

Positive Education: Effect of 11 Weeks Long Well-being Course on Well-being of University Students (A Repeated-Measures Study)

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ABSTRACT

This article presents the effectiveness of the well-being education class on university students after 11 weeks of systematic well-being education. Considering the increasing mental health issues of university and college students worldwide, universities are rethinking their approach and desire to provide evidence-based well-being classes circumscribing focus beyond student academics (e.g. student motivation and learning) to student skills of well-being (e.g. emotion awareness and optimism). The effectiveness of the presented positive education program was measured pre and post well-being course intervention. Nine different building blocks scientifically proven to generate subjective well-being (PERMA, PERMA-H, PERMA V and PERMA+4) were assessed in relation to students' life satisfaction. In this article, the design of the student well-being class is described along with the class content and effectiveness of the well-being class intervention that was delivered at Charles University in Prague, Czech Republic in the 2022/2023 Academic Year. The class significantly increased experimental group students' life satisfaction as well as particular key building blocks of well-being (positive emotions, engagement, relationships, meaning, accomplishment, mindset, environment and economic security) considering the standard deviation and 95% confidence interval and the two-tailed *P* value for testing the null hypothesis, compared to the control group.

Keywords: well-being; subjective well-being, student well-being; positive education; well-being education; university; life satisfaction; PERMA; PERMA-H, PERMA V, PERMA+4; building blocks; mental health; health

1. INTRODUCTION

1.1. Students Well-being

Universities and colleges worldwide host a significant proportion of young adults (UNESCO, 2023), which is approximately 235 million, out of which 20% have been diagnosed with serious mental health issues (WHO, 2022). Data in 2023 year make clear that the majority of university and college students (60%) are experiencing mental health issues of one kind or another (e.g. depression, anxiety and suicidal thoughts). Higher education worldwide faces students' mental health crisis and the World Health Organization expects mental health illnesses to be the leading group of illnesses in 2030. Mental health is defined as *a state of well-being in which an individual realizes their abilities, can cope with the normal stresses of life, can work productively and is able to make a contribution to their community* (World Health Organization, 2023) and mental well-being is characterized by not only the lack of problems or distress, but mainly by the presence of strengths and positive qualities that allow us to flourish and thrive. Centers for Disease Control and Prevention (2018) states that even though there is no consensus on a single definition of well-being, there is a general agreement that, at minimum, a state of well-being includes the presence of positive emotions and moods (e.g., contentment, happiness), the absence of negative emotions (e.g., depression, anxiety), satisfaction with life, fulfillment and positive functioning. Thus, well-being can be described as judging life positively and feeling good and can be defined as optimal psychological experience and functioning (Deci and Ryan 2008). Psychological well-being is closely intertwined with happiness (Salama-Younes 2011), life satisfaction (Campbell et al. 1976) and flourishing (Diener et al. 2010). As concerns about poor mental health and psychological well-being in college and university students keep growing (Oswalt et al. 2020; Skvorcova et al. 2020; Abelson, 2022; Julian et al., 2022), universities and colleges are forced to change their approach from helping students in need into an active, evidence based primary prevention of mental health issues. Including, designing, validating and implementation of interventions systematically building student's well-being.

1.2. Generating Academic Achievement with Well-being Support

University and college students themselves are looking for a way to improve their personal well-being, as well as their academic achievements. Constantly growing students' mental health issues, poor academic achievements and increased school dropout rates call for effective positive psychology education supporting well-being in students' everyday lives. It has been shown that well-being education and well-being interventions in academia build the well-being of university students (Khatri & Duggal, n/a; Lugosi, 2019; Ribeiro-Silva, 2022; Waters, Lea & Loton, 2021; Abelson et al., 2022; Baik & Brooker, 2019; Barker et al., 2021; Bell, 2022; Drolet & Rodgers, 2010; Ecclestone & Hayes, 2009; Fouché & Martindale, 2011; Gan et al., 2022; Hill et al., 2021; Iordache-Platis, 2020, Kardas & Yalcin, 2021; Kleinman, 2014; Lambert & Joshanloo, 2019, Lambert et al., 2019; Mahalingam & Rabelo, 2019; Mahatmya & Thurston, 2018; Ng & Boey, 2021; Richards & Tangney, 2008; Sherman, 2021; Wang et al., 2021; Watson & Turnpenny, 2022; Young et

al., 2022) and that well-being of college and university students generates academic success (Antramian, 2017; Gaultney, 2010; Hartley, 2013; Jones et al., 2021; Morris, 2022, Mousa & Ali, 2022; Sánchez-Cardona, 2021; Kočí, 2023; Kočí & Donaldson, 2022; Sosu & Pheunpha, 2019; Taing et al. 2013).

1.3. Building Academic Well-being

Seligman (2011) illustrated that well-being can actively be developed through pursuing five measurable building blocks - Positive Emotions, Engagement, Relationships, Meaning, and Accomplishment - which he called PERMA. Science has introduced several PERMA extensions, such as the highly validated PERMA-H model (Norris et al., 2013), PERMA V (Zhivotovskaya, 2018) and PERMA+4 (Donaldson et al., 2020). Empirical evidence on the PERMA extension frameworks resulted in the proposal of four more building blocks of well-being, listed as Physical Health/Vitality, Mindset, Environment, and Economic Security. In the post pandemic era, academic well-being has garnered increased attention as a major university student's health interest. A key value that university and college students look for and seek to gain from their tertiary education is well-being. Educating about well-being as a part of the study program could be an effective opportunity for positive education intervention and prevention strategies. Yet, there has been a traditional focus on fixing what is not working rather than, for a more comprehensive and balanced support of university and college mental health, focus on both. On supporting students in need, as well as on building positive functioning of students by increase of quality of life, growth of character strengths, and growth of building blocks of well-being (e.g. see, Seligman, 2018). Higher education is starting to embrace its key role in promoting student well-being and life skills (e.g. emotion emotional awareness and regulation, communication, building relationships, empathy, giving and receiving help, showing respect, goal setting, decision making, problem solving, taking new and different perspectives, building self-efficacy, optimism, and a sense of purpose or meaning) by providing evidence-based and practical classes based on scientifically proven principles for effective educational intervention.

1.4. Following the science to design effective PPI

Systematic reviews and Meta-Analyses (e.g. Drozd et al., 2014; Feicht et al., 2013, Ivtzan et al., 2016; Schotanus-Dijkstra et al., 2017 in Donaldson et al., 2021) have identified the most promising positive psychology interventions (PPIs) for generating well-being based on the most rigorous experimental evidence available in the peer-reviewed literature that provide a good sense of what one might expect when designing or replicating a PPI to generate well-being. Following the science, the most effective PPIs were found to have in common several traits that can lead to effective PPIs design. Successful interventions, thus ways to effective positive psychology education appear to be designed based on (a) scientific evidence and are (b) tailored to fit the specific needs and contexts of participants. E.g. participants can tailor their learning by choosing the topics or activities that resonate with them. (c) Longer interventions, multi-week training appear to increase positive outcomes and have been found to be more effective than short ones, yet, the time invested into program activities to be effective. The design with (d) mutually reinforcing activities

generates effect and also (e) flexibility can encourage adherence and help meet a variety of participant needs and motivations across different contexts. (f) Self-selection allows participants to choose where and when they complete the modules based on their schedule and to choose the activity that suits them in line with their intrinsic motivation the best. (g) Multicomponality has been proven as effective, such as bringing in a variety of topics, exercises, and skills based on the science of positive psychology. In order to design effective PPI it is important to make the program (h) accessible, e.g. financially or considering the invested time and location/platform chosen for the training or to consider an access to technology due to the economical background. Providing (i) reminders and the (j) possibility to check on progress was shown as increasing the engagement. Research also suggests that facing the interventions does not necessarily have to be the most effective way in the 21st century since all the most effective PPIs mentioned in a study above were (k) online interventions. Many users prefer and seek to attend online PPIs. Yet, research shows that online PPIs are more effective when (l) being supplemented by live expert and/or peer support. (m) Individualized interventions tended to show greater effects than self-help or group interventions across meta analyses. (o) Workbooks and (p) email communication/support/additional information providings have been shown as effective supplementation to the programme. Science administers training to help people improve their own well-being by giving them knowledge and skills that will support them in daily life as the most effective. The most promising PPIs (in Donaldson et al., 2021) illustrated that providing opportunities to learn, practice, reflect, relate, and plan can help ensure effectiveness. Yet, many of the published studies evaluating positive education are limited in using science to follow the evidence-based traits to build effective PPIs. This study addressed this gap by designing a class following the complex recommendations on an effective PPI design as well as the complex class content following the new theory of well-being with 9 essential building blocks leading to a good life. Building the well-being of students is meaningful and can be very effective. Positive university and college education can focus on both, on academic learning delivering the traditional outcomes of schooling as well as building students' well-being and health. While writing a book *Well-being and Success for University Students: Applying PERMA+4*, the author Jana Koci has designed a multi-week (11) Well-being Class following the science to design an effective positive psychology intervention. In Fall semester 2022, the class: *Positive Psychology: How to Build Well-being and Success of University Students* was born, taught and tested for its effectiveness at Charles University in Prague, Czech Republic with the follow up course opened for students from leading European Universities that are members of the 4EU+ alliance in Spring semester 2023.

2. MATERIALS AND METHODS

2.1. Trial design

This was a double-arm controlled repeated-measures study in Czech and International undergraduate students from Charles University in Prague. The aim of the study was to

evaluate the effect of 11 week long **well-being education intervention** on students' life satisfaction and building blocks of well-being (Seligman, 2011; Norrish et al., 2013; Zhivotovskaya, 2018; Donaldson et al., 2020) in the Fall semester of 2022/2023 Academic Year. The intervention effect was tested on 3 groups of students. First group G1 attended a Students Well-being Course that was held for Czech students with regular meetings (each week for 90 minutes, in Czech language, both online and in person). The second group G2 attended a course that was held simultaneously for 11 weeks with regular meetings (every 2 weeks for 90 minutes, in English language, both online and in person). Both groups together created the Experimental group EG with the total number of 46 students who signed up for the study (30 Czech students {3 males, 27 females} and 16 international students {3 males, 13 females}). The total number of students from the Experimental group who attended at least 80% of the course and thus met the conditions for participating in the study was 20 {16 from G1 and 4 from G2; 2 males, 18 females}. One student was excluded due to the bipolar inconsistent data, even though she attended 80% of the course. Thus, the total number of participants in this study was 19 {2 males, 17 females}. The third group consisted of 27?? {3 males, 24 females} students who did not attend the Students Well-being Course. All outcome variables were assessed before and after the intervention.

2.2. Intervention design

Intervention: Student Well-being Class

While writing the book *Well-being and Success for University Students: Applying PERMA+4*, the author of the book, and assistant professor of Health and Well-being Education Jana Koci, Ph.D. has designed the Well-being Education Intervention to support the well-being of Charles University students. She designed a certified and highly evidence-based class: *Positive Psychology: How to Build Well-being and Success of University Students*. Jana Koci, Ph.D. taught the classes on building student wellbeing and evaluated the designed intervention effectiveness in fall semester of Academic Year 2022/2023. The Students Well-being Class *Positive Psychology: How to Build Well-being and Success of University Students* was designed to provide participants with an in-depth understanding of new theories of well-being along with providing evidence of well-being directly influencing academic achievements. Each lesson introduced the current findings on chosen well-being topics and presented strategies on how to practically incorporate such evidence-based well-being activities into university student's everyday life to support students' positive functioning. Course began with a class (1. class) reviewing scientific evidence accumulated in the field of positive psychology over more than two decades. Over the 11 classes, the courses inspect well-being promotion at universities, as well as the efficiency of activities building well-being in the everyday life of university students. This research was placed in the context of a relatively new framework, PERMA+4, which summarizes the building blocks of well-being including positive emotions (2. class), engagement (3. class), relationships (4. class), meaning (5. class), achievement (6. class), physical health (7. class), positive mindset (8. class), creating positive environments (9. class), economic security (10. class), and building resiliency (11. class), thus last class was devoted to a popular topic of stress management and building resiliency. Students had an

opportunity to learn how to care for their own well-being in the specific university environment and as a part of their student's lifestyle through each building block focused lectures, group discussions, and by practicing hands-on well-being activities that helped them not only to thrive but also to get more successful at school.

Outcome Based Education

Positive Psychology: How to Build Well-being and Success of University Students is a class that was designed in accordance to outcome based education. Learning outcomes set for the class were following. Student can: (a) explain in own words what is well-being and positive functioning of students and list specific benefits of good well-being for university students, (b) present current situation in university student well-being and express their own opinion on why is mental health of students in crisis, (c) describe the new theory of well-being PERMA (including extensions PERMA H; PERMA V; PERMA+4 by (Norrish et al., 2013; Zhiotovskaya; and Donaldson et.al. 2020) and name building blocks of well-being hidden in the acronyms, (d) demonstrate elementary theory and connect it to positive functioning in topics of positive emotions; engagement; positive relationships; meaning; achievement; physical health/vitality; mindset; environment; economic security; and resiliency, (e) name important representatives (professors and researchers) in positive psychology and resources where to learn more (literature, journals, articles and educational webs), and (f) apply skills of well-being (e.g. emotion awareness, building relationships, empathy, giving and receiving help, goal setting, decision making, building self-efficacy and revealing meaning) in their everyday life.

Content

Well-being Education Intervention (the Positive Psychology: How to Build Well-being and Success of University Students course) consisted of 11 classes (introductory class on students well-being and 11 classes, each covering one of the building blocks of well-being tailored to university and students lifestyle e.g. Positive Emotions, Relationships or Mindset). The multi-week intervention resulted in a total of 990 minutes (450 minutes for international students) of Student Well-being Education per semester. The content of the individual classes was: (1) Introduction to Well-being and Success for University Students; (2) Building Student's Positive Emotions; (3) Building Student's Engagement; (4) Building Student's Positive Relationships; (5) Building Student's Meaning; (6) Building Student's Achievement; (7) Building Student's Physical Health; (8) Building Student's Mindset; (9) Building Student's Environment; (10) Building Student's Economic Security; and (11) Building Student's Resilience.

2.3. Participants

Experimental group consisted of 19 (2 males, 17 females) undergraduate students from Charles University in Prague, both Czech students and International Students from the USA, China, Venezuela, Turkey or Ukraine.

GROUP 1

Students have attended at least 80% of 11 weeks long intervention (11 meetings; 90 minutes a week held both, online and in person) resulting in 990 minutes of student well-being education. Starting Date of the course was 10/12/2022 and Ending Date: 12/21/2022. The date of pre-test measurement was 10/10/2022 and the date of post-test measurement was 12/22/2022. Starting number of students was 30 students from Charles University, Faculty of Education who were freshmen and graduate students (3 males, 27 females). The final Number of students who attended more than 80% was 16 (1 male, 15 females)

GROUP 2

Students have attended at least 80% of 11 weeks long intervention (5 meetings, 90 minutes every 2 weeks held both, online and in person) resulting in 450 minutes of student well-being education. The date of pre-test measurement was 10/10/2022 and the date of post-test measurement was 12/22/2022. The Starting Date of the intervention was 10/26/2022 and Ending Date was 12/21/2022. Starting number of students was 16 International Students from Charles University, Faculty of Education, both freshmen and graduate students. Number of students who attended more than 80% was 4 (1 male, 3 females).

GROUP 3

Students have not attended any positive intervention. The date of pre-test measurement was 10/10/2022 and the date of post-test measurement was 12/22/2022. Starting number of students was XX Czech from Charles University, Faculty of Education, both freshmen and graduate students. Number of students who attended both pre-test and post-test was xxx (?? male, ?? females).

2.4. Methods

PERMA

We measured student well-being using Cantril scale composite self evaluation of different life domains generating well-being that included PERMA (Seligman 2011) factors of student's self evaluation in how well are they doing in general in experiencing positive emotions, engagement, positive relationships, meaning and achievement; along with four more domains from PERMA-H model (Norrish et al., 2013), PERMA V (Zhivotovskaya) and PERMA+4 (Donaldson et. al, 2021) of physical health/vitality, mindset, environment and economic security. Students indicated how they would rate the particular life domains on the scale 0 - 10. The number of 0 = represented the worst for students, so called weaknesses (they indicated that they are not satisfied nor they consider the building block as flourished nor positively functioning) and 10 = represents the best for students, so called strengths (they indicated that they are highly satisfied and they consider the building block as highly flourished and positively functioning).

Life Satisfaction

The Satisfaction With Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985) is a measure of the judgmental component of subjective well-being used to assess a 5-item scale designed to measure global cognitive judgments of student's life satisfaction. Students indicated how much they agree or disagree with each of the 5 items using a 7-point scale that ranges from 7 strongly agree to 1 strongly disagree.

2.5. Outcomes

Dependent variables were PERMA+4 related variables: Positive emotions, Engagement, Relationships, Meaning, Accomplishment, Physical Health, Mindset, Environment and Economic Security. An arbitrary overall measure of PERMA+4 was computed as the mean of all nine domains. All variables were measured at Charles University in Prague, at the Faculty of Education.

PERMA+4

In his other well-known book *Flourishing* (2011) Professor Seligman presents five building blocks of well-being that enable our flourishing in our life (positive emotions, engagement, relationships, meaning, achievement). He called all five elements of well-being above with an acronym of PERMA when each building block can help to increase well-being by focusing on combinations of feeling good, being fully engaged with life, building high quality relationships, living meaningfully and accomplishing your goals. Professor Seligman's new framework of well-being has been complemented by professor Donaldson with four more building blocks in 2019 (Donaldson, 2019; Donaldson et al., 2021b, 2022a,b) with the acronym of PERMA+4. The newest building blocks of well-being are physical health, mindset, environment and economic security with the acronym of PERMA+4. This theory of well-being represents nine building blocks of well-being as we know them today.

Description of the instrument used for the measurement: measured outcome (the well-being pillars)

Students were asked to evaluate their well-being given the instructions "Please, imagine a ladder with steps numbered from 0 at the bottom to 10 at the top. The top of the ladder represents the best result (I feel very confident in this particular strength), while the bottom of the ladder represents the worst (I would like to build this particular strength better)." Students were asked to assess themselves using a set of statements that could help them to assess how well they felt about each well-being building block.

Positive emotions (Experiencing happiness, joy, love, gratitude, etc. in the here and now.) "I generally experience positive emotions (happiness, joy, love, gratitude, interest etc.) either alone or with others often, I feel overall satisfied with my life, I devote a satisfying time to my hobbies and interests, and I enjoy what I do at work and at school."

Engagement (Being highly absorbed or experiencing flow while engaged in activities of one's life.) "I generally experience flow and engagement in my everyday life activities, in work and at school often. I feel engaged while doing my hobbies, while spending time with other people or even while being alone."

Relationships (Having the ability to establish and maintain positive, mutually beneficial relationships with others, characterized by experiences of love and appreciation.) “I generally experience high quality relationships with my boss or supervisor, classmates, co-workers, friends, family members, significant other(s), and I have a great relationship with myself.”

Meaning (The experience of being connected to something larger than the self or serving a higher purpose.) “I generally experience meaning in everyday life activities and purpose in life, meaning in school activities and purpose in school studies. I build meaningful relationships and I participate in meaningful activities in my community. I feel spiritual.”

Achievement (Experiencing a sense of mastery over a particular domain of interest or achieving important or challenging life/work goals). “I generally recognize and celebrate my achievements. I am generally satisfied with my personal life achievements, education achievements, education achievements, relationships achievements, self-improvement achievements, and my financial achievements.”

Physical health (Operationalized as a combination of high levels of biological, functional, and psychological health assets.) “I generally feel physically healthy considering my body movement, body posture, nutrition and sleep while being able to relax, breathe properly and successfully avoid risky behavior.”

Mindset (Adopting a growth mindset characterized by an optimistic, future-oriented view of life, where challenges or setbacks are seen as opportunities to grow. This may also be a function of positive psychological capital). “I generally feel resilient, confident in myself, responsible, hopeful, optimistic, future oriented, having a growth mindset, and persistent and passionate about my long-term goals.”

Environment (The quality of one's physical environment (which includes spatiotemporal elements, such as access to natural light, fresh air, physical safety, and a positive psychological climate) aligned to the preferences of the individual.) “I generally experience a positive, healthy, and supportive environment at home, in my family, at work or at school, in my community, and online and I spend a satisfying amount of the time outdoors in nature.”

Economic security (Perceptions of financial security and stability required to satisfy individual needs.) “I generally feel financially secure considering my income, savings, investments, access to quality health care and I am managing my financial expenses well.”

2.6. Sample size

Experimental group consisted of 19 (2 males, 17 females) undergraduate students from Charles University in Prague, both Czech students and International Students from the USA, China, Venezuela, Turkey or Ukraine. Control group consisted of xxx Czech students from Charles University, Faculty of Education, both freshmen and graduate students. Number of students who attended both pre-test and post-test was xxx (?? male, ?? females).

2.7. Statistical Analysis

The descriptive statistics are expressed as mean and standard deviation (SD). Based on current recommendations to improve data analysis practices [6], we implemented an estimation approach following analytical procedures reported in previous articles published by the DBSS Research Division [3,7]. Thus, to determine statistical significance, we examined the 95% CIs for the difference between the mean change scores ($\Delta = \text{post} - \text{pre}$). If the 95% CI excludes zero, the difference will attain significance at the $p < 0.05$ level. Effect size was calculated as unbiased Cohen's d (d_{umb}), considering a result of ≤ 0.2 as a small, 0.5 as a moderate, ≥ 0.8 as a large effect, and ≥ 1.30 as a very large effect [8]. Estimation plots were generated to display the repeated measures data across two time points (at baseline and after eight weeks). A difference-in-differences (Diff-in-Diff) analysis was performed to compare changes in the outcome variables between the groups [9].

3. RESULTS

A total of 20 participants were potentially eligible; however, one student of the Experimental group exhibited questionable results and was, therefore, excluded from the study to prevent result bias. The rest of the participants attended and complied with the intervention without attrition (Figure 3).

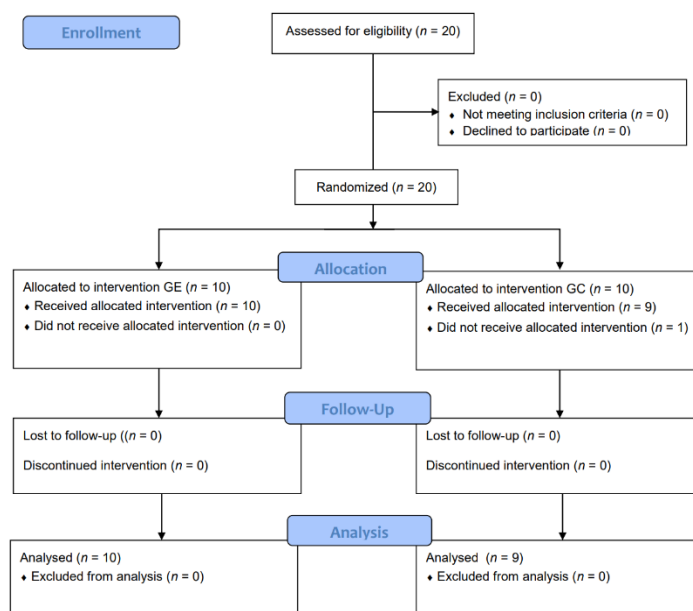


Figure 3. CONSORT flow diagram

3.1. PERMA and PERMA+4 assessment

Table 1 presents a descriptive analysis of the sample of participants at baseline without significant differences between EXP and CONTROL groups.

Table 1. Descriptive information of participants at baseline

| Variable | Experimental (<i>n</i> = 20) \bar{x} (SD) | 95% CI (min, max) | Control (<i>n</i> = 30) \bar{x} (SD) | 95% CI (min, max) | <i>P</i> value |
|-------------------|---|----------------------|--|----------------------|----------------|
| Positive emotions | 6.85 (1.81) | 6.00, 7.69 | 6.76 (1.83) | 6.08, 7.45 | 0.875 |
| Engagement | 6.35 (1.38) | 5.70, 6.99 | 7.16 (1.59) | 6.56, 7.76 | 0.069 |
| Relationships | 6.85 (1.34) | 6.21, 7.48 | 7.26 (1.83) | 6.5, 7.95 | 0.389 |
| Meaning | 6.7 (1.92) | 5.80, 7.59 | 6.43 (2.17) | 5.62, 7.24 | 0.659 |
| Accomplishment | 6.65 (1.72) | 5.84, 7.45 | 6.4 (2.01) | 0.75, 5.64 | 0.651 |
| Physical Health | 6.55 (2.21) | 5.51 (7.58) | 6.8 (1.60) | 6.20, 7.39 | 0.645 |
| Mindset | 6.55 (1.90) | 5.65 (7.44) | 6.63 (1.90) | 5.92, 7.34 | 0.88 |
| Environment | 6.35 (1.38) | 5.70 (6.99) | 7.16 (1.59) | 6.56, 7.76 | 0.69 |
| Economic Security | 5.7 (1.62) | 4.93 (6.46) | 5.76 (2.25) | 4.92, 6.60 | 0.91 |
| Average PERMA+4 | 6.48 (0.69) | 6.16 (6.81) | 6.62 (1.25) | 6.16, 7.09 | 0.65 |

Data are expressed as mean (standard deviation) and 95% confidence interval. A two-tailed *P* value for testing the null hypothesis of no difference between the two group means is reported.

The results of all variables are expressed as Δ (SD) [95% CI]; d_{unb} [95% CI] and presented in Table 3. After post-test assessments, there were no significant differences in XXXXXXXXX compared to baseline measures in XXXXXXX. XXXXXXXXX.

Table 3. Pre- and post-intervention data on the study variables.

| Variable | Group | Pretest | Posttest | Δ | d_{unb} |
|----------|-------|---------|----------|----------|------------------|
|----------|-------|---------|----------|----------|------------------|

| | | \bar{x} (SD) | \bar{x} (SD) | \bar{x} (SD) [95% CI] | δ [95% CI] |
|-------------------|--------------|----------------|----------------|------------------------------|-----------------------|
| Positive emotions | Experimental | 6.85 (1.81) | 7.9 (0.96) | 1.05 (1.84) [0.18, 1.91] * | 0.693 [0.11, 1.31] |
| | Control | 6.76 (1.83) | 6.5 (2.37) | -0.26 (1.59) [-0.86, 0.32] | -0.122 [-0.39, 0.14] |
| Engagement | Experimental | 6.2 (2.01) | 7.55 (1.19) | 1.35 (2.23) [0.30, 2.39]* | 0.783 [0.16, 1.45] |
| | Control | 6.43 (1.86) | 5.8 (2.36) | -0.63 (1.54) [-1.2, -0.05]* | -0.289 [-0.56, -0.02] |
| Relationships | Experimental | 6.85 (1.34) | 8 (1.48) | 1.15 (1.38) [0.50, 1.79]* | 0.778 [0.30, 1.30] |
| | Control | 7.26 (1.83) | 6.93 (1.89) | -0.33 (1.47) [-0.88, 0.21] | -0.17 [-0.46, 0.10] |
| Environment | Experimental | 6.35 (1.38) | 7.55 (1.43) | 1.2 (1.98) [0.26, 2.13]* | 0.817 [0.16, 1.516] |
| | Control | 7.26 (1.46) | 7.26 (1.46) | 0.1 (1.80) [-0.57, 0.77] | 0.064 [-0.35, 0.48] |
| Meaning | Experimental | 6.7 (1.92) | 8 (0.97) | 1.3 (2.07) [0.32, 2.27]* | 0.819 [0.18, 1.50] |
| | Control | 6.43 (2.17) | 5.8 (2.05) | -0.63 (1.42) [-1.16, -0.10]* | -0.291 [-0.55, -0.04] |
| Accomplishment | Experimental | 6.65 (1.72) | 7.5 (0.94) | 0.85 (1.66) [0.07, 1.62]* | 0.586 [0.04, 1.16] |
| | Control | 6.4 (2.01) | 6.23 (2.16) | -0.16 (1.48) [-0.72, 0.38] | -0.078 [-0.33, 0.17] |
| Physical Health | Experimental | 6.55 (2.21) | 6.55 (2.30) | 0 (1.74) [-0.81, 0.81] | 0,000 [-0.33, 0.33] |
| | Control | 6.8 (1.60) | 6.5 (1.63) | -0.3 (1.68) [-0.92, 0.32] | -0.180 [-0.55, 0.19] |
| Mindset | Experimental | 6.55 (1.90) | 7.5 (1.23) | 0.95 (1.66) [0.16, 1.73] * | 0.568 [0.09, 1.07] |
| | Control | 6.63 (1.90) | 6.26 (2.19) | -0.36 (1.54) [-0.94, 0.20] | -0.174 [-0.44, 0.09] |
| Environment | Experimental | 6.35 (1.38) | 7.55 (1.43) | 1.2 (1.98) [0.26, 2.13] * | 0.817 [0.16, 1.51] |
| | Control | 7.16 (1.59) | 7.26 (1.46) | 0.1 (1.80) [-0.57, 0.77] | 0.064 [0.35, 0.48] |
| Economic Security | Experimental | 5.7 (1.62) | 6.95 (1.84) | 1.25 (2.40) [0.12, 2.37] * | 0.689 [0.06, 1.35] |
| | Control | 5.76 (2.25) | 5.83 (2.47) | 0.06 (2.65) [-0.92, 1.05] | 0.027 [-0.37, 0.42] |

Data is presented as mean (\bar{x}) and standard deviation (SD). Δ : post-test – pre-test; d_{unb} , unbiased Cohen's d ; CI, confidence interval. * Statistically significant change ($p < 0.05$).

Figure 4 shows the Gardner Altman estimation plots of all the variables in each group.

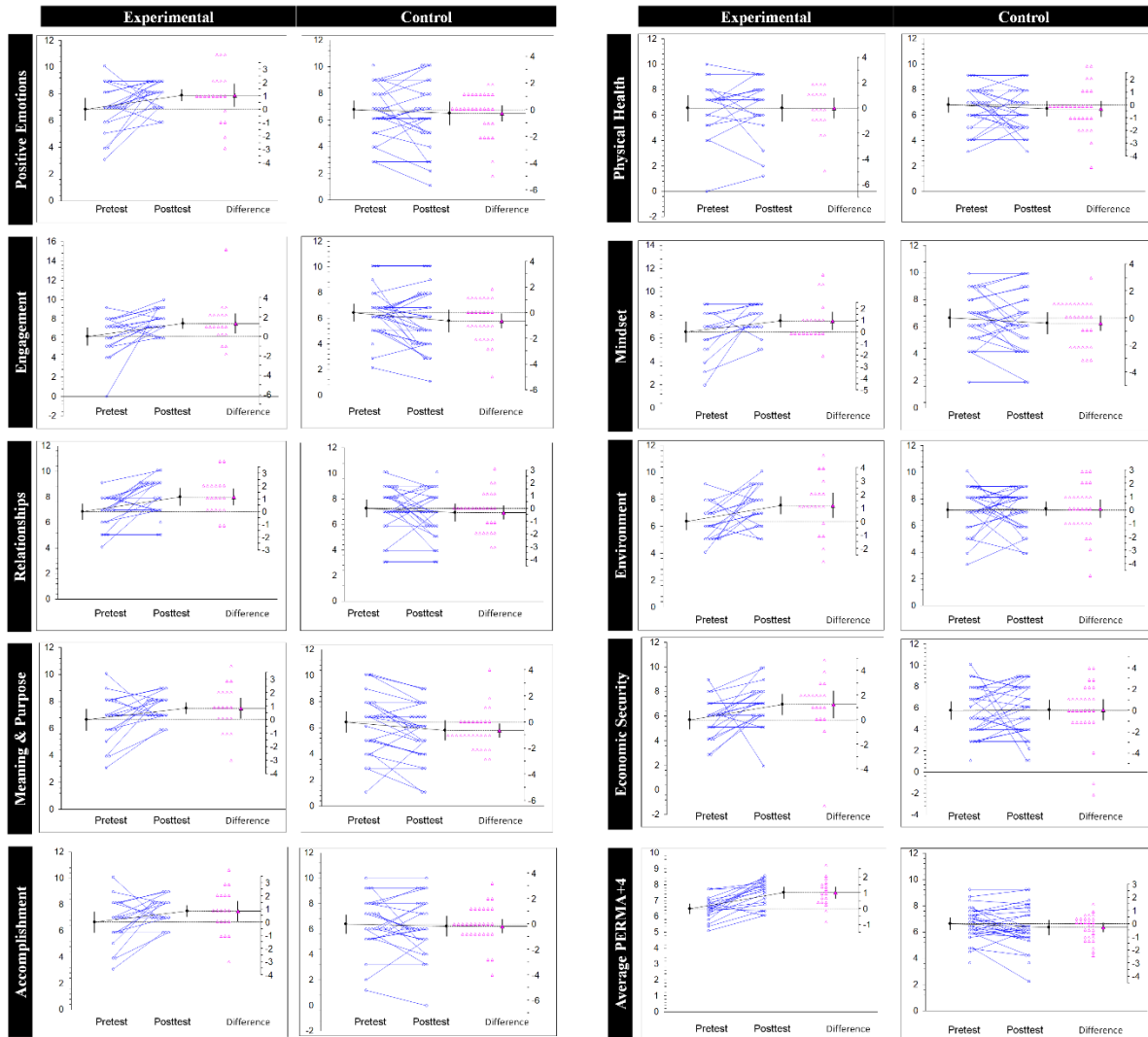


Figure 4. Estimation plots showing pre- and post-intervention values on analyzed variables. Paired data from Experimental (left) and Sham (right) groups are shown as small circles joined by blue lines. The differences between the initial (pre) and final (post) means are plotted on a floating difference axis whose zero is aligned with the pre-test mean. The filled pink triangle marks the difference on that axis and the 95% CI on that difference is displayed. The differences are shown as open triangles on the difference axis.

There were significant differences between the EG and Sham groups with regards to the change in selected variables. The results of this Diff-in-Diff analysis (DID [95% CI], p value) is reported in Table 3.

Table 3. Difference-in-differences analysis

| Variable | Mean ($\Delta_2 - \Delta_1$) | DID | 95% CI | <i>p</i> |
|------------|--------------------------------|-------|----------------|----------|
| SJ | 0.35 – 0.23 | 0.11 | -5.42, 5.65 | 0.96 |
| CMJ | -1.82 – 0.12 | -1.95 | -7.84, 3.93 | 0.50 |
| MVC_Hip-L | 15.77 – 21.5 | -5.72 | -46.79, 35.34 | 0.77 |
| MVC_Hip-R | 5.45 – 20.3 | 14.84 | -48.58, 18.89 | 0.37 |
| MVC_Knee-L | 51.33 – 48.4 | 2.93 | -125.7, 131.55 | 0.96 |
| MVC_Knee-R | 8.66 – 11.7 | -3.03 | -120.5, 114.39 | 0.96 |

Difference of differences (DID) for EG (Δ_1) and Sham (Δ_2) groups. The *p* value is two-tailed with statistical significance when $p < 0.05$.

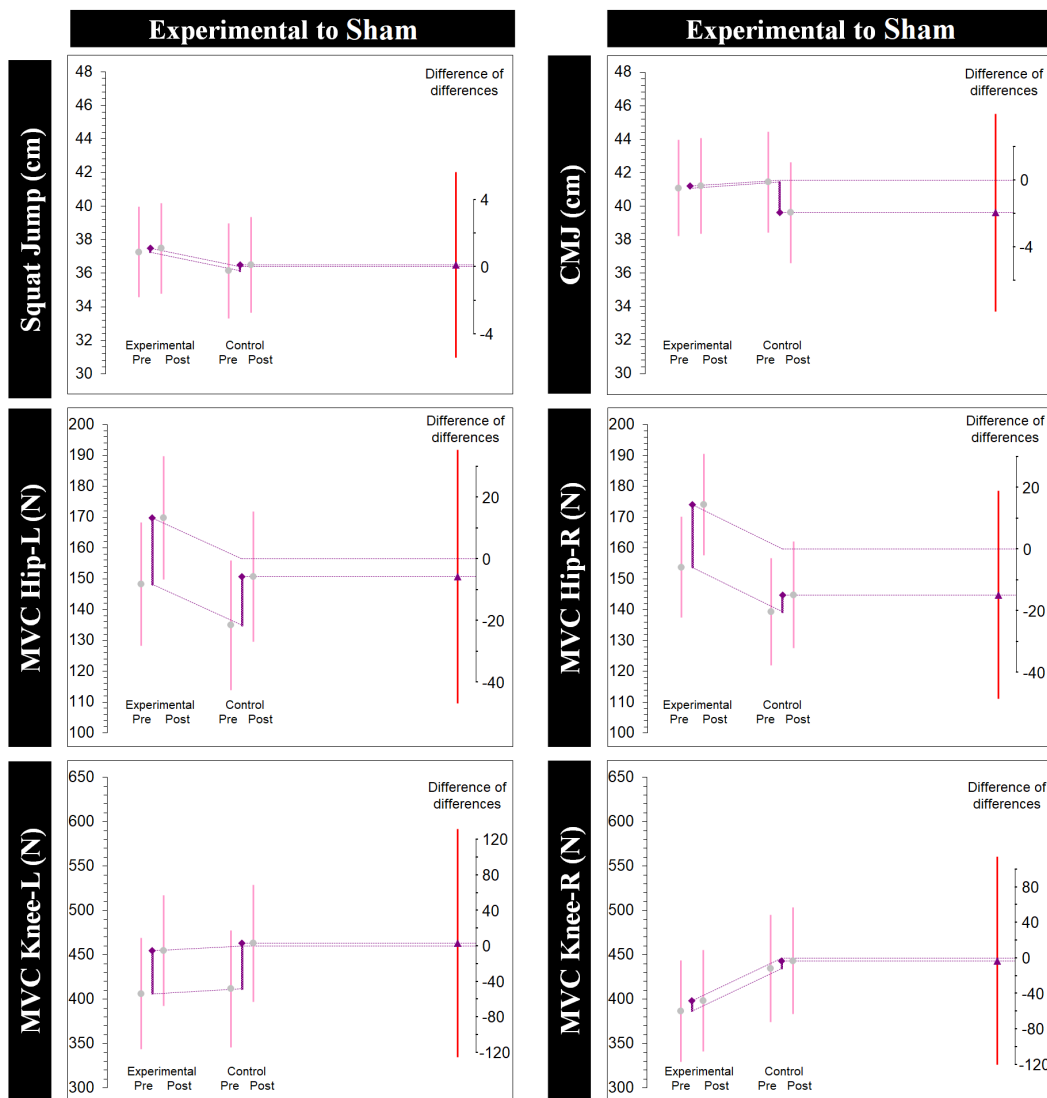


Figure 5. Difference-in-difference estimation plots for all variables. This graphic shows the difference ($\Delta =$ post-test – pre-test) of the differences, which is the calculation of the group means: Experimental (Δ_1) and

Sham (Δ_2) groups on selected variables. The effect chosen for examination is displayed as the triangle, with its 95% CI, against a floating different axis.

3.2. Satisfaction with life assessment

Please assess the results here.

3.3. Open Ended Questions Assessment of Well-being Class Effectivity

The whole experimental group, thus 100% of students (84.2% Strongly Agree; 15.8% Agree) reported that their knowledge about well-being got deeper than it was before the well-being class. 100% of students (89.5% Strongly Agree; 10.5% Agree) reported that their skills on how to build well-being got better than they were before the well-being class and 100% (94.7% Strongly Agree; 5.3% Agree) of students would recommend this course to other students).

On the question on what to do better or differently next time so the course is even more valuable for other students have students most often suggested: not to record the classes thus students feel even more safe to talk; create “homeworks” for students in between classes; extend classes for 120 minutes instead of 90 minutes”; to make a course a part of their accreditation; to offer ECTS credits for the course; to figure out how to make the course open for all students (hundreds or even thousands of students); to create retreats where students can spend with teacher even a few days in row as an alternative to meeting once every week.

Vice versa examined students appreciated, found beneficial, or reported as what they believe that worked well on the student's well-being course: opening individual classes with thematic quizzes; presenting highly professional and appealing prezi presentations; drawing flowers as their well-being assessment each class; sharing their (both good or bad) life experiences with others via chat box or polling; friendly and safe climate; positive vibes, passion for work and excitement of the teacher that was contagious for the students; real life examples; up-to-date theory on different topics; hands on activities; introduction of main psychologist and literature recommendations on each topic; synchronized (in real time) on-line classes extended with in-person meetings; possibility to have camera turned off and no pressure to participate, thus possibility to only listen.

DISCUSSION

The positive effect of the well-being class Positive Psychology: How to Build Well-being and Success of University Students delivered at Charles University in Prague, Czech Republic in the 2022/2023 academic year as a positive education intervention on well-being in university and college students was significant. The assessed long-term systematic well-being education in this article has been shown to have many benefits from deepening

the knowledge on health and well-being, particularly PERMA+4 building blocks of well-being, increasing intrinsic motivation of students to care for their own well-being, and adopting skills through evidence-based tools and activities helping students to manage their well-being self-care.

The authors suggested that repeated measures studies to validate effectiveness of long term educational interventions are needed. The authors suggest deeper well-being analysis, not only to analyze 9 (potentially 10 with Authenticity in PERMA5) main building blocks of well-being, but also to fracture each life domain in subsections to specify well-being assessment as much as possible (e.g. Physical Health can be assessed specifically in Adequate Body Movement, Good body posture, Optimal Nutrition, High Quality Sleep, Regular Relaxation, Proper Breathing, and Avoidance of Risky Behavior. Such a detailed well-being assessment would help to determine the life domains that need well-being education intervention the most. Future studies on effectiveness of proposed well-being courses could help understand the weak spots and strengths of positive education. Repetition of well-being evaluation in time (e.g. 3 months after the well-being course, and 6 months after the course) is needed to also validate the long term effectiveness of positive education.

Limitations

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Future directions

There were repetitive discussions with the class participants about the significant importance of authenticity and realness on one's well-being and life satisfaction during the intervention (11 weeks). Not only as authenticity being a crucial aspect of each individual building block (e.g. relationships where one can be truly themselves will have a completely different impact on our well-being compared to relationships where one tries to fit in by changing their behaviors, people pleasing or not setting boundaries; as well as the achievement of goals that are aligned with one's true values will have stronger impact on one's well-being compared to accomplishment of goals that one sets as a result of attempt to fit in social norms or to fulfill expectations of others, e.g. parents or friends and much more) but also as an individual building block itself (authenticity as student's potential strength). Thus, we would like to propose a vision for future design of model extension with the 10th building block of well-being: Authenticity, generating the new acronym of PERMA5. The individual subtopics of the new building block were established based on literature review (most commonly in the field of psychology, social-psychology, personality development and philosophical directions, particularly existentialism), international experts' assessment and based on the repeated discussions with the experimental group participants. The proposed subsections of Authenticity are: Knowing Yourself; Accepting and Loving

Yourself for Who You Are; Knowing Your Values and Acting According to Them; Knowing Your Passions and Acting According to Them; Saying What You Truly Think; Setting Boundaries and Saying No without Guilt; Being Your True Self in Your Relationships; Being Vulnerable; and Taking Responsibility for Your Actions. Proposed subsections as well as the building block of Authenticity itself need to be tested on internal consistency and the Delphi Technique (the judgment of an expert panel) to identify the sufficiency of building blocks will be conducted. Authenticity as a 10th building block is being tested for consistency at a students' well-being assessment organized at Charles University in 2023 (data were collected in May, 2023).

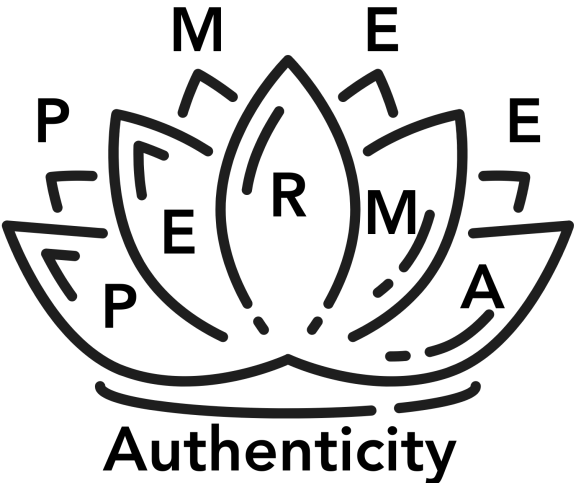


Figure 4. PERMA5: The Framework for Building Academic Well-being

This study was also repeated in the Spring semester 2023, with validated and more complex PERMA and PERMA+4 (PERMA5) assessment tools. The class was held once a week (for 12 weeks) for Czech speaking students of Charles University and also once a week (for 12 weeks) for English speaking students from foreign European Universities within the 4EU+ Alliance (thus Heidelberg Universität, Sorbonne Université, University of Copenhagen, Université de Genève Università degli Studi di Milano, University of Warsaw).

CONCLUSIONS

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Acknowledgments

We would like to thank all students who participated in this study and to the Charles University leadership for making this study possible.

Author Contributions

Conceptualization, XXX. and XXX.; methodology, XXX.; validation, XXX; formal analysis, XXX.; writing the paper, XXX. and XXX.; review and editing, XXX. and XXX.; administration, XXX. All the authors have read and agreed to the published of the manuscript.

Funding

This research is a part of the program to support the strategic management of universities 2022 – 2025: Well-being and Academic Achievement of University Students - University Students' Well-being Assessment and Intervention Design to support Charles University Students' Well-being. Charles University Rectorate. New Measures Development to Support the Reconciliation of Study or Work and Family Life: Mental Health of Students' and University Staff, Including Burnout Prevention.

Institutional Review Board Statement

The study was conducted according to the guidelines of the Declaration of Helsinki and approved by the Ethics Committee of the University of Antioquia on 12 September 2019, act number 059.

Data Availability Statement

All data is available upon request.

Conflicts of Interest

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