



Swiss principals' emotions, basic needs satisfaction and readiness for change during curriculum reform

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Abstract

Based on an interdisciplinary theoretical approach, this study examines the relationship between school principals' perceived satisfaction of their basic psychological needs during curriculum reform, their evaluation of the new curriculum's usability, their emotional experience and their readiness to engage actively in the curriculum implementation. The sample consists of 359 public school principals in Switzerland, who filled out a questionnaire. Data were analyzed using equation modeling. The results indicate that principals are more open towards the implementation when they evaluate the usability of the new curriculum positively. Further, we found that change-related governance policies supporting the satisfaction of the need for social relatedness, fosters principals' readiness for change, their evaluation of the new curriculum and their experience of enjoyment, the latter of which relates positively to their readiness to engage in the implementation at their school. The results of the present study suggest that not only teachers' but also school principals' emotions do play an important role in the context of educational change and that arranging for needs-oriented innovation governance is worth the effort.

Keywords Change readiness · Curriculum implementation · Emotions · Needs-satisfaction · School principals · Self-determination theory

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Introduction

With the assumption that school reform improves school, educators worldwide find themselves confronted with different exigencies and imperatives of educational change (Shirley 2017). Educational change has become an omnipresent phenomenon that pervades everyday work in school. It has been stated that many educational change attempts do not meet the intended aims (Fullan 2007) and that the sustainable implementation of innovative practices is “easier said than done” (Fink and Stoll 1998). The question is why.

The success of an educational reform depends on many factors: the characteristics of the innovation itself, organizational resources and, as educational change always concerns persons (Evans 2001), the individual’s readiness for change, comprising both a cognitive and affective component (Rafferty et al. 2013). For that matter, emotions are decisive in contexts of educational change as they can either foster or reduce a person’s willingness to engage in activities related to the change event or to adopt the innovation itself (e.g. Day 2011; Hargreaves 2005).

The high relevance of emotions in school has been well evidenced mainly by research on teachers and their work in the classroom (for an overview, cf. Frenzel 2014; Keller et al. 2014; Sutton and Wheatley 2003). As educational reforms usually aim at the development of teachers’ practices in the classroom, they challenge their professional identity, which is closely bound to their emotional reaction to the change process (Kelchtermans et al. 2009; Lee and Yin 2011; Reio 2005; van Veen et al. 2005). Apparently, teachers are more likely to accept the innovation when their sense-making of the reform is positive (März and Kelchtermans 2013) and their change-related emotional reactions do not harm their personal integrity (Schmidt and Datnow 2005). Turner et al. (2009) emphasize that how teachers evaluate, emotionally experience and engage in professional development is strongly determined by their organizational framework of personal relationships, especially to their principals. In their interpersonal circumplex model, the authors argue that principals’ emotions are strongly aligned to teachers’ emotions and motivation to implement professional development. They are one essential component of principals’ support for teachers’ motivations. While Turner et al. (2009) rather focus on principals as ‘active protagonists’ and on teachers as the ‘recipients’ in the principal-teacher relationship, we ask about the antecedents of principals’ own emotions and motivation during change, seeing them in the role of a change agent but also as a recipient. As James and Vince (2001, p. 308) point out, persons of authority in complex organizations like school principals are not enclosed in a vacuum, but “can expect to be recipients of the fantasies and projections from, for example, other staff, parents or governors”. In the context of large-scale school reforms, principals themselves are “on the receiving end” (Bartunek et al. 2006) as they have to deal with a change initiated by others. Consequently, they will experience the change process also emotionally.

School principals’ emotions have so far been examined particularly from a coping research perspective and in terms of leadership regarding their relevance to teachers’ behavior and school culture, also in contexts of change (for an overview,

cf. Berkovich and Eyal 2015). Still, a gap can be identified when we focus on principals' emotions linked to the governance policies of educational reform and their change-related behavior (ibid.). This gap becomes even more apparent when we do not only think of school principals in their role as leaders and school managers, but as the ones who are themselves led (or "governed") by legal and institutional frameworks, or other agents of their organization, i.e. teachers or superior members of the school administration.

This is the starting point of this study. We refer to research that has identified emotions as an inherent element of organizational learning (Ashkanasy 2003), which, as Vince (2001, p. 1329) points out, "occurs in the context of social relations and as a result of complex interactions, which are profoundly influenced by both individual and collective emotions". We aim at contributing to the understanding of school principals' emotions and their determinants in contexts of educational change. This paper targets to examine (a) how principals' emotions can be explained by their perception of implementation efforts exerted by their educational authorities during curriculum reform (we call this "innovation governance"), i.e. the degree to which these are perceived as corresponding to the principals' basic psychological needs for autonomy, competence and social relatedness (we call this "needs-orientation"), and, (b) how these support their motivation to implement the reform, i.e. their readiness for change.

Our theoretical foundation is set in educational governance research, Self-Determination Theory (SDT; Deci and Ryan 2008; Ryan and Deci 2000) and emotion research. Based on a cognitive appraisal theory of emotions (Lazarus 1984), this study examines school principals' emotions in the context of a curriculum reform in the German-speaking region of Switzerland. On the educational governance level, the way the new curriculum has been implemented was examined under the concept of needs-oriented innovation governance. The linking device is Deci and Ryan's Self-Determination Theory. From a SDT-perspective, change is more likely to be accepted when the persons involved experience satisfaction of their basic psychological needs for autonomy, competence and social relatedness (Deci 2009). Accordingly, we argue that innovation governance (processes and structures of the curriculum implementation) that is autonomy-supportive and allows principals to feel competent and socially related promotes a positive emotional experience of the reform and motivates principals to engage actively in the innovation process.

Conceptual framework: Theoretical notions, evidence and hypotheses

Principals' readiness for change

Reasons for implementation problems have been seen in the reform's governance policy and organizational environment. It has been explained that how individuals perceive and judge processes of change also depends on how change is governed (Altrichter 2015). Educational governance is more than the sum of structural, organizational or administrative features of the educational system that set the

conditions for any reform process. Rather, it deals with “how regulation and performance of school systems is achieved, sustained and transformed under the perspective of coordination of action between various social actors in complex multi-level systems” (Altrichter 2015, p. 10). Accordingly, the educational governance policy is not any abstract entity existing purely in form of paragraphs and laws. Instead, educational governance is a highly subjective, but also social performance of interactions between various groups of people. In our field of study, principals are considered as key figures of change. Thus, we are interested in their role during change and their perception of innovation governance.

If the organizational context of a school provides for a positive innovation culture (collective readiness for change, or a positive organizational climate), change processes tend to be implemented more easily (Hargreaves 1995; Hoy 1990). Still, the organizational setting being a result of the amalgamation of collective processes, any change-related activity eventually is performed by a single person.

A person’s readiness for change, i.e. “the extent to which [...] individuals are cognitively and emotionally inclined to accept, embrace, and adopt a particular plan to purposefully alter the status quo” (Holt et al. 2007, p. 235) is considered of paramount importance for successful implementation. Thus, we are interested in Swiss school principals’ readiness for change with regard to the curriculum implementation. We would like to know how their readiness for change relates to their perception of innovation features and innovation governance policy, which we put under the scrutiny in the light of needs-orientation. In compliance with SDT and research on emotions during educational change, we assume that principals’ readiness for change concerning the implementation of the LP21 in their school is predicted positively by their perception of innovation governance, their evaluation of the usability of the new curriculum and their emotional experience of the educational policy related to the implementation of the curriculum reform.

Why is needs-oriented innovation governance relevant for principals’ readiness for change?

Autonomy has proven to be a plurivalent concept in educational research. As a core concept in educational policy analysis, autonomy often refers to the distribution of decision-making power, which is considered as an indicator of how centralized a system of education is (EURYDICE 2007; OECD 2017). Evidence shows that legal and organizational configurations with regard to school principals’ autonomy differ across systems (OECD 2012). A “high degree of (local/individual) autonomy in the school system” is related to better education outcomes (OECD 2016).

From a psychological perspective, SDT (Deci and Ryan 2008; Ryan and Deci 2000) postulates autonomy to be an innate psychological need and an essential nutrient for an individual’s motivation. In its core, SDT tries to explain a person’s motivation to do or not do certain things. SDT proposes that individuals have three basic psychological needs: the need for competence, autonomy, and social relatedness. Evidence suggests that when individuals experience satisfaction of these basic needs, they are more highly and intrinsically motivated (ibid.). Findings in

occupational psychology suggest that the satisfaction of these intrinsic psychological needs plays an important role for job satisfaction and work engagement (Gagné 2015). This has been echoed also in research on school principals' job satisfaction (Warwas 2012) and work engagement (Bakker and Xanthopoulou 2013). We use the SDT-perspective applied in occupational psychology, e.g. with regard to work engagement (Deci et al. 2001; Gagné 2015; Gagné and Deci 2005), and argue that principals' readiness for change during curriculum implementation is related to the satisfaction of their basic psychological needs. Hence, we assume that principals' motivation to engage in the implementation of the new curriculum in their school can be extrinsic or intrinsic, depending on whether they feel driven by external incentives (or pressure) or by their own belief that the curriculum will be beneficial for their students and teachers.

In this study, we consider a principal's initial readiness for change (Holt and Vardaman 2013) as a form of prospective work engagement comprising action tendencies that are a result from the evaluation of change-related factors, like e.g. the assessment of the innovation. In line with Deci (2009), we assume that innovation governance policies that correspond to the involved persons' psychological needs for competence, autonomy and social relatedness foster the motivation to indulge in the implementation process and to internalize its "value and behavioral regulations" (ibid. p. 245). We define those structures as "needs-oriented innovation governance". We postulate that a principals' readiness for change is the higher the more positively they feel their basic psychological needs for autonomy, competence and social relatedness satisfied (Hypothesis 1).

The cognitive appraisal of the new curriculum

Subsuming general change literature, it is basically three dimensions that may contribute to or hinder successful innovation implementation: (1) The characteristics of the innovation itself (e.g. its usability, i.e. its relative advantage in relation to previous approaches, its compatibility with existing practices, its complexity, i.e. its accessibility; Rogers 1983), i.e. the change valence (Weiner 2009); (2) The characteristics of the innovation adopters (a person's willingness to change, tolerance of uncertainty, self-efficacy beliefs concerning change, etc.); (3) The characteristics and circumstances of the organization in which the innovation takes place (Rogers 1983; Wejnert 2002).

In educational change literature, similar themes have been discussed as critical factors (Hall and Hord 2015; Hargreaves 2010). For instance, if the objective of the educational innovation is perceived to be congruent with their professional beliefs, teachers are more likely to change their teaching practices (März and Kelchtermans 2013; Schmidt and Datnow 2005). Next to congruency, the usability of an innovation seems to be an essential factor for its acceptance (Rogers 1983; Wisdom et al. 2014). With regard to changes in the school context, it has been found that teachers tend to check, whether the innovative elements benefit their students (Fullan 2007). We suggest the same mechanisms for school principals and hypothesize that their

readiness for change is the higher, the more useful they appraise the new curriculum for the improvement of instruction quality (Hypothesis 2).

What do emotions bring to it?

This paper builds on a social-cognitive appraisal theory of emotions (Lazarus 1984; Pekrun et al. 2011), transferred to situations of educational change. Broadly speaking, appraisal theory intends to explain why persons often react with completely different emotions to situations that are seemingly similar. With reference to Lazarus (1984) we conceptualize emotions as affective responses to a person's cognitive appraisal of a situation, i.e. as the result of interpreting an event. Based on appraisals, an emotion implicates three fundamental aspects: (1) a relational one as the person interacts with his or her environment, (2) a motivational one when s/he assesses the relevance of a situation with regard to his or her goals, and (3) a cognitive aspect as individuals appraise a situation by thinking about its relevance for his or her life. Basically, emotions can be categorized according to their valency (positive vs. negative emotions), their intensity (strong vs. weak) and their temporal dimension (state vs. trait). Accordingly, positive emotions like enjoyment, curiosity, or hope and negative emotions such as anxiety, anger or sadness form two categories (Reeve 2009).

Emotions in contexts of educational reforms have been investigated in various ways. As a dependent variable, foremost with regard to teachers and their work in the classroom, it has been investigated which emotions are triggered by educational reforms and which antecedents frame them (Hargreaves 2010; Scott and Sutton 2009; Sutton and Wheatley 2003). If they perceive appreciation, rewards and praise by others, teachers feel affirmed in their professional identity, fostering positive emotions (Day et al. 2005; Hargreaves 2001; Reio 2005; van Veen et al. 2005). Hargreaves (1995, p. 292) showed that teachers' feeling of freedom (e.g. in planning), conceptually similar to autonomy, leads to positive emotions and the experience of 'flow' as defined by Csikszentmihalyi (1990). Negative teacher emotions, such as anxiety, have been related to their feeling threatened or vulnerable in their professional identity (Kelchtermans 2005). Teachers' experience of anger and frustration have been found to be inhibitors for their reform effort and willingness to adopt change and develop professionally (Borko 2002). For teachers, it has been found that mandated change often implies a "sense of compulsion", puts them under pressure and causes negative emotions that are named in one breath with their resistance to change (Clement 2014). At the same time, it is important to keep in mind the mechanism of emotional transmission effects, in the line of which it has been argued that "teacher-principal interpersonal interactions may be critical to teachers' perception of reform, their emotions, and their motivations to implement high-quality professional development for educational reform" (Turner et al. 2009, p. 255). Thus, school principals' emotions can be considered an important influence on school faculty's behavior in general (Beatty 2007; Lambersky 2016) and change-related behavior and emotions in particular (Owens and Valesky 2011; Yariv 2009). Therefore, it seems worthwhile to have a closer look at the question of how principals' perception of change-related governance policy relates to their emotional experience

and individual readiness for change during curriculum implementation. In research on school principals' emotions, the assertion is well established that studies on the question of how their emotions relate to educational practice, especially in contexts of change, are scarce (Ärlestig et al. 2016; Berkovich and Eyal 2015). Still, principals' emotions have been investigated and identified as an important momentum of leadership because principals function as "gatekeeper[s] balancing on the threshold between inside and outside" of the school (Kelchtermans et al. 2011, p. 96). Due to their position, principals experience external demands and pressure, are expected to deal with them and to transmit them into the school (ibid.), generating numerous emotional responses. In the context of curriculum implementation, school principals are expected to professionally manage the change process.

In this study, we consider the principals' assessment of the new "Curriculum 21" (i.e. its usability as an innovation) and their perception of the curriculum-related innovation governance as emotion-relevant acts of appraisal. We regard the governance policy of educational change, i.e. how the new curriculum implementation is governed, as an element of social–historical context. With reference to educational emotion research, we argue that the affective component is highly critical for a person's behavioral tendency during change processes. Therefore, we assume that a principals' initial readiness for change during curriculum implementation is the higher, the more positive emotions they experience (Hypothesis 3). We also propose that principals experience more negative and less positive emotions if they perceive the curriculum 21 as useless for the improvement of instruction in the classroom (Hypothesis 4).

There is only little evidence on principals' emotions with regard to the satisfaction of their basic psychological needs. If principals perceive their superiors as providing little support and autonomy, principals experience negative emotions (Beatty 2000; Carr 1994). Principals' positive affective commitment is fostered by high autonomy support (Chang et al. 2015). Interestingly, the implementation of neoliberal policies, increasing principals' autonomy and responsibility, conflicts with their professional commitment, which is primarily based on students' interests. This feeling of dissonance has been associated with negative emotions and stress (Blackmore 2004).

Apparently, research on the relationship between principals' satisfaction of the psychological need for competence in reform contexts and their emotional experience of the same is scarce. Based on other works on the satisfaction of basic psychological needs (e.g. of teachers; Deci et al. 2001; Skaalvik and Skaalvik 2014), it can be assumed that principals who perceive themselves as competent in their everyday work experience more positive emotions and work satisfaction.

Findings on principals' social relatedness indicate that a relationship based on cooperation, respect, appreciation and mutual support between principals and teachers promotes positive emotions (Beatty 2000; Brennan and Ruairc 2011; Gronn and Lacey 2004), while the opposite is observable for a lack of those elements, leading to negative emotions or even emotional exhaustion (Friedman 2002). Therefore, we suggest that principals' emotional experience of the innovation governance is positively related to their perceived satisfaction of psychological needs (Hypothesis 5). Furthermore, emotions and cognitive appraisals are inextricably linked (Scherer

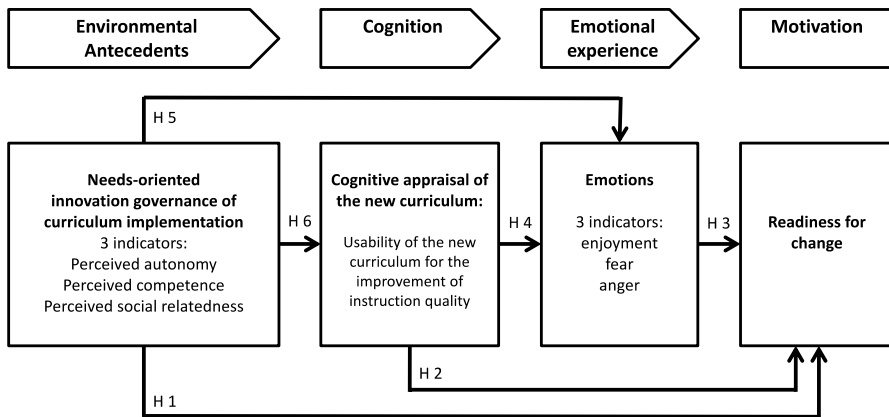


Fig. 1 Conceptual model

2001) so that a positive relation is assumed between the perceived satisfaction of basic psychological needs and the cognitive appraisal of the curriculum (Hypothesis 6).

Conceptual model

To sum up, the present study examines the role of Swiss school principals' emotions in the context of curriculum implementation. The conceptual model of this study (cf. Fig. 1) was developed in compliance with Deci and Ryan's (2000) SDT and cognitive appraisal theory of emotions (Lazarus 1984). In order to explain principals' readiness for change, we included needs-oriented innovation governance, the appraisal of the new curriculums usability and their emotional experience as predictors. As the relations can represent direct and indirect effects, mediation effects were tested as well.

Contextual setting: Switzerland's school principals and the innovation governance policy of the new "Curriculum 21"

The governance policy of the new "Curriculum 21"

As an important contextual factor of this study, the story of the new Swiss "Curriculum 21" ("Lehrplan 21"=LP21) and its implementation deserves closer attention as its political foundation is based on the deeply rooted Swiss tradition of direct democracy in educational governance that differs from many educational systems (Criblez 2015). At first sight, Switzerland ranks among those countries with only an average percentage of decisions taken at school level (OECD 2012, p. 504). However, the educational system in Switzerland is not governed centrally. Operating

on the political principle of subsidiarity,¹ each of the 26 cantons that constitute the Swiss Confederation has the authority over its own education system. In this federally governed system, each canton traditionally had its own school syllabus. Political plans to harmonize the 26 cantonal curriculums for state-run compulsory education have been made since the 1970s, but with not much success (Bieber 2016). While first preparations for the curriculum project were started in 2002, only in 2006 did the Intercantonal Agreement on the Harmonization of Compulsory Schooling (HarmoS) come into existence by the Swiss Conference of Cantonal Ministers of Education (in German: “Erziehungsdirektorenkonferenz”, EDK) and adopted the draft bill (EDK 2010). Between 2007 and 2010, HarmoS was signed by 15 cantons via referendums, while 7 declined (EDK 2010). Lately, one more canton ratified HarmoS and thereby accepted the obligation to follow the harmonization within a 6-years period. In the French-speaking cantons of Switzerland, the Plan d’étude romand (PER) was implemented between 2011 and 2014. Educational governance policies in these cantons have been described as following the “French tradition, which is rather directorial and obtains a relatively high social standing for school leaders (*monsieur le directeur*)” (Huber 2011, p. 475). Different from the German-speaking cantons, where the implementation of the new curriculum is based on voluntary participation, in the French-speaking cantons, the implementation was obligatory for all of them (Lehmann 2016). In the Italian-speaking canton of Ticino, a new curriculum in the sense of HarmoS was introduced step by step starting in 2015.² By 2016, through consensus-based political decisions, the new LP21 was accepted by most Swiss cantons.

An educational policy of decentralization was not only performed on a legal level, but also during the elaboration of the new curriculum. Several pre-project groups involving representatives of various cantons and levels of the education system (including members of teachers’ unions, school principals and administrators, educational scientists, etc.) started working on the new curriculum in 2006. Their concepts and ideas were the basis for the first draft of the new curriculum that was compiled from 2010 to 2014 by the EDK in the form of a “basic report” (“Grundlagenbericht”). Undergoing a multistage process of political consensus finding, this working paper was gradually turned into the final version of the LP21. In this context, “gradually” means that the document underwent political consultation (“Vernehmlassung”) twice. During the consultation processes, the education authorities considered it to be paramount to also involve teachers and school principals, whose feedback was used to further develop the curriculum draft (particularly, to shorten it). After the curriculum was officially and democratically approved, from 2011 to 2015 the implementation of the new curriculum was prepared. Each canton could decide on when they want to implement the curriculum. All the 21 cantons that accepted to implement the new curriculum want to do so until the year 2021.

¹ Subsidiarity is one of the fundamental principles in the Swiss educational governance system: decisions are always taken on the lowest possible political or institutional level.

² Unfortunately, there have not been any studies on the implementation process in this canton, on which we could report.

In the Canton of Bern, where this study was conducted, the first kick-off meetings for school principals took place in August 2015. During these meetings³, all the school principals of the Canton of Bern were invited to obligatory informative meetings organized by their regional school inspectorates. Those meetings not only included general information on how the curriculum should be implemented in the Canton of Bern (and which forms of support the principals could count on), but also served to positively attune the principals. During these days, school principals were also asked to form “cooperation networks” with principals of closely located schools. Thereby, they were enabled to plan working together during the implementation of the curriculum. School principals were expected and allowed to decide which trainings their staff needed in order to enable them to teach according to the new curriculum. In the spring of 2016, the first trainings were on offer, intended to prepare teachers to develop their instructional skills according to the new curriculum.

Although the reform can be considered a large-scale school reform (comprising 21 of the 26 Swiss cantons), based on a top-down approach, this short report has made clear that the educational governance policy of this curriculum reform included strong participatory elements. This form of democratic participation is an integral part of the governance linked to the implementation of the new curriculum. Furthermore, by empowering school principals to decide on which measures should be taken in their own schools, they are allowed a relatively high degree of agency, i.e. of decision-making autonomy. The latter has to be seen within the context of the educational governance system as a whole. Therefore, in the following chapter, we will explain how school principals in Switzerland are positioned in a multi-level system of actors.

School principals in Switzerland

In the Bernese official reform agenda of the new curriculum, school principals have been addressed as the most important change facilitators with regard to the curriculum implementation (ERZ 2014). The governance structures shown in Fig. 1 make it clear that a school principal’s position brings with it a complex network and intense social interaction with actors on various levels of the school system. In order to understand the special nature of innovation governance as a contextual factor of this study, the overall governance structure of principals’ position has to be acknowledged.

As can be seen in Fig. 2, Swiss—and also Bernese—principals are in a sandwich position between higher and lower levels of the education system. This makes them both subjects and objects during large-scale reforms. Their position also requires them to perform social interaction with different groups of actors continuously. It must be noted that the role of a school principal as such varies from canton to canton. Municipalities with bigger schools have established the role of a school

³ The first author herself took part in all the 14 kick-off meetings in the year 2015 for participant observation.

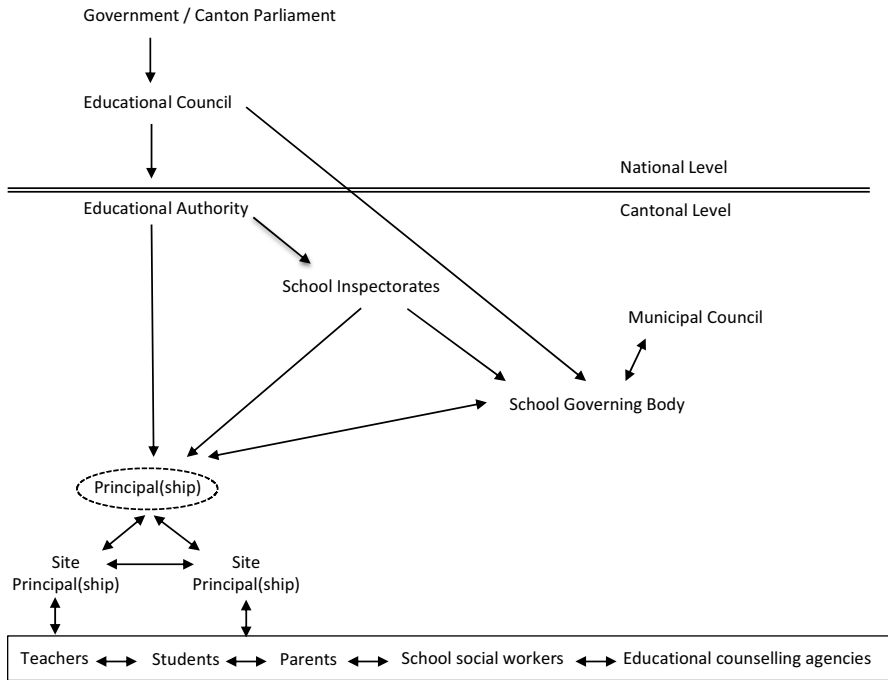


Fig. 2 Swiss school principals' "sandwich position" (adapted from Huber 2011)

principalship much earlier than those in with tiny rural schools. In the Canton of Bern school principals have only been introduced in the 1990s. Prior to this, each school had one teacher elected as "administrator", a *primus inter pares*, who was responsible foremost for organizational tasks, while most pedagogical decisions have been taken by local school boards (Criblez 2015; Huber 2011). Since a new law was passed in the Canton of Bern in 2008 (Reform des Volksschulgesetzes, Reform of the School Law for Obligatory Education, "REVOS08"), the role of school principals has been strengthened tremendously: municipalities can now decide to pass on their competencies to the school principals, who are then given much more decision-making power than before. Many have done so. Therefore, it can be stated that principals have "expand[ed] their roles and functions" (Huber 2011, p. 478).

In the present study, school principals' perception of the complex amalgamation of situations, processes and information from upper-level actors is subsumed with the term "innovation governance".

Method

Participants and design

This paper draws on a questionnaire that was administered during the regional meetings of the 14 Bernese school inspectorates in the year 2016. At the meetings,

about 660 school principals took part, 359 of whom (45% female) returned the fully completed questionnaire. i.e. the return quota is 54%. The participants were informed that the participation was voluntary and that the data would be treated confidentially. The participants were between 26 and 67 years old with an average age of 51.3 years ($SD = 8.22$). On average, the participants had a work experience of 13.42 years ($SD = 8.7$) in the position of school principal and a span of control over teachers of 30.2 ($SD = 20$).

Instruments

As a dependent variable, individual readiness for change was assessed by means of a topic-oriented 6-items adapted and shortened scale used by Schumacher (2015) in contexts of educational change (e.g. “I will engage actively in the realization of the curriculum implementation at my school.”; $\alpha = .80$).

The measurement of *needs-oriented innovation governance* relies on the *Basic Psychological Need Satisfaction at Work scale* (BPNWS, (Deci et al. 2001) and comprises the following 16 items:

- *Autonomy during curriculum implementation* 4 items, e.g. “During curriculum implementation, it is in my power to decide how the implementation will proceed”, $\alpha = .85$;
- *Competence during curriculum implementation* 6 items, e.g. “I can coach the teachers at my school adequately during the implementation process.”, $\alpha = .86$;
- *Social relatedness during curriculum implementation* 6 items, e.g. “During the curriculum implementation I feel accepted by my staff.”, $\alpha = .83$.

Assessing *innovation valence* as one of the most influential readiness factors (Weiner 2009), the *perceived usability of the new curriculum* was measured with 4 items (e.g. “The new curriculum is highly useful for the improvement of instruction in the classroom”, $\alpha = .75$).

School principals’ *emotional experience* was assessed by the measurement of their enjoyment, anger and anxiety (the most frequently mentioned emotions in the context of educational change), each with 4 items based on Frenzel et al.’s “Teacher Emotions Scales, TES” (Frenzel et al. 2016). This scale was developed for the measurement of teachers’ achievement emotions in the classroom. We adapted the TES to our context because, as change facilitators, school principals are taken accountable for their actions and, thus, experience achievement situations. Reliabilities of our adapted version were good for *enjoyment* ($\alpha = .88$) and *anger* ($\alpha = .78$), and acceptable for *anxiety* ($\alpha = .73$).

Except from the scale measuring emotions (with a four-point Likert scale from 1 (“not at all”) to 4 (“very much”), rating was done with a seven-point ordinal scale, in which 1 indicated “I don’t agree at all” and 7 “I totally agree.” In order to avoid ordering effects, items were presented in random sequence.

Table 1 Correlations, means and standard deviations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Perceived autonomy (<i>1–7</i>)	–							
(2) Perceived competence (<i>1–7</i>)	.20	–						
(3) Perceived social relatedness (<i>1–7</i>)	.37	.37	–					
(4) Usability of the curriculum (<i>1–7</i>)	.19	.17	.30	–				
(5) Enjoyment (<i>1–4</i>)	.32	.28	.50	.41	–			
(6) Anger (<i>1–4</i>)	–.31	–.20	–.40	–.17	–.37	–		
(7) Anxiety (<i>1–4</i>)	.10	–.30	–.24	–.10	–.30	.52	–	
(8) Readiness for change (<i>1–7</i>)	.20	.30	.44	.43	.57	–.21	–.15	–
<i>M</i>	4.95	5.51	5.62	4.63	2.58	1.46	1.58	5.01
<i>SD</i>	1.16	0.85	0.89	0.69	0.68	0.55	0.58	0.68

Numbers in italics indicate no significant correlations. All other correlations are significant at $p < .01$, .001 (2-tailed). Levels of measurement are indicated in brackets after each label

Data analysis

Data analyses were performed only with fully completed questionnaires ($N=359$). Means, standard deviations and inter-correlations between the variables were calculated with the statistics software SPSS version 23.

With *Mplus* (Muthén and Muthén 1998–2012), we performed structural equation modeling (SEM) for the examination of the relationships between principals' perception of innovation governance, their appraisal of the curriculum's usability, their emotional experience and their readiness to engage in the implementation of the new curriculum in their school. This allowed us to calculate the measurement and structural model simultaneously.

For model fit evaluation, the following fit-indices were considered: the Comparative Fit Index (CFI), the Tucker-Lewis Index (TLI), the Root Mean Square Error of Approximation (RMSEA) and the Standardized-Root-Mean-Square-Residual (SRMR). Model fit was judged as good if the CFI and TLI values were above .95, and the RMSEA and SRMR values are below .06. The model fit is acceptable when CFI and TLI exceed .90 and RMSEA and SRMR are less than .08 (Hu and Bentler 1999). Missing data were handled using the Full Information Maximum Likelihood Algorithm (FIML).

Results

Descriptive statistics

Table 1 illustrates the means, standard deviations and inter-correlations of the examined variables. Overall, needs-oriented innovation governance was perceived very positively with all the mean values on the upper level. With a mean

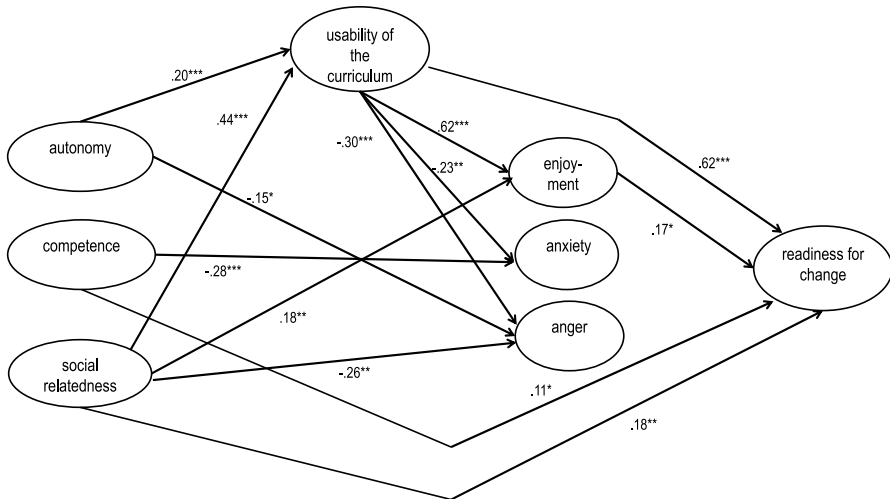


Fig. 3 Structural equation model predicting *enjoyment*, *anxiety*, *anger* and *readiness for change* by factors of the innovation environment (innovation governance) and the perception of the innovation’s usability. Displayed are the standardized beta coefficients

of 5.62 ($SD=0.89$), principals felt their need for social relatedness during curriculum implementation highly satisfied. The same is true for their needs for competence ($M=5.51$, $SD=0.85$) and for autonomy ($M=4.95$, $SD=1.15$). Their perception of the usability of the new curriculum for the improvement of instruction quality in the classroom was also rated highly ($M=4.63$, $SD=0.69$).

On average, principals’ experience of enjoyment ($M=2.58$, $SD=0.68$) during curriculum implementation has a central tendency to be higher than their experience of anger ($M=1.46$, $SD=0.55$) and anxiety ($M=1.58$, $SD=0.58$). Judging from the data, principals were highly ready for change, i.e. to engage for the implementation of the new curriculum in their school ($M=5.01$, $SD=0.68$). Gender differences for all variables were tested with a t test for independent samples and revealed non-significant results.

Correlations were computed among eight scales on data for 359 principals. The results suggest that 26 out of 28 correlations were statistically significant, nine of which greater than $r=.35$ ($p<.001$). The emotion “enjoyment” correlated strongly positively with social relatedness ($r=.50$) and readiness for change ($r=.57$). Results indicate a reverse relationship between anger and perceived social relatedness ($r=-.40$) and, unsurprisingly, with enjoyment ($r=-.37$). Anxiety correlated positively on a particularly high level with anger ($r=.52$). Another finding is the strong positive relation between the perceived usability of the new curriculum for the improvement of instruction quality and principals’ readiness for change ($r=.57$). The readiness for change also correlated positively with perceived social relatedness ($r=.44$).

Testing of the proposed structural model

Results with regard to the model specified accounting for all three emotions simultaneously are presented in Fig. 3⁴. Taking the fit indices into consideration this specified model shows an acceptable model fit (χ^2 (df) = 1297.93 (640); CFI = .902; TLI = .892; RMSEA: .053; SRMR = .062).

Two factors catch the reader's eye as very important predictors of principals' readiness for change. First, the *usability of the new curriculum* explained both the principals' experience of enjoyment ($\beta = .62$) and their readiness for change ($\beta = .62$). These relations were the strongest in the model; but the perceived usability of the curriculum also explained (to a lesser extent) the experience of anger ($\beta = -.30$) and anxiety ($\beta = -.23$): If the new curriculum was perceived as useful, principals also experienced higher enjoyment and less anxiety and anger and they were more ready for change processes. Second, *social relatedness* was clearly associated with many other variables in the model: It explained the usability of the curriculum ($\beta = .44$), enjoyment ($\beta = .19$), anger ($\beta = -.26$), and principals' readiness for change ($\beta = .18$), but it was not associated with principals' anxiety. Therefore, if a principal's need for social relatedness was fulfilled, the new curriculum was perceived as more useful, the joy-experiences were more pronounced and anger was experienced less.

Compared to the impact of social relatedness, the other two basic psychological needs seem to have a weaker impact. The satisfaction of the need for competence revealed a minor but significant explanatory power with regard to readiness for change ($\beta = .11$) and the experience of anxiety ($\beta = -.28$). The satisfaction of the basic need for autonomy during curriculum implementation neither had an effect on readiness for change, nor on the experience of enjoyment and anxiety. Still, it explained principal's anger experiences ($\beta = -.15$): The more the need for autonomy during implementation was satisfied, the less anger did a principal experience.

Finally, contrary to expectations, anger and anxiety seem to have no direct explaining effect with regard to readiness for change.

Testing for mediation

In a next step, we focused on the question of how the perceived usability of the curriculum mediates the relationship between needs-oriented innovation governance and principals' emotions (enjoyment, anger and anxiety). As Table 2 indicates, we found several significant indirect effects suggesting mediation. Full mediation was detected for the relationship between perceived social relatedness and anxiety ($\beta_{\text{indirect}} = -.100$) and between perceived autonomy and enjoyment ($\beta_{\text{indirect}} = .121$) via the mediator "perceived usability of the curriculum". Partial mediation (again via the mediator appraised usability of the curriculum) was found for perceived autonomy and anger

⁴ Due to the relatively small sample size, we also calculated three separate models (one model for each emotion), in order to double-check the stability of the results. The same results emerge from both forms of calculation. In order to account for the interdependency of principals' emotions properly, we report the overall model only.

Table 2 Testing for mediation. Standardized direct and indirect effects of a perceived needs-oriented environment mediated by the perceived usability of the curriculum on principals' emotions

Effects	Enjoyment		Anger		Anxiety	
	Estimate	SE	Estimate	SE	Estimate	SE
Perceived autonomy						
Total	.165**	.059	-.209**	.064	-.010	.069
Indirect	.121**	.041	-.058*	.023	-.044	.021
Direct	.044	.053	-.152**	.065	.034	.070
Perceived competence						
Total	.088	.057	-.044	.063	-.293***	.065
Indirect	.037	.038	-.018	.019	-.014	.014
Direct	.051	.050	-.027	.061	-.279***	.065
Perceived social relatedness						
Total	.455***	.059	-.394***	.066	-.190*	.074
Indirect	.273***	.047	-.130***	.037	-.100*	.039
Direct	.182**	.062	-.263***	.076	-.090	.084

no asterisk: non significant ($p > .05$); * $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$

($\beta_{indirect} = -.058$; $\beta_{direct} = -.152$), as well as between perceived social relatedness and enjoyment ($\beta_{indirect} = .273$; $\beta_{direct} = -.182$) and anger ($\beta_{indirect} = -.130$; $\beta_{direct} = -.263$). It is worth noting that the perceived usability of the new curriculum showed no significant mediation effects between perceived competence as an aspect of innovation governance and principals' emotions. Instead, only a direct effect of the perceived competence on anxiety could be found ($\beta_{direct} = -.279$). Most strikingly, the total effects were particularly strong regarding the relation between need for relatedness and principals' emotions (directly and indirectly via the appraised usability of the curriculum).

We also tested for mediation effects of a perceived needs-oriented innovation governance (environment) on principals' readiness for change through the perceived usefulness of the new curriculum *and* principals' emotions. The detailed results of the mediation analyses are presented in Table 3.

To summarize: While we identified full mediation in the relation between perceived *autonomy*, perceived usability of the new curriculum, principals' emotions and readiness for change ($\beta_{indirect} = .146$), no mediation effects were found for perceived *competence* on principals' readiness for change via the aforementioned mediators. Instead, the models indicate significant direct effects of the perceived competence on principals' readiness for change ($\beta_{direct} = .108$). Additionally, we found strong direct and indirect effects with regard to perceived *social relatedness* on principals' readiness for change suggesting partial mediation ($\beta_{indirect} = .346$; $\beta_{direct} = .184$).

Table 3 Testing for mediation

Effects	Readiness for change	
	Estimate	S.E.
Perceived autonomy		
Total	.103	.057
Total indirect	.146**	.047
Specific indirect		
Autonomy → usability → r. f. change	.121**	.042
Autonomy → joy → r. f. change	.007	.010
Autonomy → anxiety → r. f. change	.000	.002
Autonomy → anger → r. f. change	-.002	.01
Autonomy → usability → joy → r. f. change	.020	.010
Autonomy → usability → anxiety → r. f. change	.000	.002
Autonomy → usability → anger → r. f. change	-.001	.003
Direct	-.043	.046
Perceived competence		
Total	.161**	.055
Total indirect	.053	.045
Specific indirect		
Competence → usability → r. f. change	.037	.038
Competence → joy → readiness f. change	.009	.009
Competence → anxiety → readiness f. change	.002	.014
Competence → anger → readiness f. change	.000	.002
Competence → usability → joy → r. f. change	.006	.007
Competence → usability → anxiety → r. f. change	.000	.001
Competence → usability → anger → r. f. change	.000	.001
Direct	.108*	.045
Perceived social relatedness		
Total	.530***	.055
Total indirect	.346***	.051
Specific indirect		
Social relatedness → usability → r. f. change	.273***	.051
Social relatedness → joy → r. f. change	.031	.017
Social relatedness → anxiety → r. f. change	.000	.005
Social relatedness → anger → r. f. change	-.003	.015
Relatedness → usability → joy → r. f. change	.046	.020
Relatedness → usability → anxiety → r. f. change	.001	.005
Relatedness → usability → anger → r. f. change	-.001	.008
Direct	.184***	.056

Standardized direct and indirect effects of a perceived needs-oriented environment mediated by the perceived usability of the curriculum and the experienced emotions on principals' readiness for change

no asterisk: non significant ($p > .05$); * $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$

Discussion and conclusions

The present study aimed at examining the relationship between school principals' perception of innovation governance with regard to the curriculum's implementation, their appraisal of the innovation's usability, principals' emotional experience in the context of this educational change and their readiness to engage actively in the implementation of the new curriculum at their schools.

On a descriptive level, we found that principals in the Canton of Bern (a) feel their basic psychological needs for autonomy, competence and social relatedness well fulfilled during curriculum implementation; (b) seem to see the new curriculum as a valuable instrument for the improvement of classroom teaching; (c) experience more enjoyment than anger and anxiety during the reform process, and, (d) seem to be highly motivated to actively engage in the implementation of the LP21 in their schools. Given the principals' positive perception of the change-related governance policy and their high readiness to engage in the change process, we can assume that the governance policy of the curriculum reform based on a multi-year approach has probably paid off.

On a theoretical level, we intended to benefit from the combination of three research perspectives: the issue "curriculum implementation" has been viewed through the lenses of psychological theories of emotion and motivation, from the viewpoint of an educational policy approach and with reference to implementation studies. The study itself was based on a contextual description of the governance policy framing the implementation of the curriculum and the collection of quantitative data from school principals. The integrative perspective both on the individual and the systemic level of educational change policy was intended as an enrichment to research on school principals' behavior during curriculum reform.

In line with Kelchtermans et al. (2011), we addressed principals as "gatekeepers" as they mediate between the outside-school and the inside-school. We proposed a conceptual model with several hypotheses on the interrelation between the perceived needs-oriented innovation governance of curriculum implementation, the cognitive appraisal of the usability of the new curriculum, principals' experience of enjoyment, anger and anxiety and readiness of change. In the following section we will discuss the results of the empirical test of our conceptual model.

Needs-oriented governance Hypothesis 1 on needs-oriented innovation governance and principals' readiness for change was formulated based on two ideas. First, we leaned on findings from research on self-determination in contexts of educational reform (Deci 2009). Second, we conceptualized H1 with a strong interest in all the processes of social organization and coordination during reform as suggested by an educational governance perspective. Thus, we followed an approach in which concepts closely related to SDT have turned out as powerful propositions for successful innovation implementation (Altrichter 2005). We can confirm H1 in so far as a needs-supportive environment positively correlates to school principals' readiness for change.

Principals' readiness of change In accordance with findings from implementation studies (Hall and Hord 2015; Holt and Vardaman 2013), we were able to confirm that principals' readiness for change can be explained to a large extent by their evaluation of the innovation's value in all the three models (support of *H2*). As shown in Fig. 3, the negative emotions *anger* and *anxiety* were not predictive for principals' readiness for change in this study, while a link could be detected for enjoyment (support of *H3* for enjoyment; rejection of *H3* for anxiety and anger). This finding might be plausible if one thinks of a principals' professional identity, of which emotion regulation seems to make up quite a part (Gronn 2010; Poirel and Yvon 2014). Similar to teachers (Sutton 2007), principals probably use emotion regulation strategies dozens of times a day and inhibit their experience of anger or anxiety for the sake of the fulfillment of their professional role (Blackmore 2004, 2010). Furthermore, school-based emotion research reveals that negative emotions exhibit less clear behavioral effects compared to positive emotions. For example, anxiety experienced by students can enhance their effort in learning, but it can also reduce their engagement if the intensity of the experienced anxiety is too high (Pekrun 2014). Similar ambiguous effects can be assumed for the relation between principals' negative emotions and their readiness for change. Thus, it seems necessary to integrate the intensity of the experienced emotion as a possible intervening variable in future research.

Principals' emotions and the perceived usability of the new curriculum One core assumption of this paper was that emotions play a significant role within the interrelationships of the examined variables. Indeed, we could confirm many of the expected relations, though not all.

In line with appraisal-approaches to emotions (Lazarus 1984), we found a link between the perceived usability of the curriculum and principals' emotions (confirmation of *H4*). Similar to the above-mentioned result with regard to principals' readiness of change, the interrelation was most pronounced for enjoyment. This finding might be traced back to the fact that the perceived usability of the curriculum can be regarded as a core appraisal of enjoyment: Enjoyment typically arises if the environment is perceived as valuable and useful, and if the person perceives the environment as controllable (see for example, control-value theory as proposed by Pekrun 2006). The appraisal pertaining the usability of the curriculum is important for principals' anger and anxiety as well as indicated by the still significant but weaker path coefficients; however, other appraisals might be more relevant for explaining those emotions (e.g. a low perceived coping potential accompanied by a high value belief typically increases anxiety). Therefore, future studies should go beyond assessing solely the appraisal reflecting the usability of the curriculum. In fact, it seems sensible to integrate other appraisals in future work, as emotions typically arise from a set of different appraisals (e.g. novelty, goal-conduciveness, coping potential, normative self-compatibility; Scherer 2001). This implies also the incorporation of social appraisals (e.g. Manstead and Fischer 2001).

Overall, our results provide evidence for the importance of basic-needs satisfaction based on SDT in implementation policies (Deci 2009). Prior work has already documented that a positive perception of the innovation's features and their implementation quality fosters change agents' experience of the innovation

process (Deci 2009; Deci and Ryan 2008). Altogether, we could confirm that a needs-oriented governance of curriculum implementation, distinguishing the need for autonomy, competence and social relatedness, revealed a significant relation to principals' emotions (support of *H5*) and also to principals' cognitive appraisal of the usability of the new curriculum (support of *H6*). But, it has to be emphasized that not all three basic psychological needs functioned equally in our model: our three indicators of innovation governance did not reveal equally strong effects with regard to their explanatory power of principals' emotions and cognitive appraisals. Some indicators also showed non-significant effects.

Interestingly, the indicator *perceived social relatedness* exhibited the strongest relations to the principals' emotions and cognitive appraisals. An explanation for this finding could be seen (a) in the very nature of educational leadership that implies plenty of social interaction and coordination, and (b) in school principals' mission during curriculum reform: Education authorities expect school principals to pave the way for the successful implementation of the new curriculum in their schools, i.e. to engage their staff in the operationalization of innovative teaching practices. In both ways, school principals socially perform and individually reflect also on an affective level, which is an integral part of their transformative leadership.

In contrast to expectations, *perceived autonomy* has proven to be less relevant than expected given the abundance of literature on the value of autonomy for schools and their principals. For example, Gagne et al. (2000) found that an autonomy-supportive environment fosters individuals' acceptance of organizational change. In our study, perceived autonomy only predicted the appraised usability of the curriculum and principals' anger directly, while the effect on anxiety was non-significant and the effect on enjoyment was fully mediated by principals' appraisal. The clear direct link between lack of perceived autonomy and principals' anger deserves closer attention as it parallels findings that have been repeatedly found for higher education (HE) teachers: In general, professions differ in terms of their claim for autonomy. Principals and teachers (school teachers and HE teachers) typically express a high need for autonomy arising inherently from their profession. If the autonomy within the profession is threatened, which ultimately also affects professional identity, negative emotions—in particular anger but also job dissatisfaction are likely to arise (Chang et al. 2015; Forrester 2000; for HE teachers: Olsen 1993).

Finally, *perceived competence* revealed a strong effect on principals' anxiety. More concretely, the less satisfaction of the need for competence principals feel during the reform, the more anxiety they experience. That is to say, almost a third of the variance regarding the experience of anxiety can be explained by principals' lack of feeling competent during curriculum implementation. However and against expectations, no link was found between perceived competence and enjoyment and anger. On a bivariate level, the expected correlations were detected (albeit on a low level), but they became non-significant in the calculated model. This might be explained statistically as shared variance between indicators tends to result in non-significant paths in a joint model. Another explanation can be derived with regard to content and sample characteristics: Having a glimpse on the sample characteristics, it becomes clear that many very experienced principals participated in the study. As a consequence, the mean level of

the perceived competence scale was rather high. It can be assumed that the perceived competence scale would reveal higher variance if less experienced principals participated in the study as well. Thus, future research should systematically explore the importance of the fulfillment of the need for competence by selecting a more heterogeneous sample of principals with regard to leadership experience taking “experience” (also with regard to innovation processes) as a possible moderator variable into account.

On a practical level, the results confirm that also more distal social contexts are perceived as need supportive (Ryan and Deci 2017). Therefore, needs-oriented governance policies are a worthwhile endeavor as they are obviously related to the motivational mindset of those who are involved and can foster their readiness for change. This implies that needs-orientation during educational change should be considered relevant on each and every level of the system. It has been shown that leaders’ emotions impact on their followers (teachers) affective experience during change (Beatty 2011; Gooty et al. 2010). Therefore, it is obvious that educational governance policies that also consider their school principals’ (and, of course, teachers’) basic psychological needs are recommendable: When school principals and teachers recognize the new curriculum as personally meaningful and even enjoy the continuous development of their instructional practice, needs-oriented change policies help to increase their high-quality motivation (Rigby and Ryan 2018) and to deal with the innovation more easily, and support the implementation of the innovation.

Limitations and future research

Standardized questionnaires based on self-assessment in a cross-sectional study are only snap-shots and do not allow us to identify causal relations. Bernese school principals might experience more intense emotions during their real interaction with teachers during curriculum implementation. Additionally, school principals have been shown to believe that they are expected to be rational rather than emotional personalities (Crawford 2007). This might have influenced their response behavior unconsciously. Although people’s readiness for change is a strong predictor of their behavior during change, we only investigated their planned behavior, which might be different from their real actions (intention-behavior gap). In order to find this out, future research in this area should conduct studies that examine the emotional dynamics, the way principals’ emotions are “publicly and collaboratively formed” (Zorn and Boler 2007, p. 137) by certain underlying—but hidden—norms, during the reform process.

Appendix

See Tables 4, 5, 6.

Table 4 Testing for mediation

Enjoyment	Effects	Readiness for change	
		Estimate	S.E.
Perceived autonomy	Total	.103	.057
	Total indirect	.148***	.046
	Specific indirect		
	Autonomy → usability → r. f. change	.117**	.040
	Autonomy → enjoyment → r. f. change	.009	.011
	Autonomy → usability → enjoyment → r. f. change	.022*	.0011
	Direct	-.044	.045
Perceived competence	Total	.158**	.055
	Total indirect	.043	.043
	Specific indirect		
	Competence → usability → r. f. change	.042	.043
	Competence → enjoyment → readiness f. change	.000	.002
	Competence → usability → enjoyment → r. f. change	.000	.001
	Direct	.116**	.044
Perceived social relatedness	Total	.529***	.055
	Total indirect	.348***	.049
	Specific indirect		
	Social relatedness → usability → r. f. change	.262***	.048
	Social relatedness → enjoyment → r. f. change	.035*	.018
	Relatedness → usability → enjoyment → r. f. change	.050**	.019
	Direct	.181***	.054

Standardized direct and indirect effects of a perceived needs-oriented environment mediated by the perceived usability of the curriculum and *enjoyment* on principals' readiness for change

no asterisk: non significant ($p > .05$); * $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$

Table 5 Testing for mediation

Anger	Effects	Readiness for change	
		Estimate	S.E.
Perceived autonomy	Total	.104	.057
	Total indirect	.143**	.047
	Specific indirect		
	Autonomy → usability → r. f. change	.138**	.046
	Autonomy → anger → r. f. change	.004	.009
	Autonomy → usability → anger → r. f. change	.001	.003
	Direct	−.039	.048
Perceived competence	Total	.158**	.055
	Total indirect	.043	.043
	Specific indirect		
	Competence → usability → r. f. change	.042	.043
	Competence → anger → readiness f. change	.000	.002
	Competence → usability → anger → r. f. change	.000	.001
	Direct	.116**	.044
Perceived social relatedness	Total	.529***	.055
	Total indirect	.317***	.051
	Specific indirect		
	Social relatedness → usability → r. f. change	.307***	.050
	Social relatedness → anger → r. f. change	.007	.015
	Relatedness → usability → anger → r. f. change	.003	.006
	Direct	.212***	.057

Standardized direct and indirect effects of a perceived needs-oriented environment mediated by the perceived usability of the curriculum and *anger* on principals' readiness for change

no asterisk: non significant ($p > .05$); * $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$

Table 6 Testing for mediation

Anxiety	Effects	Readiness for change	
		Estimate	S.E.
Perceived autonomy	Total	.104	.057
	Total indirect	.137**	.046
	Specific indirect		
	Autonomy → usability → r. f. change	.137**	.045
	Autonomy → anxiety → r. f. change	.002	.005
	Autonomy → usability → anxiety → r. f. change	.002	.002
Perceived competence	Direct	−.034	.047
	Total	.158**	.055
	Total indirect	.061	.045
	Specific indirect		
	Competence → usability → r. f. change	.041	.043
	Competence → anxiety → readiness f. change	.019	.014
Perceived social relatedness	Competence → usability → anxiety → r. f. change	.001	.001
	Direct	.097*	.047
	Total	.528***	.055
	Total indirect	.316***	.050
	Specific indirect		
	Social relatedness → usability → r. f. change	.305***	.049
	Social relatedness → anxiety → r. f. change	.006	.007
	Relatedness → usability → anxiety → r. f. change	.005	.004
	Direct	.213***	.055

Standardized direct and indirect effects of a perceived needs-oriented environment mediated by the perceived usability of the curriculum and anxiety on principals' readiness for change

no asterisk: non significant ($p > .05$); * $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$

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