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How signature strengths develop positive interdependence and empowerment in an inclusive education context

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Abstract

This study evaluates the Individual Strengths, Collective Power! program in fostering students' use of strengths vocabulary and improving classroom relationships in an inclusive education setting in Switzerland, where students with and without special educational needs and disabilities (SEND) attend school together. The study involved 179 students, ages 8 to 12, divided into an experimental group that received specific training and an active control group that had access to program resources, regardless of their SEND status. The study used the Strengths Use Scale (SUS) and the Gratitude Questionnaire to measure students' awareness of their strengths and gratitude. In addition, a sociometric measure, the Peer Acceptance Index (PAI), was developed to assess classroom dynamics. Results indicate that strengths-based interventions significantly expanded students' vocabulary of strengths and increased positive discourse, particularly among girls. Time and age were the main predictors of positive peer commentary, rather than the interventions themselves, which had no significant effect on PAI scores. The study suggests that strengths-based tools, even without guided use, can positively influence students' language about strengths, although they did not change classroom relationships within the 9-week period. Further research is recommended to explore the specific effects and mechanisms of strengths-based interventions in inclusive settings.

KEYWORDS
empowerment, inclusive education, positive education, positive interdependence, signature strengths, strengths-based interventions

Key Points

- Strengths-based interventions contribute to the enrichment of students' vocabulary about their own strengths.
- Student-reported gratitude predicts the use of strengths-based vocabulary and the frequency of positive comments about others.
- The interventions appear to have a greater impact on girls' discourse regarding the use of strengths-based vocabulary.
- The strengths-based interventions do not have a significant effect on relationships between students over the 9 weeks of the intervention.

INTRODUCTION

Youth mental health has become a global concern, with the prevalence of mental health disorders surpassing that of adults in 2021 (OECD, 2021). In parallel with this crisis, there has been a shift in the educational landscape towards more inclusive practices (Ainscow & César, 2006; UNESCO, 1994). Inclusive education has become indispensable to foster school environments that meet the needs of all students and promote diversity (Booth et al., 2003). In line with this, Positive Education (PosEd), an approach centered on promoting happiness, well-being, and the development of character strengths alongside traditional skills, has gained traction (White, 2021).

This study aimed to examine the relevance of Positive Education (PosEd), particularly the use of signature strengths using the 'Individual Strengths, Collective Power!' program (Bressoud, Shankland, Gay, & Samson, 2023), in implementing and enhancing inclusive education.

Background and key concepts

Inclusive education promotes positive views of diversity and difference (White et al., 2023). According to Ainscow (2005), its goal is to create educational communities that embrace human diversity and empower each student, regardless of their special educational needs and disabilities (SEND) status, to develop competence, autonomy and connectedness (Ryan & Deci, 2000). Positive interdependence and empowerment are central to this vision. *Positive interdependence* refers to the cooperative relationships among students that are fostered when each student's individual strengths are recognized and valued (Johnson et al., 2008). This recognition promotes a sense of connectedness and mutual reliance among students, enhancing the social dynamics of the classroom. Positive interdependence can manifest through the gratitude students feel towards their peers (Bartlett & DeSteno, 2006). *Empowerment* in the context of inclusive education refers to the process of increasing students' autonomy and confidence in their abilities (Perkins & Zimmerman, 1995). Empowerment is fostered through acknowledging each student's individual strengths and creating an environment where these strengths can be used and developed. This process promotes a sense of competence in students and fosters connectedness, thereby reinforcing positive interdependence within the classroom.

Implementing inclusive educational practices, however, poses a significant challenge. How can teachers help students see diversity as a resource rather than a difficulty? One possible solution is to apply the principles of positive psychology in education, also known as PosEd. *PosEd* can be defined as an educational approach that emphasizes not only traditional skills but also the promotion of socio-emotional skills (White, 2021). For example, a review of 12 meta-analyses involving over 1 million students (Durlak et al., 2022) suggests that PosEd programs have a statistically significant positive impact on academic performance as well as on socio-emotional learning, self-awareness, prosocial behaviour, conduct problems, drug use, behaviour and emotion difficulties.

At the core of PosEd is the recognition and development of *character strengths*, that is, the positive traits naturally present in individuals that contribute to their well-being and fulfilment (Linley, 2008). Although the concept of character strengths finds its roots in Greek philosophy and the writings of Aristotle (Haidt, 2006), it has become a prominent research topic in positive psychology, largely due to the work of Peterson and Seligman (2004). Character strengths include creativity, kindness, perseverance and many others, which can be harnessed through strengths-based interventions.

Strengths-based interventions in the educational field are practices that leverage each student's distinct character strengths (Niemiec, 2019; Wagner & Ruch, 2023; White et al., 2023). By focusing on students' strengths rather than their weaknesses, these interventions offer teachers practical tools for fostering academic achievement, wellbeing, positive emotions, class cohesion, perceived social support or socio-emotional skills (Lavy, 2020; Linkins et al., 2014; Quinlan et al., 2014).

Strengths-based interventions come in many different forms, as evidenced by programs with diverse names such as 'Strengths for the journey' (Foka et al., 2022), 'Celebrating Strengths' (Fox, 2008), 'Mindfulness-Based Strength Practice' (Via Institute on Character, 2023), 'Awesome Us!' (Quinlan, 2012), and 'Individual Strengths, Collective Power!' (Bressoud et al., 2023b). A comprehensive review by Coppley and Niemiec (2021) highlights the wide variation in these types of interventions. Prioritizing the recognition and use of pre-existing character strengths, that is, *signature strengths*, is a promising approach in the context of inclusive education. Various authors have emphasized the relevance of recognizing and using signature strengths as a lever to develop people's empowerment and improve the quality of interactions among groups (Proyer et al., 2015; Schutte & Malouff, 2019).

In order to empower students with or without SEND in inclusive settings and to improve the quality of relationships in classrooms, a focus has been made on teachers implementing strengths-based interventions themselves, which makes them more effective (Quinlan et al., 2018). Indeed, as the teacher can support empowerment and relationship quality throughout the year, it is more effective than an external professional who would not be able to offer a continuous focus on students and classroom strengths. In-service teacher training can be an interesting entry point for promoting strengths-based interventions. Through this type of training, teachers can discover, develop, and experiment with materials for students.

The summary of key concepts can be found in Table 1.

Problem statement

In the context of inclusive education, the use of strengths-based interventions may play a key role in promoting positive interdependence and empowerment in the classroom (Coppley & Niemiec, 2021). However, understanding of their application and effects in such contexts remains limited, particularly when focusing primarily on character strengths for individuals with disabilities (Niemiec et al., 2017). Moreover, there is a gap in research regarding the impact of strengths-based interventions on perceptions of human diversity in heterogeneous contexts. The mechanisms by which such interventions promote positive interdependence and empowerment have received little empirical attention.

To develop a pedagogical intervention that focuses on signature strengths and aims to foster positive interdependence and empowerment within an inclusive classroom, one can take inspiration from the principles proposed by Linkins et al. (2014). These principles encompass: (1) establishing a shared framework or language, (2) recognizing and reflecting on the strengths of others, (3) identifying and reflecting on one's individual strengths, (4) practicing and applying these strengths and (5) identifying, celebrating, and nurturing the strengths of the group.

Given these considerations and the program's explicit alignment with these principles, the 'Individual Strengths, Collective Power!' program (Bressoud et al., 2023b) was selected to evaluate interventions in an inclusive context.

Research purpose and questions

Our research sought to address this gap in the literature by examining how PosEd interventions, specifically strengths-based interventions, can foster inclusive education. This research aimed to answer the following research questions: how can interventions based on teacher in-service training and the 'Individual Strengths, Collective Power!' program influence (1) students' perceptions about themselves and their peers, and (2) perceptions about classroom relationships, central elements in the development of positive interdependence and empowerment?

Hypotheses

Considering the key role of positive interdependence and empowerment as levers in the development of a quality inclusive context, our specific research hypotheses were:

1. Does implementation of the 'Individual Strengths, Collective Power!' program increases the use of strengths-based vocabulary and positive mentions of peers during student discourse?
2. Does implementation of the 'Individual Strengths, Collective Power!' program increase peer acceptance?

METHODOLOGY

Participants

The total sample consisted of 179 students, divided between the experimental and active control groups, regardless of their SEND. The experimental group included 104 students in six classes, while the active control group consisted of 75 students in four classes (see Table 2 for details). Teachers from all 10 classes were female. Their teaching experience ranged from 4 to 30 years in the experimental group and 4 to 35 years in the active control group.

Study context

Data collection took place in a French-speaking region of Switzerland where an inclusive policy has been in place

TABLE 1 Definition of key concepts.

Key concept	Definition
Character strength	Positive traits naturally present in individuals that contribute to their well-being and fulfilment (Linley, 2008)
Empowerment	The process of increasing students' autonomy and confidence in their abilities (Perkins & Zimmerman, 1995)
Inclusive schools	Educational communities that embrace human diversity and empower each student, regardless of their special educational needs and disabilities (SEND) status (Ainscow, 2005)
Positive interdependence	Cooperative relationships among students that are fostered when each student's individual strengths are recognized and valued (Johnson et al., 2008)
Positive education	An educational approach that emphasizes not only traditional skills but also the promotion of socio-emotional skills (White, 2021)
Signature strength	Pre-existing character strengths (Proyer et al., 2015)
Strengths-based interventions	Practices in the educational field that leverage each student's distinct character strengths (Niemiec, 2019)

TABLE 2 Sample description for students.

	Experimental group	Active control group
Number of classes	6	4
Students (Perc. of girls)	104 (46.2%)	75 (44%)
Mean age (stand. deviation)	9.83 (1.06)	9.84 (1.17)

for over 30 years. This policy ensures that students with SEND participate in regular school life within their local area. The goal is for every student, where possible, to attend his or her local village school; therefore, inclusive solutions are preferred over segregated ones (CIIP, 2023). In this educational context, most students identified with SEND, under current law, participate fully in school life, as do all students without SEND. Within the classroom, these students benefit from teaching resources that are tailored to their specific needs.

This study adopts an aggregated approach, focusing on the entire classroom rather than specific categories of students or SEND. This approach is based on the understanding that categorizing students by their SEND can lead to labeling and stigmatization (Rubie-Davies, 2010).

All involved classes were inclusive and adhered to the region's education laws. In practice, each class operated within a framework that embraced diversity, with teaching support available as required. Data about the types of SEND or the number of students with SEND was not collected. Instead, the study evaluated the impact of a strengths-based intervention on the overall classroom. This approach recognizes that all students, irrespective of their individual differences or needs, can benefit from a strengths-based approach to education (White et al., 2023). In addition, some SEND may involve challenges in the ability to make and maintain friendships, as well as deficits in social language and communication. A strengths-based approach could provide opportunities for peer support and empowerment in such cases.

Ethical considerations

This study project was approved by the Ethics Committee of UniDistance (Switzerland) on 10 November, 2022. Informed consent was obtained from the students, their parents, and the participating teachers prior to data collection. All participants were informed about the study's purpose, the voluntary nature of their participation, and their right to withdraw at any time without consequence. Anonymity and confidentiality of the collected data were ensured throughout the research process, and participants were assigned unique identifiers to protect their identity. All data collected during the study are securely stored and protected by the Valais University of Teacher Education (Switzerland), in compliance with the institution's data protection policies. Access to the data

is restricted to the research team members directly involved in the study.

Study design

The study used a non-randomized research design with two distinct groups. Each group consisted of classes led by teachers who were recruited through voluntary participation. The first group, referred to as the experimental group, consisted of students taught by teachers who were interested in learning more about character strengths through in-service training and implementing a simplified version of the 'Individual Strengths, Collective Power!' program (Bressoud et al., 2023b) with active coaching. The second group, the active control group, consisted of students taught by teachers who wished to implement a pedagogical approach freely inspired by the 'Individual Strengths, Collective Power!' program. These teachers were contacted through a regional school board. Pre- and post-intervention data were collected to assess the impact of the two conditions. This methodological choice allows for a deeper understanding of how strengths-based interventions influence the variables of interest without interfering with the natural environment. Specifically, the topic of character strengths was timely in the context of data collection, and it was not possible to identify classes that could serve as a passive control group.

Measurement

Strengths use scale

At each measurement time, students' awareness of their signature strengths was assessed using the strengths use scale (SUS), originally developed by Govindji and Linley (2007). The French translation proposed by Forest et al. (2012) and validated by Bressoud et al. (2023a) was used in this study. The 14-item scale was adapted for students by deleting two items ('I know what I can do best', 'I know the things I am good at') that led to confusion. The items (e.g. 'I know how to use my strengths') were rated on a scale from 1 (*I strongly disagree*) to 7 (*I strongly agree*).

For the pre-test data in this study, Cronbach's alpha was acceptable ($\alpha = 0.79$). The Kolmogorov–Smirnov test was employed to assess the normality of the distribution of the differences in SUS scores separately for the active control group ($n = 67$) and the experimental group ($n = 103$). The results revealed a violation of the normality assumption for the active control group, with a *p*-value of 0.024, while the experimental group's distribution did not violate the normality assumption ($p = 0.486$). Furthermore, according to the interpretation guidelines of Weston and Gore (2006),

the control group exhibited a moderate negative skewness (−0.68, SE = 0.10) and a more peaked distribution than normal (kurtosis = 2.77, SE = 0.10), while the experimental group showed a slight negative skewness (−0.39, SE = 0.10) and a mildly elevated kurtosis (2.15, SE = 0.10).

Despite the normality violation of the control group, the skewness and kurtosis indices suggest moderate deviations for the control group and minor deviations for the experimental group. Given these results, we proceeded with the planned analyses, recognizing the potential limitations of the partial violation of normality.

Gratitude Questionnaire

To assess students' gratitude levels as an indicator of positive interdependence we used the French version (Tachon et al., 2021) of the Gratitude Questionnaire developed by McCullough et al. (2002). The French version consists of five items (e.g. 'I readily say thank you to people'), rated on a scale from 1 (*I disagree*) to 5 (*I agree*).

During the pre-test, Cronbach's alpha values were at the lower limit of accepaility (α = 0.62). The Kolmogorov–Smirnov test examined the normality of mean score differences separately for the active control (*n* = 67) and experimental (*n* = 103) groups, revealing violations for both (*p* = 0.003 and *p* = 0.028, respectively). According to the interpretation guidelines of Weston and Gore (2006), the control group showed a moderate negative skewness (−0.66, SE = 0.08) and a more peaked than normal distribution (kurtosis = 2.48, SE = 0.08), while the experimental group showed a slightly positive skewness (0.13, SE = 0.06) and a slightly increased kurtosis (1.04, SE = 0.06).

Although both groups violated normality, the skewness and kurtosis indices suggest moderate deviations for the active control group and minor deviations for the experimental group. Given the robustness of parametric tests to moderate violations of normality with sufficiently large sample sizes (Schmider et al., 2010), we proceeded with the planned analyses while acknowledging the potential limitations associated with the scale's low internal consistency and partial violation of normality.

Students' discourse

At each measurement time, students were asked to provide a free-form description of themselves in three to four sentences. This method of gathering qualitative data through discourse is well suited to detecting shifts in participants' perceptions (Willig, 2022). The discourses were then double-blindly rated by two researchers using a list of all randomly sorted items (Rosenthal & Rosnow, 2008). The raters were not able to identify which text corresponded to which student, class, group or measurement time.

The raters were given two criteria to evaluate each text: strength discourse orientation, explicitly the use of a strengths vocabulary (e.g. 'I am able to show gratitude when I am helped'), and other discourse orientation, explicitly the frequency of positive comments about others (e.g. 'I enjoy spending time with my friends'). Prior to the rating process, the raters attended a preliminary meeting with the mediator, who trained them in the use of the scoring criteria and instructed them to assign a score of 0, 1, 2 or 3 for each criterion.

Use of a strengths vocabulary to talk about him or herself
They assigned 0 point if there was no mention of any character strengths, 1 point if exactly one strength was mentioned (e.g. 'I think I am a forgiving person', 'I show an aesthetic sense in art class'), 2 points if two strengths were mentioned, or 3 points if three or more strengths were mentioned.

Frequency of positive comments about others
Regarding how others were referred to in the text, the raters assigned 0 point if there was no mention of others in a positive way, 1 point if there was one positive mention of others (e.g. 'I know how to help my family', 'my friends give me good advice'), 2 points if there were two positive mentions of others, or 3 points if there were three or more positive mentions of others. The raters subtracted 1 point if there were negative references to others (e.g. 'I like to mock my sister', 'I think my neighbor is terrible at school').

Agreement
The two raters conferred twice, once at the beginning of the evaluation and once at the end. At the start of the evaluation, they compared 10 items to ensure that the criteria were being applied consistently, with the help of the mediator. After the evaluation phase, the raters and the mediator conferred again to ensure that all scores were combined accurately. The inter-rater agreement for our ordinal data was assessed using weighted Cohen's kappa (Cohen, 1968) giving values of 0.75 for the *strength* criteria and 0.73 for the *others* criteria; this indicated substantial agreement between the raters based on the cutoffs established by Landis and Koch (1977). The mediator addressed any divergent scores and proposed them for consensus among the raters. For example, if there was a difference in scoring on an item, the raters listened to each other's arguments and the mediator made a joint proposal that was then accepted. Agreements were easy to reach because the criteria were quantifiable. Any items requiring mediation were collaboratively modified before being included in the validated data for analyses.

Peer acceptance index

In this study, we used four sociometric questions inspired by Coie and Dodge's (1988) peer assessment model. At each measurement point, students were asked to name up to three classmates in response to the following categories: (1) classmates they like best, (2) classmates they like least, (3) classmates they enjoy working with, and (4) classmates they do not enjoy working with. This conventional sociometric procedure was designed to gain an understanding of the relationships perceived as positive or negative within the classroom (Moreno et al., 1943; Wasserman & Faust, 1994).

While Coie and Dodge (1988) originally used a categorization method that divided students into five different groups based on their characteristics, we developed an alternative approach that involves creating an acceptance score for each individual student and named it the *Peer Acceptance Index* (*PAI*). This score serves as a quantitative measure that allows researchers and teachers to track and monitor changes in students' acceptance levels over time. By using this methodology, we aim to gain a more nuanced understanding of the development and progression of acceptance among students with or without SEND, which may provide valuable insights for promoting inclusive educational environments.

First, we calculated the maximum score that each student in his or her class could achieve at a given measurement point. Based on the questions asked, a positive maximum score was reached when all peers mentioned the same student in questions 1 and 3. Similarly, a negative maximum score was reached when all peers mentioned the same student in questions 2 and 4. The PAI for each student was then calculated as seen in (1):

$$\text{PAI}_{i,k} = \frac{(m_{i,k} - p_{i,k})}{(n_{j,k} - 1) \times 2} \quad (1)$$

where $\text{PAI}_{i,k}$, corresponding to the peer acceptance index of student i at the time of observed measurement k, is a decimal number between −1.00 and 1.00; $m_{i,k}$ is an integer corresponding to the sum of peer mentions of student i in answers to questions 1 and 3 at the time of observed measurement k; $p_{i,k}$ is an integer corresponding to the sum of peer mentions of student i in answers to questions 2 and 4 at the time of observed measurement k; $n_{j,k}$ is an integer corresponding to the total of participants in class j at the time of observed measurement k.

The Peer Acceptance Index (PAI) is an easy tool to observe differences between and within groups. For example, an index around 0 indicates that the student is perceived neutrally in the class (no mention by peers or an equal number of positive and negative mentions); the closer the student's index is to 1, the more he or she is perceived positively. Conversely, the closer the index is to −1, the more negatively the student is perceived.

Procedure and intervention

All measurements were taken twice, 1 week before the intervention and 1 week after the intervention, for both the experimental group and the active control group. Three types of data were collected: self-reported scales, students' discourse and reported relationships within the class.

The 9-week intervention was based on a simplified version of the 'Individual Strengths, Collective Power!' program (Bressoud et al., 2023b). This program includes more than 40 pedagogical activities that allow students to explore the signature strengths present within their classroom, following the educational steps proposed by Linkins et al. (2014).

Each session lasted 45 min per week over a period of 9 weeks, a duration chosen to align with similar interventions in previous studies (e.g. Quinlan et al., 2014). Prior to the intervention, teachers in the experimental group received 6 h of in-service training. The main goal of this training was to clarify the concept of signature strengths and encourage personal experimentation, as well as to introduce the program and its educational objectives. Teachers participated in this training as a team and outside of working hours. Throughout the intervention, teachers received weekly remote coaching, which included feedback and discussions in writing about assigned tasks via Microsoft Teams, an online platform (see Table 3). For example, teachers had the opportunity to ask for clarification of planned tasks or to comment on the pedagogical relevance of an activity after it had been conducted.

Teachers in the active control group were part of the same school center and had access to all program materials through a web platform. They were free to use the program activities as they saw fit.

Data analysis

Data processing and analysis was carried out using R 4.3.2 (R Core Team, 2023), with the *tidyverse* package (Wickham et al., 2019) used for data processing. Cronbach's alphas were performed with the *psych* package (Revelle, 2023), and mixed models were performed with *lme4* (Bates et al., 2015) and *ordinal* (Christensen, 2022) packages.

Scores on the SUS and the Gratitude Questionnaire, as well as students' age, and gender, were used as predictors in two cumulative linear mixed models (Agresti, 2010; James et al., 2021) set up to observe variation across time and group in students' use of strengths vocabulary to talk about themselves and the frequency of positive comments about others, respectively. This choice is appropriate when dealing with a dependent variable consisting of ordered categories with both continuous and categorical independent

TABLE 3 Content of the intervention.

Week	Main purpose	Tasks (examples)
1	Discover the 24 strengths to understand resource diversity	Ask one student to stand at the front of the class and think of a strength; the other students guess the strength by asking questions. Engage in group discussion to identify the strengths present in given situations
2	Discover the 24 strengths to understand resource diversity	Use strength definitions to match corresponding titles in memory games or crosswords. Practice defining strengths. Read a story to understand the role of a specific strength
3	Observe classmates' strengths	Engage in a group activity called 'strengths detective', focusing on each student under the teacher's guidance to identify underlying strengths from given actions. Be a detective for a few days to identify a strengths-related action based on a target set by the teacher
4	Observe classmates' strengths	Choose a less-known classmate and identify their strengths in various situations, with teacher's assistance. Read a story and identify the main characters' strengths. Describe a situation where a classmate demonstrated a strength
5	Identify one's own strengths	Keep a log of personal character strengths for 1 week, noting situations where a strength was used. At the end of the week, review the log. Identify the top four strengths and create a personal emblem illustrating them
6	Identify one's own strengths	Choose a personal strength and present it in a poster format with keywords, drawings, arrows and titles. Explain it to the rest of the class or group of classmates. Draw a situation where personal pride was felt, identifying the strengths shown to achieve something positive
7	Use the group's strengths	Ask students to suggest difficult situations. Create a short play to interpret the situation, employing strengths to propose solutions to the problems encountered. Reflect on how to use strengths, choosing a personal strength and answering related questions in writing
8	Use the group's strengths	Share an experience that made the day better, happier, or more enjoyable, and link it to the strengths activated
9	Celebrate group strengths	Place a token in a jar when someone demonstrates a strength, noting the strength or student's name. The fuller the jar becomes, the more successful the challenge. When the jar is full, celebrate the success

variables. In both models, class membership was included as a random effect.

Finally, a repeated measures ANOVA was used to compare the change in students' Peer Acceptance Index (PAI).

RESULTS

Description of scale scores

The mean Strengths Use Scale (SUS) score for the experimental group was 5.05 (SD = 1.02) at Time 1, and 5.06 (SD = 1.11) at Time 2. The active control group had a mean SUS score of 5.50 (SD = 0.77), which decreased slightly to 5.25 (SD = 0.93) at the second time point (Time 2).

On the Gratitude Questionnaire, the mean score of the experimental group was 4.24 (SD = 0.60) at Time 1, which increased moderately to 4.36 (SD = 0.58) at Time 2. On the other hand, the active control group had a mean score of 4.17 (SD = 0.73) at Time 1, which decreased slightly to 4.13 (SD = 0.72) at Time 2.

Given the violation of the normality assumption for both scales, the decision was made not to conduct tests of statistical significance, making these differences merely indicative.

Scores for student discourse

Use of a strengths vocabulary to talk about him or herself

Table 4 shows that in the experimental group (n = 104 at both times) a significant number of participants scored 0 at Time 1 (n = 47), but scores at Time 2 were evenly distributed from 0 to 2 (n = 25 each), with a slight spike at 3 (n = 29). In the active control group (n = 75 at Time 1; n = 68 at Time 2), the use of a strengths vocabulary scores at Time 1 were predominantly 0 (n = 40), while the scores distribution at Time 2 were more evenly distributed, with a peak at 3 (n = 32).

The mixed model analysis, which employed sum contrasts, yielded significant results (refer to Table 5 for details). Based on treatment contrasts, the interaction effect of time and group was found to be significant (b = −0.91, SE = 0.44, z = −2.09, p = 0.037), indicating that discourse on strengths develops over time, particularly in the active control group as compared to the experimental group. The Gratitude Questionnaire also showed a significant effect (b = 0.80, SE = 0.20, z = 4.03, p < 0.001), suggesting that the more gratitude students report, the more strengths-oriented their discourse. Interestingly, gender was significantly associated

($b=0.37$, SE$=0.11$, $z=3.48$, $p<0.001$), indicating that being a girl was associated with increased strengths vocabulary.

Frequency of positive comments about others

In the experimental group (see Table 6), most discourses scored 0 at Time 1 ($n=45$), while at Time 2 the distribution was more spread out towards 0 and 2 ($n=41$ and 28, respectively). In the active control group, the distribution of scores for frequency of positive comments about others was highest at 0 at Time 1 ($n=37$) and more evenly distributed at Time 2, with 15 to 19 participants across scores.

Table 7 presents the findings from the mixed model analysis conducted with sum contrasts to predict the scores of positive comments about others. Time was a significant predictor, indicating that scores tended to be higher after the intervention ($b=-0.32$, SE$=0.11$, $z=-3.00$, $p=0.003$). The Gratitude Questionnaire demonstrated a significant impact on the scores ($b=0.75$, SE$=0.19$, $z=3.88$, $p<0.001$), revealing that the more participants reported gratitude, the more they would use positive comments about others. Age also exerted a significant effect ($b=0.32$, $SE=0.16$, $z=1.98$, $p=0.048$), suggesting that the older the participants, the higher their score. In contrast, the interaction between time and group was not significant ($b=-0.16$, $SE=0.10$, $z=-1.48$, $p=0.138$) indicating that the effect of time in the frequency of positive comments about others did not differ between groups.

TABLE 4 Evolution of use of a strengths vocabulary.

	Total	Score 0	Score 1	Score 2	Score 3
Experimental group					
Time 1	104	47	33	15	9
Time 2	104	25	25	25	29
Active control group					
Time 1	75	40	14	12	9
Time 2	68	14	11	11	32

Note: A use of a strengths vocabulary score of 0 indicates that the text does not contain any elements of strengths vocabulary. A score of 3 indicates that the text contains at least three elements of strengths vocabulary.

Predictor variable	Estimate	Standard error	z	p
Gender	0.37	0.11	3.48	<0.001**
Age	0.30	0.18	1.71	0.086
SUS	0.00	0.12	0.01	0.995
Gratitude Questionnaire	0.80	0.20	4.03	<0.001**
Time	−0.77	0.11	−6.77	<0.001**
Group	0.16	0.24	0.67	0.501
Time × Group	−0.23	0.11	−2.09	0.037*

*$p<0.050$. **$p<0.001$.

Peer acceptance index

In the experimental group, students had a mean score of 0.03 (SD$=0.19$) at Time 1 ($n=104$), ranging from −0.62 to 0.38. At Time 2, the mean score increased to 0.05 (SD$=0.19$), with scores ranging from −0.65 to 0.44. For the active control group, students had a mean score of 0.03 (SD$=0.18$) on the PAI at Time 1 ($n=75$). Scores ranged from −0.68 to 0.29. At Time 2 ($n=68$), the mean score remained stable at 0.03 (SD$=0.19$), with scores ranging from −0.50 to 0.33. (see Figure 1 for a visualization of the dispersion).

The ANOVA test indicated no significant interaction effect between time and group ($F(1,347)=0.32$, $p=0.569$).

DISCUSSION AND CONCLUSION

Main findings

The purpose of this study was to examine the impact of a PosEd program called 'Individual Strengths, Collective Power!' on positive interdependence and empowerment among students aged 8 to 12. The program focused on signature strengths based on Peterson and Seligman's (2004) framework, following the instructional progression suggested by Linkins et al. (2014). Two conditions were tested: guided use after specific in-service training (experimental group) and free use of the program's resources (active control group). An original aspect of this study was its focus on inclusive education as a specific context for inquiry. The study examined changes in students' vocabulary related to their strengths and the frequency of positive comments about others, both in the experimental and active control groups.

Our findings suggest that strengths-based interventions in both groups contributed significantly to enriching students' vocabulary regarding their own strengths. Interestingly, the more gratitude students reported, the more they were able to use strengths vocabulary about themselves and speak positively about others. More specifically, strengths-based interventions had a greater impact on girls' strengths vocabulary in their discourse, while time and age were better predictors of the frequency of positive comments about others. Finally,

TABLE 5 Main coefficients for use of a strengths vocabulary (sum contrasts).

strengths-based interventions did not affect students' perceptions of relationships over the 9 weeks, as measured by the Peer Acceptance Index.

When examining students' discourse, the impact of time becomes evident in terms of the language used and the positive inclusion of others in their narratives. Students tend to incorporate more strengths-based terms

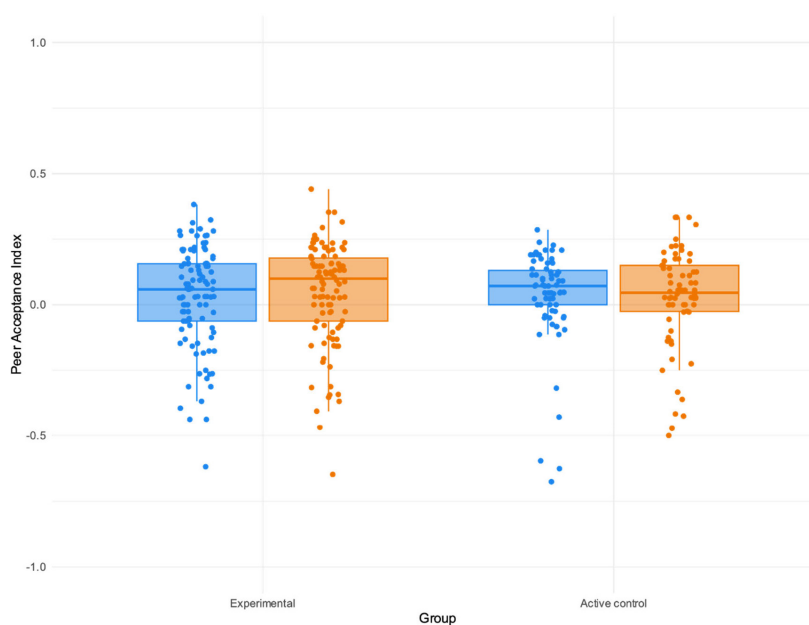**TABLE 6** Evolution of frequency of positive comments about others.

	Total	Score 0	Score 1	Score 2	Score 3
Experimental group					
Time 1	104	45	40	14	5
Time 2	104	41	28	28	7
Active control group					
Time 1	75	37	15	15	8
Time 2	68	18	19	16	15

Note: A score of 0 indicates that the text does not contain any positive comments about others. A score of 3 indicates that the text contains at least three positive comments about others.

such as kindness, forgiveness, gratitude and social intelligence. Various authors, such as Wang and Degol (2016), see this type of discourse as a sign of positive interdependence through a positive classroom climate. These findings align with current literature and research (e.g. Allen et al., 2022; Schutte & Malouff, 2019).

In relation to students' scores on the Gratitude Questionnaire, our findings indicate that this measurement strongly predicts the use of a strengths vocabulary and the frequency of positive comments about others. Consistent with the literature (Shankland & Rosset, 2017), as students become more grateful, they are more likely to talk about themselves and others in terms of strengths.

In an inclusive educational context, managing heterogeneity and differences in perception is crucial (e.g. Ainscow & César, 2006). Recent literature highlights the potential of strengths-based approaches, particularly for SEND, by encouraging the recognition of strengths regardless of need or disability (Niemiec & Tomasulo, 2023). These preliminary findings suggest that the pedagogical

TABLE 7 Main coefficients for frequency of positive comments about others (sum contrasts).

Predictor variable	Estimate	Standard error	z	p
Gender	0.18	0.10	1.68	0.093
Age	0.32	0.16	1.98	0.048*
SUS	−0.18	0.12	−1.50	0.135
Gratitude Questionnaire	0.75	0.19	3.88	<0.001**
Time	−0.32	0.11	−3.00	0.003*
Group	0.26	0.21	1.28	0.202
Time × Group	−0.16	0.10	−1.48	0.138

*$p<0.050$. **$p<0.001$.

FIGURE 1 PAI distribution by time and group.

approach implemented in the classroom influences how students talk about others and use strengths vocabulary about themselves in their discourse. From a pedagogical point of view, the development of the students' discourse between times 1 and 2 is promising. It helps to understand the impact of a classroom's functioning on positive inter-dependence and empowerment. These findings on inclusive practices are important because they highlight the range of pedagogical tools available to teachers to promote human diversity, and character strengths interventions appear to be useful pedagogical tools in this area.

Limitations

Although our results are promising, the remarkable progress observed in the active control group raises important questions about the relevance of the in-service training development provided to teachers in the experimental group. It suggests that the impact of strengths-based interventions may not be solely attributable to the specific training received by teachers in the experimental group, and that other factors may be contributing to the observed progress. The active control group, which consisted of classes that experienced a school culture focused on supporting and developing strengths without formalized practices within the classroom, may have benefited from this broader per-spective shift. In future studies, it would be interesting to explore the potential benefits of combining the two ap-proaches examined in this study. By integrating both the formal dimension of classroom exercises and the broader dimension of developing a school culture focused on strengths-based perspectives, researchers could examine the combined effects of these complementary strategies.

Another point to consider is the ability of the Gratitude Questionnaire to predict students' dis-course. It should be treated with extreme caution due to the questionable internal consistency and normal-ity of the distribution of the questionnaire. The use of self-reported measures may also be problematic in the present study; several teachers indicated that students completed both scales quickly and without fully understanding the items. This leads to questioning the relevance of using the Gratitude Questionnaire and the SUS with 8–12-year-old students.

Future directions

From an educational perspective, this study makes a significant contribution by highlighting the benefits of PosEd in supporting inclusive education in a French-speaking context. Practices rooted in positive psychol-ogy deserve greater attention from the field of education to improve and establish a school climate that values individual differences. In addition, this study provides a framework that may be adaptable to other linguistic contexts, particularly those of German and Italian-speaking regions, as Swiss inclusion laws also apply to these two cultural spheres. Moreover, strengths-based interventions can help combat sociometric hierarchies in the classroom by focusing on each student's abilities. By promoting a strengths-based culture, teachers can create a more egalitarian environment where each stu-dent's contributions are valued, ultimately fostering a supportive and inclusive learning community, regardless of a student's SEND status. Finally, it would be inter-esting to compare effect sizes between non-inclusive and inclusive educational settings. Regarding this last point, future research should aim to measure the level of inclu-sion within the observed classrooms.

In terms of research contribution, this study indicates promising avenues for exploring the effects of interven-tions on signature strengths within inclusive contexts. It sets the foundation for future research aimed at better understanding how gratitude influences students' per-ception of diversity in their classrooms. Additionally, future studies could investigate the development of re-lationships within the classroom through PosEd inter-ventions in inclusive contexts, using more appropriate measurement tools. Direct observations of behaviour could be considered as part of a single case study design (Kratochwill & Levin, 2014).

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REFERENCES

Agresti, A. (2010) *Analysis of Ordinal Categorical Data*. Hoboken: Wiley.

Ainscow, M. (2005) Developing inclusive education systems: what are the levers for change? *Journal of Educational Change*, 6(2), 109–124. Available from: https://doi.org/10.1007/s10833-005-1298-4

Ainscow, M. & César, M. (2006) Inclusive education ten years after Salamanca: setting the agenda. *European Journal of Psychology of Education*, 21(3), 231–238. Available from: https://doi.org/10.1007/BF03173412

Allen, K.-A., Furlong, M.J., Vella-Brodrick, D. & Suldo, S.M. (Eds.). (2022) *Handbook of positive psychology in schools: supporting process and practice*, Third edition. Taylor & Francis Group: Routledge.

Bartlett, M.Y. & DeSteno, D. (2006) Gratitude and prosocial behavior: helping when it costs you. *Psychological Science*, 17(4), 319–325. Available from: https://doi.org/10.1111/j.1467-9280.2006.01705.x

Bates, D., Maechler, M., Bolker, B. & Walker, S. (2015) Fitting linear mixed-effects models using lme4. *Journal of Statistical Software*, 67(1), 1–48. Available from: https://doi.org/10.18637/jss.v067.i01

Booth, T., Nes, K. & Strømstad, M. (Eds.). (2003) *Developing inclusive teacher education*. London: RoutledgeFalmer.

Bressoud, N., Shankland, R., Dubreuil, P., Forest, J., Belleville, K., Samson, A.C. et al. (2023) French adaptation of the strengths use scale. *Journal of Psychoeducational Assessment*, 0, 1–7. Available from: https://doi.org/10.1177/07342829231205811

Bressoud, N., Shankland, R., Gay, P. & Samson, A.C. (2023) *"Individual strengths, collective power!": a teacher-driven proof of concept for strengths-based education [manuscript submitted for publication]*. Switzerland: Valais university of teacher education.

Christensen, R.H.B. (2022) Ordinal—regression models for ordinal data. R Package Version 2022.11-16. https://CRAN.R-project.org/package=ordinal

CIIP. (2023). *Politique de pédagogie spécialisée en Suisse romande*. CIIP. Available from: https://www.ciip.ch/Activites/Pedagogie-specialisee/Pedagogie-specialisee

Cohen, J. (1968) Weighted kappa: nominal scale agreement provision for scaled disagreement or partial credit. *Psychological Bulletin*, 70(4), 213–220. Available from: https://doi.org/10.1037/h0026256

Coie, J.D. & Dodge, K.A. (1988) Multiple sources of data on social behavior and social status in the school: a cross-age comparison. *Child Development*, 59(3), 815–829. Available from: https://doi.org/10.2307/1130578

Coppley, J. & Niemiec, R.M. (2021) Character strengths interventions in education systems. In: Kern, M.L. & Wehmeyer, M.L. (Eds.) *The Palgrave handbook of positive education*. Cham: Springer International Publishing, pp. 395–420. Available from: https://doi.org/10.1007/978-3-030-64537-3_16

Durlak, J.A., Mahoney, J.L. & Boyle, A.E. (2022) What we know, and what we need to find out about universal, school-based social and emotional learning programs for children and adolescents: a review of meta-analyses and directions for future research. *Psychological Bulletin*, 148(11–12), 765–782. Available from: https://doi.org/10.1037/bul0000383

Foka, S., Hadfield, K., Pluess, M. & Mareschal, I. (2022) Strengths for the journey project—School of Biological and Behavioural Sciences. School of Biological and Behavioural Sciences—Queen Mary University of London. Available from: https://www.qmul.ac.uk/sbbs/about-us/our-departments/psychology/strengths-for-the-journey-project/

Forest, J., Mageau, G.A., Crevier-Braud, L., Bergeron, É., Dubreuil, P. & Lavigne, G.L. (2012) Harmonious passion as an explanation of the relation between signature strengths' use and well-being at work: test of an intervention program. *Human Relations*, 65(9), 1233–1252.

Fox, J. (2008) *Celebrating strengths: building strengths-based schools*. Coventry: CAPP-Press.

Govindji, R. & Linley, P.A. (2007) Strengths use, self-concordance and well-being: implications for strengths coaching and coaching psychologists. *International Coaching Psychology Review*, 2(2), 143–153.

Haidt, J. (2006) *The happiness hypothesis: finding modern truth in ancient wisdom*. New York: Basic books.

James, G., Witten, D., Hastie, T. & Tibshirani, R. (2021) *An introduction to statistical learning: with applications in R*, Second edition. New York: Springer.

Johnson, D.W., Johnson, R.T. & Holubec, E.J. (2008) *Cooperation in the classroom*, 8th edition. Edina: Interaction Book Co.

Kratochwill, T.R. & Levin, J.R. (Eds.). (2014) *Single-case intervention research: methodological and statistical advances*. Washington: American Psychological Association.

Landis, J.R. & Koch, G.G. (1977) The measurement of observer agreement for categorical data. *Biometrics*, 33(1), 159. Available from: https://doi.org/10.2307/2529310

Lavy, S. (2020) A review of character strengths interventions in twenty-first-century schools: their importance and how they can be fostered. *Applied Research in Quality of Life*, 15(2), 573–596. Available from: https://doi.org/10.1007/s11482-018-9700-6

Linkins, M., Niemiec, R.M., Gillham, J. & Mayerson, D. (2014) Through the lens of strength: a framework for educating the heart. *The Journal of Positive Psychology*, 10(1), 64–68. Available from: https://doi.org/10.1080/17439760.2014.888581

Linley, A. (2008) *Average to a+: Realising strengths in yourself and others*. Coventry: CAPP Press.

McCullough, M.E., Emmons, R.A. & Tsang, J.-A. (2002) The grateful disposition: a conceptual and empirical topography. *Journal of Personality and Social Psychology*, 82(1), 112–127. Available from: https://doi.org/10.1037/0022-3514.82.1.112

Moreno, J.L., Jennings, H.H. & Stockton, R. (1943) Sociometry in the classroom. *Sociometry*, 6(4), 425. Available from: https://doi.org/10.2307/2785221

Niemiec, R.M. (2019) *The power of character strengths: appreciate and ignite your positive personality*. Cincinnati: VIA Institute on Character.

Niemiec, R.M., Shogren, K.A. & Wehmeyer, M.L. (2017) Character strengths and intellectual and developmental disability: a strengths-based approach from positive psychology. *Education and Training in Autism and Developmental Disabilities*, 52(1), 13–25.

Niemiec, R.M. & Tomasulo, D.J. (2023) *Character strengths and abilities within disabilities: advances in science and practice*. Cham: Springer International Publishing AG.

OECD. (2021) *Mental health and young people*. OECD. Available from: https://www.oecd.org/coronavirus/en/data-insights/mental-health-and-young-people

Perkins, D.D. & Zimmerman, M.A. (1995) Empowerment theory, research, and application. *American Journal of Community Psychology*, 23(5), 569–579. Available from: https://doi.org/10.1007/BF02506982

Peterson, C. & Seligman, M.E.P. (2004) *Character strengths and virtues: a handbook and classification*. American Psychological Association: Oxford University Press.

Proyer, R.T., Gander, F., Wellenzohn, S. & Ruch, W. (2015) Strengths-based positive psychology interventions: a randomized placebo-controlled online trial on long-term effects for a signature strengths vs. a lesser strengths-intervention. *Frontiers in Psychology*, 6(MAR), 1–14. Available from: https://doi.org/10.3389/fpsyg.2015.00456

Quinlan, D. (2012) *Awesome us: the individual, group and contextual effects of a strengths intervention in the classroom*. [Doctoral thesis]. Dunedin: University of Otago.

Quinlan, D., Swain, N., Cameron, C. & Vella-Brodrick, D.A. (2014) How 'other people matter' in a classroom-based strengths intervention: exploring interpersonal strategies and classroom

outcomes. *The Journal of Positive Psychology*, 9760(October), 1–13. Available from: https://doi.org/10.1080/17439760.2014.920407

Quinlan, D., Vella-Brodrick, D.A., Gray, A. & Swain, N. (2018) Teachers matter: student outcomes following a strengths intervention are mediated by teacher strengths spotting. *Journal of Happiness Studies*, 20, 2507–2523. Available from: https://doi.org/10.1007/s10902-018-0051-7

R Core Team (2023). *R: a language and environment for statistical computing.* Vienna: R Foundation for Statistical Computing. Available from: https://www.R-project.org/

Revelle, W. (2023) *Psych: procedures for psychological.* Evanston: Psychometric, and Personality Research, Northwestern University.

Rosenthal, R. & Rosnow, R.L. (2008) *Essentials of behavioral research: methods and data analysis*, 3rd edition. Boston: McGraw-Hill.

Rubie-Davies, C.M. (2010) Teacher expectations and perceptions of student attributes: is there a relationship? *British Journal of Educational Psychology*, 80(1), 121–135. Available from: https://doi.org/10.1348/000709909X466334

Ryan, R. & Deci, E. (2000) Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *The American Psychologist*, 55(1), 68–78. Available from: https://doi.org/10.1037/0003-066X.55.1.68

Schmider, E., Ziegler, M., Danay, E., Beyer, L. & Bühner, M. (2010) Is it really robust?: reinvestigating the robustness of ANOVA against violations of the Normal distribution assumption. *Methodology*, 6(4), 147–151. Available from: https://doi.org/10.1027/1614-2241/a000016

Schutte, N.S. & Malouff, J.M. (2019) The impact of signature character strengths interventions: a meta-analysis. *Journal of Happiness Studies*, 20(4), 1179–1196. Available from: https://doi.org/10.1007/s10902-018-9990-2

Shankland, R. & Rosset, E. (2017) Review of brief school-based positive psychological interventions: a taster for teachers and educators. *Educational Psychology Review*, 29(2), 363–392. Available from: https://doi.org/10.1007/s10648-016-9357-3

Tachon, G., Shankland, R., Marteau-Chasserieau, F., Morgan, B., Leys, C. & Kotsou, I. (2021) Gratitude moderates the relation between daily hassles and satisfaction with life in university students. *International Journal of Environmental Research and Public Health*, 18, 13005. Available from: https://doi.org/10.3390/ijerph182413005

UNESCO. (1994) *The Salamanca statement and framework for action on special needs education.* UNESCO.

Via Institute on Character. (2023) Mindfulness-based strengths practice (MBSP): live online course. VIA Institute on Character. Available from: https://www.viacharacter.org/courses/mindfulness-based-strength-practice

Wagner, L. & Ruch, W. (2023) Displaying character strengths in behavior is related to well-being and achievement at school: evidence from between- and within-person analyses. *The Journal of Positive Psychology*, 18(3), 460–480. Available from: https://doi.org/10.1080/17439760.2022.2109196

Wang, M.-T. & Degol, J.L. (2016) School climate: a review of the construct, measurement, and impact on student outcomes. *Educational Psychology Review*, 28(2), 315–352. Available from: https://doi.org/10.1007/s10648-015-9319-1

Wasserman, S. & Faust, K. (1994) *Social network analysis: methods and applications*, 1st edition. Cambridge: Cambridge University Press. Available from: https://doi.org/10.1017/CBO9780511815478

Weston, R. & Gore, P.A. (2006) A brief guide to structural equation modeling. *The Counseling Psychologist*, 34(5), 719–751. Available from: https://doi.org/10.1177/0011000006286345

White, J., McGarry, S., Falkmer, M., Scott, M., Williams, P.J. & Black, M.H. (2023) Creating inclusive schools for autistic students: a scoping review on elements contributing to strengths-based approaches. *Education in Science*, 13(7), 709. Available from: https://doi.org/10.3390/educsci13070709

White, M.A. (2021) A decade of positive education and implications for initial teacher education: a narrative review. *Australian Journal of Teacher Education*, 46(3), 74–90. Available from: https://doi.org/10.14221/ajte.2021v46n3.5

Wickham, H., Averick, M., Bryan, J., Chang, W., McGowan, L.D., François, R. et al. (2019) Welcome to the tidyverse. *Journal of Open Source Software*, 4(43), 1686. Available from: https://doi.org/10.21105/joss.01686

Willig, C. (2022) *Introducing qualitative research in psychology (fourth edition)*. London: Open University Press.

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