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Original

Predicting the pre-service teachers' teaching intention from educator-created (dis)empowering climates: A self-determination theory-based longitudinal approach

Antonio Granero-Gallegos [a,*], Ginés D. López-García [a], and Rafael Burgueño [a,b]

[a] *Departamento de Educación, Universidad de Almería, Almería, Spain*
[b] *Departamento de Didáctica de las Lenguas, las Artes y el Deporte, Universidad de Málaga, Málaga, Spain*

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ABSTRACT

Guided by self-determination theory, this two-wave longitudinal research aims to examine the associations between pre-service teachers' perceptions of educator-created (dis-)empowering climates and their teaching intention, considering the bright and dark motivational pathways. A total of 1,258 secondary pre-service teachers (55.5% women, M_{age} = 26.17, SD = 5.66) have participated. The results from path analysis have shown positive associations between educator-created perceived empowering climates and need satisfaction, autonomous motivation, and teaching intention in pre-service teachers, while educator-created perceived disempowering climates have been positively related to pre-service teachers' need frustration, controlled motivation and amotivation. The conclusions have suggested that pre-service teachers' perceptions of educator-created (dis-)empowering climates during their initial teacher education program play a determining role in their teaching intention.

Predicción de la intención docente del profesorado en formación inicial a partir del clima de (des-)empoderamiento creado por el formador del profesorado: un análisis longitudinal basado en la teoría de la autodeterminación

Palabras clave:
Ser docente
Elegir la docencia como profesión
Estudiante a docente
Calidad de la motivación
Ambiente social de aula
Clima motivacional

RESUMEN

Basado en la teoría de la autodeterminación, esta investigación longitudinal de dos olas tiene por objetivo analizar las relaciones entre la percepción del profesorado en formación inicial sobre el clima de (des-)empoderamiento creado por el formador y su intención docente, considerando la secuencia motivacional brillante y oscura. Han participado un total de 1258 docentes de secundaria en formación inicial (55.5% mujeres; M_{edad} = 26.17, DT = 5.66). Los resultados del *path analysis* han mostrado asociaciones positivas entre el clima percibido de empoderamiento creado por el formador del profesorado y la satisfacción de las necesidades, motivación autónoma e intención docente del profesorado en formación inicial. En cambio, el clima percibido de desempoderamiento creado por el formador se ha relacionado positivamente con la frustración de las necesidades, la motivación controlada y la desmotivación de los futuros docentes. Las conclusiones han sugerido que el clima de (des-)empoderamiento creado por el formador del profesorado percibido por el profesorado en formación inicial durante el programa de formación inicial docente juega un rol determinante a la hora de promocionar su intención docente.

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* Corresponding author.
E-mail address: agranero@ual.es (A. Granero-Gallegos).

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Introduction

The teacher shortage has become a priority for public administrations in most developed countries (Organisation for Economic Cooperation and Development, 2018). In an attempt to improve the recruitment and retention processes of new teachers within the education system, public educational administrations have focused on initial teacher education programmes, which is an appropriate stage to train highly motivated teachers with a strong desire to practice teaching (Organisation for Economic Cooperation and Development, 2018). Within such programmes, the teacher educator plays an essential role in guiding pre-service teachers not only in the training process, but also in favouring motivational processes and their teaching intention (Fray & Gore, 2018; Rots et al., 2014). However, no studies have been found that have examined the potential influence that educator-created motivational climates might play in developing motivation and teaching intention among pre-service teachers.

One of the strongest theories in studying the socio-environmental influences on motivation and behavioural intention (i.e., teaching intention) is Self-Determination Theory (SDT; Ryan & Deci, 2017). According to SDT (Ryan & Deci, 2017), the social environment created by the teacher educator, such as (dis-)empowering climates (Duda & Appleton, 2016), can favour or undermine the quality of motivation and, consequently, develop or hinder the teaching intention of pre-service teachers. Given that motivational processes fluctuate over time (Burgueño et al., 2022; Ryan & Deci, 2017), there is a need to analyse the effects of educator-created (dis-)empowering climates on motivational processes and teaching intention through longitudinal designs. Therefore, the present research was designed to longitudinally analyse the predictive effects of the pre-service teachers' perception of educator-created (dis-)empowering climates on their teaching intention at the beginning and at the end of the initial teacher education programme, using the dual motivational sequence described by SDT.

Self-determination theory in initial teacher education

SDT represents a broad motivational structure for studying the socio-contextual influence on human motivation and behaviour (Ryan & Deci, 2017). A central axis of the SDT is to develop autonomous motivation, where behaviour is adopted based on experiences guided by enjoyment and the search for new horizons, their alignment with personal values and goals, and by identifying their benefits. In contrast to the adaptive quality of autonomous motivation, one finds controlled motivation (i.e., behaviour undertaken from experiences based on both self-imposed pressures and a sense of external obligation) or amotivation (i.e., the total absence of intentionality toward the desired behaviour). SDT argues that autonomous motivation would lead to adaptive outcomes, whilst controlled motivation and amotivation would yield maladaptive outcomes. Indeed, previous cross-sectional studies into initial teacher education (Burgueño et al., 2017; Silva et al., 2018) have shown that, while autonomous motivation was positively related to teaching intention (i.e., the degree to which pre-service teachers plan and strive to work as teachers; Fishbein & Ajzen, 2009); amotivation has a negative association with teaching intention (Burgueño et al., 2017). Conversely, there was an inconsistent relationship between controlled motivation and teaching intention given that while Bruinsma and Jansen (2010) reported a negative and significant relationship between controlled motivation and teaching intention, Burgueño et al. (2017) showed a positive but weak relationship with teacher intention. In contrast, Silva et al. (2018) found a non-significant association between both variables.

According to SDT (Ryan & Deci, 2020), autonomous motivation would be promoted by satisfying the basic psychological needs for autonomy (i.e., experiences of being a causal agent), competence (i.e., experiences of mastery and effectiveness) and relatedness (i.e., experiences of belonging and connection with others). Controlled motivation and amotivation would be facilitated by the frustration of the needs for autonomy (i.e., feelings of coercion and being controlled), competence (i.e., feelings of ineffectiveness and inferiority), and relatedness (i.e., feelings of loneliness and social exclusion). Similarly, SDT maintains the idea of cross-paths between need-based experiences and the quality of motivation, such that need satisfaction would buffer the experiences of controlled motivation and amotivation, while need frustration would undermine the levels of autonomous motivation (Vansteenkiste et al., 2020). Previous research into initial teacher education has reported the positive and significant relationship between need satisfaction and autonomous motivation (Granero-Gallegos, López-García, et al., 2023; Kaplan & Madjar, 2017; López-García et al., 2023), while non-significant associations were found between need satisfaction and controlled motivation or amotivation (Kaplan & Madjar, 2017; López-García et al., 2023). On the other hand, cross-sectional research has shown that need frustration was positively associated with controlled motivation and amotivation and unrelated to autonomous motivation (Granero-Gallegos, López-García, et al., 2023). Although this study made a valuable contribution by examining the relationship between need frustration and motivation among pre-service teachers, to the best of our knowledge, the differentiated influence of need frustration on the three qualities of motivation in initial teacher education remains still to be longitudinally studied.

SDT holds the premise that pre-service teachers' perceptions of need-based experiences and the quality of motivation would be supported or thwarted by their interpretation of both their interactions with the teacher educator and the motivational climates generated by this socialising agent during the initial teacher education programme.

The role of teacher educators

The teacher educator is a key figure within the initial teacher education programme who guides the pre-service teacher training process. Especially critical in this process is the educator-created motivational climate, that is, what the teacher educator does and says along with the way the learning environment is structured. Recently, Appleton et al. (2016) proposed a distinction between empowering and disempowering climate by including elements of both SDT (i.e., autonomy support, social support, and control) and achievement goal theory (i.e., task-involving and ego-involving climates). An empowering climate is characterised by elements of autonomy support (i.e., the teacher educator provides opportunities to choose, explains the importance of the activities undertaken, and recognises the preferences and interests of the pre-service teachers), social support (i.e., the teacher educator makes pre-service teachers feel valued and cared for as people), and a task-involving climate (i.e., the teacher educator establishes

success criteria of an intra-personal nature, such as effort, or the learning of new skills). In contrast, a disempowering climate is characterised by elements of control (i.e., the teacher educator imposes his/her own class agenda, which the pre-service teachers have to comply with rigorously and strictly) and an ego-involving climate (i.e., the teacher educator establishes interpersonal success criteria, such as comparing abilities between the pre-service teachers, awarding prizes for doing well and punishments when one is wrong).

Duda and Appleton (2016) postulate that empowering climates would tend not only to energise need satisfaction, but also to buffer experiences of need frustration. In the same way, they maintain that disempowering climates would mostly tend to facilitate need frustration, as well as to undermine need satisfaction to a lesser extent. To the best of our knowledge, a growing body of cross-sectional studies on initial teacher education has reported positive relationships between a perceived educator-created empowering climate and need satisfaction, and between a perceived disempowering climate and need frustration (Granero-Gallegos, Baena-Extremera et al., 2023; Granero-Gallegos, López-García et al., 2023). Both cross-sectional studies also indicated that perceived educator-created empowering climates were negatively and secondarily related to need frustration, perceived disempowering climates were unrelated to need satisfaction (Granero-Gallegos, Baena-Extremera et al., 2023; Granero-Gallegos, López-García et al., 2023).

According to SDT (Ryan & Deci, 2017; Vansteenkiste et al., 2020), it is thought that the perception that pre-service teachers have of motivational climates in the initial education programme will yield a variety of learning-related outcomes, to the extent that need satisfaction and autonomous motivation are promoted. Thus, when pre-service teachers perceive their educator as creating an empowering classroom climate, they would likely have their needs satisfied and, consequently, adopt more autonomously motivated behaviours in that context. It is also believed that when pre-service teachers develop need satisfaction and autonomous motivation in the context of initial teacher education, they tend to look for other opportunities to satisfy their needs and develop their autonomous motivation in a similar context (i.e., the professional context). On the other hand, when pre-service teachers perceive their educator as creating a disempowering classroom climate, they would tend to promote need frustration and, in turn, the adoption of more controlled motivated behaviours. The dual process proposed by the SDT consisting of a bright motivational path (i.e., an empowering climate [need-supportive environment] → need satisfaction → autonomous motivation → adaptive outcomes) and a dark motivational path (i.e., a disempowering climate [need-thwarting environment] → need frustration → controlled motivation → maladaptive outcomes) is relevant in understanding and explaining the persistence or abandonment of the target behaviour among pre-service teachers (Ryan & Deci, 2017, 2020).

The present study

To the best of our knowledge, there are no studies on initial teacher education that have analysed the longitudinal effects of the pre-service teachers' perception of educator-created (dis-)empowering climates on their teaching intention, considering the bright and dark motivational paths proposed in SDT. To date, only two cross-sectional studies into initial teacher education were found with focus on examining the interplay between educator-created (dis-)empowering climates with need-based experiences and the quality of motivation in the eyes of pre-service teachers (Granero-Gallegos, Baena-Extremera et al., 2023; Granero-Gallegos, López-García et al., 2023). The only longitudinal study we found (Burgueño et al., 2022), in addition to being far from (dis-)empowering climate conceptualisation, operationalised motivation through the relative autonomy index, which made it impossible to know the differentiated effects that each quality of motivation might have on the teaching intention of pre-service teachers. Although such works made a valuable contribution to initial teacher education, a new study is required that, based on the distinction between empowering and disempowering climates, and following the two motivational paths described by SDT, analyses in a longitudinal way the role that the educator-created motivational climate might play in the teaching intention of pre-service teachers.

Therefore, the objective of the present research was to examine longitudinally the predictive effects of the pre-service teachers' perception of educator-created (dis-)empowering climates on their teaching intention at the beginning and at the end of the initial teacher education programme, using the bright and dark motivational paths described by SDT. Consistent with Duda and Appleton's framework and the SDT assumptions (Ryan & Deci, 2017), a model was tested (Figure 1) to analyse the predictive effects of the pre-service teachers' perception of educator-created (dis-)empowering climates on their need satisfaction and frustration during the degree programme. In addition, we explored how need-based experiences would be associated with the quality of motivation in the Professional Master's in Education (PME) programme. Finally, we investigated how the bright and dark motivational paths described by the SDT would be related to teaching intention among pre-service teachers.

Method

Participants

A total of 1,258 pre-service teachers from the PME participated, representing 34.44% of the total study population (3,653, according to official data from every Andalusian university). The participants were balanced by gender (55.5% women, 44.0% men and 0.5% other) and aged between 21 and 61 years (M_{age} = 26.17, SD = 5.66). While 1,452 pre-service teachers completed the questionnaire in T1, only 1,258 pre-service teachers completed the questionnaire again in T2. This represents a sample loss of 194 participants (13.36%). However, it should be noted that 37 potential participants in T1 and a further 26 participants did not give their informed consent and therefore did not participate in this research. The participating pre-service teachers belonged to the following Andalusian public universities: University of Almeria (13%), University of Cadiz (3.7%), University of Cordoba (7.7%), University of Granada (28.9%), University of Jaen (3.6%), University of Huelva (11.6%), University of Malaga (25.2%), and University of Sevilla (6.4%). They studied the following specialties: Physical Education (8.7%), Foreign Languages (14.1%), Spanish Language and Literature (9.9%), Mathematics (8.3%), Music (2.3%), Educational Orientation (6.8%), Health Processes (2.4%), Industrial Technology and Processes (6.3%), Biology and Geology (8.5%), Drawing, Image and Plastic Arts (5.8%), Economics (6.3%), Philosophy (1%), Physics and Chemistry (4.3%), Training and Work Orientation (3.7%), Geogra-

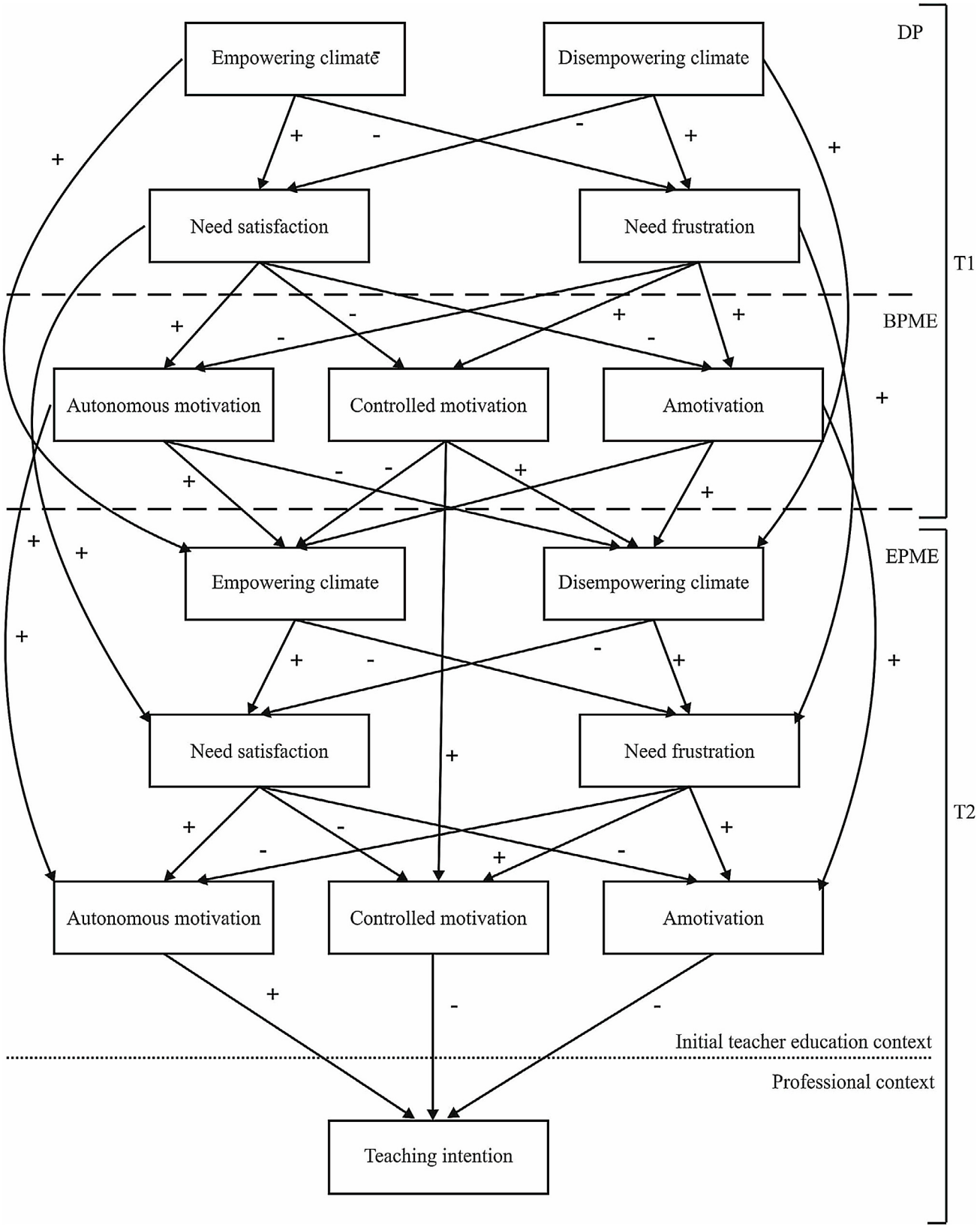

Figure 1. Theoretically hypothesised model to be tested.

phy and History (9.2%), Hospitality and Tourism (1%), and Computer Science (1.4%).

Each participant had to meet the following inclusion criteria: (1) to be enrolled in the PME programme at an Andalusian public university during the 2021/2022 academic year; (2) to give their informed consent to participate; (3) to attend classes regularly; and, (4) to complete the questionnaires fully.

Instruments

Educator-created (dis-)empowering climates

The *Educator-Created Empowering and Disempowering Climate Questionnaire* (Granero-Gallegos, Baena-Extremera et al., 2023) was used. It includes 21 items to measure *autonomy support* (five items, e.g., "My teacher gave the students choices and options"), *task-involving climate* (four items, e.g., "The teacher expects us to learn new skills and gain new knowledge"), *social support* (three items, e.g., "My teacher listened openly and did not judge the student's personal feelings"), *control* (six items, e.g., "My teacher was less supportive of students when they were not performing well") and *ego-involving climate* (three items, e.g. "The teacher gives more attention to the successful students"). Items are scored on a Likert scale ranging from 1 = totally disagree to 5 = totally agree. In line with previous research (Granero-Gallegos, Baena-Extremera et al., 2023), the *empowering climate* average was estimated from the average values of *autonomy support*, *task-involving climate* and *social support*, whilst the *disempowering climate* was estimated from the average values for *control* and *ego-involving climates*.

Need satisfaction in initial teacher education

We used the Spanish version adapted to education by León et al. (2011) of the *Échelle de Satisfaction des Besoins Psychologiques* (Gillet et al., 2008). The instrument includes 15 items grouped into five items per dimension to measure the *satisfaction of the need for autonomy* (e.g., "I feel free to make my own choices"), *competence* (e.g., "I feel I am good at what I do"), and *relatedness* (e.g., "I feel I get along with the people around me"). Items are scored on a Likert scale ranging from 1 = strongly disagree to 5 = strongly agree. Consistent with SDT (Vansteenkiste et al., 2020), the *need satisfaction* average was computed by the average values of *autonomy, competence* and *relatedness satisfaction*.

Need frustration in initial teacher education

We used the Spanish version adapted to education by Cuevas et al. (2015) of the *Psychological Need Thwarting Scale* (Bartholomew et al., 2011). The instrument includes 12 items grouped into four items per dimension to measure the *frustration of the need for autonomy* (e.g., "I feel pushed to behave in certain ways"), *competence* (e.g., "Situations occur in which I am made to feel incapable"), and *relatedness* (e.g., "I feel I am rejected by those around me"). Items are scored on a Likert scale ranging from 1 = strongly disagree to 7 = strongly agree. Consistent with SDT (Vansteenkiste et al., 2020), the *need frustration* average was computed by the average values of *autonomy, competence* and *relatedness frustration*.

Motivation for initial teacher education

The Spanish version (Burgueño et al., 2017) of the *Academic Motivation Scale* (Vallerand et al., 1992) was used. The instrument includes 32 items, grouped into four items per dimension to measure *intrinsic motivation towards experience stimulation* (e.g. "For the pleasure of reading interesting topics"), *intrinsic motivation towards accomplishments* ("For the satisfaction I feel in achieving each of my personal goals"), *intrinsic motivation towards knowledge* (e.g. "For the pleasure of knowing more about the issues that interest me"), *integrated regulation* (e.g. "Because I consider it to be in accordance with my values"), *identified regulation* (e.g. "Because it will possibly allow me to enter the labour market in the field that I like"), *introjected regulation* (e.g. "Because passing at university makes me feel important"), *external regulation* (e.g. "Because in the future I want to have a good life") and *amotivation* (e.g. "I honestly don't know; truly, I have the impression that I'm wasting my time in the Master's/degree."). Items are scored on a Likert-type scale ranging from 1 = does not correspond at all to 5 = corresponds exactly. Consistent with previous SDT-based research into teacher education (Burgueño et al., 2020), the mean scores for *autonomous motivation* were estimated by averaging the subtypes of *intrinsic motivation*, *integrated regulation* and *identified regulation*, while mean values for *controlled motivation* were calculated by taking the average scores of *introjected regulation* and *external regulation*.

Teaching intention

The *Future Teaching Intention Scale* (Burgueño et al., 2022) was used. This unidimensional instrument includes three items (e.g., I will try to work as a teacher in the next three years) to measure the pre-service teachers' future *teaching intention*. Items are scored on a Likert-type scale from 1 = totally improbable to 7 = extremely probable.

Procedure

This research comprised a two-wave longitudinal panel design. The data were collected at two different times: the start (T1, October 2021) and the end (T2, May 2022) of the PME. In T1, pre-service teachers completed a questionnaire that measured the *educator-created (dis-)empowering climate* during the degree programme (DP), their *need satisfaction* and *frustration* in relation to the training received during the DP, their existing academic *motivation* at the beginning of the PME (BPME), and their *teaching intention* (used as a control variable). In T2, pre-service teachers completed a new questionnaire that assessed the *educator-created (dis-)empowering climate* during the PME, their *need satisfaction* and *frustration* in the PME, their current academic *motivation* at the end of the PME (EPME) and their *teaching intention* for the coming years.

For the data collection process, the academic heads of the PME programmes at the eight Andalusian public universities were contacted to inform them of the research objectives and request their collaboration. After obtaining all the required permissions, the research team proceeded to administer the questionnaire in person (in the classroom) via an online form to collect the T1 data. In T2, the participants were invited to complete the online questionnaire via email. In both cases, the respondents were provided with information on the relevance of the research, the voluntary and anonymous nature of participation, that there were no rewards for participating, and that they could cease participation in the study at any time. In the same way, it was explained to them that there were no right or wrong answers since we only wanted to know their perceptions and opinions regarding the initial teacher training programme. To ensure adequate data quality, blinding was carried out between the participants surveyed and the research team responsible for the data analysis. This research has the approval of the Bioethics

Committee of the University of Almeria (Ref: UALBIO2021/009) and followed the research standards concerning human beings established in the Declaration of Helsinki.

Data analysis

To ensure the trustworthiness of the results from the structural equation modelling (SEM) approach, it was estimated that a minimum sample size of 1,217 participants was required. This estimation was carried out with *Free Statistics Calculator* v.4.0 (Soper, 2023). It detected effect sizes $f^2 = 0.16$ with a statistical power of .95, and a significance level of $\alpha = .05$ for a SEM consisting of 16 observable variables. Firstly, the data were screened, detecting no univariate (Z scores over $\pm$ 3) or multivariate (Mahalanobis D^2 at $p < .001$) outliers (Tabachnick & Fidell, 2019). Secondly, descriptive statistics and correlations between the study variables were estimated. Thirdly, Cronbach's alpha, McDonald's Omega, Raykov's composite reliability coefficient, and average variance extracted (AVE) were computed to gather reliability evidence. A good reliability level is achieved when values are higher than .70 in Cronbach's alpha, McDonald's Omega and Raykov's composite reliability coefficients (Viladrich et al., 2017), and greater than .50 in AVE (Fornell & Larcker, 1981). Fourthly, to test the predictive relationships between the study variables, an SEM (in terms of path analysis) was performed to guarantee a ratio of at least ten participants per parameter (1,258 participants/97 parameters) (Kline, 2016). The hypothesised model was estimated by the maximum likelihood method paired with the 5000-resampling bootstrapping technique (Kline, 2016). As covariates in the model were introduced the university, pre-service teachers' gender, and their teaching intention at the BPME. Assessment of the model's fit was made with values up to 5 for the coefficient between χ^2 and the degree of freedom (χ^2/df), values greater than .95 for Comparative Fit Index (CFI) and Tucker–Lewis Index (TLI), in conjunction with scores as high as .06 for Standardised Root Mean Square Residual (SRMR) and Root Mean Square Error of Approximation (RMSEA) (Kline, 2016). To examine the indirect effects, the Hayes (2017) proposal was followed, indicating that any indirect effect (i.e., mediated) is significant ($p < .05$) when the confidence interval at 95% (95% CI) does not include the zero value. For a better interpretation of the results, the total variance explained (R^2) was considered as an effect-size measure (Dominguez-Lara, 2017). A small, medium, or large effect size corresponds to values lower than 0.02, close to 0.13, or greater than 0.26 (Dominguez-Lara, 2017). The data were analysed using *Statistical Package for the Social Sciences* v.29 (IBM® SPSS, Chicago, IL, USA) and IBM® SPSS Amos v.29.

Results

Descriptive statistics, reliability coefficients and correlations between variables

Table 1 shows mean scores higher than the mid-point of the respective measurement scale for *empowering climates*, *need satisfaction*, *autonomous motivation*, *controlled motivation*, and *teaching intention*, both at the BPME and at the EPME, while *disempowering climates*, *need frustration* and *amotivation* at the BPME and the EPME obtained mean scores lower than the mid-point of the measurement scale. There were values between .81 and .95 in Cronbach's alpha, between .79 and .95 in McDonald's Omega, between .73 and .94 in Raykov's coefficient, and between .50 and .79 in AVE. Moreover, there were positive correlations between *empowering climates*, *need satisfaction*, *autonomous motivation*, and *teaching intention*, both in T1 and T2, just as *disempowering climates*, *need frustration*, and *amotivation* were positively correlated in T1 and T2. In addition, *empowering climates* were negatively correlated with *need frustration* and *amotivation* in T1 and T2, while negative correlations were found between *disempowering climates* and *need satisfaction*, *autonomous motivation*, and *teaching intention* in both T1 and T2.

Path analysis

The hypothesised model obtained a good fit: $\chi^2(df = 39) = 150.10$, $p < .001$, $\chi^2/df = 3.85$ CFI = .99, TLI = .96, SRMR = .027, RMSEA = .048 (90%CI = .040 – .056, $p_{close} = .673$). The results from the predictive associations are presented in Figure 2. The total explained variance accounted for 40% of *teaching intention* at the EPME.

Relationship between the (dis-)empowering climates, need-based experiences, and quality of motivation (T1)

Figure 2 shows that, in the DP, the pre-service teachers' perception of an educator-created *empowering climate* predicted their *need satisfaction* positively and their *need frustration* negatively. A *disempowering climate* positively predicted *need frustration*. Moreover, both an *empowering climate* and *need satisfaction* in the DP were positively and directly related not only to *autonomous motivation* at the BPME, but also to *controlled motivation*, although to a lesser extent. Furthermore, *need satisfaction* in the DP negatively predicted *amotivation* at the BPME while *need frustration* in the DP had a positive direct effect on *controlled motivation* and *amotivation* at the BPME. Regarding the mediation analysis, need satisfaction in the DP significantly mediated the association of an *empowering climate* in the DP with *autonomous motivation* (total effects: $\beta = .41$; 95%CI = .33, .46; $p = .014$) and *controlled motivation* ($\beta = .25$; 95%CI = .15, .28; $p = .006$), but not with *amotivation* at the BPME ($p = .711$). Similarly, *need frustration* mediated the relationship between a *disempowering climate* in the DP and *controlled motivation* (total indirect effects: $\beta = .09$; 95%CI = .06, .013; $p = .010$) and *amotivation* at the BPME (total indirect effects: $\beta = .13$; 95%CI = .09, .18; $p = .007$).

Relationships between (dis-)empowering climates, need-based experiences, and quality of motivation across both measures (T1-T2)

Figure 2 shows that each variable under study in the DP had a direct and positive effect on itself at the EPME. Moreover, *autonomous motivation* at the BPME positively predicted an *empowering climate* at the EPME, whereas *amotivation* at the BPME predicted a *disempowering climate* positively and an *empowering climate* negatively, both at the EPME. Apart from these direct effects, the relationship of an *empowering climate* between the DP and EPME was significantly mediated by *need satisfaction* and *autonomous motivation* (total indirect effects: $\beta = .03$; 95%CI = .01, .10; $p = .006$). Similarly, the relationship of a *disempowering climate* between the DP and at the EPME was significantly mediated by *need frustration* and *amotivation* (total indirect effects: $\beta = .04$; 95%CI = .016, .075; $p = .007$).

Table 1
Descriptive statistics, reliability coefficients and Pearson's correlations among variables

	M (SD)	α	ω	*ρ*	AVE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Empowering climate $_{DP}$	3.55 (0.72)	.89	.85	.86	.50		−.46**	.10**	.56**	−.35**	.37**	.15**	−.10**	.38**	−.14**	.29**	−.18**	.30**	.14**	−.10**	.06*
Disempowering climate $_{DP}$	2.34 (0.85)	.88	.88	.88	.53			−.04	−.25**	.46**	−.08**	.08**	.19**	−.15**	.33**	−.10**	.21**	−.08**	.06*	.12**	.02
Teaching intention $_{BPME}$	6.10 (1.35)	.93	.93	.89	.55				.22**	−.15**	.23**	.16**	−.28**	.04	−.01	.17**	−.15**	.22**	.15**	−.20**	.59**
Need satisfaction $_{DP}$	3.63 (.060)	.91	.80	.76	.53					−.56**	.44**	.15**	−.16**	.30**	−.08**	.48**	−.31**	.32**	.13**	−.10**	.11**
Need frustration $_{DP}$	2.37 (0.74)	.92	.82	.90	.75						−.19**	.10**	.35**	−.15**	.20**	−.32**	.48**	−.14**	.08**	.21**	−.07*
Autonomous Motivation $_{BPME}$	3.55 (0.82)	.94	.86	.90	.74							.47**	−.22**	.28**	.01	.29**	−.14**	.64**	.33**	−.18**	.25**
Controlled Motivation $_{BPME}$	3.19 (0.87)	.81	.79	.91	.56								.13**	.13**	.10**	.10**	.06*	.34**	.64**	.01	.12**
Amotivación $_{BPME}$	1.57 (0.87)	.86	.86	.86	.60									−.10**	.20**	−.16**	.27**	−.16**	.04	.44**	−.25**
Empowering climate $_{EPME}$	3.62 (0.77)	.91	.89	.88	.51										−.25**	.57**	−.32**	.45**	.20**	−.24**	.04
Disempowering climate $_{EPME}$	1.99 (0.80)	.89	.89	.89	.52											−.15**	.43**	.03	.17**	.32**	.01
Need satisfaction $_{EPME}$	3.72 (0.65)	.92	.81	.73	.51												−.54**	.48**	.18**	−.23**	.15**
Need frustration $_{EPME}$	2.30 (0.75)	.92	.81	.92	.79													−.20**	.10**	.43**	−.11**
Autonomous motivation $_{EPME}$	3.41 (0.89)	.95	.87	.94	.56														.52**	−.23**	.30**
Controlled motivation $_{EPME}$	3.17 (0.89)	.82	.80	.91	.57															.11**	.19**
Amotivation $_{EPME}$	1.83 (1.03)	.87	.87	.87	.62																−.29**
Teaching intention $_{EPME}$	6.10 (1.40)	.95	.95	.88	.54																

Note. α = Cronbach's alpha; ω = McDonald's omega; *ρ* = Raykov's composite reliability coefficient; AVE = Average variance extracted; DP = Degree Programme; BPME = Beginning of the professional master's in education; EPME = End of the professional master's in education.
**$p < .01$. *$p < .05$.

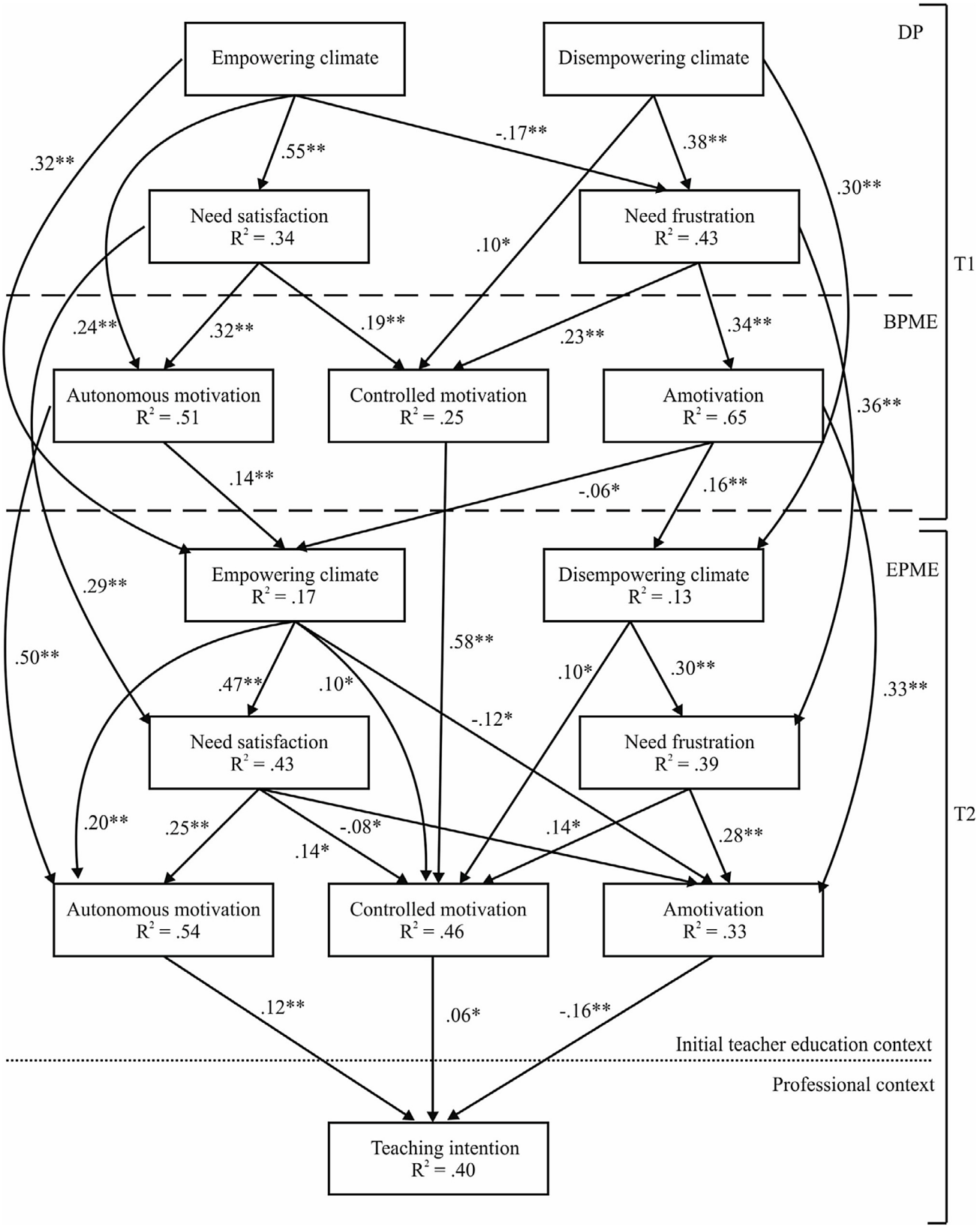

Figure 2. Longitudinal associations of *perceived educator-created (dis-)empowering climates* on *teaching intention* via *need-based experiences* and quality of *motivation* among pre-service teachers.

Note. Only significant paths are graphically depicted. T1 = Time 1; T2 = Time 2; DP = Degree Programme; BPME = Beginning of the professional master's in education; EPME = End of the professional master's in education; ** $p < .01$. * $p < .05$.

Relationships between (dis-)empowering climates, need-based experiences, quality of motivation, and teaching intention (T2)

Figure 2 also shows that an *empowering climate* at the EPME predicted *need satisfaction*, *autonomous motivation*, and *controlled motivation* positively, whereas it predicted *need frustration* and *amotivation* negatively. Moreover, a *disempowering climate* positively predicted *need frustration* and *controlled motivation*. *Need satisfaction* positively predicted *autonomous motivation* and *controlled motivation*, whereas *need frustration* positively predicted *controlled motivation* and *amotivation*. Furthermore, *both autonomous motivation* and *controlled motivation* positively predicted *teaching intention*, although *controlled motivation* did it to a lesser degree. *Amotivation* negatively predicted *teaching intention* at the EPME. Lastly, while a significant indirect effect was found between an *empowering climate* in the DP and *teaching intention* at the EPME ($\beta = .06$; 95%CI = .04, .08; $p = .010$), there was a non-significant indirect effect between a *disempowering climate* in the DP and *teaching intention* at the EPME ($\beta = -.01$; 95%CI = -.02, .01; $p = .499$). On the other hand, the R^2 expressed large effect sizes in *need satisfaction*, *need frustration*, the three qualities of *motivation* and *teaching intention* at the EPME.

Discussion

Grounded on SDT, the aim of the present research was to examine longitudinally the interplay between the pre-service teachers' perception of educator-created (dis-)empowering climates and their teaching intention at the BPME and the EPME, using the bright and dark motivational pathways outlined by SDT. Overall, the results from the path analysis found that the pre-service teachers' perception of an educator-created empowering climate was positively related to their need satisfaction, autonomous motivation, and teaching intention. Conversely, the pre-service teachers' perception of educator-created disempowering climates was positively associated with their need frustration, controlled motivation and amotivation.

Relationship between the (dis-)empowering motivational climates, need-based experiences, and quality of motivation in the early stages of initial teacher education

In the first part of the hypothesized model, the results show an empowering climate perceived in the DP positively predicted both need satisfaction in the DP and autonomous motivation at the BPME, while negatively predicting need frustration. These results align with the SDT postulates (Ryan & Deci, 2017), as well as with previous cross-sectional studies (Granero-Gallegos, Baena-Extremera et al., 2023; Granero-Gallegos, López-García et al., 2023), underlining the importance of the role of an empowering climate in not only energising adaptive motivational processes, but also in buffering maladaptive experiences. One possible explanation would be that when pre-service teachers perceive their teacher educator using elements of autonomy support with intrapersonal criteria of success in the classroom and showing their involvement, they tend not only to feel themselves to be causal agents (autonomy satisfaction), effective in the activities they carry out (competence satisfaction), integrated in the classroom (relatedness satisfaction) and participating in the initial education programme guided by reasons that are more self-determined (autonomous motivation), but also have reduced feelings of both autonomy frustration and competence frustration towards a task and, in turn, less a feeling of being excluded by the teacher educator (relatedness frustration). In addition to the direct effect between an empowering climate in the DP and autonomous motivation at the BPME, our results found an indirect effect between both variables through need satisfaction in the DP, suggesting that pre-service teachers could develop their autonomous motivation in the BPME in a complementary way, through a more reflective process that accumulates experiences linked to need satisfaction throughout the DP.

Moreover, our results show that the pre-service teachers' perception of educator-created disempowering climates positively predicted their need frustration and controlled motivation in the DP. A plausible justification would be that, when pre-service teachers perceive their educator as adopting controlling strategies (control) together with interpersonal criteria for success in the classroom (an ego-involving climate), they would be more likely to feel that they must do the activity in a certain way (autonomy frustration), feel inferiority and inefficiency towards this task (competence frustration), as well as feel coldness from their educator (relatedness frustration) and a sense of responsibility and duty when participating in the classroom (controlled motivation). In addition, our results point to an indirect effect between a disempowering climate in the DP and amotivation at the BPME through need frustration in the DP, suggesting that pre-service teachers feel amotivated at the BPME through a prolonged accumulation of need frustration experiences rather than by a direct process of exposure to disempowering climates. In any case, the quality of motivation to study the PME would depend largely on the previous educational experiences of the pre-service teachers.

Maintenance of (dis-)empowering climates, need-based experiences, and quality of motivation over the initial teacher education programme (T1-T2)

Continuing with the hypothesised model, our results show that perceived (dis-)empowering climates, need satisfaction and frustration in the DP, as well as the three qualities of motivation at the BPME, positively predicted perceived (dis-)empowering climates, need satisfaction and frustration and the three qualities of motivation at the EPME. Regarding the social factors, there is both a direct relationship between an empowering climate in the DP and in the EPME, as well as an indirect relationship mediated by need satisfaction and autonomous motivation, and a negative relationship mediated by need frustration and amotivation. In turn, a disempowering climate in the DP also showed an indirect relationship through need frustration and amotivation to a disempowering climate at the EPME. Therefore, this study provides information on the stability of the motivational climate generated by the teacher educator.

Regarding need-based experiences and motivation, firstly, an indirect need frustration relationship was found between the DP and the EPME through amotivation at the BPME and a disempowering climate at the EPME, as well as an indirect need satisfaction relationship between the DP and the EPME through autonomous motivation at the BPME and empowering climates at the EPME. Similarly, the association of autonomous motivation at the BPME with the EPME was mediated by need satisfaction and an empow-

ering climate, just as the relationship of motivation between the BPME and the EPME was mediated by need frustration and a disempowering climate at the EPME. These results align with previous research into initial teacher education (Burgueño et al., 2022) which examined the temporal stability of perceptions of need-based experiences and amotivation among pre-service teachers. These results highlight the importance of developing need satisfaction and autonomous motivation from the initial stages of teacher education given its motivational impact on the future. Indeed, our findings on the stability of motivational processes could be largely due to the influence of both contextual and situational social factors, including motivational climates created by the teacher educators (Ryan & Deci, 2017).

Relationship between (dis-)empowering climates, need-based experiences, quality of motivation, and teaching intention (T2)

In the final part of the model (EPME) and partially consistent with previous research, both cross-sectional (Burgueño et al., 2017; Silva et al., 2018) and longitudinal (Burgueño et al., 2022), teaching intention was positively predicted (and to a greater extent) by autonomous motivation than controlled motivation and, negatively, by amotivation. A possible justification would be that pre-service teachers develop a strong teaching intention when they understand that the initial teacher education programme is a pleasant activity with important benefits associated to their future teaching career (autonomous motivation), rather than completing the programme as a way of meeting the requirements imposed by the public administration to access the teaching profession (controlled motivation). Likewise, pre-service teachers who reflect a lack of both utility and interest in the initial teacher education programme (amotivation) would tend to have less teaching intention. Finally, our results found a positive indirect effect between a perceived empowering climate in the DP and teaching intention at the EPME through need-based experiences and the quality of motivation at the BPME and EPME. These findings would imply that the creation of empowering climates by the teacher educator in the DP and PME would facilitate need satisfaction and autonomous motivation during the initial teacher education programme and, consequently, would contribute to promoting a strong teaching intention in the pre-service teachers by the time they complete the initial teacher education programme. On the other hand, no significant indirect effects were found between educator-created disempowering climates and teaching intention, suggesting that exposure to motivational climates characterised by control and interpersonal criteria of success favour neither adaptive motivational processes nor the desire amongst pre-service teachers to access the teaching profession.

Implications for initial teacher education

The results of the present study underline the importance of maximising the empowering climates and, in turn, minimising disempowering climates as much as possible in developing a strong teaching intention in pre-service teachers during their initial teacher education programme. Thus, it is recommended that the teacher educator creates empowering climates focused on providing opportunities for choice, meaningful justifications for undertaking activities and favouring initiative (i.e., autonomy support), as well as establishing criteria based on the process, and on personal improvement (i.e., task-involving climate) together with an environment that socially and emotionally supports pre-service teachers (i.e., social support). Similarly, it is suggested that teacher educators avoid or, at least, decrease the disempowering climates through the minimised use of contingent rewards, expressions that imply a strong sense of responsibility or obligation such as "you have to" or "you must", or strategies based on inducing guilt and public shame (i.e., control), as well as to avoid establishing criteria based on social comparison and the excessive use of punishments when pre-service teachers do not meet the educator's expectations (i.e., an ego-involving climate). On the other hand, the results show that various intervention programmes could be conducted to train teacher educators in how to create empowering climates more effectively and, in turn, reduce as much as possible the instructional elements characteristic of a disempowering climate in initial teacher education programmes.

Limitations and future research

Although the findings from this research represent an advance in understanding the role that the perceived educator-created (dis-)empowering climate can play in teaching intention, a series of limitations must be considered. First, the use of a correlational design that, although it included different time points, did not allow us to establish cause-effect relationships between the variables under study. Therefore, future research needs to analyse the effects between a (dis-)empowering climate and the different motivational and cognitive variables considered using experimental designs. Second, the exclusive use of self-reported measures could limit a full understanding of the relationships between the variables analysed. Thus, new studies need to analyse the educator-created (dis-)empowering climate through different viewpoints, such as external observation instruments and self-reports from the educators themselves, to allow a better triangulation of the data as well as to examine the degree of agreement between pre-service teachers and their educator. Third, although this research evaluated pre-service teachers' perceptions of the (dis-)empowering climate generated by the main agent involved in the initial teacher education, there might be other socialising agents that somehow explain teaching intention of pre-service teachers. Accordingly, further research is required to explore the influence (combined or separate) of other socialising agents involved in initial teacher education programmes, including family-generated motivational climates (Bruinsma & Jansen, 2010). Fourth, although the sample was considered representative of the population under study, the lack of randomisation in the sample selection process suggests that the results should be interpreted with some caution. Consequently, new studies are needed that have a greater heterogeneity in the pre-service teacher sample when considering the type of training received (e.g., online, blended, or face-to-face), the type of education centre (i.e., public, or private), as well as pre-service teachers at other school levels (e.g., early-childhood education or primary education).

Conclusions

This research gathers evidence on the differentiated role that perceived educator-created (dis-)empowering climates in the DP and PME play in both motivational processes and teaching intention in pre-service teachers. This study adds to the existing body

of evidence pertaining to the SDT literature in the context of initial teacher education, indicating that motivational dynamics and teaching intention would be influenced by the educator-created motivational climates during the initial teacher education programme. More specifically, our results highlight the need for the teacher educator to create empowering climates in order to promote not only adaptive motivational processes and a strong teaching intention, but also to minimise the generation of disempowering climates as much as possible. Thus, our findings could serve as a guide for teacher education programme makers and teacher educators to sensitise them into using empowering climates that favour need satisfaction, autonomous motivation, and teaching intention among pre-service teachers. In this sense, initial teacher education programmes could facilitate predominantly autonomous motivational processes which could contribute to pre-service teachers staying committed over time and remaining in the education system as highly qualified teachers.

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Conflict of interests

The authors have no conflicts of interest to disclose.

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