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A latent class analysis on students' beliefs about teachers' practices enhancing their well-being

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Student well-being and student voice are two interrelated concepts that can play a critical role in education. While Student well-being refers to the overall state of students' physical, mental, and emotional health, student voice represents the active involvement and participation of students in shaping their own educational experiences. Notwithstanding the intimate association, there is a limited body of research that explores how students' distinct perceptions of teachers' practices that promote their well-being influence students' actual well-being levels. To address this research gap, a study was conducted involving 486 students. The participants, with an average age of 13.5 years, completed a questionnaire. Among the participants, 51.1% identified as female, and 13.6% had experienced academic retention. The latent class results classified the 7–9 grade student's beliefs about teacher's practices into "few times," sometimes' and "often." The model fitting results were as follows: Akaike Information Criterion (AIC) was 2,555.904, Bayesian Information Criterion (BIC) was 2,610.244, Adjusted Bayesian Information Criterion (aBIC) was 2,568.983, and Entropy was 0.802. Compared with the "few times" and "sometimes" class, the "often" class was more prevalent in 8th grade ($p = 0.05$) and among male students ($p = 0.04$). Findings show that class membership is a predictor of student well-being (interpersonal, life satisfaction and perceived competence). Students who feel that their teachers are attentive, supportive, and address their needs more frequently are more likely to experience enhanced well-being.

KEYWORDS

teacher practices, students well-being, teacher differentiated practices, students perceptions, teacher responsiveness

Introduction

The positive impact of student well-being on academic achievement, future life quality, and overall fulfillment is globally recognized (Bücker et al., 2018; OECD, 2019a; Cárdenas et al., 2022; Ling et al., 2022). Inclusion of students' voices informs policy and practice development, fostering a student-centered environment that enhances school experiences, teaching quality, and learning outcomes (Messiou, 2019; Aldridge and Bianchet, 2022). Prioritizing student well-being and holistic needs promotes academic success and overall life satisfaction, acknowledging the interconnectedness between well-being and educational outcomes.

In Portugal, in line with international policies and practices (OECD, 2017, 2019a,b), a recent educational focus has emerged on a student-centered approach (Ministry of Education, 2022), recognizing the interconnectedness of student well-being and student

voice as critical elements in education. Student well-being encompasses physical, mental, and emotional health, as well as their sense of belonging, happiness, self-esteem, resilience, and stress management (Govorova et al., 2020; Hossain et al., 2023; McNeven et al., 2023).

Historically, well-being has been conceptualized through two philosophical perspectives: hedonic and eudaimonic views, with the former emphasizing positive feelings and the cognitive and affective domains, and the latter focusing on self-actualization and intrinsic values (Deci and Ryan, 2008). However, recent literature advocates for an integrative approach that combines both perspectives, acknowledging the importance of considering both hedonic and eudaimonic aspects of well-being (McLellan and Steward, 2015; Buerger et al., 2023; Hossain et al., 2023; McNeven et al., 2023). These perspectives offer different lenses to comprehend and evaluate well-being, facilitating a comprehensive understanding of the multidimensional nature of human flourishing (Huta and Waterman, 2014).

On the other hand, pupil voice represents the active involvement and empowerment of students in decision-making processes, valuing their unique perspectives, opinions, and experiences (Aldridge and Bianchet, 2022; Jones and Hall, 2022; Scarparolo and MacKinnon, 2022). By providing opportunities for students to express their thoughts, ideas, and concerns, pupil voice contributes to shaping their learning experiences, school policies, and overall educational journey. When combined with pupil well-being, this synergy fosters a positive and inclusive educational environment, where students feel heard, supported, safe, and respected, facilitating their overall development and active engagement in learning (Halliday et al., 2019). However, although there has been an increasing amount of research focusing on students' well-being and students' voice as separate entities, there is a noticeable scarcity of studies that integrate students' perspectives concerning teachers' practices that facilitate their well-being. As Halliday et al. (2019) stated "frequently, assumptions are made about what might be best for student well-being, with little input from the students themselves" (p. 174).

Portugal has recently established a tradition of understanding and monitoring the landscape of psychological health and well-being among school-aged children and adolescents (e.g., Matos et al., 2022, 2023), also participating in the large-scale study "Health Behavior in School-aged Children" (Guedes et al., 2023). However, these studies do not explicitly address the relationship between students' differentiated perceptions of teachers' practices and their levels of well-being.

Despite the scarcity of studies on the subject, it is worth mentioning two recent studies that have presented somewhat similar findings. Pozas et al. (2021) conducted multilevel analyses with 379 students in Austria, demonstrating that tailored instruction based on individual competence levels increased students' sense of achievement, active engagement, positive self-concept, and overall well-being. Govorova et al. (2020), analyzing responses from 248,620 students across 35 OECD countries, revealed that teacher support significantly predicted student well-being, emphasizing the importance of teachers ensuring comprehension, providing additional assistance, and integrating learning experiences. Neither of the studies considers the differentiated impact that teachers' practices, or rather, the perception of teachers' practices, may have on different students. Within this theoretical framework, in this brief report, we will address this gap by investigating the connection between students' distinct perceptions of teachers' practices that promote their well-being and students' actual well-being levels. More specifically, this study addressed the following research questions:

R1. How can middle school students (7th−9th grade) be classified according to their beliefs about the frequency of teacher practices enhancing students' well-being?
R2. Are there differences observed in the demographic characteristics (gender and grade) among the identified profiles?
R3. How does membership in different types of profiles predict the well-being of students?

Method

Participants

The selection of participants was carried out through a non-probabilistic sampling process, and participants were selected based on their availability and consent to participate in the study (Cohen et al., 2018). Schools were randomly selected, with invitations sent to several schools in the Lisbon District of Portugal, and five schools accepted to participate. All pupils and their legal representatives provided consent forms.

The final sample consisted of 486 participants. Of these, 52.1% were female ($N = 253$) and 47.9% were male ($N = 233$). Participants were aged between 11 and 18 years old, with an average age of 13.5 years and a standard deviation of 1.09. Regarding years of schooling, 32.5% of students ($N = 158$) attended the 7th grade, 42.2% attended the 8th grade ($N = 205$), and 25.3% attended the 9th grade ($N = 123$). In terms of retention, 86.4% ($N = 420$) reported never being retained, while 13.6% ($N = 66$) had been retained one or more times.

Procedure

Before data collection, the study obtained formal approval from the General Directorate of Education (DGE), ensuring data privacy and confidentiality. Informed consent was obtained from all participants and their legal representatives. Data collection occurred in a single moment, with the concern not to disturb the normal functioning of classes. Data were collected with the presence of the researcher, to clarify possible doubts. The questionnaires were distributed both online (through the Qualtrics platform) and in paper format, depending on the possibility/availability of internet access. After collecting the questionnaires, the results were analyzed and processed.

Data analysis

Confirmatory Factor Analysis (CFA) was used to assess the factorial structure of both scales, with preference given to the

WLSMV (Weighted Least Squares Means and Variance Adjusted) estimator in the MPlus software due to the ordinal nature of the collected data (Bandalos, 2014). To evaluate the overall fit of the scales, the Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA) were utilized (Kline, 2016; Wang and Wang, 2020). Notably, the chi-square value, which is commonly reported in confirmatory factor analysis, was not considered for model adequacy assessment due to its sensitivity to sample size (Kline, 2016; Wang and Wang, 2020). Cronbach's alpha was used to evaluate the internal consistency of the factors.

Measures

Students' perception of teachers' practices

Teachers' practices were selected based on exploratory interviews and existing literature (Vostanis et al., 2013; Gaitas and Alves Martins, 2016; Aluri and Fraser, 2019; Maelan et al., 2019), aligning with the four dimensions identified by Maelan et al. (2019): "Being Responsive to Pupils' Academic Needs" (e.g., "Teachers provide tasks suited to my needs"), "Relating to pupils as individuals" (e.g., "Teachers talk to me about things that are important to me, even if they don't have to do with school"), "Reducing School-Related Stress" (e.g., "Teachers help me develop my self-confidence in all situations"), and "Creating Relatedness within the Classroom" (e.g., "Teachers promote activities where I need to collaborate with my classmates"). The scale used in this study consists of 40 items, measuring the frequency of practice implementation by teachers. Participants rated each item on a 6-point scale ranging from never (1) to often (6). The scale "Creating Relatedness within the Classroom" was excluded from the analysis due to low reliability ($\alpha = 0.63$). After removing the scale "Creating Relatedness within the Classroom" we re-run the analyses and the three-factor model of the scale that assesses students' well-being also shows good adjustment indices. The adjusted three-factor model presented a very good fit (CFI = 0.0.94; TLI = 0.0.93; RMSEA = 0.04), since CFI and TLI values above 0.90 and RMSEA values below 0.08 are indicative of a good structural fit (Kline, 2016; Wang and Wang, 2020). The internal consistency of the scale ranges between 0.78 and 0.84.

Students' well-being scale

The original instrument, titled "How I feel about myself and School," was developed to assess the well-being of children in school settings. It was constructed and validated in England in a study involving 5,170 students aged 7–14 from 20 primary and secondary schools, aiming to explore the relationship between creative initiatives and young people's well-being (McLellan and Steward, 2015). The 21-item scale encompasses four dimensions: Interpersonal well-being (e.g., "I feel people are friendly"), Life Satisfaction (e.g., "I feel I enjoy things"), Perceived Competence (e.g., "I feel I am doing well"), and Negative Emotions (e.g., "I feel miserable"). Items are scored on a 6-point response format from never (1) to often (6), integrating the hedonic and eudaimonic conceptualizations of well-being (Deci and Ryan, 2008). The subscale "Negative emotions" was removed from analysis due to its low reliability (0.59). The final adjusted model for the three dimensions presented a good fit (CFI = 0.0.95; TLI = 0.0.94; RMSEA = 0.06) and the internal consistency of the scale ranges between 0.79 and 0.88.

Data analysis

To run the latent class analysis (LCA) we selected the dimension "Being Responsive to Pupils' Academic Needs" due to the strongest correlation with student well-being ($r = 0.416$, $p < 0.001$). Each item of "Being Responsive to Pupils' Academic Needs" dimension was parameterized by LCA, and the latent class model (LCM) was constructed, which is a statistical analysis that assigns individuals to classes based on their probability of being in classes given the pattern of scores they have on indicator variables (Muthén and Muthén, 2000). The model selection was based on various criteria, including the Akaike information criterion (AIC), Bayesian information criterion (BIC), sample-size adjusted Bayesian information criterion (aBIC), Bootstrap likelihood ratio test (BLRT), and adjusted Lo-Mendell-Rubin likelihood ratio test (aLMR). The methodology used to deal with missing data consisted of using the Full Information Maximum Likelihood (FIML) procedure. After identifying the latent classes, a regression was used to analyse to what extent class membership predicts students' well-being. SPSS 28.0 and Mplus 8 statistical software were used to analyse the data, and $p < 0.05$ was taken as the criterion of significance.

Results

Latent class analysis of students' beliefs about the frequency of teacher practices

As shown in Table 1, the AIC, BIC, and aBIC indices decreased as the number of latent classes increased, reaching their lowest value in Model 3. The entropy value, which measures the accuracy of sample classification, was highest in Model 3 at 0.802, indicating that this model provided the most precise classification of students' beliefs about the frequency of teacher practices among the three latent classes.

Based on the model fit evaluation and the conditional probability distribution of the latent class, the students' beliefs about the frequency of teacher practices were grouped into three classes: class 1 (53%), class 2 (37%), and class 3 (10%). Class 1 was named 'often' due to the high probability of students frequently perceiving teacher practices. Class 2 was named "sometimes" as students in this group had a moderate probability of perceiving teacher practices. Class 3 was named "few times" reflecting the low probability of students perceiving these practices.

Figure 1 show the conditional probability of the latent class of students' beliefs about the frequency of teacher practices.

In class 1, the item probability of "often" use the teaching practice "Teachers encourage me to participate in all class activities" (97%) was the highest, and the item probability of "Teachers give me the time I need to carry out the activities" (88%) was the lowest.

Compared with the other 2 classes, the conditional probability of class 1 tends to be highest. In class 2, the item probability of using "sometimes" the teaching practice "Teachers give me the time I need to carry out the activities" (98%) was the highest, and the item probability of "Teachers encourage me to do all the activities" (44%) was the lowest. In class 3, the item probability of using "few times" the teaching practice "Teachers encourage me to participate in all class activities" (44%) was the highest, and the item probability of "Teachers give me the time I need to carry out the activities" (19%) was the lowest. Therefore, class 1 was named the "often", class 2 was the "sometimes", and class 3 was the "few times" class.

From the comparative analysis of subgroups (see Figure 1) of students according to their beliefs about the frequency of use of practices that promote their well-being, we found that: (1) the probability of using practices such as giving more time to complete tasks, clearly defining what students should accomplish and promoting a positive climate decreases in class (C2) that classifies the frequency of use as "sometimes", while class (C3) which considers that teachers use "few times" these practices increases in this set of teaching practices. These two classes (C2 and C3) converge in the probability of using the practice "Teachers encourage me to do all the activities"; (2) Class 1 and 2 share the lowest probability of teachers using the practice "Teachers give me the time I need to carry out the activities"; (3) The practices in which there is the greatest discrepancy in the likelihood of its use among subgroups of students is related to classroom climate ("Teachers promote a positive climate within the classroom" and "Teachers make me feel welcome in the classroom"). However, class 1 ("often") is the most likely to perceive that teachers use this type of practices to promote well-being.

Table 2 shows the association between demographic characteristics and latent classes based on students' beliefs about the frequency of teacher practices enhancing students' well-being. Chi-square analyses indicated that for the sociodemographic characteristics, the distribution of gender ($p = 0.04$) and grade ($p = 0.05$) differed among the classes of students, except for retention ($p = 0.62$).

Results indicated that when students believe that teachers are responsive to their academic needs, the association between perceived practices and gender is significant ($\chi 2 = 6.25$, $p = 0.044$; Kendall's tau-b $= -2.41$, $p = 0.0016$). According to the adjusted residuals (AR $= -9$), male students in class 1 perceive "often" teachers practices more than expected. As for school level, a significant association was found between grade and class membership ($\chi 2 = 6.25$, $p = 0.05$; Kendall's tau-b $= -2.76$, $p = 0.783$). Students from grade 8 perceive "often" teachers practices more than expected (AR $= -2.1$). Based on these results, we can infer that male 8th graders, compared to other groups of students, tend to overvalue teaching practices that are responsive to their academic needs. This suggests that this subgroup perceives

TABLE 1 Results of latent class model (LCM) fitting information.

Model	AIC	BIC	aBIC	Entropy
1	2,930.758	2,955.838	2,936.795	1
2	2,539.522	2,623.123	2,559.644	0.753
3	2,555.904	2,610.244	2,568.983	0.802

TABLE 2 Association between participants' demographic characteristics and latent classes.

	Latent classes			$\chi 2$	p
Gender	1	2	3	6.23	0.04
Female	119	105	29		
Male	**136**	76	21		
Grade	1	2	3	9.23	0.05
7	85	52	21		
8	**96**	87	22		
9	74	42	7		

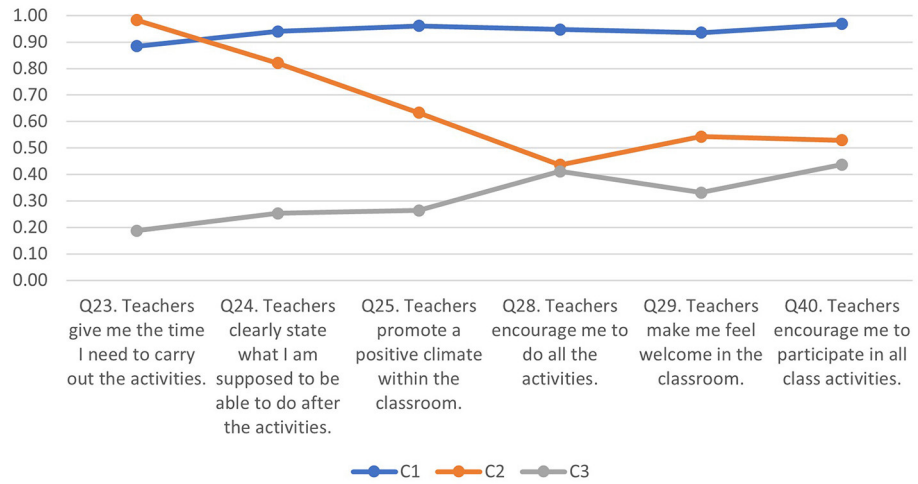

FIGURE 1
Visual representation of latent classes of students' beliefs about the frequency of teacher practices.

TABLE 3 Model fit measures for profile membership predicting student's well-being.

Student's well-being dimension	R^2	Adjusted R^2	F	p
Interpersonal well-being	0.298	0.244	77.6	<0.001
Life satisfaction	0.146	0.143	40.9	<0.001
Perceived competence	0.166	0.162	46.8	<0.001

greater benefit from teachers' attentiveness to their academic requirements, highlighting the importance of gender- and grade-specific approaches in teaching practices.

Profile membership predicting student's well-being

A linear regression was performed to determine if class membership predict the students' well-being. The results for the three models are depicted in Table 3.

The results of linear regression show that 24.4% of variance of "interpersonal well-being" is explained by that class membership ($F = 77.6$, $p < 0.001$). Based on the standard estimates, the class membership related to being responsive to pupils' academic needs predicts students' well-being. Furthermore, members of class 1, who perceive the often use of teacher practices, tend to have higher levels of interpersonal well-being than the other classes. As indicated by these results, responsive teachers enhance students' well-being.

The linear regression results show that 14.3% of variance of "life satisfaction" is explained by class membership ($F = 40.9$, $p < 0.001$). The analysis of the individual contribution of each calls membership as predictor reveals that the class 1 is the strongest predictor of life satisfaction among students ($\beta = -1.106$, $p < 0.001$).

Finally, 16.2% of the variance of "perceived competence" is explained by class membership ($F = 46.8$, $p < 0.001$). As in the previous two models, class 1 ("often" use of teacher practices) is the strongest predictor ($\beta = -1.264$, $p < 0.001$).

Discussion

The present study used a person-centered approach to investigate the classification of students based on their beliefs regarding the frequency of teacher practices that enhance their well-being (R1). Through a latent class analysis, conducted using teachers' practices concerning being responsive to students' academic needs, three different classes were identified: (1) Students who consider that teachers often use these practices; (2) Students who consider that teachers sometimes use these practices; and (3) Students who consider that teachers use these practices few times. These varying perceptions of teacher responsiveness can have multiple implications, including: (1) potential effects on student engagement, motivation, and academic performance, with high levels of perceived responsiveness associated with increased interest and effort in studies; (2) influence on student-teacher relationships, fostering stronger bonds and a supportive learning environment; (3) impact on student satisfaction and well-being, as fulfilled needs contribute to contentment and positive attitudes toward school (Amholt et al., 2020; Hossain et al., 2023; McNeven et al., 2023). Additionally, these perceptions may contribute to the achievement gap by intensifying existing disparities in educational outcomes (OECD, 2019a; Clarke, 2020; Pozas et al., 2021).

Moreover, to address some of the implications previously mentioned, this study also examined the variations in demographic characteristics such as gender and grade within the identified profiles (R2) and investigated how different types of profile membership predict students' well-being (R3). Our results suggest that both 8th-grade students and males perceive a higher frequency of pedagogical practices promoting their well-being. This finding aligns with a recent systematic review that demonstrated a consistent pattern of gender differences, indicating that, in general, boys tend to report higher scores of well-being (Amholt et al., 2020). Concerning grade-level, in Portugal, this difference could be explained by students at this grade being in an intermediate year, with lesser exposure to adaptation and adjustment processes (7th) and exam pressure (9th). This exemption may contribute to a more positive evaluation of teachers' practices. These findings reinforce the contradictory nature of the impact of grade level and age on well-being, emphasizing the need for further research (Amholt et al., 2020; Clarke, 2020).

Regarding our last research question, our results indicate that class membership, in function of frequency of teacher practices, predicts students' well-being. It was found that students who believe that their teachers are more responsive to their needs, tend to exhibit higher levels of well-being (Govorova et al., 2020; Pozas et al., 2021; Zheng, 2022). In other words, students who feel that their teachers are attentive, supportive, and address their needs more frequently are more likely to experience enhanced well-being.

Our study contributes to the literature by highlighting the differentiated impact of teachers' practices on students' well-being, emphasizing the importance of considering students' perspectives. The novelty of this research lies in its person-centered approach and its focus on the frequency of teacher practices from the students' viewpoint. By employing latent class analysis to categorize students' beliefs about the frequency of teacher practices and their impact on well-being, we identified distinct subgroups within the student population based on their perceptions. This approach, not extensively explored in previous research, provides a more nuanced understanding of how different students perceive and are affected by teachers' practices, highlighting the importance of tailored educational strategies. Specifically, our study delves into how specific perceptions of teacher responsiveness influence student well-being.

However, our study has several limitations that should be acknowledged. First, the exact number or percentage of sample members within each class was not determined, which may affect the generalizability of the findings. Second, the names of the classes ("few times," "sometimes," "often") may not fully capture the complexity and nuances of teacher practices. These limitations suggest the need for more precise measures and a deeper exploration of the classifications used in future research.

Additionally, the non-probabilistic sampling process and the focus on a specific geographic region may limit the applicability of our results to other contexts.

Moreover, it was found that frequent use of such teacher practices emerges as a predictor of student well-being, particularly interpersonal well-being. Specifically, when teachers frequently use practices that address students' needs, it predicts higher levels of well-being (Clarke, 2020; Pozas et al., 2021). However, practices associated with the classroom climate, such as promoting a positive climate within the classroom and making students feel welcome, do not play the key role in promoting well-being as suggested by previous literature (Lester and Cross, 2015; Lombardi et al., 2019; Wang et al., 2020; Leurent et al., 2021). Instead, encouraging student participation in lessons is perceived as the most influential pedagogical practice for promoting well-being. Supporting students' needs, involving them in decision-making processes, and valuing their perspectives through pupil voice have been shown to enhance student well-being.

Considering that this study was conducted based on students' perspectives, some fundamental implications can be inferred. The first is the importance of positive teacher-student relationships in education. Teachers should strive to create an environment where students feel valued, respected, involved, and supported. Understanding each student's unique needs and providing personalized support is crucial. Additionally, teachers play a vital role in offering emotional and social support, fostering open communication, and cultivating a sense of belonging, contributing to enhancing students' overall development and well-being.

Further investigation into these implications is crucial for informing the development of strategies that enhance teacher-student interactions, promote equity, and improve overall educational experiences. Ongoing research using students' perspectives will offer valuable insights into effective interventions and targeted approaches to teacher practices that positively impact students' well-being.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by Directorate-General for Education (DGE), through the School Environment Survey Monitoring System (MIME). The studies were conducted in accordance with the local legislation and institutional requirements. Written informed consent for participation in this study was provided by the participants' legal guardians/next of kin.

Author contributions

SG, JC, and AP contributed to the conception and design of the study. AP was primarily responsible for data collection and database organization. JC performed the statistical analysis and wrote the corresponding section. SG drafted the initial manuscript, paying special attention to the introduction and discussion. All authors actively participated in the revision and rewriting process, offering valuable insights and feedback to improve the clarity and coherence of the manuscript. Through their collective efforts, a final version was produced and submitted, demonstrating a collaborative and comprehensive study. All author has thoroughly reviewed and approved the manuscript, indicating their agreement with its content and confirming its readiness for submission.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

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