MULTIDISCIPLINARY SCIENCE JOURNAL

RESEARCH ARTICLE
Published Online: September 22, 2023
https://doi.org/10.31893/multiscience.2024040

Effect of the subject - 'Happiness Engineering' on Indian senior secondary school students

Ashraf Alam[a] | **Atasi Mohanty**[a]

[a]Rekhi Centre of Excellence for the Science of Happiness, Indian Institute of Technology Kharagpur, India.

Abstract The objective of this research is to investigate the implications of teaching *Happiness Engineering* subject on various positive psychological outcomes, including subjective well-being, prosocial behavior, and life satisfaction among students enrolled in the 11th and 12th grades, hailing from two senior secondary schools situated in the Bokaro district of Jharkhand, India. The research involved 216 participants from seven classes, who were randomly assigned to one of two conditions: HE (*Happiness Engineering*) and Control. Participants were selected such that students who took *Happiness Engineering* as a compulsory subject were part of the HE groups, and those who did not, were part of the Control group. The researchers investigated the development and expression of overall well-being in students, including subjective well-being, gratitude, prosocial behavior, and life satisfaction. The effect of this intervention (teaching of *Happiness Engineering* subject) was then compared to the control condition (where participants did not engage in *Happiness Engineering* classes). The results of the study revealed several significant findings. First, participants who were part of the HE intervention group reported higher levels of optimism and life satisfaction and lower levels of negative affect. This suggests that the act of consciously focusing on and appreciating positive aspects of one's life can lead to increased well-being and decreased negative emotions. An exceptionally profound revelation came to light concerning the robust correlation between HE classes and contentment regarding the scholastic milieu. It is noteworthy that, both directly after the implementation of the intervention and during the subsequent assessment at the end of a four-week period, the cohort exposed to the HE intervention exhibited elevated levels of satisfaction in their educational environment in contrast to the control condition. The study unveiled that *Happiness Engineering* is an effective school subject that has the potential to profoundly influence young adults in perceiving and engaging with their school environment, ultimately fostering a more positive and enriching educational experience.

Keywords: teacher education, curriculum, pedagogy, school education, positive education, India

1. Introduction

Adolescence is a phase characterized by changes in various aspects of a person's life, including physical, social, emotional, and intellectual domains (Freud, 1958). During early adolescence, individuals may exhibit behaviors and characteristics more reminiscent of childhood (referred to as latency), while late adolescents gradually develop behaviors that align with those of adults. However, it is important to recognize that they do not fully belong to either category. Adolescence can be quite challenging to deal with (Holmbeck & Kendall, 2002). This developmental stage is often marked by turbulence, as early adolescence is associated with increased familial distance, disruptions in relationships, and sometimes even experiences of depression (Silverberg and Steinberg, 1990; Steinberg, 1987). Due to the rapid shifts in mood and the presence of intense positive and negative emotions that adolescents commonly experience (Myers, 1992), and the emotional state of disconnection, they often struggle to maintain a stable level of positive emotions. During this transitional phase, there is an opportunity for various outcomes, including negative consequences, inactivity, or positive psychological development. By considering these variables, we can better understand the impact of different influences on the developmental trajectory of adolescents. By understanding the relationship between these positive qualities and various aspects of adolescent well-being, we can explore how they serve as potential buffers against adversity. Adolescents who experience higher levels of life satisfaction are less likely to engage in problematic behaviors. This suggests that fostering positive emotions and a sense of contentment can help offset the risk of engaging in detrimental behaviors. Life satisfaction has also been found to moderate the impact of stressful life events on the development of externalizing disorders (Suldo & Huebner, 2004). By promoting happiness and well-being (see Figures 1-14), we can potentially reduce the likelihood of adolescents engaging in harmful behaviors.

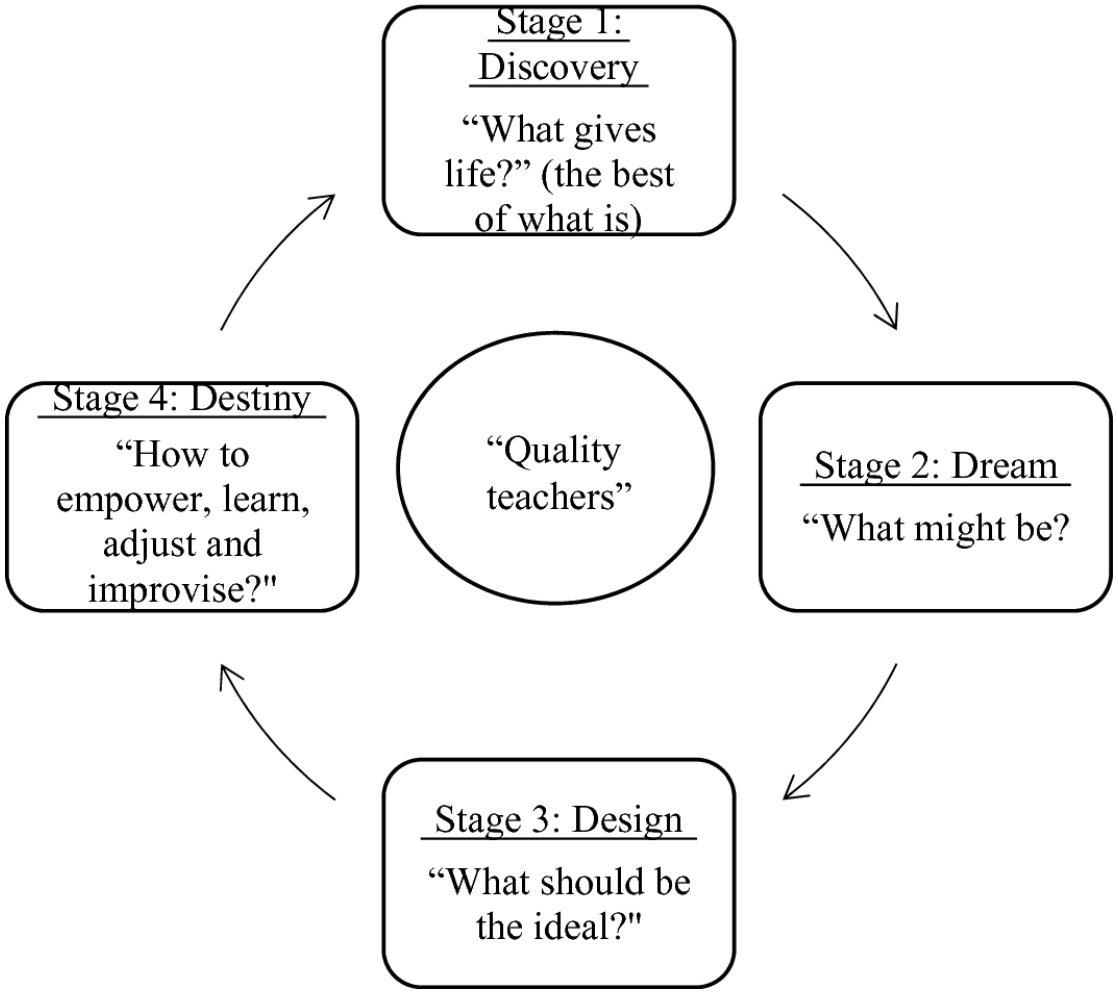

Figure 1 Stage 1—The appreciative inquiry 4-D cycle (Cooperrider et al., 2008; White & McCallum, 2020).

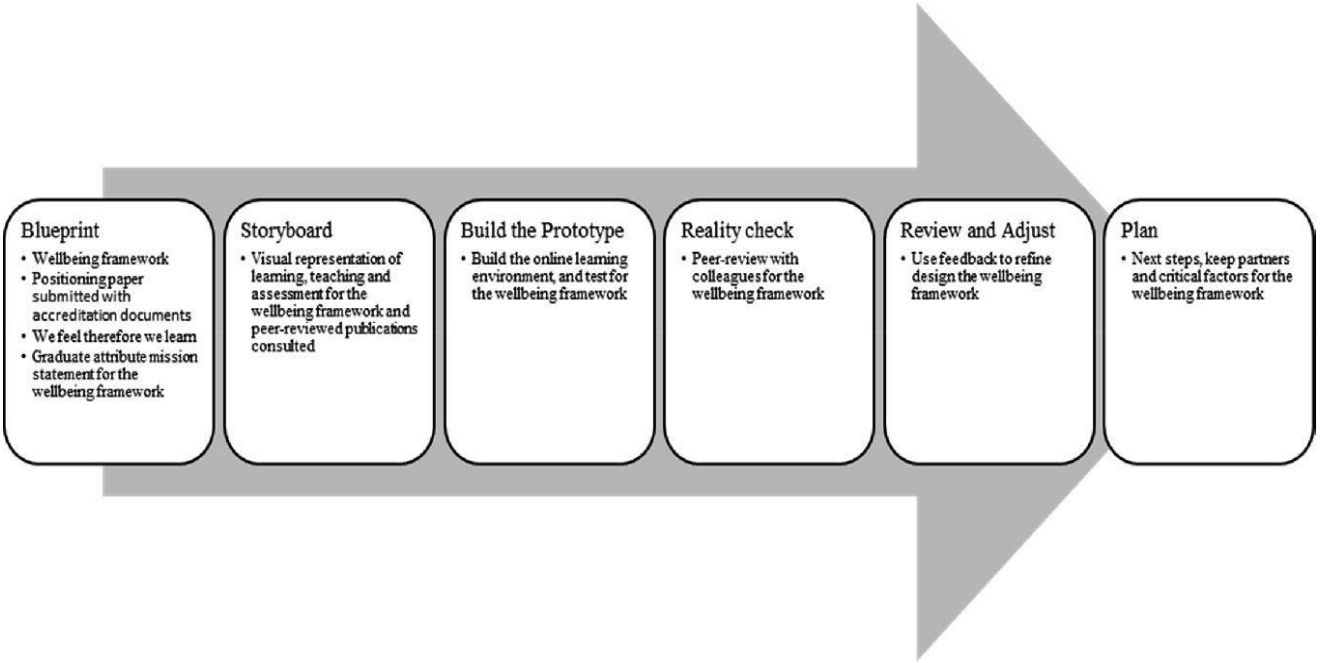

Figure 2 The carpe diem process for the development of the wellbeing framework (Salmon & Wright, 2014; White & McCallum, 2020).

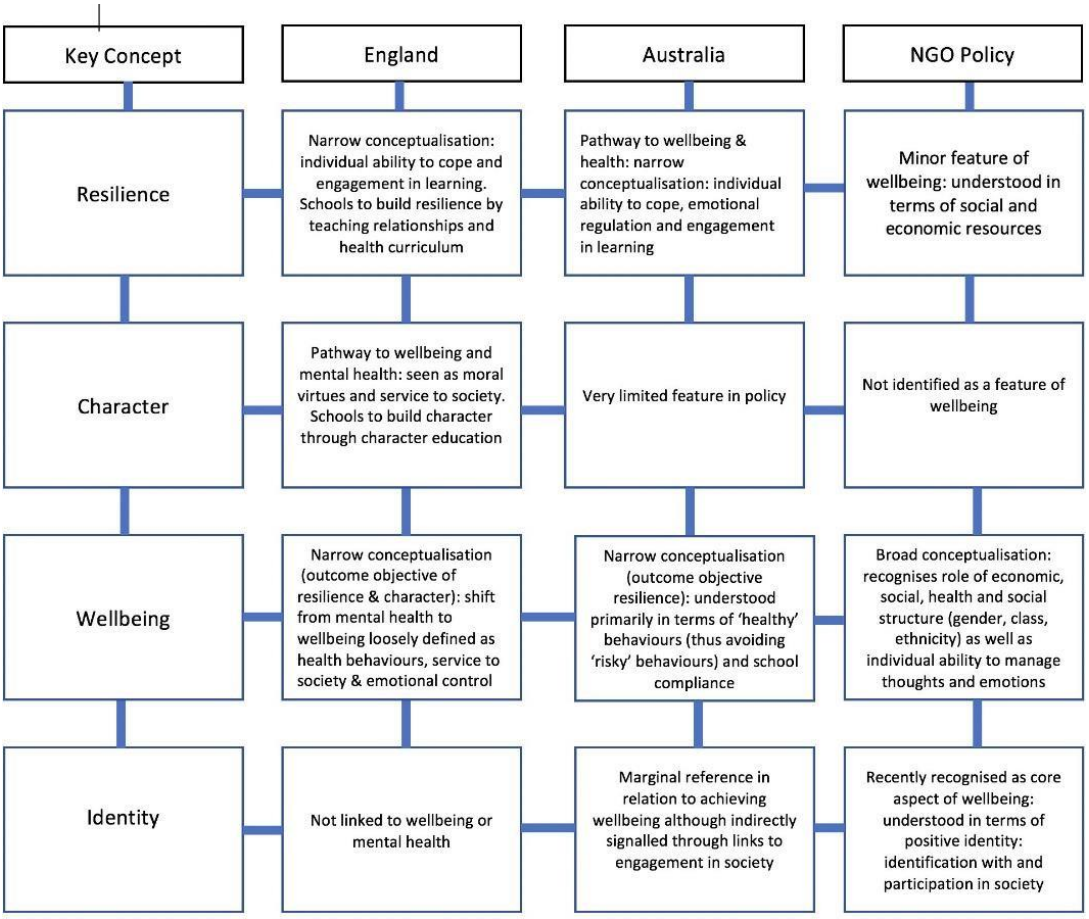

Figure 3 Educational policy on schools' role in mental health promotion: key concepts (Brown & Shay, 2021).

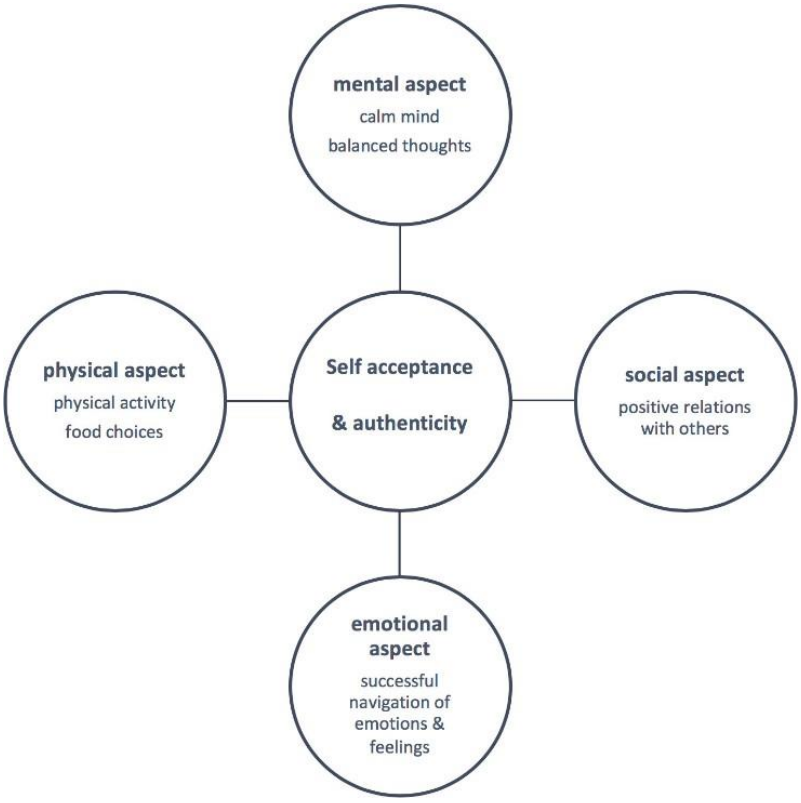

Figure 4 Model outlining school students' views on the constituents of wellbeing (Brown & Shay, 2021).

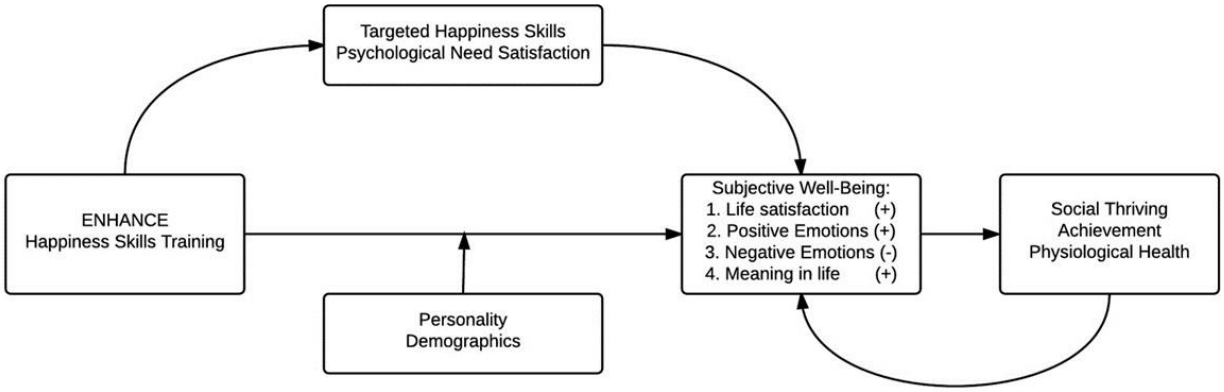

Figure 5 Theoretical model of outcomes for ENHANCE (Kushlev et al., 2017).

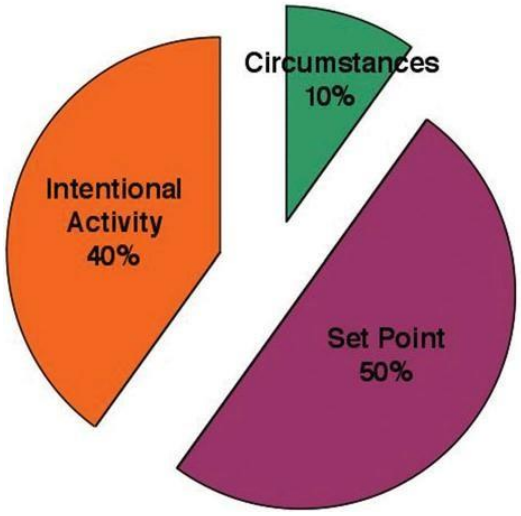

Figure 6 The pie chart aspect of the sustainable happiness model (Lyubomirsky et al., 2005; Lyubomirsky et al., 2005).

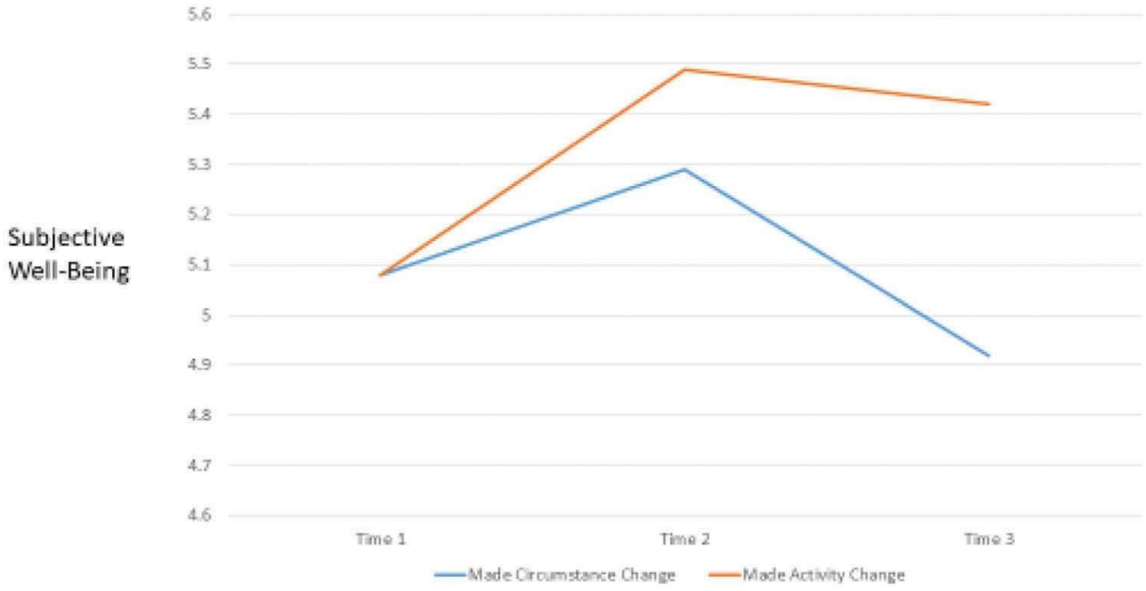

Figure 7 Longitudinal effects of making an assigned activity change compared to making an assigned circumstance change (Sheldon & Lyubomirsky, 2006).

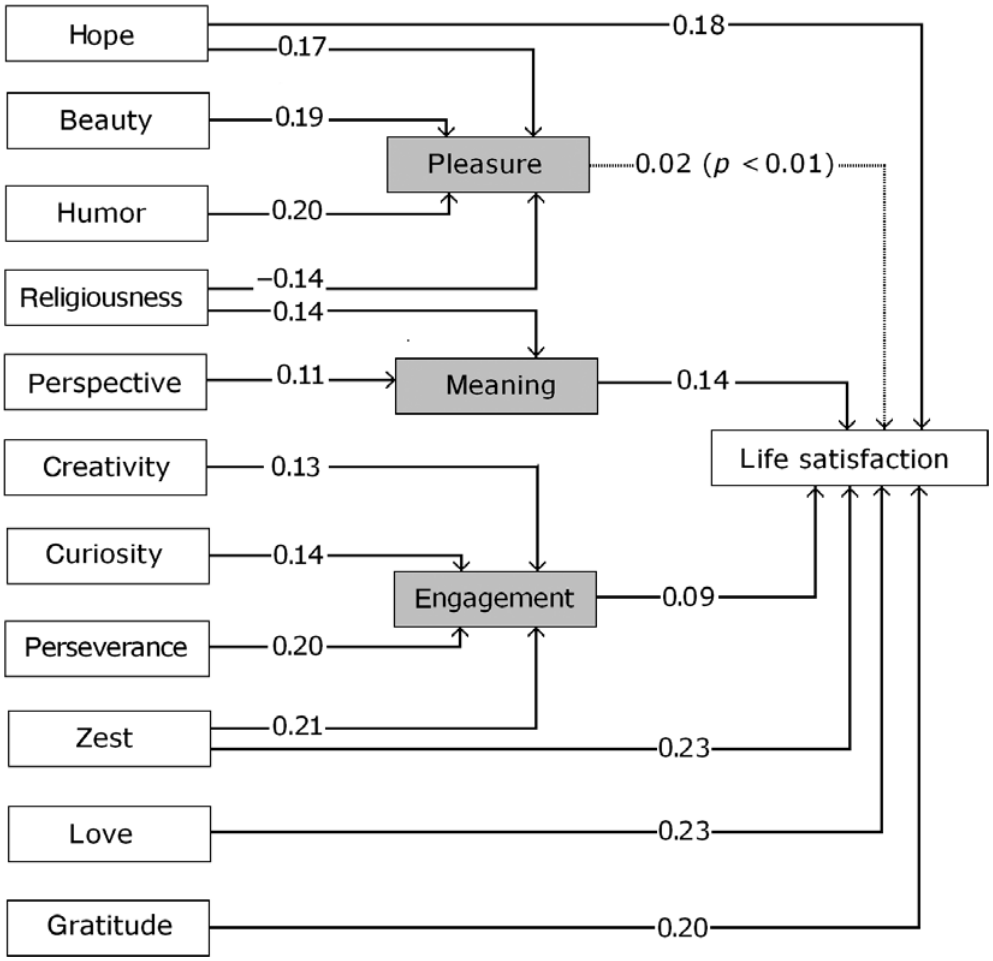

Figure 8 Path diagram. Figures in the diagram are standardized beta coefficients ($p < 0.001$ except where noted). Paths involving demographic variables are omitted, and only paths entailing character strengths with standardized beta coefficients > 0.10 are shown (Peterson et al., 2007).

Figure 9 Model indicating the relationship between identity and wellbeing for young people (Brown & Shay, 2021).

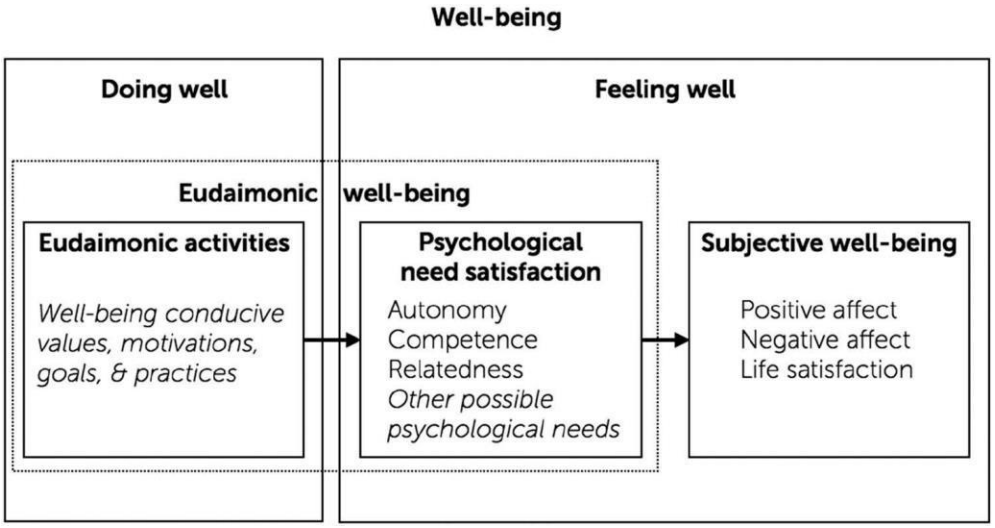

Figure 10 The eudaimonic activity model (Martela & Sheldon, 2019; Sheldon, 2018).

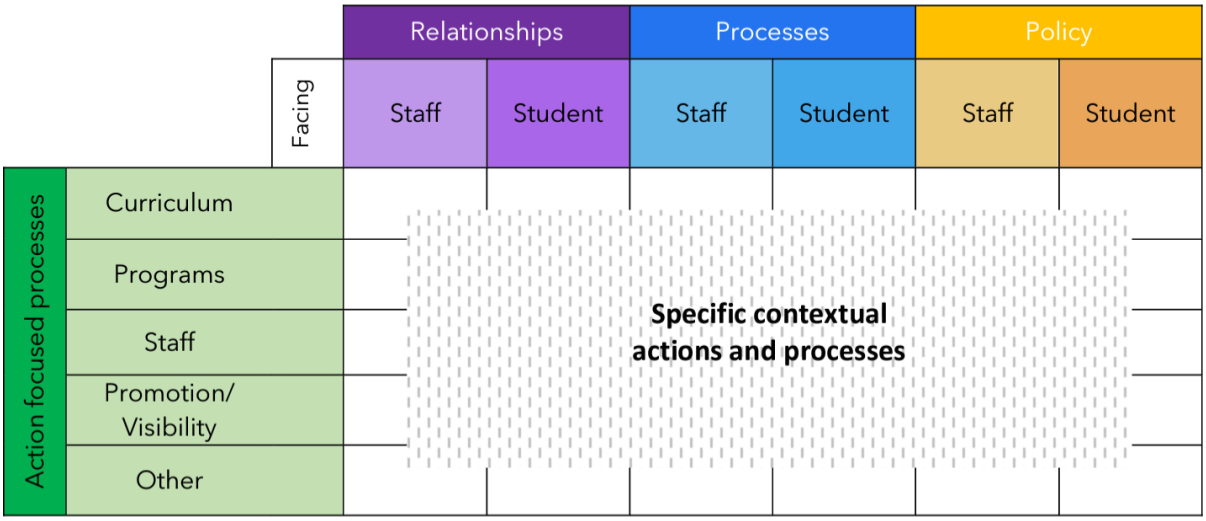

Figure 11 The Initial Wellbeing Framework for Action (Gillett-Swan, Graham, Cayas, & Crisp, 2019).

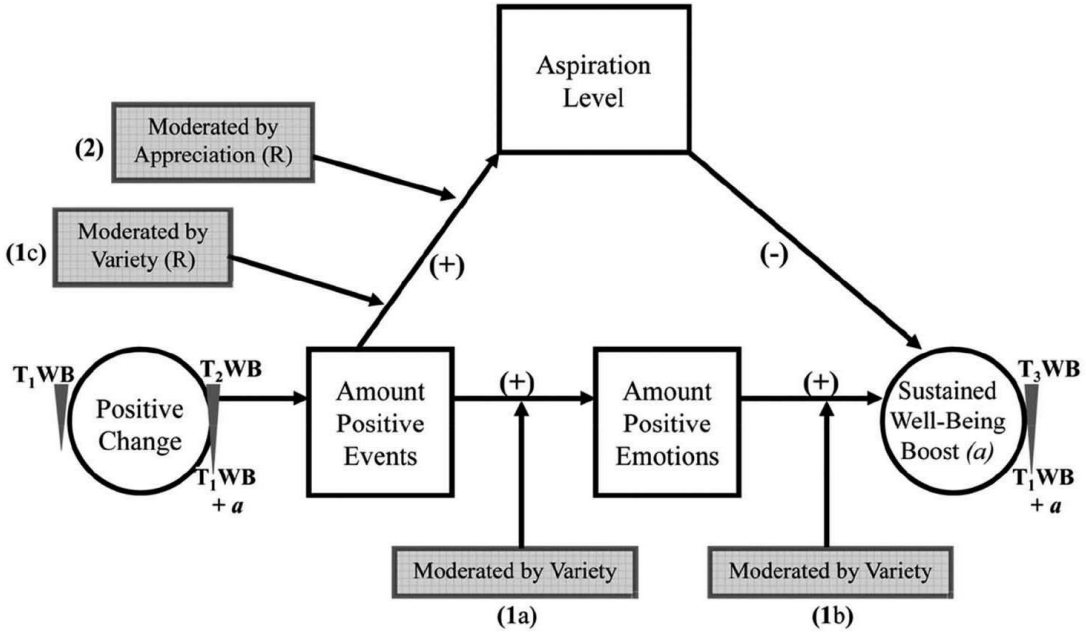

Figure 12 The hedonic adaptation prevention model (Sheldon & Lyubomirsky, 2012).

Figure 13 Interplay Wellbeing Framework (Wilson et al., 2018).

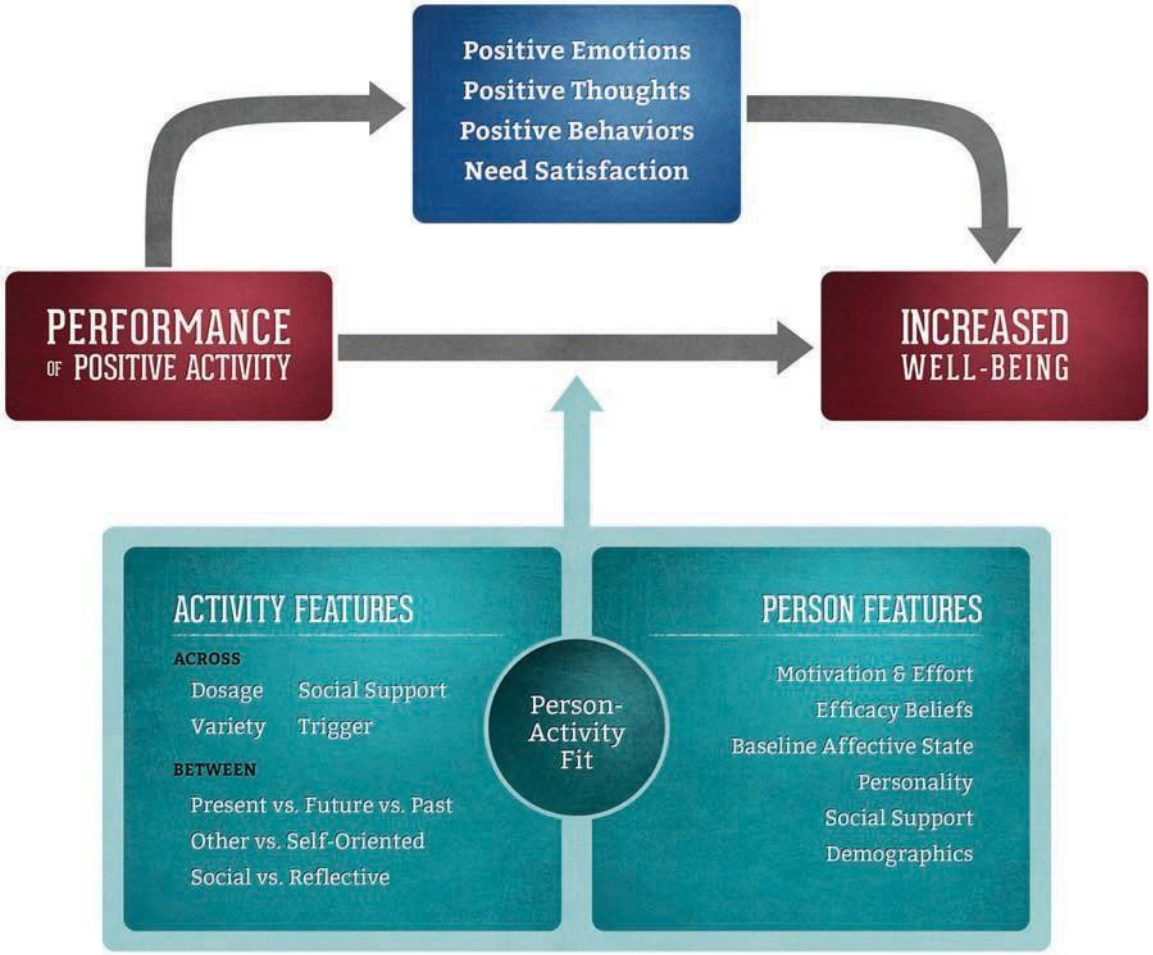

Figure 14 The positive-activity model (Lyubomirsky & Layous, 2013).

While adolescence is commonly characterized as a period of turbulence and stress for both individuals and families (Freud, 1958), focusing on happiness and well-being can help mitigate the negative effects of these challenges and offer a buffer for future occurrences. By nurturing positive attributes such as gratitude, subjective well-being, prosocial behavior, life satisfaction, and optimism, adolescents can develop a resilient mindset that enables them to navigate through the complexities of this developmental stage. The positive-activity model (see Figure 14) aims to explain how and why performing positive activities makes people happier. In Figure 14, illustrated at the top, positive activities increase positive emotions, positive thoughts, positive behaviors, and need satisfaction, all of which in turn enhance well-being. Features of positive activities (e.g., dosage and variety) and of the person (e.g., motivation and effort) influence the degree to which the activities improve well-being. An optimal person-activity fit (i.e., the overlap between activity and person features) further predicts an increase in well-being (Lyubomirsky & Layous, 2013). Encouraging adolescents to recognize and capitalize on their strengths and positive emotions can foster a sense of empowerment and enhance their overall well-being. It is important to note that promoting happiness and wellbeing does not negate or dismiss the genuine difficulties and struggles that adolescents may face. Instead, it provides them with resources and strategies to better cope with and overcome adversity. By understanding the significant role that positive attributes play in adolescent development, we can work toward creating environments and interventions that foster these qualities and support the overall psychological health and resilience of young individuals.

1.1. The Current Investigation

The objective of this study is to investigate the implications of teaching the subject of *Happiness Engineering* on various positive psychological outcomes, including subjective well-being, gratitude, prosocial behavior, and life satisfaction among students enrolled in the 11th and 12th grades, hailing from two senior secondary schools situated in the Bokaro district of Jharkhand, India. The HE (*Happiness Engineering*) intervention among senior secondary school students between the age group of 16-19 years hailing from India on their positive psychological functioning aims to address the gaps in the 'happiness and well-being literature of India' and shed light on the role of teaching happiness to school students in their holistic development. Understanding whether happiness and well-being emerge naturally in teenagers or develop gradually over time can provide valuable insights into their origin and development. Additionally, investigating whether there are differences in how boys and girls experience and express happiness can help us understand potential gender-related factors that influence their wellbeing. Can teenagers be encouraged and taught to practice happiness in their daily lives? If so, how does this cultivation of happiness impact their overall well-being and positive psychological functioning? Answering these questions can provide practical implications for educators, parents, and practitioners working with children, as it may offer effective strategies for promoting positive development and well-being in teenagers. Research has shown that happiness is associated with a range of positive outcomes in adults, such as increased life satisfaction, improved relationships, and enhanced mental health. However, it remains unclear whether these findings can be extrapolated to teenagers in India in an Indian school setting. Investigating the effects of teaching happiness on positive psychological functioning in 'school students' can help identify potential protective factors and interventions that promote their well-being.

The researchers aimed to investigate the effects of this intervention on students who took *Happiness Engineering* (https://www.ashrafalam.co.in/Happiness-Engineering) as a compulsory subject. It intends to look at the social, physical, and psychological well-being of 11th and 12th graders. The study spanned a duration of 12 weeks. Subsequently, the researchers evaluated the influence of the intervention on diverse outcome measures, both directly after the intervention and during a subsequent assessment at a 4-week follow-up period. The rationale for conducting this study lies in the existing literature that suggests a positive relationship between compassion, resilience, hope, growth mindset, and well-being in adult samples. Therefore, it is logical to explore whether teaching these modules (units) that are part of the *Happiness Engineering* subject has a positive effect on the overall life satisfaction of school students. The researchers hypothesized that teaching this subject would be linked to higher levels of subjective well-being. The hypothesis is grounded in the understanding that gratitude, hope, resilience, compassion, growth mindset, etc., have the potential to enhance well-being and promote positive outcomes in late teenagers. By providing teenagers with techniques to foster these positive psychological traits, the researchers aimed to contribute to the development of sustainable well-being among this age group. To examine this hypothesis, the study employed a randomized control design. Students from 11th and 12th grades were randomly assigned to one of the two conditions: HE or control. Students in the control condition were those who did not study the *Happiness Engineering* subject. Data were collected at two time points: immediately after the 12-week intervention and at a 4-week follow-up. Various measures were used to assess the outcomes of interest, including physical symptoms, gratitude, prosocial behavior, appreciation toward aid, and subjective well-being. Understanding the impact of teaching this subject on teenagers' well-being can inform the development of interventions and strategies that foster positive psychological functioning and contribute to their overall development. The researchers postulated that active participation in the *Happiness Engineering* class would yield augmented levels of subjective well-being, heightened appreciation toward acts of assistance, enhanced prosocial behavior, and reduced physical symptoms in comparison to control conditions. By investigating these hypotheses, the study aimed to contribute to the understanding of how the *Happiness Engineering*

subject can promote well-being and provide valuable insights for intervention that is targeted at Indian students of standards 11 and 12.

2. Method

2.1. Participants

The sample for this study comprised 216 senior secondary school students from grades 11 and 12, with a mean age of 17.84 and a standard deviation of 0.59. The sample was divided into two groups: HE (n = 107) and Control (n = 109). The students in the experimental group were enrolled in the *Happiness Engineering* subject, whereas those in the control group were not. A total of 7 classes took part in this study, where three classes were studying the subject of *Happiness Engineering*, and four classes were not. In terms of the demographic composition of the sample, approximately 49.8% of the participants were male, 40.7% were female, and 9.5% did not report their gender. The majority of the participants identified as upper castes (Brahmins and Rajputs), accounting for 68.9% of the sample. It is noteworthy that within the control group, there was one class that failed to fulfill the measurement requirements during one of the daily data collection sessions, specifically on the 11th day. This was primarily because the teacher inadvertently forgot to distribute the data collection packets to the students in that particular class on that specific day. Further information regarding the differences between these distinct groups can be found in the results section of the study. These details regarding the sample and data collection procedures are important to consider when interpreting the study results.

2.2. Measures

Prior to the start of the study, a careful review of the existing psychological tools was conducted by a group of seven school psychologists, six professors of psychology, and both researchers. The purpose of this review was to ensure that the language used in the tools was appropriate for the age range of the participants in the current study. The school psychologists and professors of psychology examined the tools with a critical eye, considering factors such as readability, clarity, and comprehension. To ensure the suitability of the measures, the researchers conducted a pilot test using a subset of students randomly selected from the school population. It is worth noting that these students were not included in the final sample of participants for the actual study. The purpose of the pilot test was to gather feedback from the students regarding their understanding of the measures, any difficulties they encountered, and any suggestions they had for improving the clarity or wording of the items. The feedback collected from the pilot test, along with the recommendations provided by the school psychologists and professors of psychology, was considered by both researchers. Based on this feedback, a final version of the measures was created, incorporating revisions and refinements to ensure optimal clarity and comprehension. Both researchers of the study played a crucial role in the construction and finalization of the tools. They carefully reviewed the revised versions and engaged in discussions to address any discrepancies or concerns. Their objective was to reach a consensus on all items, ensuring that they accurately assessed the constructs in a manner suitable for the target age group. This iterative process of review and refinement reflects the researchers' commitment to rigor and attention to detail in the development of the final version of the tools. By ensuring that the tools were appropriate and understandable for the participants, the researchers aimed to maximize the validity and reliability of the data collected, ultimately enhancing the quality and integrity of the study's findings. The researchers employed a specific assessment schedule in this study, administering certain measures at different data points. During the pretest phase, participants were asked to complete several measures. First, they provided demographic information, which included details such as their age, gender, and caste. This information helped characterize the sample and provide important contextual information for the study. In addition to demographics, participants also completed measures assessing various aspects of their well-being. These measures aimed to capture their subjective evaluation of their own well-being, including their overall life satisfaction and physical symptoms they may have been experiencing. The researchers were interested in understanding how the intervention (teaching *Happiness Engineering* subject) would impact these dimensions of well-being. Participants completed a measure that assessed their prosocial behavior. This measure aimed to capture participants' tendencies to engage in helpful and considerate actions toward others. The researchers were interested in examining whether teaching the *Happiness Engineering* subject would influence participants' proclivity to exhibit prosocial behaviors. Between the pretest and posttest, two measures were completed: the prosocial behavior measure and the well-being ratings. This interim assessment aimed to capture any immediate changes in well-being and prosocial behavior resulting from the intervention. This allowed the researchers to assess the short-term impact of the intervention. By collecting data at multiple time points, the researchers were able to examine the sustained effects of teaching *Happiness Engineering* subject to 11th and 12th standard students. The pretest provided baseline data, allowing for a comparison of participants' initial state with their subsequent responses. This comprehensive assessment strategy enabled the researchers to explore how the intervention influenced different dimensions of well-being, such as prosocial behavior, reactions to aid, physical symptoms, gratitude, and life satisfaction. By administering the measures consistently across different data points, the researchers ensured the collection of robust and reliable data to address the research questions and objectives.

2.2.1 Prosocial behavior

In this study, participants were asked to report their engagement in prosocial behavior on a daily basis throughout 12 weeks. Prosocial behavior refers to actions that are intended to benefit others or contribute positively to society. To assess participants' involvement in prosocial behavior, they were presented with two specific questions and asked to respond with either "yes" or "no." The first question asked participants if they had helped someone with a problem since the previous day. This item aimed to capture instances where participants had provided practical assistance or support to someone facing a difficulty or challenge. By answering "yes," participants indicated that they had indeed engaged in helping behavior by offering tangible assistance to another individual. The second question focused on participants' provision of emotional support. Participants were asked if they had offered someone emotional support since the previous day. Emotional support encompasses providing comfort, empathy, or understanding to others who may be experiencing emotional distress or difficulties. By answering "yes" to this question, participants indicated that they had provided emotional support to someone, either through listening, offering kind words, or being emotionally present for that person. These two questions aimed to capture different aspects of prosocial behavior, encompassing both practical and emotional forms of support. The inclusion of these items allowed researchers to assess the frequency and extent of participants' prosocial behaviors in their daily lives. By asking participants to report their prosocial behavior on a daily basis, the researchers gathered data on the frequency and occurrence of these behaviors over time. This daily assessment approach provided a more detailed and comprehensive understanding of participants' prosocial tendencies compared to relying on retrospective recall over longer time periods. The "yes" or "no" response format offered a simple and straightforward method for participants to indicate whether they engaged in prosocial behavior each day. This format allowed for quick and efficient data collection and reduced the cognitive burden on participants, enabling them to provide responses without excessive effort or complexity.

2.2.2 *Responses to Assistance, Benefit, or Help Received from Others*

Participants were asked to indicate how they handled their most serious problem by checking off one or more coping responses from a provided list. The available coping response options encompassed accepting empathy and solace from another individual, engaging in conversations with someone to express their emotions and thoughts, and actively seeking assistance or guidance from a supportive individual. If participants selected any of these coping responses, they were then asked to rate their feelings toward the person who had helped them using a set of specific adjectives. The researchers provided a list of affect adjectives that captured different emotional states participants might have experienced toward the person who offered them support. The adjectives included appreciative, frustrated, glad, understood, surprised, embarrassed, annoyed, and grateful. Each adjective was followed by a Likert scale, allowing students to designate the intensity of each emotion they felt toward the helper. By including this assessment tool, the researchers sought to understand how participants perceived and responded to the assistance they received when facing their most serious problem. Examining participants' emotional responses toward the person who helped them provided insights into their level of gratitude and how it relates to their overall coping experience. The use of a Likert scale allowed participants to quantify and express the intensity of their emotions, providing a more nuanced understanding of their subjective experiences. The range of adjectives provided covered a broad spectrum of emotional states, including positive emotions such as gratitude, gladness, and appreciation, as well as potentially negative emotions such as annoyance or frustration. This comprehensive set of adjectives allowed participants to accurately capture their emotional responses toward the helper.

2.2.3 *Physical Symptoms*

To assess participants' physical symptoms, the researchers asked them to indicate which emotional sensation they had undergone over the course of this study. A list of symptoms was provided, and participants were instructed to check off the symptoms they had encountered. The reported symptoms encompassed a range of physical discomforts, comprising headaches, dizziness, abdominal distress or discomfort, respiratory difficulties, chest pain, nasal congestion, sensations of coldness or excessive heat, diminished appetite or anorexia, coughing or a sore throat, muscular stiffness or soreness, as well as feelings of nausea or an impending urge to vomit. The inclusion of a physical symptoms assessment in the study was important because physical health is closely linked to overall well-being. By examining the presence and frequency of physical symptoms, researchers gained insights into the participants' self-perceived health status. Using a checklist format allowed for a straightforward and efficient way for participants to indicate the symptoms they had experienced. This method simplified data collection and provided a standardized approach to assessing physical symptoms across participants. By incorporating this measure into the current study, the researchers aimed to assess the participants' physical well-being and any potential changes in symptoms over the 12-week period. By including this assessment, researchers examined the relationship between physical symptoms and psychological well-being.

2.2.4 *Life satisfaction*

In this study, the researchers employed two items to assess participants' overall life satisfaction. These items were chosen for their ability to capture both concurrent and prospective assessments of life satisfaction. The use of a Likert scale allowed participants to express their subjective evaluation of their overall life satisfaction within the given timeframe. By providing a range of response options, participants selected a point on the scale that aligned with their perception of their current life satisfaction, enabling the researchers to quantify and analyze these subjective evaluations. In addition to assessing current life satisfaction, the researchers were also interested in participants' prospective evaluations of their life satisfaction. By including a prospective assessment, the researchers understood participants' expectations and anticipations regarding their future life satisfaction. This item allowed participants to provide insights into their perceptions of their future well-being, considering the upcoming week. The Likert scale provided a quantitative measure that allowed for comparisons and analysis of participants' expectations across different conditions or groups. Using these two items, the researchers examined both the current and prospective dimensions of participants' overall life satisfaction. This comprehensive assessment approach offered a more inclusive and wide-ranging understanding of participants' subjective evaluations of their life satisfaction at different time points. While self-report measures of life satisfaction are subjective and reliant on individuals' perceptions, they are widely used and have demonstrated utility in understanding individuals' subjective well-being.

To evaluate the multifaceted nature of life satisfaction, the researchers employed a scale devised by Seligson, Huebner, and Valois (2003) called the Brief Multidimensional Students' Life Satisfaction Scale (BMSLSS). This scale was designed to gauge overall life satisfaction as a higher-order construct, as well as various lower-order constructs using individual items. The BMSLSS encompasses five items that capture distinct domains of life satisfaction. These domains encompass familial relationships, friendships, the school experience, self-perception, and the quality of the living environment. To assess their satisfaction within each domain, participants were requested to rate their level of contentment using a Likert scale, where 1 represents extreme dissatisfaction and 7 signifies utmost delight. The scale provided a comprehensive assessment of various aspects of life that contribute to overall life satisfaction. By including multiple domains, the BMSLSS acknowledged that life satisfaction is not a unitary construct and can be influenced by different areas of individuals' lives. This approach allowed for a nuanced understanding of participants' satisfaction in specific domains, in addition to their overall life satisfaction. To calculate the overall life satisfaction score, the researchers summed the scores across the five items. This score provides a general indicator of participants' satisfaction with their lives as a whole. By examining both the overall score and individual domain scores, researchers gained insights into which specific areas contributed toward participants' overall life satisfaction. The BMSLSS has demonstrated good internal consistency, with reliability coefficients (alphas) of .75 for middle school students and .81 for high school students. These coefficients indicate that the scale items consistently measure the construct of life satisfaction within the respective samples. Construct validity, which refers to the extent to which a scale measures the intended construct, has been supported by the BMSLSS. Confirmatory factor analyses indicated a strong relationship between the scale and the concept of overall life satisfaction. By considering both the overall life satisfaction score and individual domain scores, researchers captured the multidimensional nature of life satisfaction and gained insights into specific areas that contribute to overall well-being. The scale's use of a Likert scale response format provided a standardized and quantifiable way for participants to express their levels of satisfaction in each domain. The response options allowed for distinctions between varying degrees of satisfaction, enabling participants to provide nuanced and differentiated responses.

2.2.5 *Wellbeing ratings*

In this study, the researchers utilized a set of 25 affect terms. These affect terms were used to capture a range of emotional experiences that participants might have encountered during their daily lives. These items aimed to cover a wide spectrum of emotional states that individuals might experience. The selected affect terms included terms such as "scared," "proud," "jittery," "afraid," "inspired," "active," "enthusiastic," "hopeful," "hostile," "attentive," "thankful," "determined," "guilty," "nervous," "strong," "upset," "grateful," "ashamed," "irritable," "alert," "excited," "distressed," "interested," "appreciative," and "forgiving." To assess participants' experiences of these affective states, a Likert scale was employed. Participants were requested to assess the magnitude of each emotional state they encountered "since yesterday" on a daily basis. The evaluation entailed employing a Likert scale spanning from 1 (indicating minimal or no presence) to 5 (denoting a high degree of intensity), thereby enabling participants to signify the extent to which they experienced each specific emotion. By using this set of affect terms and the Likert scale, the researchers aimed to capture participants' daily fluctuations in emotional experiences. This approach provided a nuanced understanding of participants' affective states over time, enabling the researchers to examine how the teaching of the *Happiness Engineering* subject influenced participants' emotional well-being on a day-to-day basis. Collecting daily ratings of affective experiences provided a detailed and fine-grained understanding of participants' emotional states, allowing for an examination of short-term fluctuations and changes resulting from the intervention. This approach enabled the researchers to explore whether teaching the subject of *Happiness Engineering* has an immediate impact on participants' emotional experiences or whether its effects unfold gradually over time.

2.3. Procedure

The PI (Principal Investigator), who is the first author of this paper, engaged in overseeing the teaching of 4 teachers whom the researchers of this investigation had hired and trained to teach the *Happiness Engineering* subject. Lesson plans and unit plans for 12 weeks were prepared beforehand and given to the hired teachers for the teaching of the *Happiness Engineering* subject. The modalities of the curriculum's transaction were briefed to the four teachers. These teachers were hired for a period of four months. The four teachers were extensively trained by both researchers online for four months over the Zoom meeting app before the commencement of the *Happiness Engineering* class (i.e., before the commencement of this study). The details of the pretest/posttest quasi-experimental design that was to be administered to the sample were explained to the hired teachers. First, a pretest was administered. The four teachers then taught the *Happiness Engineering* to the three classes in two schools, and subsequently, a posttest was administered. The teaching continued for 12 weeks without a break. Finally, a follow-up test was administered. The sample for this study comprised 216 senior secondary school students from grades 11 and 12, with a mean age of 17.84 and a standard deviation of 0.59. The sample was divided into two groups: HE (n = 107) and Control (n = 109). The researchers employed a quasi-experimental design to investigate the effects of HE and Control conditions on the participants. The students in the experimental group were enrolled in the *Happiness Engineering* subject, whereas those in the control group were not. A total of seven classes took part in this study, where three classes were studying the subject of *Happiness Engineering*, and four classes were not. This distribution ensured that an approximately equal number of classes were exposed to each condition, promoting fairness and reducing potential biases in the results. The random assignment of classes to conditions helped to establish comparability between the groups, enhancing the validity of the findings. By including students from various backgrounds, the researchers aimed to capture a broader spectrum of experiences and perspectives. This approach enhanced the generalizability of the findings and allowed for a more comprehensive understanding of the effects of interventions across different subgroups within the student population. The researchers included as many students from the seven classes as possible to enhance the statistical power and reliability of the results. It is important to note that the control group consisted of four classes that did not receive any specific treatment or intervention. The control group served as a baseline comparison against which the HE conditions were assessed. By comparing the outcomes of the experimental group to those of the control group, the researchers examined the unique effects of the HE condition on the measured variables. The quasi-experimental design with random assignment of classes to conditions ensured a representative sample and reduced potential biases.

Several weeks before the study began, the PI (first researcher) took the initiative to introduce himself to the entire classroom. He addressed the students and informed them about the upcoming research, explaining the *Happiness Engineering* subject, its purpose, and the pedagogy that would be applied. He told them that during the class, he would seek their help to answer questions about their thoughts and feelings. He sought their cooperation. This initial interaction aimed to establish rapport and create a positive atmosphere of collaboration between the principal investigator and the students. A week prior to the commencement of the pretest phase, the PI undertook the task of conducting individual meetings with each of the four hired teachers who participated in the study. These meetings served as a platform for the PI to comprehensively apprise the teachers of all the measures and provide them with an overview of the study's instructions. This meticulous step was crucial in ensuring that the teachers possessed a thorough understanding of the study's protocols and were well-equipped to facilitate the process of data collection. By engaging in these individual meetings, the researchers aimed to foster a collaborative and informed environment among the teachers, instilling a sense of confidence in their roles as integral facilitators of the research. This personalized approach allowed for direct communication, enabling any potential queries or concerns raised by the teachers to be addressed promptly. To maintain the integrity of the study, a strategic decision was made to keep three out of the four teachers unaware of the specific hypotheses and blind to the experimental conditions. Moreover, it served as an opportunity to emphasize the significance of maintaining confidentiality and minimizing potential bias that could inadvertently influence the outcomes. The intentional blinding of the three teachers to the specific hypotheses and experimental conditions was a deliberate methodological choice. It served to minimize the possibility of unintentional bias or expectancy effects that could arise from the teachers' knowledge of the precise nature of the study. This approach ensured that the data collection process remained as objective as possible, reducing the potential for any inadvertent influence on the results. The researchers' proactive initiative of conducting individual meetings with the teachers, familiarizing them with the measures and instructions, demonstrated a commitment to transparency and standardization within the study.

To ensure the intervention's uniformity, a standardized script was furnished to the teachers. All four teachers were assigned different modules to teach as per their expertise. Clear instructions were given to the teachers in the lesson and unit plans about the transaction of the *Happiness Engineering* curriculum, the teaching-learning materials (TLMs) to be used, and the pedagogy to be employed. Adherence to the predetermined protocols served as a crucial tool in maintaining the fidelity of the intervention, thus establishing a consistent framework for all participants. By tailoring the instructions to the specific conditions assigned to each teacher, the study aimed to deliver a targeted and appropriate intervention to the participants, ensuring that they received consistent guidance and support throughout the study. Despite the inherent

challenges posed by scheduling and class size constraints, steps were taken to mitigate potential variations and ensure the integrity of the intervention across all classrooms. The researchers conducted several random integrity checks to address the potential influence of demand characteristics. By randomly selecting specific time points to collect the data, the researchers assessed whether the instructions and procedures were followed accurately and consistently across classrooms. The use of a standardized protocol for the study and regular integrity checks served multiple purposes. First, it helped standardize the intervention and reduce potential variations in how the study was presented across classrooms. This standardization was crucial to ensure that participants in different conditions received comparable information and instructions. Second, the standardized protocol helped mitigate demand characteristics by minimizing potential cues or biases that teachers might unintentionally convey to the students. By providing teachers with a consistent framework, the researchers aimed to create a neutral and objective environment for the participants to engage with the study. By collecting data packets from each teacher on a daily basis, the researchers monitored adherence to the study protocols and detected any deviations or inconsistencies that might have arisen. These checks added an additional layer of quality control and increased confidence in the reliability of the data collected.

3. Results

3.1. Well-being

3.1.1 Gratitude

The results revealed differences in felt gratitude among the conditions immediately after the intervention. Additionally, it suggested continued differences in felt gratitude among the conditions during the 4-week follow-up period. Effect sizes indicated that the observed effects were small to medium in magnitude, indicating a meaningful impact of the experimental conditions on felt gratitude. To further examine the differences, follow-up tests were conducted. The findings revealed that individuals in the HE conditions exhibited markedly higher levels of gratitude than those in the control group during both the post-test and follow-up evaluations. These results demonstrated a statistically significant difference, indicating that engaging in classroom activities of *Happiness Engineering* subject had a discernible impact on participants' overall sense of gratitude, persisting even after the intervention period. This suggests that studying *Happiness Engineering* had a positive impact on participants' felt gratitude, as they reported higher levels of gratitude compared to those who did not study the subject. The researchers also explored whether there was an interaction between gender and condition. The results did not reveal a significant interaction, indicating that the relationship between gender and condition did not significantly influence felt gratitude at these time points. This suggests that the effects of the gratitude intervention on felt gratitude were consistent across both male and female participants.

3.1.2 Positive and negative affect

The information procured after the analysis of data does not indicate any significant disparities in positive affect reported by participants across the two conditions. However, when scrutinizing negative affect, notable distinctions emerged among the conditions. Specifically, employing the 71-day negative affect composite as the dependent variable, a substantial main effect for condition surfaced. This main effect yielded an F value of 6.92 and a p-value below .01, denoting statistical significance. The effect size, as gauged by η2, was .07, suggesting a moderate impact. To delve further, subsequent analyses were performed via follow-up tests to explore the specific dissimilarities between the two conditions. These findings underscore the positive impact of the HE condition in reducing negative affect. Thus, the results signify the absence of a main effect for condition on positive affect. These findings emphasize the potential advantages of teaching *Happiness Engineering* subject for the emotional well-being of students.

3.2. Life Satisfaction

A significant main effect emerged for satisfaction with the school experience. The HE group expressed significantly greater satisfaction with their school experience compared to the control group. This finding indicates that the HE intervention positively influenced participants' satisfaction with their school environment, highlighting the beneficial effects of learning HE subject on school-related satisfaction. The same analyses conducted previously were replicated, this time using the ratings of life satisfaction at the 4-week follow-up. The objective was to investigate how the different conditions (HE and control) influenced participants' assessments of life satisfaction after a 4-week period. The results revealed that participants in the HE group provided more favorable ratings for their upcoming week compared to those in the control condition. This finding suggests that learning the HE subject had a positive impact on participants' outlook for the future, indicating that HE subject can foster a more optimistic perspective. Consistent with the findings from the posttest stage, participants in the HE condition reported significantly higher satisfaction with their school experience compared to the control condition. This signifies that learning *Happiness Engineering* can enhance satisfaction and foster positive experiences

within the school environment, emphasizing the benefits of introducing *Happiness Engineering* as a compulsory school subject across India.

3.3. Physical Illness

The study generated a health composite score for the 4-week follow-up and the post-test. To create this composite score, the values of 12 items were summed at each data point. The purpose of this composite score was to capture an overall measure of participants' health experiences. By combining the values of the 12 items into a composite score, researchers aimed to obtain a comprehensive assessment of participants' health experiences. These items likely encompassed a range of factors related to physical health, such as physical symptoms, overall well-being, or specific health indicators. The inclusion of multiple items allowed for a more comprehensive and robust evaluation of participants' physical health. The findings indicated that the factors or interventions being studied did not have a substantial impact on participants' physical well-being. The lack of significance suggests that any observed differences in health outcomes or conditions were likely due to chance or other nonsignificant factors.

3.4. Reactions to Acts of Assistance

The ratings of well-being and life satisfaction were examined at three distinct time points: pretest, posttest, and the 4-week follow-up. These ratings were aggregated and subjected to analysis in relation to the reported emotions of gratitude evoked by acts of assistance. To gauge these emotions, a composite of gratitude was constructed by summing the feelings of gladness, understanding, appreciation, and gratefulness. Bivariate correlations were conducted to explore the associations between the gratitude composite and various measures of well-being at each data point. These measures encompassed positive affect, life satisfaction during the preceding weeks, optimism regarding the forthcoming week, and overall life satisfaction. The findings unequivocally demonstrated that there were significant correlations between the emotions of gratitude arising from assistance and the measures of well-being at all three data points, with a significance level of $p < .01$. This implies that individuals who reported higher levels of grateful emotions also tended to experience more positive affect and greater satisfaction with their lives. The findings indicate a positive relationship between gratitude and well-being, suggesting that the experience of gratitude can contribute to a more positive outlook and higher life satisfaction. In contrast, upon investigating the association between the well-being measures and negative reactions to acts of assistance, encompassing feelings of frustration, embarrassment, or annoyance, significant positive correlations were conspicuously absent. Instead, a noteworthy number of the correlations exhibited significant negativity, suggesting that negative reactions to acts of assistance were linked to diminished levels of well-being. This suggests that negative emotions in reactions to acts of assistance may have detrimental effects on well-being, highlighting the importance of cultivating positive emotions for overall psychological well-being. These findings emphasize the significance of teaching the *Happiness Engineering* subject (to which Gratitude is one of the modules) in promoting positive affect and life satisfaction. It is pertinent to highlight that experiencing surprise in reactions to acts of assistance demonstrated a positive correlation with positive affect at both the posttest and the 4-week follow-up. This implies that being caught off guard by acts of aid can elicit positive emotions. When considered collectively, the data unequivocally indicate a discernible connection between grateful emotions in reactions to acts of assistance and positive affect, as well as various facets of life satisfaction. These findings underscore the profound significance of cultivating feelings of gratitude in response to acts of kindness, emphasizing their potential impact on individuals' overall well-being and life satisfaction.

3.5. Prosocial Behavior

The researchers examined the relationship between teaching *Happiness Engineering* and prosocial behavior in students of standards 11^{th} and 12^{th} (a late teenage population). To assess prosocial behavior, a comprehensive measure was constructed by integrating data from multiple time points, encompassing the pretest, posttest, 4-week follow-up, and the 12-week interval between the pretest and posttest. The composite score for the pretest, posttest, and follow-up was derived by summing the scores of two carefully devised items aimed at capturing participants' inclination toward acts of helpfulness and cooperation. These items were thoughtfully designed to tap into individuals' propensity for engaging in prosocial acts. Moreover, a 12-week aggregated score was computed by averaging the scores of these two items over the 12-week period spanning from the pretest to the posttest. The presence of significant correlations between the two items at each time point indicates that they consistently measured the underlying construct of prosocial behavior throughout the duration of the study. Subsequently, the researchers sought to investigate the primary impact of the experimental condition on the composite scores of prosocial behavior, analyzing the 12-week aggregate, posttest, and 4-week follow-up measures. By creating a composite score from multiple time points, the researchers obtained a comprehensive understanding of participants' prosocial behavior over an extended period. The inclusion of the 12-week aggregate score allowed for an assessment of sustained prosocial behavior beyond the immediate intervention period. This approach enabled the researchers to capture potential changes in participants' prosocial tendencies over time and evaluate the overall impact of

the experimental condition. Analyzing the main effect of the condition (teaching of *Happiness Engineering* subject) on the prosocial composite scores at different time points offered valuable insights into the efficacy of the intervention in promoting prosocial behavior. By comparing the scores between different conditions, the researchers assessed whether the experimental condition had a significant influence on participants' prosocial behavior, both in the short term (posttest and 4-week follow-up) and in the longer term (12-week aggregate). The results strongly suggest that teaching and learning the subject of *Happiness Engineering* nurtures a sense of prosocial behavior, contributing to the experience of positive emotions and an enhanced sense of life fulfillment.

4. Discussion

One of the most striking and captivating outcomes of this study is the notable revelation that participants assigned to the HE group consistently reported significantly higher levels of satisfaction with their school experience compared to their counterparts in the control conditions. This compelling finding remains robust and persistent across both the immediate post-test and the 4-week follow-up assessments. The significance of this particular finding should not be understated, particularly in light of previous research that has highlighted a substantial proportion of high school students expressing discontentment with their school experiences (Huebner et al., 2000). When students express a sense of satisfaction with their school experience, it signifies a positive disposition toward attending school, deriving pleasure from school-related activities, perceiving the educational environment as intellectually stimulating, feeling at ease within the school milieu, and recognizing personal growth and academic progress. Importantly, school satisfaction has been strongly linked to both academic and social success, as underscored by Verkuyten & Thijs (2002). Therefore, the finding that the teaching of *Happiness Engineering* subject resulted in heightened school satisfaction implies that teaching *Happiness Engineering* subject has the potential to counter negative academic experiences and potentially alleviate other adverse outcomes, such as low grades or absenteeism. This finding holds immense significance, as it offers a practical and effective approach to enhance students' satisfaction with their school experience. By actively encouraging students to take up *Happiness Engineering* as a compulsory school subject, educators and administrators may be able to positively impact students' overall perception of their academic environment and foster a more favorable attitude toward school. This intervention has the potential to counteract negative perceptions that students may develop, leading to improved well-being, engagement, and motivation within the educational context.

When students are more satisfied with their school experience, they are more likely to be motivated, engaged, and focused on their studies, which can ultimately lead to improved academic performance. Additionally, higher levels of school satisfaction have been associated with decreased absenteeism, as students who perceive school positively are more inclined to attend regularly. By addressing students' satisfaction with their school experience through teaching the subject of *Happiness Engineering*, educators may indirectly contribute to better educational outcomes and support students' overall development and success. Furthermore, the practicality, feasibility, and effectiveness of teaching the *Happiness Engineering* subject make it a promising approach for widespread implementation in educational settings across the country. The simplicity of the intervention, involving the teaching of *Happiness Engineering* subject, renders it accessible and feasible for integration into existing school routines. The twelve-week duration of the intervention allowed for sustainable changes in students' mindset and attitudes toward school, enabling long-term benefits. Moreover, the intervention's effectiveness in enhancing students' school satisfaction suggests that it could be a cost-effective and efficient strategy for schools to adopt, with the potential for widespread implementation.

This intervention holds the promise of fostering a positive school climate, enhancing academic outcomes, and promoting the holistic development of students. By encouraging students to focus on the positive aspects of their school life and fostering gratitude for those aspects, educators and practitioners can potentially improve students' overall well-being and engagement with school. This intervention provides a cognitive shift that redirects attention from the negative aspects or challenges of school to the positive elements that students can appreciate. Moreover, the positive relationship between school satisfaction and academic and social success underscores the importance of addressing students' perceptions and emotions toward their educational environment. When students feel satisfied with school, they are more likely to be motivated, engaged, and perform better academically. They are also more likely to have positive social interactions and develop meaningful connections with peers and teachers. This aligns with the notion that positive emotions and well-being are closely tied to cognitive, emotional, and social functioning.

5. Conclusions

In this research, teaching the subject of *Happiness Engineering* has been found to contribute to individuals' overall well-being and life satisfaction. The researchers establish a foundation for the importance of teaching the *Happiness Engineering* subject. The majority of the hypotheses advanced in this study were substantiated, providing evidence that the induction of teaching *Happiness Engineering* subject was associated with enhanced well-being, heightened gratitude levels, and diminished negative emotions. Notably, significant alterations were discerned at the 4-week follow-up across all

dependent variables, revealing that the teaching of *Happiness Engineering* subject was linked to augmented optimism, overall life satisfaction, and contentment within specific domains such as the school environment and place of residency. The study demonstrates that teaching the subject of *Happiness Engineering* in school children of standards 11 and 12 yields positive outcomes in terms of well-being and gratitude levels. These findings contribute to the growing body of research on positive education and its impact on positive psychological functioning.

The study also highlights the need for further exploration to better understand the underlying processes that drive the long-term effects of teaching the subject of *Happiness Engineering*. However, it is important to note that the intervention's effects on school satisfaction were assessed over a relatively short period of twelve weeks. Further research is needed to examine the long-term impact and sustainability of the intervention in promoting school satisfaction and its associated benefits. Nonetheless, these findings provide valuable insights into the potential of teaching *Happiness Engineering* as a practical and effective approach to enhancing students' satisfaction with their school experiences and potentially improving their overall academic and social success. The researchers duly acknowledge the potential impact of contextual factors or demand characteristics inherent to the study environment. It is reasonable to consider whether the students, while participating in the study within their classroom milieu, may have been influenced by situational cues. While this concern holds merit, the researchers contend that its influence on the outcomes is unlikely to be substantial. The research poses thought-provoking questions regarding the potential effects of teaching the subject of *Happiness Engineering* and its impact on one's perspective of the world. It draws a parallel between happy individuals who are more attuned to rewards in their immediate environment and the idea that engaging with the subject of *Happiness Engineering* may prime individuals to view humankind through a more appreciative lens. This research suggests that over time, this shift in perception could lead to a greater overall sense of gratitude.

Furthermore, the research raises the question of how teaching the subject of *Happiness Engineering* may influence one's cognitive schema, which encompasses the core beliefs and frameworks through which individuals interpret the world. It ponders the potential specific outcomes that may result from this influence. Drawing from research indicating that positive emotions, such as joy and contentment, can expand an individual's thought-action repertoire, this research proposes that felt gratitude may also lead to outcomes relevant to the success of children and adolescents within educational settings. These outcomes could encompass various aspects, including academic improvements, increased attendance, and the development and maintenance of positive peer relationships. To explore these possibilities, this research suggests that future research should investigate the effects of teaching *Happiness Engineering* subject on a range of outcome variables. In addition to academic indicators such as grade improvement and attendance rates, researchers should consider other related variables such as disciplinary actions (e.g., detention rates), standardized test scores (e.g., CAT, GRE, GATE, JEE, and NEET scores), and long-term achievements such as college acceptance rates. To capture the dynamics and changes over time, this research emphasizes the importance of utilizing a longitudinal research design.

Ethical Considerations

All subjects gave their informed consent for inclusion before they participated in the study.

Declaration of interest

No potential conflict of interest was reported by the authors.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

References

Brown, C., & Shay, M. (2021). From resilience to wellbeing: Identity-building as an alternative framework for schools' role in promoting children's mental health. *Review of Education*, *9*(2), 599-634.

Cooperrider, D., Whitney, D & Stavros, J. (2008). *Appreciative inquiry handbook for leaders of change* (2nd ed.). Brunswick, OH: San Francisco, CA: Crown Custom Publishing; BK, Berrett-Koehler.

Freud, A. (1958). Adolescence: the psychoanalytic study of the child, 16, pp. 225-278

Gillett-Swan, J., Graham, L., Cayas, A., & Crisp, N. (2019). A Wellbeing Framework for Action to support student voice implementation in schools. Queensland University of Technology, Brisbane.

Holmbeck, G. N., & Kendall, P. C. (2002). Introduction to the special section on clinical adolescent psychology: Developmental psychopathology and treatment. *Journal of Consulting and Clinical Psychology*, *70*(1), 3.

Huebner, E. S., Drane, W., & Valois, R. F. (2000). Levels and demographic correlates of adolescent life satisfaction reports. *School Psychology International*, *21*(3), 281-292.

Kushlev, K., Heintzelman, S. J., Lutes, L. D., Wirtz, D., Oishi, S., & Diener, E. (2017). ENHANCE: Design and rationale of a randomized controlled trial for promoting enduring happiness & well-being. *Contemporary clinical trials*, *52*, 62-74.

Lyubomirsky, S., & Layous, K. (2013). How do simple positive activities increase well-being?. *Current directions in psychological science*, *22*(1), 57-62.

Lyubomirsky, S., King, L., & Diener, E. (2005). The benefits of frequent positive affect: Does happiness lead to success?. *Psychological bulletin*, *131*(6), 803.

Lyubomirsky, S., Sheldon, K. M., & Schkade, D. (2005). Pursuing happiness: The architecture of sustainable change. *Review of general psychology*, *9*(2), 111-131.

Martela, F., & Sheldon, K. M. (2019). Clarifying the concept of well-being: Psychological need satisfaction as the common core connecting eudaimonic and subjective well-being. *Review of General Psychology*, *23*(4), 458-474.

Myers, D. G. (1992). *The Pursuit of Happiness: Discovering the Pathway to Fulfillment, Well-being, and Enduriong Personal Joy*. Harper Collins Publishers.

Peterson, C., Ruch, W., Beermann, U., Park, N., & Seligman, M. E. (2007). Strengths of character, orientations to happiness, and life satisfaction. *The journal of positive psychology*, *2*(3), 149-156.

Salmon, G., & Wright, P. (2014). Transforming future teaching through 'Carpe Diem'learning design. *Education sciences*, *4*(1), 52-63.

Seligson, J. L., Huebner, E. S., & Valois, R. F. (2003). Preliminary validation of the brief multidimensional students' life satisfaction scale (BMSLSS). *Social Indicators Research*, *61*, 121-145.

Sheldon, K. M. (2018). Understanding the good life: Eudaimonic living involves well-doing, not well-being. *The social psychology of living well*, 116-136.

Sheldon, K. M., & Lyubomirsky, S. (2006). Achieving sustainable gains in happiness: Change your actions, not your circumstances. *Journal of happiness studies*, *7*, 55-86.

Sheldon, K. M., & Lyubomirsky, S. (2012). The challenge of staying happier: Testing the hedonic adaptation prevention model. *Personality and Social Psychology Bulletin*, *38*(5), 670-680.

Silverberg, S. B., & Steinberg, L. (1990). Psychological well-being of parents with early adolescent children. *Developmental psychology*, *26*(4), 658.

Steinberg, L. (1987). Impact of puberty on family relations: Effects of pubertal status and pubertal timing. *Developmental psychology*, *23*(3), 451.

Suldo, S. M., & Huebner, E. S. (2004). Does life satisfaction moderate the effects of stressful life events on psychopathological behavior during adolescence?. *School Psychology Quarterly*, *19*(2), 93.

Verkuyten, M., & Thijs, J. (2002). School satisfaction of elementary school children: The role of performance, peer relations, ethnicity and gender. *Social indicators research*, 203-228.

White, M. A., & McCallum, F. (2020). Responding to teacher quality through an evidence-informed wellbeing framework for initial teacher education. *Teacher education in globalised times: Local responses in action*, 115-137.

Wilson, B., Quinn, S. J., Abbott, T., & Cairney, S. (2018). The role of Aboriginal literacy in improving English literacy in remote Aboriginal communities: an empirical systems analysis with the Interplay Wellbeing Framework. *Educational Research for Policy and Practice*, *17*, 1-13.