adapted
"SO7: I know how to adapt to the values of my school.	Haaster et al (2005) adapted
"SO8: I understand how my work contributes to my school's objectives.	Haaster et al (2005) adapted
SO9: I know the rules, routines and procedures of my school.	Haaster et al (2005) adapted
SO10: I understand my management style (top-down, participative, democratic, etc.).	Haaster et al (2005)
SO11: I feel familiar with my school as a working environment.	Mukamurera et al (2019) adapted
SO12: I don't know who really makes the important decisions in my school. (R)	Friedman and Kass (2002)
SOCIALIZATION TO TEACHING TASKS (STIC)	
"STIC1: I know how to maintain a classroom climate conducive to learning.	Mukamurera et al (2019) adapted
"STIC2: I know how to deal with students who display inappropriate behaviour.	Mukamurera et al (2019) adapted
STIC3: I know how to motivate students who show little interest in the subject and school work.	Mukamurera et al (2019) adapted
"STIC4: I know how to establish a rapport with my students that is conducive to learning.	N. A.

Items (n = 43)	Sources
STE5: I know how to adapt to pupils with special needs in terms of differentiated teaching.	Mukamurera et al (2019) adapted
STE6: I know how to plan my teaching over the year.	Mukamurera et al (2019) adapted
*STE7: I've mastered my subject content.	N. A.
*STE8: I know how to assess my students based on subject content and planning.	Mukamurera et al (2019) adapted
*STE9: I know how to explain my subject to students so that they understand it.	Mukamurera et al (2019) adapted
STE10: I know how to convey subject content so that it can be taught.	N. A.
*STE11: I know how to get my students to give their best, even when the subject is difficult.	N. A.
STE12: I know how to use the programmes available to me and adapt when they change.	N. A.
ST13: I know how to carry out the administrative tasks involved in managing my class(es).	Fernet et al (2008) adapted
*STE14: I know how to prepare lessons so that my preparation serves my teaching.	N. A.
STE15: I know how to get involved in the decision-making processes that affect my school.	Friedman and Kass (2002) adapted
STE16: I know how to get involved in the running of my school beyond the work I do in class.	N. A.
STE17: I know how to work with other people in the school when the situation calls for it (PMS, educators, etc.).	N. A.
STE18: I know how to deal with parents when the situation calls for it.	Skashyik and Skashyik (2007)

Note: (R) = reversed item; in bold = final version items; N. A. = items designed by the authors.

APPENDIX B: Final measuring instrument (ISaTE)

Items (n = 20)	Modalities of response
SO CIALISATION TO TEACHING TASKS	
I know how to maintain a climate conducive to learning in the classroom.	1 2 3 4 5
I know how to solve problems with students with learning disabilities, inappropriate behaviour.	1 2 3 4 5
I know how to build a rapport with my students that helps them to learning.	1 2 3 4 5
I've mastered my subject content.	1 2 3 4 5
I know how to assess my students according to subject content and planning.	1 2 3 4 5
I know how to explain my subject to students in such a way that they will include.	1 2 3 4 5
I know how to bring out the best in my students, even when the subject is difficult.	1 2 3 4 5
I know how to prepare the lessons so that my preparation is at the top of my game. my teaching.	1 2 3 4 5
SO CIALISATION IN THE WORK GROUP	
I don't consider any of my colleagues to be friends (R).	1 2 3 4 5
I don't usually take part in informal social events organised by colleagues (R).	1 2 3 4 5
I'm not usually present at gatherings colleagues (R).	1 2 3 4 5
SO CIALISATION TO THE MICRO-POLITICAL CLIMATE	
I know who the most influential people among my colleagues are.	1 2 3 4 5
I can identify the people who are most important to me colleagues.	1 2 3 4 5
I understand the internal politics between colleagues (e.g. who has access to what). influence, what needs to be done to improve or maintain a good team climate).	1 2 3 4 5
ORGANISATIONAL SO CIALISATION	
My school's goals are my goals too.	1 2 3 4 5
I think I fit in well with my school.	1 2 3 4 5
The values of my school are also my values.	1 2 3 4 5
I support the objectives set by my school.	1 2 3 4 5
I know how to adapt to my school's values.	1 2 3 4 5
I understand how my work contributes to my school's objectives.	1 2 3 4 5

Note. + 1 = strongly disagree; 2 = partly disagree; 3 = neutral; 4 = partly agree; 5 = strongly agree. (R) = reversed item.