Journal of Positive School Psychology
2022, Vol. 6, No. 1, 25–37

http://journalppw.com/jppw
https://doi.org/10.47602/jpsp.v6i1.268

Research Article

Implementation of a Positive Psychology Curriculum in a High School Setting: A Mixed Methods Pilot Study

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Abstract

This study used a mixed-method design to examine the qualitative feasibility of a comprehensive positive psychology curriculum taught by an educator in a naturalistic high school classroom. Limited efficacy testing was also performed. Using a naturalistic quasi-experimental design, this study examined the qualitative impact and feasibility of a high school positive psychology course compared to a standard psychology course. Qualitative variables examined included student attrition, demand, implementation, and practicality as well as student feedback. Quantitative self-report measures of well-being were also included. Participants were 113 adolescents enrolled at a high school in the Mountain West United States. The course was found to have high demand and low rates of attrition. The educator noted that preparing the course was feasible and did not require external funding. Feedback from students was overwhelmingly positive with many of them noting the positive effect that it had on their well-being and ability to cope with challenges. Quantitative results were mixed. These results largely support previous research that has associated positive outcomes with the employment of positive psychology interventions in a classroom setting. Future research should focus on the quantitative effects of school-based positive psychology interventions in a larger scale, high-powered sample.

Keywords: Positive psychology, school psychology, high school, well-being, pilot study

Positive psychology belongs in schools. The positive psychology movement has built up a large body of research over the last 20 years that demonstrates the efficacy of positive psychology interventions (PPI) for improving adolescent outcomes (Ciocanel et al., 2016; Seligman et al., 2009; Tejada-Gallardo et al., 2020; Waters, 2011). The current PPI literature shows that these interventions lead to positive outcomes such as increased subjective and psychological well-being, which are important aspects of successful youth development (Tejada-Gallardo et al., 2020). Furthermore, research conducted in the K-12 school system shows that PPIs are effective at promoting other outcomes related to well-being including optimism, social-emotional functioning, self-control, self-efficacy, and academic performance (Catalano et al., 2002; Seligman et al., 2009; Shoshani & Steinmetz, 2014; Taylor et al., 2017; Waters, 2011). Adolescence can certainly be a stressful time, and intervention is oftentimes needed to mitigate outcomes associated with the stress response. Previous research has found that adding PPIs to an adolescent's education can reduce negative symptoms including anxiety, depression, and general distress, and that these improvements remain significant even six months later (Brunwasser et al., 2009; Shoshani & Steinmetz, 2014; Taylor et al., 2017). Schools are a logical and natural environment for positive psychology intervention delivery because of the sheer amount of time that adolescents spend in the classroom and because both parents and educators see improving adolescent well-being as an important aspect of education (Seligman et al., 2009). Positive psychology belongs in schools because education should help adolescents live more full and meaningful lives. Focusing on improving mental health through the implementation of PPIs in the classroom would be a

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pivotal step toward achieving that goal.

Positive psychological interventions improve adolescent well-being through the delivery of psychoeducation and implementation of experiential activities that focus on specific positive psychology constructs. Principles include constructs such as mindfulness, character strengths, positive relationships, and gratitude (Armenta et al., 2020; Gander et al., 2016; Proctor et al., 2011; Shoshani & Steinmetz, 2014; Zenner et al., 2014). Mindfulness interventions in K-12 are associated with enhanced cognitive and academic performance, socially competent behaviors, optimism, and self-efficacy (Meiklejohn et al., 2012; Schonert-Reichl et al., 2010; Taylor et al., 2017; Zenner et al., 2014). Mindfulness interventions have resulted in decreases in depressive symptoms, anxiety, somatic distress, physical symptoms, and negative affect (Biegel et al., 2009; Broderick & Metz, 2009). However, much of the research on mindfulness interventions in these settings has failed to include active control conditions and diverse participant characteristics or have failed to report student demographics (Felver et al., 2015). Character strengths interventions, a subset of PPIs that focus on enhancing character traits that lead to optimal functioning, have facilitated increases in life satisfaction, academic performance, positive affect, prosocial behavior, and well-being (Proctor et al., 2011; Quinlan et al., 2012). Positive relationship interventions have also led to decreases in depressive symptoms (Gander et al., 2016). Gratitude interventions have been found to improve life satisfaction and motivation (Armenta et al., 2020). Although there are a number of PPIs, the research on each of these different types of PPIs demonstrates their efficacy for improving adolescent well-being and gives further credibility for their implementation in classroom settings.

The K-12 education system provides an environment that is shared by a wide range of the population, and is thus a particularly accessible platform for PPI dissemination (Strein et al., 2003; Kerner et al., 2005). While the implementation of psychological interventions in the classroom is nothing new, until the last few decades this type of research has focused almost exclusively on preventing negative mental health outcomes without attempting to facilitate positive ones (Larson, 2000). In order to improve the mental health and well-being of the general student population (in addition to treating already existing symptoms), education and interventions in schools should focus on improving well-being in addition to simply preventing or minimizing symptoms of psychopathology (Suldo et al., 2008). Universal interventions which focus on the entire student population rather than targeting specific student subgroups (e.g., at-risk teens) have the potential to promote psychological resilience for all students. This preventive model could avert the need for more intensive and expensive interventions in the future and simultaneously boost student well-being (Taylor et al., 2017). While research has been conducted demonstrating the efficacy of PPIs for specific subgroups, in this study we chose a universal approach in order to increase accessibility and encourage widespread dissemination of positive psychology principles (Roth et al, 2017; Foka et al., 2021; Waters, 2011). The ultimate goal of this research was to develop a universal delivery model in which PPIs are accessible in all schools, so a focus on the general student population was appropriate.

Despite the growing interest in positive psychological education, problems with current interventions still remain (Roth et al., 2017). Major limitations that exist within the current literature include a lack of comprehensive measures and curriculum, insufficient teacher training, and a sparsity of real-world, naturalistic implementation (Chodkiewicz & Boyle, 2017; Collins et al, 2013; Shoshani & Steinmetz, 2014; Waters, 2011; White, 2016). First, the wide variability in how interventions have been conducted makes the overall efficacy of the PPI approach difficult to measure (Taylor et al., 2017). Given that course curriculums, teacher training, and intended outcomes have not been standardized, the generalizability and replicability of previous research is inconclusive (Brunwasser et al., 2009; Deutsch et al., 2017; Taylor et al., 2017; Zenner et al., 2014). There is a need for a standardized curriculum that could be easily implemented by a conventional educator. Second, much of past research has consisted of intervention efficacy studies performed under laboratory conditions and little research has considered the logistics of how a positive psychology curriculum could be implemented in actual schools (Eichas et al., 2019). Real-world application is important because the context within which an intervention is delivered can have a significant impact on its outcomes (Eichas et al., 2019). Finally, past interventions have been inconsistent in the training and credentials of the instructor of positive psychology courses. Some studies

have had psychologists or researchers conduct the intervention while others have had high school educators teach the courses (Collins et al., 2013; Shoshani, & Steinmetz, 2014). PPIs run by psychologists or researchers rather than teachers may not properly demonstrate how well a specific intervention will work in a classroom for various reasons. K-12 teachers do not have the same expertise as psychologists, and psychologists or researchers may not have a sufficient understanding of how to properly implement a high school curriculum or the challenges associated with this process (Shoshani, & Steinmetz, 2014). In order to more effectively implement and measure the effects of positive psychological interventions in the classroom, a consistent curriculum and delivery model needs to be developed that allows for standardization and replication.

The purpose of this study was to determine the feasibility and general efficacy of a classroom PPI format that will address some of the aforementioned concerns. This research will hopefully serve as a springboard for future research on universal implementation and dissemination of PPIs in the classroom. Specifically, this study implemented a comprehensive positive psychology curriculum in a high school classroom that was taught by an actual teacher at the school. Our intervention used a multi-target classroom-based intervention focused on increasing student well-being, healthy relationships, and life satisfaction. The primary aim of this study was to examine general feasibility based on a number of variables such as demand, practicality, attrition, etc. Student approval for the curriculum was measured through a thematic analysis of written student feedback. Secondary to these aims, a quasi-experimental design was implemented in order to examine preliminary quantitative effects of the positive psychology course on well-being as compared to a standard high school psychology course.

First, we hypothesized that this teacher-led positive psychology curriculum would be a feasible intervention format that would provide a positive qualitative experience for students. Feasibility was determined by variables including student attrition, demand, implementation, practicality, and student satisfaction. A basic thematic analysis was conducted from written student feedback to identify common themes and gauge general satisfaction with the intervention. Second, we hypothesized that students who were taught the positive psychology curriculum would report greater levels of well-being at the end of the course than students enrolled in a general psychology course. More specifically, we hypothesized that students in the intervention group would report greater improvements in well-being, life satisfaction, gratitude, resilience, emotional functioning, and relationship quality upon completing the course and at a 3-month follow up.

Method

Participants

Participants were students enrolled in either a semester-long positive psychology or standard introductory psychology course at a high school in the Mountain West United States. The cohort enrolled in the standard psychology course was evaluated as a control. A total of 139 students initially chose to participate in the study, with 67 enrolled in the positive psychology course and 72 in the standard psychology course. All participants were invited to complete self-report measures of well-being at different time points throughout the course and after course completion. After all self-report responses were collected, a series of validity scales based on matched item pairs was used to screen for response inconsistencies or random reporting. As a result of poor validity scale performance, 26 responses were excluded from analyses. The total number of responses included in analyses was 113, comprising 56 positive psychology and 57 standard psychology students. Of note, 17 control participants who took the standard psychology course in fall subsequently enrolled in the positive psychology course and were included in the experimental group during the winter semester. Participants were 85 females and 28 males. The sample was 85% white, 9% hispanic/latino, and 6% other or mixed ethnicity. Participant ages ranged from 15-18 with a mean age of 16.6.

Procedures

Group assignment was non-random and students willingly enrolled in their prospective course. All students enrolled in the classes were offered the opportunity to participate in the study, though participation was completely voluntary and not required for class credit. Before beginning the study, both parent and child consent forms were completed. Measures were obtained during the fall and winter semester of the 2018-2019 school year. Both courses were taught by the same instructor. Students participated in the course and completed measures at four different time points: the beginning of the semester, halfway through the semester, at the end of the semester, and at a 3-month follow up. Attrition rate for second round responses was >1%, third round was

2%, and fourth round was 43%. Students who subsequently participated in the winter positive psychology course after taking the standard psychology course in the fall were not administered the 3-month follow up control measures as these coincided with their enrollment in the positive psychology course.

Curriculum

Positive psychology course. The positive psychology high school course curriculum used in this study was developed and taught by one of the researchers who is a high school instructor. The course centered on teaching students' daily strategies to improve well-being through evidence-based positive psychology principles. A foundation of the course was the background of positive psychology and an introduction to the construct of subjective well-being. The course was developed to map onto Martin Seligman's PERMA model, with the sections of the course focusing on positive emotions, engagement, relationships, meaning, and achievement (Seligman et al., 2018, 2011, 2009). Additionally, the class added a subject area related to positive stress which previous research has highlighted as an important aspect of well-being (Branson et al., 2019). The PERMA model has significant research support, particularly in the area of adolescent PPIs (Kern et al, 2015; Shoshani et al., 2016; Waters, 2011). The course covered various principles of positive psychology, positive correlates of each, and strategies to practice each principle. Topics outlined in the course included optimism, gratitude, mindfulness, positive relationships and effective communication, engagement and meaning, exercise, stress, flow, willpower, grit, and growth mindset. To supplement in-class learning, students were assigned to choose a book that discusses well-being from a researcher in the field of positive psychology (the list of books is included in the supplementary material). The class was structured to provide frequent opportunities for experiential application of the principles covered in class. For example, when learning about mindfulness, students were assigned to track their cell phone usage outside of class to cultivate awareness of "mindless" choices such as automatically picking up their phone to scroll through social media. At the start of class each day, students were asked to complete a gratitude journal and record personal experiences of positive emotion. The focus of these experiential learning opportunities was to provide students with a foundation of strategies that could be used outside the classroom and in their lives to benefit their mental health and well-being.

Standard psychology course. Curriculum for the standard psychology course used in the control group was based on the National Standards for High School Curricula published by the American Psychological Association (APA, 2013). Because the course is only one semester in length, select topics from the national standards were covered. The course covered different theoretical approaches in psychology such as cognitive, biological, social, humanistic, etc. Core topics outlined in the course included basic neurobiology and epigenetics, childhood development, social psychology, personality, sleep and consciousness, memory, intelligence, psychopathology, and different types of psychotherapy.

Table 1. Positive psychology class outline

Section Title	Description
Introduction to Class	Basic Overview of positive psychology
Mindfulness	What mindfulness is and how it relates to well-being
Cognitive Distortions	Examining how our thinking patterns get in the way of well-being
Positive Emotions	Using positive emotions to improve physical and mental health
The Upside of Stress	Using the stress response effectively to improve well-being
Character Strengths and Personality Traits	Using positive personality characteristics to improve well-being
Positive Relationships	Using positive psychology principles to improve personal relationships
Accomplishment	Using willpower, grit, and growth mindset to improve well-being
Engagement and Meaning	Using flow and meaning to enhance well-being
Food Choice and Exercise	Using food and exercise to improve well-being

*For a more detailed description of the course curriculum please see the supplementary material

To supplement in-class material, students were assigned to choose a book to read outside of class that is relevant to the field of psychology. An outline of the course curriculum for the standard psychology course is also available in the supplementary materials.

Measures

Measures included in this study were intended to assess different aspects of well-being and constructs related to positive psychology.

Survey on Flourishing (SURF). The Survey on Flourishing (SURF) was used as a general measure of subjective well-being. SURF is a 19-item Likert scale measure that uses a broad-based approach to assess subjective well-being. Internal consistency in the present sample was α =.94. SURF was found to correlate significantly with other measures of well-being including the PERMA profiler (r = .79), the Satisfaction with Life Scale (r = .75), and the Positive Affect subscale of the Positive and Negative Affect Schedule (PANAS) (r = .69), indicating convergent validity (Butler & Kern, 2016; Diener, 1985; Thompson, 2007).

PERMA Profiler (Butler & Kern, 2016). The Overall Well-being scale of the PERMA profiler was also used to measure general subjective well-being (Butler & Kern, 2016). Based on Seligman's conceptualization of the five pillars of well-being (positive emotion, engagement, relationships, meaning, and accomplishment), the PERMA profiler is made up of intended to measure each of these five pillars (Seligman, 2011; Butler & Kern, 2015). Internal consistency in the present sample was α = .94. Scores on the Overall Well-being subscale of the PERMA profiler have shown to correlate with other measures of subjective well-being (Diener et al., 1985, 2009; Stewart-Brown et al., 2009; Butler & Kern, 2016).

Positive and Negative Emotion Schedule, Short Form (PANAS; Watson et al., 1988). Because affective experience is an integral component of well-being, the PANAS was used to measure positive and negative affect. Each item on the PANAS is a positive affect word (e.g., "enthusiastic" or "inspired") or a negative affect word (e.g. "scared" or "hostile") and respondents are asked to report to what extent they are presently experiencing each emotion on a five point Likert scale. Internal consistency in the present sample was α =.87. Test-retest reliability coefficients have been estimated to be .54 for the positive affect scale and .45 on the negative affect scale after a period of 8 weeks (Watson et al., 1988). PANAS Negative Affect scores have been correlated highly with measures of depression (BDI) (r = .56), and distress/dysfunction (HSCL) (r = .65) in a non-clinical adult sample. PANAS Positive Affect scores correlated negatively with these same measures (BDI r = -.35; HSCL r = -.29).

Satisfaction with Life Scale (SWLS; Diener et al., 1985). Life satisfaction was measured with the 5-item Likert-style Satisfaction with Life Scale (SWLS). The SWLS is the most commonly used measure of life satisfaction and has an accumulation of research supporting its reliability and validity. Internal consistency in the present sample was α =.83. Test-retest reliability was found to be .83 after a period of 2 weeks and .84 after a period of one month (Alfonso et al., 1992; Pavot, et al., 1991). Groups expected to report low life satisfaction (abused women, prison inmates, and psychiatric patients) scored low on the SWLS. Additionally, scores on the SWLS correlated significantly with other measures of well-being including the Andrews/Withey Scale (r = .52-.68), the Fordyce Global Scale (r = .55-.82), as well as interviewer ratings (r = .43-.66) and informant reports of well-being (r = .28-.58) (Diener et al., 1985, 1991; Larsen et al., 1985; Pavot & Diener, 1993)

Gratitude Measure. Because feelings of gratitude and appreciation for one's life and circumstances are associated with subjective well-being, gratitude was also measured as an outcome (Wood et al., 2010). The Gratitude measure, a 9-item measure with Likert-based items, was used to assess gratitude. The scale was scored by averaging item responses. Internal consistency in the present sample was α =.78.

Supportive Relationships Measure. A strong social network is also an important indicator of well-being, therefore social support was assessed with the Supportive Relationships measure. This is a 20-item Likert-style scale measure that was scored by averaging item responses. Internal consistency in the present sample was α =.91.

Self-Compassion Measure. Self-compassion is defined as the ability to extend compassion to oneself despite failures or personal shortcomings (Neff, 2003). The Self-Compassion measure is a 12-item scale with Likert-based items scored by averaging item responses. The Self-Compassion measure has demonstrated good internal consistency (α = .90) and correlated strongly (r = .85) with another measure of self-compassion, the Self-Compassion Scale, short form (Raes et al., 2011). Internal consistency in the present sample was α =.86.

Results

Feasibility

We qualitatively evaluated the positive psychology course feasibility based on student demand, attrition, implementation, and practicality of the course.

Demand. There was a high demand for the subject among the student body and as a result, the class filled with relative ease. The class was filled to capacity at the start of each semester. One obstacle that prevented some students from enrolling in the course was scheduling conflicts, including the need to balance required credits with desired electives. Per district requirements, the general psychology class was mandatory and the positive psychology course was elective, therefore, students with a full schedule would have been prevented from enrolling in the positive psychology course.

Table 2. T test statistics examining baseline scores

Measure	*t*	*p*
Flourishing	.49	.63
Well-Being	.94	.35
Negative Affect	-2.82	.006*
Positive Affect	-1.25	.21
Life Satisfaction	.37	.71
Gratitude	.46	.64
Relationship Support	1.15	.25
Self-Compassion	1.03	.31

*Denotes significance at $p < .05$

Attrition. Attrition for the positive psychology course was quite low, comparable to attrition for the standard psychology course. Most students who began the positive psychology course were able to complete it. Over the course of the semester of positive psychology, 3.0% dropped out compared to 2.8% of students enrolled in the standard psychology course.

Implementation and Practicality. The positive psychology course (like the standard psychology course) was implemented over the course of one single semester. To prepare for the course, the instructor reported having become well acquainted with positive psychology by reading several positive psychology books and attending both regional and international positive psychology conferences. The instructor reported receiving unanimous support when pitching the course to the school district since the subject matter related to taking care of the students, a core aspect of the school and district's mission. There was no external funding for the class, with the cost of the instructor paid by the school district and the cost of additional books required for preparation paid for by the instructor.

Qualitative Student Feedback

Students were offered the opportunity to provide feedback about their experience in the course at the conclusion of the semester. Student feedback was overwhelmingly positive. This feedback was examined and coded thematically to identify different benefits that students reported from completing the course. Commonly, students reported that taking the course helped them to apply principles of positive psychology to their personal lives. Coded responses generally fell into the following four themes: 1) reported improvements in happiness and well-being 2) improvements in relationships 3) the ability to manage and cope with difficult emotions more effectively and 4) an ability to apply the principles that were taught in the class. The first response theme, reported improvements in happiness and well-being, was identified based on reports from several students that they felt "happier" or higher levels of positive emotion (e.g. joy, hope, pride) as a result of taking the course.

Table 3. Mean scores and standard deviations at each measurement point

Measure	Pre-test *N* = 113		Mid-Semester *N*=112		Post-Test *N* = 110		Follow up *N* = 64	
	Tx	Control	Tx	Control	Tx	Control	Tx	Control
Flourishing	4.8 (.94)	4.7 (.98)	5.1 (.92)	4.7 (.98)	5.3 (.92)	4.7 (1.1)	5.4 (.81)	5.0 (1.2)
Well-Being	8.0 (1.32)	7.7 (1.53)	8.3 (1.2)	7.7 (1.5)	8.4 (1.24)	7.8(1.74)	8.5 (1.04)	8.2 (1.9)
Negative Affect	1.7 (.52)	2.1 (.77)	1.9 (.78)	2.1 (.80)	1.7 (.56)	2.0 (.73)	1.6 (.48)	1.8 (.81)
Positive Affect	2.7 (.81)	2.9 (.84)	2.9 (.79)	2.8 (.82)	2.9 (.82)	2.8 (.91)	2.8 (.80)	2.9 (1.0)
Life Satisfaction	4.2 (1.4)	4.1 (1.21)	4.6 (1.4)	4.3 (1.3)	4.9 (1.1)	4.3 (1.4)	4.8 (1.1)	4.5 (1.4)
Gratitude	5.4 (.63)	5.4 (.81)	5.6 (.57)	5.4 (.85)	5.6 (.69)	5.4 (.80)	5.9 (.60)	5.6 (.83)
Relationship Support	5.6 (.69)	5.5 (.78)	5.7 (.67)	5.4 (.80)	5.9 (.60)	5.5 (.77)	5.9 (.58)	5.7 (.85)
Self-Compassion	3.8 (.94)	3.6 (.98)	3.4 (.97)	3.6 (1.1)	4.1 (.85)	3.8 (1.05)	4.1 (.90)	4.0 (1.1)

Table 4. *F* statistics and p-values from repeated measures mixed models

Measure	Main Effect Time		Main Effect Course Condition		Time x Treatment Interaction	
	F	*p*	*F*	*p*	*F*	*p*
Flourishing	9.67	<.001*	5.57	.02*	3.45	.02*
Well-Being	3.7	.01*	3.97	.049*	1.01	.39
Negative Affect	3.57	.01*	12.03	<.001*	.74	.53
Positive Affect	.31	.82	.07	.80	1.44	.23
Life Satisfaction	8.02	<.001*	1.43	.24	2.32	.08
Gratitude	3.22	.02*	5.69	.02*	2.02	.11
Relationship Support	3.36	.02*	4.33	.04*	.89	.45
Self-Compassion	6.54	.001*	1.62	.21	.88	.45

*Denotes significance at $p < .05$

For the second theme, improvements in relationships, a number of students reported having deeper or more meaningful connections, a greater capacity to care for others, and a stronger focus on relationships. The third theme that emerged was the ability to manage and cope with difficult emotions more effectively by applying strategies learned in the class. Most commonly, students referred to difficulty with managing stress, symptoms of anxiety or depression, or negative emotions like anger or sadness. Students noted that as a result of the class, they were able to cope with these experiences more effectively or view them as growth experiences rather than viewing them just as moments of suffering. The fourth theme was an ability to apply principles from the class such as gratitude, self-compassion, savoring, optimism, habits, goal pursuit and achievement, mindfulness, and awareness. Students noted that they gained a greater understanding of the value of these strategies as well as motivation to implement them in their personal lives. Below are three excerpts from student responses:

Student 1, Female, 17

> "I have been diagnosed with general anxiety and depression. I am on medication for it, but that has not always helped. The way positive psychology has impacted me is much larger than I could have ever imagined. I have learned how to better cope with my stress and anxiety, learning to view it as a positive and necessary thing in life rather than an illness I have".

Student 2, Female, 18

> "I noticed that as I was taking this class and we would learn about positive emotions, being mindful, and engagement, I would find myself applying these concepts in my daily life. I would be doing homework and get distracted and I would say to myself that I need to be more engaged and mindful about what I am doing".

Student 3, Male, 17

> "This class has helped me become more optimistic, instead of seeing the negative in everything. I look on the brightside a lot more frequently. Positive psychology has also helped me create better connections with my friends and family. When we learned the science of turning towards, I started applying this to my life and found people were much more open with me and receptive."

Quantitative Results

A series of t-tests were performed to determine whether there was any significant deviation in baseline measures between the treatment and control group. No significant group differences were found at baseline on any variable except negative affect. Those enrolled in the positive psychology course reported lower baseline levels of negative affect than the standard psychology students, though all other measures of well-being were not significantly different at baseline (see Table 2).

In order to test our hypothesis that students in a high school positive psychology course would report greater increases in variables related to subjective well-being than their counterparts in the standard psychology course, we used a series of repeated measures mixed models with course condition predicting well-being variables. Mixed models use maximum likelihood rather than the least squares method applied in ANOVA and are thus much more accommodating to observations with missing data points (i.e. attrition; Baldwin, 2019). Demographic variables (age, sex, and race) were controlled for in the models. For each outcome, we estimated the main effect of the course condition, the main effect of time, and the interaction between these. We also calculated Cohen's d between-group effect size estimates at the completion of the course (3rd round measurement) and at the 3-month follow up (4th round measurement). Means and standard deviations at each measurement can be found in Table 3 and in Figure 1.

Table 5. Posttest and 3-month follow up Cohen's d effect size estimates with 95% confidence intervals

Measure	*d* (at posttest)	95% CI	*d* (3 month follow up)_	95% CI
Flourishing	.56*	.17, .94	.38	-.13, .88
Well-Being	.40*	.02, .77	.22	-.28, .72
Negative Affect	-.47*	-.85, -.091	-.36	-.86, .15
Positive Affect	.095	-.28, .47	-.11	-.61, .39
Life Satisfaction	.48*	.10, .85	.25	-.25, .75
Gratitude	.38	-.002, .75	.42	-.08, .92
Relationship Support	.52*	.14, .90	.28	-.23, .78
Self-Compassion	.39*	.009, .76	.15	-.35, .65

*Denotes significance at $p < .05$

The main effects of time and course condition were statistically significant for overall well-being, gratitude, and relationship support, suggesting that both passage of time and course condition had an impact on improving these variables. There was also a significant time x treatment interaction on the flourishing variable. Therefore, those enrolled in the positive psychology course increased in flourishing over time. There was no significant treatment effect for positive affect, life satisfaction, or self-compassion (though there appeared to be a main effect for time on life satisfaction and self-compassion). Contrary to our hypotheses, there was a significant main effect for time and course condition on negative affect, with those in the standard psychology course reporting a greater decrease in negative affect over time; however, as noted previously, those in the standard psychology course reported higher levels of negative affect at baseline due to the non-random method of group assignment (See Table 4).

Between-group Cohen's d effect sizes were also measured at study completion and the 3-month follow up. Post-test effect sizes were significant for flourishing, well-being, life satisfaction, relationship support, and self-compassion. Thus, students in the positive psychology course (compared to the control group) reported higher levels of flourishing, well-being, life satisfaction, relationship support, and self-compassion at course completion. These results did not remain significant at a 3-month follow-up; however, the response rate for this follow-up was quite low which negatively impacted statistical power (43% attrition; see Table 5). The post-test effect size for negative affect was also significant, however, as noted previously, the control group was significantly higher in negative affect at baseline.

Discussion

The aims of the present study were to determine the feasibility and preliminary efficacy of teacher-led positive psychology curriculum on high school student well-being using a mixed method, quasi-experimental design. The results of this study supported our qualitative hypothesis suggesting that a positive psychology curriculum implemented by a teacher in a high school setting is a feasible method of intervention delivery. Furthermore, enrolled students reported a number of positive benefits as a result of completing the course. The preliminary quantitative findings are also promising to suggest positive effects of the curriculum on student well-being, particularly overall well-being, gratitude, and relationship support. However, several results in this study did not align with our hypotheses. Effect sizes did not remain significant at the 3-month follow-up and there were no positive treatment effects detected for positive affect, life satisfaction, or self-compassion. This lack of significance may be a result of substantial attrition at the 3-month follow up and low statistical power which will be discussed in greater detail in the subsequent section.

Strengths and Limitations

To our knowledge, this study is the first to implement a positive psychology curriculum in a high school setting developed and taught by educators without a background in clinical training. Although there are benefits to conducting research in a research setting (i.e. more control over variables), naturalistic settings are advantageous as they give a more realistic representation of behavior and treatment effects. This "real-world" implementation provides an appropriate proof-of-concept that could be reproduced by other educators in the future. The course was funded and sponsored completely by the school district and thus provides an economically feasible model. Previous positive psychology classroom interventions have been developed primarily by clinicians not actually working in the classroom setting which may result in rigid "over-manualization" and poor protocol adherence by teachers. (e.g. Havik et al.,1996; Seligman et al., 2009).

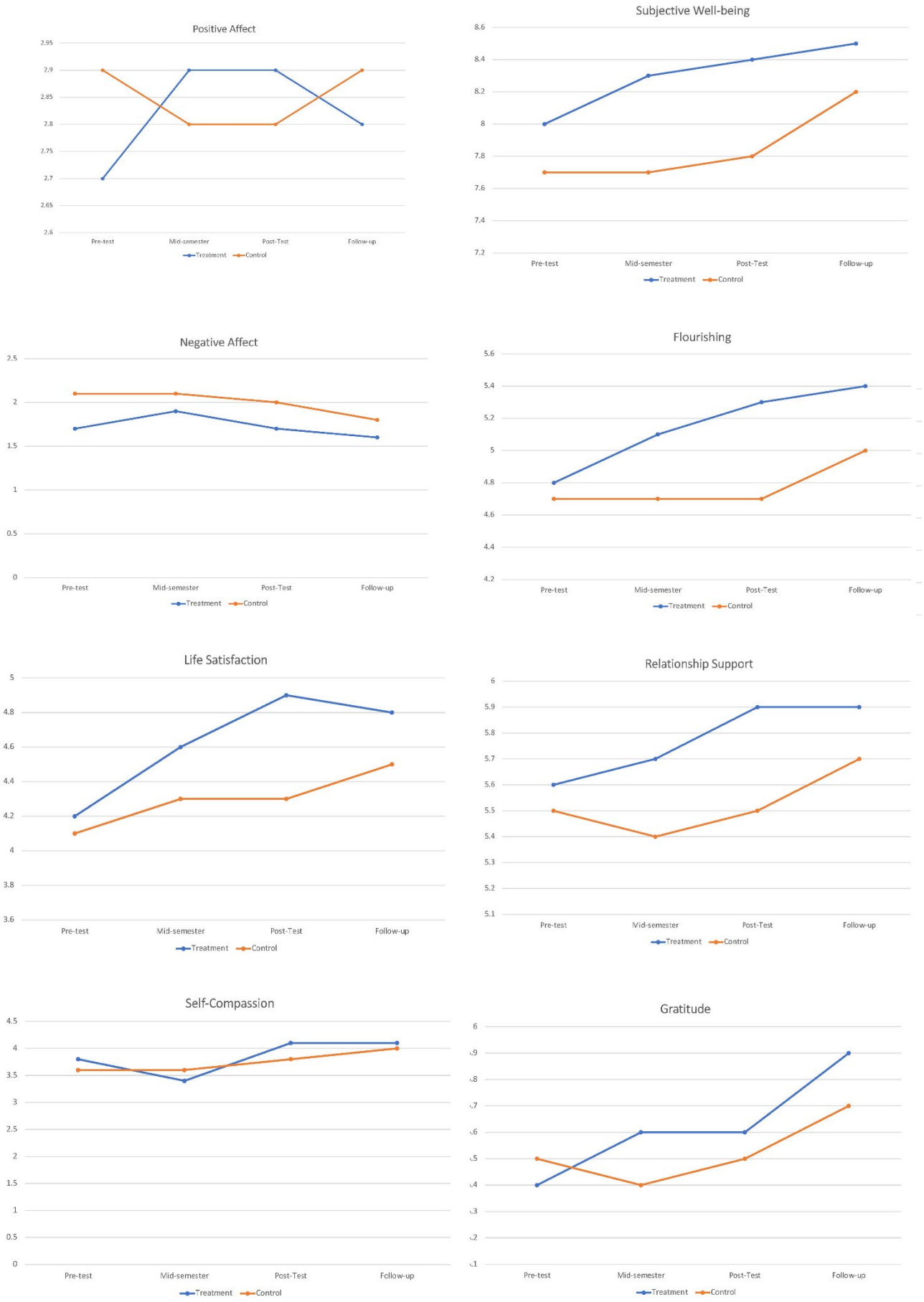

Figure 1. Group means at each of 4 time points

However, this evidence-based course was developed by the educator teaching the course, which allowed for individual tailoring to the instructor's teaching style and students. This factor may serve as a limitation for the broad dissemination of this course as future educators will also have to gain the necessary knowledge to teach the course; however, we hope this paper, along with the attached supplementary materials, will help reduce the time burden for new teachers.

This study has several significant limitations. Because it was a real-world implementation and feasibility study, we had limited control over study design features such as participant recruitment and group assignment. Students were self-selected to enroll in either course and some students enrolled in both the positive psychology and standard psychology courses. The quasi-experimental design and non-random group assignment may have led to a self-selection bias that may explain the higher baseline levels of negative affect reported by the students in the standard psychology course. This, of course, may have introduced added error variance to the results. Due to these limitations, the quantitative results are rudimentary. There was also some limitation to the qualitative feedback as only the students enrolled in the positive psychology course were asked to give written feedback on their experience in the course. Therefore, we do not have an appropriate qualitative comparison.

Another limitation was significant attrition and relatively small sample size. Although most students remained in the study through the course of the semester (3.5% attrition at course completion), attrition for the 3-month follow up measure was 43% (N = 64; see Table 2). Furthermore, conducting research in a real-world school setting with one instructor, we were unable to recruit a robust sample size. Both of these factors may have limited the power needed to detect significance of the statistical comparisons used in this study. We conducted a post-hoc two-tail between-groups power analysis to determine our present study statistical power. With alpha set at .05, these analyses revealed that observed power for the significant effect sizes at posttest ranged from 65% to 90%. For the variables that did not exhibit significant effect sizes, post-hoc power estimates ranged from 7% to 83%, with only one estimate surpassing the minimum 80% power threshold (Cohen, 1988). Likewise, post-hoc analyses suggested that power estimates did not surpass 36% for any of the effect estimates for the 3-month follow-up. A post-hoc sensitivity analysis suggested that the smallest effect size that would have been detectable with the sample size of the 3-month follow-up was .75. Therefore, it is likely that the sample employed in the present study was not sufficient to detect small or medium effect sizes.

Study Applications and Future Directions

As mentioned previously, because the study was conducted in a naturalistic setting, there were significant limitations to our design. This high school was one of few in the United States that offered a positive psychology course, which limited our sample size and statistical power to detect significant effects. Subsequent research should focus on collaborating with educators and school districts to broaden the scale of positive psychology secondary education in order to acquire a larger sample, implement more rigorous methodology, and obtain adequate statistical power to examine the effects of such a curriculum. These results largely support previous research that has associated positive outcomes with the employment of positive psychology interventions in a classroom setting. Although more research is needed to bolster these positive findings, these results provide promising qualitative results and evidence for feasibility. Positive psychology education has potential to be a scalable, cost-effective way to disseminate resources and skills that would support student well-being. The availability of positive psychology courses with experiential activities and interventions could become standard in all high schools to help fortify the well-being of adolescents and improve their ability to cope with life's challenges.

A major hurdle for developing a generalizable positive psychology curriculum is training new teachers. While this course will likely be taught by psychology teachers, the course contains specialized knowledge that teachers may not have gained during their education. For educators to become proficient in positive psychology principles, we have included a list of books and online resources as supplementary material. Additionally, the teacher who implemented this positive psychology course completed significant preparation and groundwork prior to teaching the course. However, the resources provided from this research will be usable for educators in the real-world to implement a positive psychology curriculum without requiring the same level of exertion that our intervention entailed. It is our hope that the classroom can become a widely used model of dissemination and a form of preventative mental health available to all

students. Future research should focus on scaling up the methodology used in this study to determine the effects of such a curriculum in a high-powered, yet still naturalistic, real-world sample.

Compliance with Ethical Standards

Ethical Standards

All study procedures involving human participants followed institutional and/or national research committee ethical standards and the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

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Received: March 09, 2021
Accepted: June 11, 2021
Published Online: June 25, 2021

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